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Economic Systems in the New Era: Stable Systems in an Unstable World

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Contents

Stable Development in Unstable World	
Project Management in the Region Within the Digitalization	3
L. K. Agaeva	
Human-Centric Marketing in the Digital Era	10
A. N. Agafonova, I. V. Yakhneeva, and G. R. Mukhametshina	
Problems of Confirmation of Work Experience During Procurement Related to Construction, Reconstruction	18
A. V. Azarkhin, A. N. Churakov, and S. I. Velezhev	
Environmental Performance Index as an Assessment Method of the Country's Ecological Security	25
N. A. Arkhipova and V. V. Kozhukhova	
Entrepreneurial Potential of Russian Regions: Comparative Assessment and Development Prospects	33
S. I. Ashmarina and G. M. Murzagalina	
Legal Regulation of Using the Artificial Intelligence Technology in the Banking	40
E. Y. Barakina and I. S. Ismailov	
Development of Conditions of Innovations Institutionalization Contributing to the Russian Sustainable Development	48
B. S. Bataeva and O. V. Kozhevina	
Formation of Macroeconomic Stabilization While Improving Digital Platforms and Effective Wealth Management	54
O. A. Bulavko and L. R. Tuktarova	
Scientific, Technological and Economic Problems of Mechanical Engineering Modernization in Russia	61
A. B. Vishnyakova, E. S. Popova, and L. M. Davletshina	

Decarbonization as a Factor of Sustainable Corporate Development Within Climate Change	67
A. V. Voyko, E. A. Sycheva, and A. F. Glisin	
From Import Substitution to Export Orientation in the Regional Agribusiness	76
E. P. Gusakova, D. E. Tsirulev, and I. S. Prokopenko	
Tariff Policy in the Electric Power Industry of Russia: Methods, Problems, Prospects	84
O. V. Danilova, K. V. Ordov, and I. Yu. Belayeva	
Joint-Stock Property Governance in State-Owned Companies in Conditions of Uncertainty	93
A. Yu. Dzardanov, O. A. Polischuk, and D. N. Zhuravleva	
Bioinformatics and Issues of Conclusion a Contract for Provision of Medical Services	99
N. G. Doronina, N. G. Semilutina, and M. A. Tsirina	
Foreign Law in the Relations Paradigm Involving a Foreign Element	108
Yu. A. Dorofeeva	
Modern Ways to Achieve Sustainable Company Growth	116
E. N. Egorova, T. A. Slepneva, and V. V. Tretiakova	
Analysis and Cost Estimation Algorithm as a Tool for Industrial Enterprise Management	123
A. P. Zhabin and E. V. Volkodavova	
New Reality of Directional Drilling Services During Production Decline and Coronavirus Pandemic	133
V. V. Zhivaeva and S. A. Lukyanov	
Stochastic Risk Factors to Capture Tendencies in Business and Economy	140
P. E. Zhukov	
EU Cohesion Policy 2021–2027: New Tools to Foster European Integration?	148
A. V. Zimakov and E. V. Popov	
The Future of Retail: Innovations and Basic Trends	157
N. V. Ivanova	
Institutional Environment Development of Innovative Economy of Russia: Problems and Solutions	164
M. A. Izmailova, M. Y. Veselovsky, and A. A. Stepanov	

Relationship Between Economy and Sports in Society	174
Yu. V. Kudinova, O. A. Loginova, and O. V. Zhukova	
Enterprise Knowledge Base Based on EDM System	179
M. V. Kurganova	
Infrastructure Platform for Creating and Distributing VR/AR Solutions	189
P. A. Kshniakin, A. D. Mokeev, and S. S. Chaplygin	
The Role of Environmental Security in the Country's Economy	197
N. V. Lazareva, V. O. Korunova, and D. A. Miasnikov	
Statistically Based Development of Corporate Innovation Metrics System	202
A. G. Litvinova and Y. A. Tokarev	
Effectiveness Assessment of Russian Special Economic Zones of Industrial and Production Type	210
E. R. Mamleeva, M. Yu. Sazykina, and N. V. Trofimova	
Digital Media in Higher Education: Disruptive or Sustaining Innovation?	219
V. V. Mantulenko and M. D. Goryachev	
Person as an Ontological Reason of Instability in the Global World Development	226
A. E. Makhovikov, V. V. Kozlov, and S. V. Palmov	
Specific Features of Organization Performance Management at Stages of Its Life Cycle	233
M. V. Merinov, A. V. Pavlova, and A. D. Khayrullina	
The Choice of Logistics Services Provider in the Regional Market	249
S. V. Noskov	
Relationship Between Social Business Entrepreneurship and Business Freedom: An Evidence from Russia	258
S. Panikarova, M. Vlasov, and E. Velinov	
Northern Latitudinal Railway Project: Priorities and Drivers	267
O. D. Pokrovskaya, R. V. Fedorenko, and A. S. Kamaletdinov	
Tourism After the Pandemic COVID-19: Potential Government Support Effectiveness	275
N. V. Polyanskova and G. I. Belyaeva	
Impact of International Standards on the Internal Environment of the Enterprise	282
A. W. Rakov and V. A. Karasev	

Competencies of Future Retailing Space	290
D. V. Ralyk	
Key Factors of R and D Process Modernization at Industrial Enterprises of Russia	296
A. R. Salkina and V. S. Charikov	
Business Stabilization During the Crisis	303
S. A. Sevastyanova	
Tools for Estimation of “Deterministic Chaos” of Economic Sectoral Mesodynamic	311
V. K. Semenychev and A. A. Korobetskaya	
Corruption Prevention on Electronic Trading Platforms	320
E. L. Sidorenko and A. M. Tsirin	
Assessment of Environmental Components in Municipal Development Strategies	327
A. A. Sidorov, G. E. Kudinova, and A. G. Rozenberg	
Integration of the Process Approach and Lean Manufacturing to Formalize Risk-Based Thinking	333
A. Yu. Smagina, I. V. Frolova, and V. A. Piskunov	
Factors of Investment Attractiveness of Industrial Enterprise Development Projects	343
A. V. Streltsov and G. I. Yakovlev	
GOELRO Plan - An Innovative Program for the Development of the National Economy	352
E. I. Sumburova and S. A. Zaelskaya	
Investment Attractiveness of Companies: Formation and Assessment	358
T. V. Tazikhina, J. V. Andrianova, and A. A. Zinin	
Big Data as an Instrument of Socio-economic Development in the Modern World	366
A. V. Timofeev, E. R. Khafiyatullina, and N. S. Agafonova	
Research of Small Business’ Problem Areas	373
E. P. Troshina, N. Z. Mazur, and M. I. Prygunova	
Theory and Practice of Management Decisions on Regional Cluster Policy Implementation	380
N. A. Ustina and A. A. Karlina	
Assessment of the Intercompany Relationship Between Business Interests and Human Capital	390
V. P. Fomin and N. A. Igoshina	

Features of the Development of Microinsurance in the Developing Countries' Insurance Markets	398
L. T. Khuzhamov, E. I. Kozhevnikova, and K. A. Zaitseva	
Forecast and Analytical Studies of Sustainable Development Directions of the Samara-Tolyatti Agglomeration	408
V. A. Tsybatov	
Management of Innovative Ecosystems in a Digital Transformation of the Economy	417
E. N. Sheremetyeva, L. A. Gorshkova, and N. V. Mitropolskaya-Rodionova	
Dependence Between Investment and Economic Development of Russian Regions: Copula Approach	424
L. K. Shiryayeva	
Legal Regime of Realtors' Activity as a Segment of Engineering Economy	430
F. F. Spanagel	
The Research on Peculiarities of the Blockchain Implementation in Global Regulatory Legislations	435
P. S. Shcherbachenko and A. E. Chibisov	
Innovations as a Factor of Agriculture Development in Russia	441
A. V. Shchutskaya	
The Concept of Shared Value in Ensuring Territories Inclusive Development	450
R. R. Gilfanov and A. P. Zhabin	
Experience of Innovations Institutionalization: Interaction of the World Scientific Community	460
E. A. Solentsova and A. A. Kapitonov	
Significance of the Organization of E-Learning Management System in a Modern University	467
I. G. Bakanova, E. A. Yelizarova, and L. V. Kapustina	
Globalization and Fragmentation Forces of the Current World Economy	
International Financial and Information Security Strategies: Key Aspects of Preventing Criminal Threats	479
E. L. Sidorenko, S. P. Kubantsev, and Z. I. Khisamova	
Legal Framework for Monetary Policy Coordination at the Global and Regional Levels	489
V. E. Ponamorenko	

Legal and Economic Implications of Central Bank Digital Currencies (CBDC)	496
E. L. Sidorenko, S. V. Sheveleva, and A. A. Lykov	
Non-standard Contractual Structures in the Operation of Digital Energy Trading Platforms	503
L. I. Shevchenko, I. A. Guliev, and T. R. Kulakhmetov	
Stability Analysis of Enterprises and Methods for Assessing the Likelihood of Bankruptcy	510
O. S. Aksinina	
Role of Integrated Information Systems for Modern Organizations	520
A. V. Balanovskaya, A. V. Volkodaeva, and A. V. Vshivkov	
Country Dependence on Commodity Resources and Exports	529
S. P. Bortnikov and G. S. Pracko	
Non-state Pension Funds as Participants of Investment Process and Their Social Responsibility	539
M. E. Valishina and E. N. Valishin	
Warehouse Services: Content, Types, Development Trends	547
N. I. Voitkevich and T. I. Solunina	
Borrow, but not Pay: Psychological Characteristics of Deviant Economic Behavior	553
M. A. Gagarina, A. N. Nevrujev, and N. A. Solovova	
Financial Flows in Logistics Under Economic Modernization	560
T. E. Gorgodze	
Socio-economic Problems and Perspectives of Globalization in the Context of Coronavirus Pandemic	567
A. V. Guryanova, M. A. Petinova, and N. Yu. Guryanov	
Intermediary Agreements in International Trade	574
M. N. Zubkova	
Criteria for Assessing the Effectiveness of Monetary Policy of the State	580
V. V. Kalmykov and A. A. Pomulev	
Interests of Russian Entrepreneurial Structure Participating in Automotive Strategic Alliances	590
E. A. Kandrashina and D. V. Aleshkova	
The Concept of Cooperation in the Activities of Transnational Corporations	596
L. K. Kirillova	

State Financial Support During the Crisis and Its Impact on Business Development	603
T. Yu. Kiseleva and L. D. Sanginova	
Financial Issues of Procurement Improvement in Russia Under Present-Day Conditions	613
T. M. Kovaleva	
Investment Attractiveness of Russian Oil and Gas Companies Under Economic Digitalization	623
O. Y. Kuzmina and M. E. Konovalova	
Digital Transformation of Society in the Context of the Russian Culture	632
A. V. Levchenko, P. P. Nikolaev, and L. V. Berbasova	
Impact of Internal and External Determinants on Capital Structure in Russian Companies	637
O. N. Likhacheva, L. A. Setchenkova, and A. S. Belikevich	
Fiscal Policy as an Emerging Factor of Social and Economic State Formation	643
A. Kh. Malikova, E. I. Kulikov, and K. A. Temir-Bulatov	
Charity as a Component of Corporate Social Responsibility of Business	648
E. Malysheva and J. Sharikova	
Assessment of the European Call and Put Options Cost of Innovative Projects	657
A. V. Mantulenko, D. A. Akopyan, and M. R. Gafarov	
Investment Banking and Its Features in Russia	664
A. M. Mikhaylov	
Financial Conditions for the Development of Entrepreneurship in a Modernized Economy	669
Natalia Morozko, Nina Morozko, and Valentina Didenko	
Innovations in the Development of the Individual Investment System in Russia	677
E. S. Nedorezova, K. N. Ermolaev, and F. F. Salamov	
Digitalization of Tax and Customs Control of Foreign Trade Operations	684
K. S. Pavlova and E. S. Smolina	
Special Aspects of Venture Capital Funding of Innovations in Russia	692
L. G. Pashtova	

Analyzing Oil Prices Impact on Russian Foreign Trade	702
N. P. Perstenyova and N. A. Zaychikova	
Main Trends in the Market of Electronic Financial Services in Russia	708
N. A. Petrov	
Intellectual Management of the Budget Process in Municipalities	713
A. A. Petrogradskaya, A. P. Korobova, and V. K. Barchukov	
Financing of Early Entrepreneurship Development: Informal Investments in Modern Economies	719
I. S. Pinkovetskaia and I. N. Nikitina	
Internal Control and Internal Auditing Definitions	726
V. A. Piskunov and T. M. Tarasova	
Insurance Activities in the Digital Economy of Russia	736
A. A. Prosvetova and E. E. Dozhdeva	
Financial Leasing as a Funding Instrument: Benefits and Opportunities	742
S. Y. Salomatina and E. M. Lebedeva	
Company Reform Based on Outsourcing as a Way of Innovative Management	749
A. N. Sivaks, A. L. Fursov, and O. A. Gorbunova	
Management Control of Tax Liabilities of Russian Enterprises in the Automotive Industry	758
A. Yu. Smagina and I. V. Frolova	
Methodological Aspects of Assessing and Forecasting the Financial Stability of an Enterprise	766
S. I. Sotskova	
Socio-economic Aspects of Intra-regional Distribution of Government Support of Housing Construction Industry	775
S. G. Sternik and G. V. Teleshev	
Financial Aspects of Companies Sustainable Growth	784
V. B. Frolova, O. V. Borisova, and M. P. Lazarev	
Impact of Russian International Trade on the Global Economy	794
M. E. Tsibareva, A. B. Malina, and M. A. Brazhnikov	
Deformation of the Federal Center's Fiscal Policy in Relation to the Regions	800
S. E. Channov, D. A. Karev, and E. G. Lipatov	

Tax Monitoring as an Instrument of State Support	809
K. S. Chernousova	
E-Money as a Financial Instrument in Globalized Economy: Russian Legislation Experience	815
E. N. Churakova and P. P. Lang	
Prospects for the Development of ICO as an Alternative Financing Instrument	822
M. S. Shalneva, D. A. Egorova, and T. A. Provotorova	
Automated Assessment of Personnel for Identifying Risk Behaviors ...	832
D. N. Frantasov, L. I. Papirovsckaya, and E. A. Chasovskikh	
Informatization Impact on Social and Economic Development of the Region	840
Yu. S. Kolesnikova, N. I. Larionova, E. R. Valeev, and D. N. Frantasov	
Potential of the Small Enterprise Value Assessment Using the Discounted FCF Method	846
P. Gráf and Z. Rowland	
Enterprise Value Assessment as an Evaluation Criterion of a Merger	856
H. Květová, J. Vrbka, and P. Šuleř	
Risk Premium and Comparison with Damodaran Methodology	864
N. Štefanová, T. Krulický, and V. Machová	
The Results of Dividend Policy Tools Can Be Surprising	876
E. Vágnerová and J. Horák	
Author Index	887

Stable Development in Unstable World



Project Management in the Region Within the Digitalization

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Abstract. This study examines the system of project management in the regions of the Russian Federation in the digital economy. Social and economic development of regions requires the use of modern management trends. Project management is currently one of the most popular areas of state policy implementation in the regions. The purpose of the research is to reveal the project management system in the region within the digital economy. Conducting the research, methods of quantitative and qualitative economic analysis and project management techniques were used. As a result of the study, it was revealed that the project management in the regions of the Russian Federation was formed in order to effectively implement national projects of country's strategic development to achieve national goals. Digital systems of planning, implementation, and monitoring are actively used in project management at both the federal and regional levels. One of the most effective tools for project management is the creation of regional project offices as the main coordinators of the project management process in the region.

Keywords: Digital economy · Digitalization · Project · Project management · Project office · Regional development

1 Introduction

Effective social and economic development of the regions of the Russian Federation in the digital economy requires the use of modern management mechanisms. One of the most promising and widely used methods of regional development management in Russian practice is project management. The application of project management in the regions is primarily justified by the implementation of a variety of projects and programs that require solving complex problems of social and economic development. At the same time, it is important to choose the most optimal ways to implement projects of various levels within limited budget and other resources. Nowadays, project management is an effective tool for implementing of state policy. The development of the digital economy in a global scale requires radical changes in all activity fields. Regional development requires the creation of new information management systems, which entails the implementation of many projects in this area. In this regard, recently, there has been an interest increase in the field of project management, which is confirmed by an increase data in the number of certificates received in the field of project management in both business and public administration [3]. Thus, project management of

regional development is an integral element of the management system in the digital economy and allows the most effective use of limited resources to achieve optimal results of social and economic development of regions.

2 Methodology

The author used various methods of economic and managerial analysis such as comparative analysis, method of qualitative assessments of the content and structure of an object or process, a graphical analysis method. The methods of project management were analyzed. In particular, the provisions of the national standard on project management were used. A critical analysis of the main project management criteria was conducted.

The project management system is currently one of the most regulated processes. There are many international and national project management standards that allow you to formalize project activities. The most well-known international project management standards for today are: ISO 21500 Guidance on project management, Individual Competence Baseline ICB V. 4 of the International project management association IPMA [2]. Among the national Russian standards, it is worth highlighting GOST R 54869-2011. National standard of the Russian Federation. Project management. Project management requirements [1]. Analysis of the project management categories formulation allowed us to note that currently in domestic practice, the categories formulated in national standards for project management are used. According to the national project management standard, “a project is a set of interrelated activities aimed at creating a unique product or service under time and resource constraints” [1, p. 7]. “Project management – planning, organization and control of labor, financial and material resources of the project, aimed at effective achievement of project goals” [1, p. 4].

The current practice of project management in the regions is based on the federal project management system. The main problem of projects implementation in the regions is a lack of resources and a high risk of deviation from the planned indicators. Based on this, we can formulate the concept of project management in the region as the initiation, planning, organization and control of project implementation in limited resources and risk conditions.

3 Results

The following types of projects are currently being implemented in the Russian Federation: national projects, federal projects, regional projects. Since 2016, the regions of the Russian Federation face the task of organizing project management in order to implement priority areas of strategic development of the country using the potential of the regions. In 2018, project management in the regions received a new direction of development related to the implementation of national projects in the framework of achieving national goals and strategic development goals of the Russian Federation for the period up to 2024. This required the formation of an effective project management system in the regions, allowing to optimally coordinate this process using digital

technologies. One of the ways to optimize the process of project management in the regions using digital technologies is to create a model of business procedures simplifying and the investment attractiveness of the regions increasing. As a part of this project, an information system for region – ID target models implementing was created as the main tool for implementing target models in regions. Also, an effective tool for implementing project management in the regions is the creation of regional project offices as independent divisions in the executive authorities in order to develop project activities, coordinate and monitor the implementation of national projects. Regional project offices operate in accordance with the principles of project management with full employment of employees and the availability of authorities. Figure 1 shows the functional structure of the project management system in the Samara region and the position of the project office in this hierarchy.

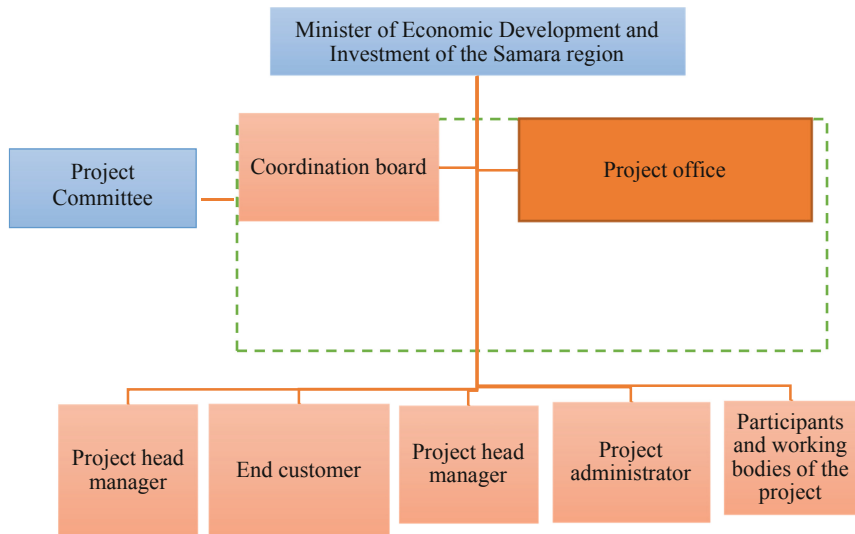


Fig. 1. Functional structure of the project management system in the Ministry of Economic Development and Investment (Samara region) (Source: author based on [6]).

The coordinating council and the project office are the permanent management bodies of the Ministry. In the process of project implementation, temporary project management bodies are created. These bodies are project committee, project supervisor, end customer, project manager, project administrator, project participants and working bodies. Such project management structure in the region corresponds to the methodological recommendations on the project management implementation in the executive authorities. Table 1 shows the project management system in the Ministry of Economic Development and Investment of the Samara region.

The system presented in Table 1 provides unification of project management approaches in the system of executive authority of the Samara region. This system defines the conditions, principles and procedure of project activities implementation in the region.

Table 1. Project management system in the Ministry of Economic Development and Investment of the Samara region

The stages of the project implementation	Actions	The subjects of project management
The initiation stage	Project proposal	Initiator
	Registration and project evaluation	Project office
	Consideration of the project proposal	Coordination board
	Decision-making of a project launching	Coordination board
	Approval of the customer, project supervisor, and project head manager	Coordination board
	Approval by the Minister	Economic development Minister
Planning stage	Organization of project planning	Project head manager
	Defining the preparation procedure, requirements, and current forms of management documentation	Project office
	Providing the project with resources and compliance with the terms and procedure for approving the package of management documentation for the project, timely problems solving	Project supervisor
	Defining the requirements goals for the project product and their proper reflection in the management documentation	Functional customer
	Review of the management documentation package	Project office Coordination board
	Approval of the project passport and project management plan	Economic development Minister
	Implementation stage	Provision of project by resources and time observance of project implementation, timely problems solving
Project implementation and goals achievement		Project head manager
Correlation of actual results and indicators with planned ones		Project office
Implementation of organizational and technical support of the project head manager activities; provision of project implementation monitoring, preparation of changes requests		Project administrators
Change management in the project		Project head manager

(continued)

Table 1. (continued)

The stages of the project implementation	Actions	The subjects of project management
Completion stage	Preparing the project final report	Project head manager
	Execution of the project head manager's instructions, forming of the project archive	Administrator
	Sending project materials to the project administrator for the project archive forming	Working bodies of the project
	Ensuring the final project report review by the Coordinating Council	Project office
	Review of the final project report and decision-making	Coordination board
	Approving of the final project report	Economic development minister

Source: author based on [6].

The project management system is based on federal and regional legal acts. Thus, the considered system of project management in the region on the example of the Samara region characterizes the main principles of this process during the implementation of national projects of strategic development of the Russian Federation. At the moment, the regions are actively developing an optimal system adapted to the conditions of a particular subject of the Russian Federation development, while clearly complying with government recommendations and requirements of international and national standards in the field of project management.

4 Discussion

Project management is one of the most relevant area in the sciences and practical society. Nowadays, many studies of domestic and foreign scientists have been presented, revealing effective directions of project management at various levels of management. The largest research in the field of project management was conducted by foreign researchers. Thus, Larsson and Larsson reveal the current direction of sustainable project management-planning, monitoring and control of project implementation and support processes, taking into account the environmental, economic and social aspects of the resource life cycle, processes, results and project results, aimed at implementation of benefits for stakeholders and implemented in a transparent manner. "a fair and ethical way that includes active participation of stakeholders." This definition implies a more holistic approach to projects in which multiple stakeholders

simultaneously participate in project management activities and benefit from the project in social, environmental, and monetary terms [5].

In the field of public project management in the digital economy Lappi, Aaltonen, Kujala suggest a three-level project management model for projects in the field of digitalization and ICT. This allows head managers and practitioners to work in the context of public sector digitalization to better understand how project management practices affect ICT projects from an e-government perspective [4].

In another study, these authors note that digital transformation, or digitalization, is one of the global megatrends that drive reforms of private and public sector organizations by implementing information and communication technology (ICT) solutions to optimize operations and provide better services to customers or citizens. Digitalization challenges the technological, organizational, and cultural thinking and capabilities of institutions and individuals, which can be a challenge, especially in the public sector, as governments must also decide legal, political, and public issues related to accountability by seeking digitalization at the national level or “e-government”. However, understanding the processes impact underlying this reform, connects different levels of public management - the level of strategic management (for example, government, Parliament), the average level of executive authorities (for example, government, Parliament). ministries, departments) and operational (ICT project) level are limited. Digitalization of the public sector, like any strategic transformation process, is ultimately carried out through ICT projects, from a simple specialized agency Internet portal to extensive multi-organizational operations management systems. From the point of view of digitalization and the point of view of ICT projects, it is extremely important to connect these projects with the digitalization strategy by ensuring the correctly targeted and properly implemented project goals [5].

Zhai, Shan, Darko, and Le note that over the past two decades, project management has attracted more attention from researchers and practitioners around the world and has become an important research area of project management. However, there is still no inclusive, quantitative and systematic analysis of recent research in this area [9].

Too, Le, and Yap, believe that in order to achieve optimal return from investment in the project, there must be a clear link between the results generated by the project and the goals of the organization. Thus, organizations must have a specific structure, so the project results would conform their organizational goals. Thus, project management is critical for influencing the success or failure of projects. Lack of support, conflicting goals, and other contextual issues in the field of senior management can have a negative impact on the progress and results of the project [8]. Among the domestic studies in the field of project management of the region, we should highlight the conclusions of Ramenskaya and Savchenko, in their opinion, the project management of regions should adopt the practice of unique regional decisions implementation, the elements of which can be adapted and replicated in the practice of less mature regions [7].

5 Conclusion

Project management is the most relevant mechanism of national projects implementation for national goals achievement, using the potential of the regions of the Russian Federation. The existing domestic project management system in the regions began to be actively formed in 2016 and today the effective legal and regulatory setting, methodological support and a system of using the best practices of the regions have been created. The research has shown that project management meets almost all conditions of the digital economy. Digital systems are used at all stages of project implementation, both at the federal and regional levels.

The most effective tool for managing project activities is the creation of regional project offices under executive authorities in the region. Project offices are a coordinating body that ensures the implementation of projects for targets achievements, and are also intended for the implementation and development of project management systems in regional executive authorities. Thus, the existing project management system in the regions of the Russian Federation allows optimal project implementation in the conditions of limited resources and the possible risks of the project implementation.

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Human-Centric Marketing in the Digital Era

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Abstract. The purpose of the article is to test assumptions about the appropriateness of the human-centric marketing concept in the digital era in terms of consumer perception and risks of social nature. Authors address the problem of distrust towards CSR programs in the digital business from both audience and business partners and identify related social opportunities and risks. The research reveals that the directions of social responsibility implementation in the digital environment are different, programs are inconsistent and implemented within the concepts of the societal marketing, the value marketing and traditional marketing concept. For the most part, the management of Russian IT companies do not perceive social responsibility as a significant part of business activity in the digital environment and do not make haste to assume obligations, including corporate digital responsibility. Success in human-centric marketing in the digital era depends on the awareness of the strategic value and threats of the digital transformation for business and society, systematization of CSR programs, and revision and a new interpretation of the marketing mix.

Keywords: Corporate social responsibility · Digital responsibility · Human marketing · Societal marketing

1 Introduction

Since the market success of such innovations as personal computers, mobile phones, low-cost mass internet, and open-source software, significant changes in business and society have taken place. Information and communication resources have become very important for the economy. This has affected the rebalancing of market forces, the hierarchy of values of entrepreneurs and consumers. Social media offer opportunities to involve active consumers both in the process of exchanging experience (e.g. consumer experience) and creating values. There are integration processes and focus on long-term cooperation within value and supply chains. According to Kotler, Kartajaya, Setiawan, 2010, there is an era of participation and joint marketing, paradoxes of globalization and cultural transformation, creative and spiritual society. The authors propose the concept of “Marketing 3.0”, or “Human-Centric Marketing” [8]. Scientists associate the advent of Digital Era with the dominance of the convergence of nano-, bio-, info-, and cogno-research (-NBIC–convergence) in scientific research and development, with

the 4th industrial revolution, the digitalization of business assets and information, the expansion of artificial intelligence, machine learning, and new methods of interpersonal communication.

Interestingly, the marketing orientation to individuals and their traits of character, as well as the transition from mass to personal, were enabled by the development of ICT in the late XX - early XXI centuries. At the same time, now the intensification of ICT trends complemented by cognitive and neural technologies evokes significant contradictions. Ethical dilemmas arise in both social and business contexts and require considerable attention [2]. For online companies, the concept of Corporate digital responsibility has been gaining higher and higher relevance [11]. The digitalization of business can form the backbone for the development of socially biased algorithms that lead to discrimination against consumers [12]. Research demonstrates that customers' trust and loyalty to a company largely depend on how that company manages personal data [15]. The advent of the Digital Era entails many changes, the consequences of which are both new opportunities and threats. From the perspective of marketing, it is necessary to establish the boundaries of responsibility and economic viability. Corporate responsibility in the digital environment is primarily the ethics of social and market interaction, informational security, freedom of decision making of both business partners and consumers. Achievement of the economic effect is directly related to the communication effect, which is specific due to the peculiarities of online forms of communication. It is necessary to revise and update the marketing complex to the conditions of operating in the digital environment [6]. The purpose of this study is to test the following hypotheses:

- consumers trust companies that are socially oriented and information transparent,
- proactive marketing activities in the digital environment leads to the emergence of new social risks.

2 Methodology

The analysis and synthesis of public data posted by Russian companies and global institutes are used as research methods. The analysis is based on comparing the results of public reporting by Russian companies with the results of external studies. In order to test the hypothesis, the research reports issued by the McKinsey Global Institute [1], Digital Research [4], Growth from Knowledge (Gfk) [7], the association of grant-making organizations in Russia “Donor Forum” [5], corporate social responsibility (CSR) and sustainability reports published by Russian companies are used. The set of selected companies includes Russian firms developing business in the digital environment, specifically IT-companies, banks, telecommunication companies, online retailers.

3 Results

Since companies interact with consumers at new levels through digital channels, establishing and maintaining the trust of both consumers and business partners becomes the most significant part of the marketing strategy. This is confirmed by the results of various studies. According to the annual study of the philanthropic activities of companies operating on the Russian market, the role of factors of the economic nature for philanthropy is increasing dramatically, from 29% of companies-respondents in 2016 to 51% in 2017 and 68% in 2018 [5]. The most popular objectives of philanthropic activities of the companies-respondents remain the solution of social problems - 94% in 2016 against 62% in 2017 and 68% in 2018, as well as the improvement of business sustainability and the development of the regions of presence - 58% in 2016 against 85% in 2017 and 60% in 2018. The relative decline in the focus on the creation of social value alone indicates the desire of the companies-respondents to tie participation in the solution of social problems to the development of their business. The authors of the study state that the trend towards the development of internal and intersectoral cooperation that complies with the 17th objective of the United Nations Sustainable Development Goals (SDGs) “Partnerships for the Goals” persists. Moreover, in the Russian philanthropic and donor community, 2019 has been declared as the year of the digitalization of philanthropy. According to the GfK survey, Russia is among the countries where consumers are most skeptical about most sources of public information [7]. In Russia, the word of scientists is most trusted (59% of respondents). The government and mass media are at about the same level of trust (31% and 29%). Influencers (celebrities, people from media, and bloggers) are trusted by 23% of respondents. Russians have the least trust in religious organizations (21%) and business (17%). Among all the countries surveyed, Russia has the lowest level of trust in information provided by the business. These low ratings are a significant signal to brands and business in general. The Russian business community should develop programs that will help increase consumer confidence. For brands, socially-oriented programs and missions, which are beneficial to society, would help to gain consumer respect and approval. Joint efforts by business and government are required to create a positive image of entrepreneurs.

More than 900 Russian Internet users aged 18 and older took part in an online survey on corporate social responsibility conducted by Digital Research. Only 23% of respondents believe that businesses that follow social responsibility principles are committed to society. Respondents consider ‘pressure from the authorities’ to be the strongest motivators for socially responsible business (36%), “fashion, desire to make a good name for themselves” (35%), “preferences of the company’s management” (33%), “awareness of the benefits and advantages acquired” (33%) [4].

Consequently, the above data demonstrate the importance of social orientation for several reasons:

- the formation of consumer loyalty is based on confidence in companies and brands,
- digitalization of business provokes new risks, including social ones,
- implementation of modern marketing principles in the digital environment determines the necessity to study issues of digital responsibility.

The study conducted by McKinsey revealed that in addition to the economic effect, digitalization also forms a social effect [1]. Availability of market information, aggregators, and analytical services provided by trading platforms enable buying goods at the best price, learning its qualities better, also from feedback from real users, and it allows customers to compare their choice with other options. This forces companies to provide high-quality products and services, along with reducing the prices. Many digital corporations have started to offer free services such as GPS navigation.

The digital transformation has a significant impact on the labor market. According to McKinsey estimates, up to 50% of work processes in the world will be automated by 2036. However, this negative trend is partly offset by improvements in labor market efficiency, new employment opportunities associated with the development of additional skills and professional expertise, particularly for people who did not have such opportunities due to social or geographical constraints. Digital technologies serve as a tool for social mobility. They promote social and financial inclusion of the population and increase the availability, quality, and convenience of services. Along with this, the use of the digital environment by business, including for marketing purposes, contributes to the emergence of new social risks (Table 1).

Table 1. Social opportunities and social risks

Social opportunities	Social risks
New employment opportunities Job creation	Structural changes in the labour market Job destruction
Access to world information resources and development of online education	Digital divide
Knowledge sharing	Digital autism Loss of quality of social relationship Manipulation effect
Communication capabilities	Restriction on freedom through total monitoring and control Socially biased algorithms Reputational risk
Improving service quality Personalized offers Customization	Ethical conflicts

Source: authors.

Analysis of reports of Russia's leading IT companies has demonstrated that none of them publish social reports, including the largest market players - Yandex and Mail.ru. In the annual reports, it is possible to find information on particular areas of social project implementation. For example, Mail.ru identified as priorities the development of social infrastructure projects, providing access to company technologies to non-profit organizations, support of initiatives for Russia's largest museums, cybersecurity, and prevention of cyberbullying. Meanwhile, Yandex does not publish any information about the external social orientation of their business or activity. Although the company

declares support for employees, in our opinion, it is determined by the specifics of the industry, which is characterized by a shortage of qualified personnel and low competition level.

Several companies publish information about their social and philanthropic programs (Kaspersky, the Compulink group), but unlike companies in other sectors of the market, IT companies are reluctant to commit to social responsibility. This attitude towards disclosure of information and activities in the area of social responsibility indicates that the management of companies does not recognize it as a significant part of their activity, although the operation and development of IT infrastructure and information security of users depend on IT companies.

There are no companies among online retailers that declare their focus on social responsibility. All projects implemented by these companies are related to their core business in one way or another and are aimed at increasing the loyalty of customers and business partners. Table 2 illustrates the CSR directions implemented by companies from various market sectors associated with digital services.

Table 2. Social responsibility subjects in the digital environment

Marketing concepts	CSR subjects	Company
The societal marketing concept	Closing the digital divide	MTS
	Increasing the share of socially oriented products and services	VimpelCom Rostelecom
	Digital enterprise development	Sberbank
	Creating a digital environment Social infrastructure development	Megafon Mail.ru
	Social projects funding	Sberbank VTB Bank Alfa Bank Otkritie Bank
The value marketing	Creation of common values Synergy of CSR practices Digital partnership	MTS Rostelecom
The marketing concept	–	Wildberries Lamoda Ozon Yandex

Source: authors.

Analysis of the social component of activities of companies in the digital environment proves that the most active are representatives of the telecommunications and banking sectors. In our opinion, the main reason is the active digital transformation of these business segments. The future of the telecommunications industry is closely linked to such concepts as the Internet of Things, cloud services, 5G adoption, Big Data technologies, mobile finance, development of convergent services, methods of content

monetization, and others. In the financial sector, 86% of local bank managers respond that they have a digital transformation program [9]. Sberbank describes successful competition with technology companies as one of the objectives of its digital transformation strategy. Meanwhile, one of the main drivers of change in the financial sector is consumer behavior change. Representatives of the young generation constitute a growing proportion of banks' customers, who tend to transfer all spheres of life to the digital environment.

4 Discussion

The outcome of the digital economy laws is an increase in the value of the product and its popularity [14]. Accordingly, the business has to share the values of its target audience by building and developing a digital brand. Factors that affect business include the power of social media, technology, and modern culture. Ethical aspects of managing a business are essential to ensuring commercial success as well. Establishing the confidence of the audience and business partners is another important factor in meeting these objectives [10]. Therefore, for digital business, it is important to identify the specifics of social relationships, possibilities to obtain the social effects, and social risks in the digital environment [3]. In this regard, a significant problem identified by the study is the skepticism of people towards most sources of public information. Consumers and business partners distrust the words. CSR's tasks and motivation are subject to doubt. This fact can be interpreted as a call to practical actions that can be effectively implemented in the life of society, involving in the concerns of socially unprotected citizens. Proof of the efficiency of intentions is important to the market. There is a Russian proverb: "it is better to see once than to hear a hundred times". The high entropy of the digital environment requires marketers to pay attention to the tool of physical evidence, to its new interpretation, to highly targeted tools of social responsibility promotion programs, visualization, and materialization of their results [13]. In the course of the study, the issues of social responsibility of digital businesses have become particularly relevant due to the outbreak of the global pandemic of COVID-19. The authors have witnessed unprecedented social support programs by digital businesses. In particular, it is worth noting the reaction of the IT companies under study. Yandex and Mail.ru companies have allocated funds to support businesses and individuals at risk. In circumstances where people are physically isolated from each other, the consumer value of digital products and services has increased significantly. In this regard, it is relevant to continue the study in light of new experiences, both from the business and consumer sides. Research on the problems of human-centric marketing in the digital era at the intersection of sociology and social psychology is of great interest.

5 Conclusion

Directions of social responsibility of business in the digital environment are various depending on the sphere of activity. This largely depends on the self-determination of affiliation with the digital business. There is no doubt in the minds of telecom representatives. As a consequence, their social responsibility programs in digital are more clearly formulated and systematic. A similar picture is observed in the banking sector, which has recognized the prospect of digital development. At the same time, major retail players focused on omnichannel sales remain focused on logistics and traditional tools of the marketing mix (product, price, promotion). While taking advantage of the privileges of digital transformation (savings on retail space, personalized trade offer, dynamic pricing, etc.), they often ignore the social needs associated with it.

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Problems of Confirmation of Work Experience During Procurement Related to Construction, Reconstruction

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Abstract. The aim of this work is to study the issue of consideration of applications for participation in procurement during construction, reconstruction, renewal of buildings. The task set in this study is to consider a problematic issue related to the confirmation of experience in this field and the lack of a unified point of view as to which contract (agreement) confirms this experience. In the process of research, the authors of the article used the method of analysis, study, generalization. As a result of the analysis, the authors made conclusions and expressed an opinion on the contract (agreement), which confirms the experience of the procurement participant.

Keywords: Agreement · Contract · General contract · Procurement · Subcontracting · Work experience

1 Introduction

World practice recognizes that the contract system in conjunction with the budget and tax systems can be considered as the basis of the modern economy [11]. In modern times, procurements form a niche business that brings good profit. However, despite the legislative regulation of the contract system, practice reveals a significant number of problems in this area for both suppliers and contractors. One of the problems when considering applications for participation in procurement is the confirmation of the experience of the procurement participant in the procurement of construction, repair, reconstruction of capital construction objects. This problem is reflected the lack of understanding what kind of contract (agreement) confirms the experience of the procurement participant in this area. There are two points of view regarding this problem. Having studied these points of view, the authors made their own conclusions.

2 Methodology

In the process of conducting this study, the authors studied regulatory acts that relate to this issue. In particular, it was established that the legislation may establish additional requirements for procurement participants that will confirm their competence, in our case, work experience. Further, the authors analyzed the norms of these normative acts in order to establish what is the process of confirmation of compliance of a procurement participant. According to the results of the analysis, it was found that the experience is confirmed by the contract or agreement that was executed by the procurement participant 3 years before the current procurement in which he participates. In the process of studying this issue, the authors identified two points of view that are fundamentally opposed to each other. One point of view belongs to the Federal Antimonopoly Service of Russia (hereinafter referred to as the FAS), which is the controlling authority in the procurement field. The second point of view was expressed by the Supreme Court of the Russian Federation. Summarizing the information received from regulatory sources, as well as analyzing both points of view, its own opinion was formed regarding the current problem. Studying, analyzing and summarizing the information received helped to conclude that it is necessary to legislate the type of contract (agreement), which confirms the experience of the procurement participant. Based on the foregoing, it is necessary to amend the current legislation.

3 Results

In accordance with Part 2 of Article 31 of Federal Law of 05.04.2013 № 44-FZ “On the contract system in the field of procurement of goods, work, services to meet state and municipal needs” [7] (hereinafter - the Law on the Contract System), by the Government of the Russian Federation additional requirements may be established for procurement participants, including work experience related to the subject of the contract and goodwill. The experience of a participant’s similar activities confirms his ability to ensure that he can perform the volume of services provided by the procurement documentation, and therefore, to use the specified admission criteria is absolutely justified. At the same time, it is necessary to consider the fact that it is unacceptable to present various requirements to the procurement participants. All procurement participants must be in the same position.

Consequently, the requirements established by the customer that are associated with the positive experience of providing similar services and the performance of similar work should be equally applied to all procurement participants. Thus, such requirements do not limit the number of procurement participants and exclude the number of procurement participants of business entities for reasons that are not related to the satisfaction of customer needs.

Requirements for procurement participants, which testify to experience in the market, do not violate the principle of equality, since these criteria apply to all procurement participants. The fact that an individual procurement participant does not meet the requirements that the customer makes does not mean that the actions of the customer unreasonably restrict competition. Therefore, since the requirements that are

established by the customer in order to exclude the risk of non-fulfillment of the contract can equally be attributed to all business entities that have the intention to participate in the procurement, do not violate antitrust prohibitions, and, therefore, the provisions of the Law on contract system.

Based on part 3 of article 31 of the Law on the contract system, a list of documents confirming the compliance of procurement participants with additional requirements is established by the Government of the Russian Federation [7]. The list of documents that a procurement participant must submit in order to confirm their experience is established by Government Decision dated 04.02.2015 No. 99 “On the establishment of additional requirements for participants in the procurement of certain types of goods, works, services, cases of attributing goods, works, services to goods, works, services, which, due to their technical and (or) technological complexity, innovative, high-tech or specialized nature, can deliver, fulfill, provide only suppliers (contractors) with the necessary level of qualification, as well as documents confirming the compliance of the procurement participants with these additional requirements” [8] (hereinafter - Decision № 99). So, in the Decision № 99, the requirements are set for the documents that must be submitted as part of the application for the purchase of repairs to the capital construction object, reconstruction, major repairs, demolition of the capital construction object. The following documents are listed: a copy of the executed contract (contract); copy of the certificate(s) of work performed; copy of permission to put capital construction into operation. A set of measures that are aimed at the procurement process includes acceptance of work, its examination, payment for work [5].

The law on the contract system provides for the obligation of the customer to draw up the result of the execution of the contract with an acceptance document. However, the requirements for the content of the above document in the Law on the contract system are not contained [2]. It should be noted that open access to complete information about all stages of the whole procurement cycle, that is, about the implementation process and the result, is formed by end-to-end informational support of procurement in the unified information system (UIS). Procurement is open to public control, and therefore, serious tasks are set for state and municipal customers in the procurement process so that both contracts, the general procurement process, and the bidding procedures are accessible not only to regulatory authorities, but also to the public control and civil society as a whole [1].

In practice, when evaluating applications submitted by procurement participants, customers are faced with contradictions that arose in the interpretation of Resolution № 99 in the explanations of the FAS, which is the controlling body, and in the interpretation of the said resolution by the courts. Consider each of these interpretations. So, in its letter dated June 19, 2019 № ME/51304/19, FAS [4] indicated the following. According to FAS, those documents that are specified in Decision № 99 should be issued in relation to the procurement participant, therefore, the procurement participant cannot provide documents in relation to other persons as evidence of experience.

According to the provisions of Article 69 of the Law on the Contract System, the application for participation is rejected if the procurement participant who submitted it does not meet the requirements of the documentation, including the additional requirements established in accordance with part 2 of Article 31 of the Law on the Contract System.

FAS believes that only a contract (agreement) to carry out the relevant work, namely, construction, reconstruction, renewal or demolition of capital construction projects, where the procurement participant is a party, that is, the general contract, can confirm the experience of the procurement participant. Therefore, based on the logic of the indicated letter of FAS, the subcontract does not confirm experience in order to apply to Decision № 99. The position of FAS is confirmed by judicial practice (The Determination of the Supreme Court of the Russian Federation of December 05, 2018 № 305-KG18-19792 on case №A40-223872/2017 [9]).

At the same time, in our opinion, the position of FAS is not entirely correct. In our opinion, customers should account all types of contracts to confirm experience, since, in Appendix № 1 to Decision № 99, experience is not dependent on the type of contract and the customer for which the procurement participants performed work [8].

Consequently, if subcontracting agreements are applied by the procurement participants as confirmation of experience, then all the commissions need to do is to check whether the submitted contracts comply with all the conditions specified in Appendix № 1 of Decision № 99.

In order to confirm the existence of experience in the execution of the contract for the performance of work it is necessary to conclude the contract according to the results of the procurement, the following groups of construction works were established:

- construction, reconstruction and renewal of capital construction facilities,
- work on the construction, reconstruction and renewal of objects that are not objects of capital construction (temporary buildings, kiosks, awnings and other similar buildings).

Therefore, if the customer has established the requirements for experience in the construction, reconstruction and overhaul of capital construction facilities, and the procurement participant has provided the required documents that confirm the experience of the work, then in this case you should check:

1. To which object the constructed object belongs. This is an object of capital construction or temporary construction, whether work was carried out at the capital construction object or at temporary construction.
2. What is the cost of a previously executed contract. It should not be less than 20% of the initial (maximum) price of the contract for the right to conclude which a purchase is being made.
3. When the facility was accepted. Acceptance of the object should be made no earlier than 3 years before the deadline for submitting applications for participation in the auction. For the transfer, an acceptance certificate of the capital construction object is drawn up, an acceptance certificate of the work performed, which must be signed by the customer and contractor (or by the contractor and subcontractor). Thus, the contract (contract) must be concluded with the procurement participant and executed by the procurement participant in full, that is, the work on the relevant contract (agreement) must be completed. It is also important to remember the fact that the territory where the procurement participant executed another contract (agreement) has absolutely no significance. If all of the above conditions are met, then, therefore, such a participant meets the additional requirements. At the same

time, the fact that the procurement participant submits a contract for the construction of a capital construction object, which is concluded with an individual entrepreneur, commercial customer, state organization has absolutely no significance, since the condition with which category of customers a contract (contract) should be concluded in additional requirements is not established. An additional requirement for the procurement participants is the experience of executing the contract (agreement) for the implementation of the relevant construction work done in the last 3 years before the filing date of the application.

4 Discussion

Decision № 99 does not establish restrictions on the grounds of concluding contracts (agreements), which are provided as evidence of performance experience. In other words, neither the Law on the contract system, nor Decision № 99 establishes that contracts (agreements) should be concluded, for example, in accordance with the Law on the contract system [8]. Therefore, it can be any civil law contract that corresponds to the subject of procurement, including subcontracting.

In addition, Article 8 of the Law on the Contract System stipulates that the focus of the contract system in the field of procurement is the process of creating equal conditions in order to ensure competition between procurement participants. Consequently, the provisions of the Law on the contract system are implemented within the law and pursues the goals of creating conditions for equal competition between procurement participants without unlawful interference regarding participation. Thus, one cannot limit oneself to the principles of formalism and, moreover, independently interpret the regulatory provisions of the legislation.

In accordance with Part 2 of Article 1 of the Civil Code of the Russian Federation (hereinafter - the Civil Code of the Russian Federation), citizens (individuals) and legal entities acquire and exercise their civil rights by their own will and in their own interest. They are free to establish their rights and obligations based on the contract and to determine any terms of the contract that do not contradict the law [3].

Article 153 of the Civil Code of the Russian Federation determines that a transaction is the action of citizens and legal entities that is aimed at establishing, changing or terminating civil rights and obligations. Therefore, if the contracts are concluded between two legal entities, the subject of the contracts is the performance of work that is required to participate in the procurement, if from the terms of the subcontract agreement we can unequivocally conclude the subject performed the work and that such work relates to construction work, then such a contract, in our opinion, is fully consistent with the terms of Decision № 99.

In addition, there are quite a lot of cases in the construction market whereas the general contractor, who has concluded a contract for construction work, either does not perform such work at all or performs some small part, yet transferring almost all of his obligations to a third party (subcontractor). Therefore, it is not possible to say that the presence of the necessary experience in construction work is confirmed exclusively by the general contractor agreements. For example, Italian law considers that by

subcontracting agreements firms improve the efficiency of their production, thereby increasing social welfare [6].

As a result of the foregoing, firstly, the fundamental principles of procurement are violated. In addition, the bidder's application, which is rejected due to the fact that a subcontract has been submitted, can often have the lowest contract price. Rejection of the application with the lowest price does not allow to effectively and significantly save budgetary funds allocated to the customer.

Thus, having analyzed the above, we can say that it is impossible to fully support the position expressed by FAS. In our opinion, persons are free to conclude any contract, therefore, for the implementation of construction work, persons are entitled to conclude subcontracts. Despite the fact that construction work is carried out on the basis of a subcontract, people still actually carry out these works, despite the fact that the subcontract implies the performance of a certain part of the work. However, this does not dispute the fact that the subcontract also confirms the experience of the tenderer. The same conclusion that the legislation does not stipulate that it is necessary to submit documents that confirm the experience of performing work exclusively as a general contractor was made by the Supreme Court of the Russian Federation in its Decision of July 23, 2019 № 301-ES19-11536 [10].

Thus, we can say that the judicial practice on this issue has changed. However, despite these changes, FAS and its territorial bodies continue to make decisions that are completely opposite to the opinion expressed by the Supreme Court of the Russian Federation. After analyzing the issue reviewed above, it becomes clear that it is necessary to regulate exactly which contract confirms the experience of the work. We believe that due to the fact that the judicial practice has changed, for consideration of applications, in order to exclude and prevent complaints about the actions of customers, it is important to legislatively fix the types of agreements, which confirm the experience of the procurement participant.

5 Conclusion

The following study reviewed one of the existing problems in the process of considering applications for participation in procurement. Unfortunately, we can conclude that the Law on the contract system is still far from ideal. Customers are wary of new counterparties, prefer to work with the companies that are verified, with which contracts were previously reached and which properly executed the contracts concluded. At the same time, it is important for customers to remember the fact that it is necessary to draw up documentation, to make demands on procurement participants on the basis of the law and the principles of current legislation, and not based on personal wishes. When setting requirements in the documentation, it is necessary to understand whether these requirements are objective. Also when considering applications of procurement participants, it is also necessary to be objective and consider applications of participants on the basis of current legislation and principles of current legislation. Based on the foregoing, it is necessary to fix the rule in Government Decision № 99 and fix it as follows: the experience of a procurement participant in procurement field of

construction, renewal, reconstruction of capital construction projects can be confirmed by both a general contract and a subcontract.

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Environmental Performance Index as an Assessment Method of the Country's Ecological Security

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Abstract. The creation of the effective environmental safety system, increasing the level of national and regional environmental performance are the most important factors in maintaining competitiveness and ensuring sustainable development of many countries. The research problem is that despite the large number of scientific works are devoted to environmental safety and environmental efficiency, there is no single methodological basis that would allow us to assess the environmental performance at the global, national, regional levels. Thus, an objective comparison of the environmental performance of different countries and regions becomes impossible. The purpose of the study is to assess environmental safety of the Russian Federation based on indicators of the Global Environmental Performance Index. The study identified problems that impede the formation of the effective environmental and economic security system of the country.

Keywords: Ecological security · Economic security · Environmental performance index · Indicators · National environmental performance

1 Introduction

In the constantly changing economic environment, the main tasks of business strategies of many Russian enterprises are to ensure safe and sustainable development, and to create an effective environmental safety system, protecting the environment from the negative impact of continuously developing technologies and manufactured products. The problem of sustainable nature management as one of the components of economic security of enterprises, the region and the country has a multifactorial and interdisciplinary nature. The main approach in solving this problem is the rational consumption of natural resources through innovative technologies for the development and processing of resources; achieving a balance between the implementation of economic activities by enterprises and compliance with the requirements of environmental conservation.

The solution to the problem of ensuring environmental safety as a subsystem of economic security is part of the complex problem of ensuring sustainable development of enterprises, regions and the country. The results of specialized studies confirm the fact that for sustainable development of the enterprise it is necessary to reduce the share

of exoecological (environmental exploiting) projects and industries that lead to environmental pollution and depletion of natural resources, and to increase the share of endoecological (environmental) initiatives that ensure the conservation and increase of natural resource potential. At the same time, the innovative orientation of environmental programs contributes to increased efficiency of entrepreneurial activity. Organizations that follow the principles of environmental efficiency and pursue responsible environmental policies receive new opportunities for growth and development, as they are more attractive from the point of view of potential investors and customers. However, the issue of assessing environmental safety at the international, national, regional and local levels remains unresolved.

Some aspects of assessing the environmental performance and environmental safety of countries and regions are considered in the works of Fan et al. [1], Khan et al. [2], Sun et al. [3], Yang and Cai [7], Zhang and Xu [8] and others. There are various studies of the environmental performance of countries, conducted by Russian and international scientific, audit organizations, research associations. The main drawback of existing studies is the lack of the standardized structure of indicators and calculation methods, which makes it impossible to compare the environmental performance of different countries and regions. The lack of the unified methodology for assessing environmental safety of enterprises negatively affects economic security of companies, making their activities less transparent and reducing their investment attractiveness. Decreased trust in the organization on the part of shareholders, investors, partners, customers and employees weakens its competitiveness, which, in turn, can weaken economic security of both the enterprise and the region (especially in the case of large and city-forming enterprises). The result of the decrease in environmental and economic security of regions will be a deterioration of environmental and economic security of the country. Thus, the relevance of the chosen research topic is confirmed by the need to assess environmental safety at the national and regional levels, as well as at the level of individual industries and enterprises to ensure economic security of both individual enterprises and the country.

One indicator of the country's environmental safety is the Global Environmental Performance Index, calculated every 2 years with the collaboration of Yale Center for Environmental Law and Policy (YCELP) of Yale University, Columbia University's Center for International Earth Information Sciences (CIESIN) and the World Economic Forum (WEF). The main advantage of this indicator is a unified calculation methodology, which is applied to the analytical data of all countries participating in the study, which ensures comparability of indicators for both different countries within the same billing period and for indicators of one country over several periods. The purpose of the study is to assess environmental safety of the Russian Federation based on indicators of the Global Environmental Performance Index and identify problems that impede the formation of the effective environmental and economic security system.

2 Methodology

The research methodology is based on general scientific methods, such as analysis, synthesis, induction, deduction, comparison, detailing, generalization, and a systematic approach. The object of research is a system for assessing environmental safety of the Russian Federation based on the Global Environmental Performance Index. The subject of the study is the problems that impede the formation of the environmental safety

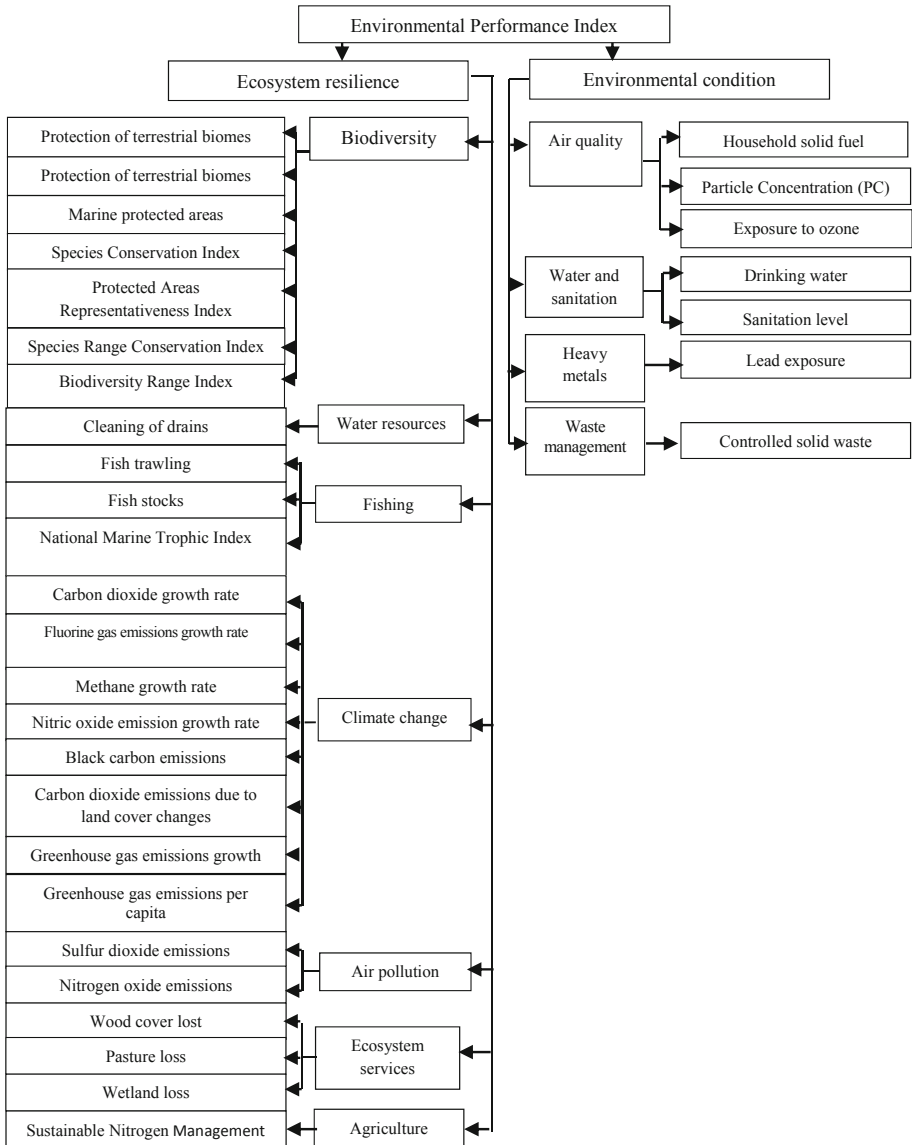


Fig. 1. Dynamics of the number of indicators and groups of problems of the Environmental Performance Index for 2006–2020 (Source: authors).

system in the Russian Federation. As part of the study, the authors analyzed the structure of the Global Environmental Performance Index, as well as index indicators for Russia. The Global Environmental Performance Index is a quantitative assessment of 180 countries' environmental performance. It combines 32 indicators of environmental efficiency, combined into 11 categories of problems, covering the issues of rational use of natural resources, ecosystem viability, and environmental conditions (Appendix A: Fig. 3) [4–6].

These categories make it possible to track the effectiveness and progress in achieving two goals of sustainable development: preserving the health of the environment and maintaining the viability of ecosystems (Appendix A: Fig. 3). The totality of these indicators allows us to assess how close countries are to achieving the established goals of environmental policy. The data sources for calculating the Environmental Performance Index (EPI) are the results of studies of international organizations, research institutes, scientific communities and government agencies. It should be noted that over the past few years, there has been a tendency to increase the detail of the index [6–8]. Compared to the previous release of the 2018 Index, the number of indicators in the 2020 Index increased from 24 to 32, and the number of problem categories from 10 to 11 (Fig. 1). In general, for the period from 2006 to 2020, the number of Index indicators increased by 16 (100%), the number of groups of key problems increased by 5 (83%) [4–6].

3 Results

Analysis of the results of studies of the Environmental Performance Index allows us to conclude that the number of countries participating in the study of the environmental performance increased from 133 in 2006 to 180 in 2020 (Fig. 2). Moreover, over the past 5 years, the number of countries participating in the study has remained unchanged (180 countries) (Fig. 2) [4–6].

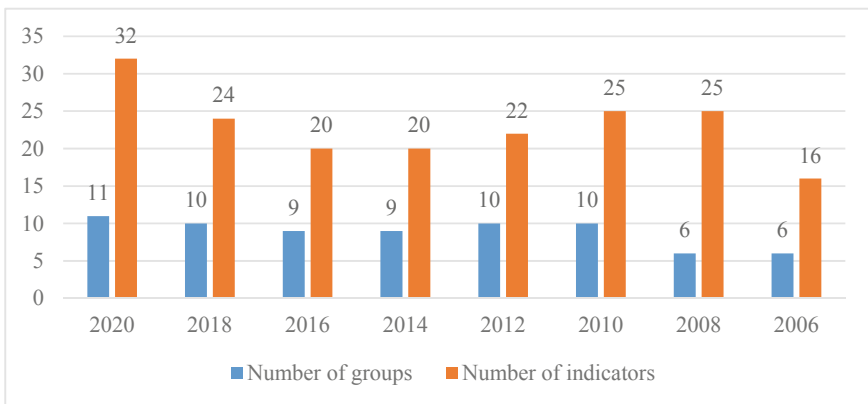


Fig. 2. Dynamics of the number of countries participating in the study of the environmental performance for 2006–2020 (Source: authors).

Russia's position in the overall environmental performance rating has declined. According to 2020 data, the country occupies only 58th place [4], while in 2016 Russia held 32nd position [6] (Table 1).

Table 1. Dynamics of the Economic Performance Index and the position of the Russian Federation in the overall ranking for 2006–2020.

Year	Economic performance index	Position of the Russian Federation in the overall ranking
2020	50,5	58
2018	63,79	52
2016	83,52	32
2014	53,45	73
2012	45,4	106
2010	61,2	69
2008	83,9	28
2006	77,5	32

Source: authors.

The number of points also has a negative trend in the last 5 years, which may indicate a deterioration in the environmental performance of the country and a weakening of its environmental safety [4–6]. To identify the problems of creating the effective environmental safety system in Russia and the main environmental threats, the indicators of the Environmental Performance Index for 2018–2020 were analyzed by groups of environmental problems (Table 2).

Table 2. The matrix of indicators of the Global Environmental Performance Index and the ranking position of the Russian Federation for 2018–2020.

Goal	Group of problems	2018		2020	
		Place	Points	Place	Points
Ecosystem resilience	Biodiversity	113	65,64	111	54,1
	Water resources	24	96,53	58	18,5
	Fishing	130	35,48	133	4,3
	Climate change	87	49,88	57	59,9
	Air pollution	23	77,78	50	81
	Ecosystem services	96	12,43	113	28,6
	Agriculture	30	47,83	26	60,5
Environmental condition	Air quality	54	79,99	47	54,1
	Water and sanitation	52	63,93	65	55,4
	Heavy metals	24	86,2	37	72,2
	Waste management	–	–	122	3,2

Source: authors.

According to the state of the environment, in 2020 Russia ranks 57th place (53 points), having dropped 13 positions in the ranking compared to 2018 (44th place) [4, 5]. Within this target area, the country occupies the best position in the rating for the Heavy Metals group (24th place in 2018 and 37th place in 2020), which assesses the impact of lead on the environment and human health [4–6]. The average number of years of life (adjusted for disability), which was lost due to environmental pollution by lead, was about 86 years for every 100,000 people in 2018 [5]. In 2020, there is an improvement in this indicator, the number of lost years decreased by 14 years and amounted to 72.2 years [4].

Russia ranks 47th in terms of Air Quality, rising by 7 positions in sub-rating compared to 2018. At the same time, there is a decrease in the number of points from 79.99 in 2018 to 54.1 in 2020, which is explained by an increase in the number of standardized age of life (adjusted for disability) per 100,000 people lost due to air pollution by solid fuel particles used by households [4–6]. In addition, the content of fine particles in the air remains high.

According to indicators in the Waste Management group, there are no comparative data for 2018, as this group of indicators was introduced only in 2020. The Russian Federation holds only 122 positions in the sub-rating [6], which indicates the need to increase the share of controlled solid waste (the share of household and commercial waste collected and processed using technologies that reduce environmental risks).

60% of the assessment depends on the level of the ecosystem viability. The significant share of this target area is explained by a large set of indicators and groups of problems in comparison with the target group of indicators “Environmental Condition”. In 2020, Russia ranks 72nd in terms of the ecosystem viability (48.8 points), falling 2 positions in the ranking compared to 2018 (70th (55.99 points)) [4–6]. For the groups “Biodiversity”, “Fishing”, “Ecosystem Services”, Russia is not included in the first hundred countries participating in the rating. According to the group of indicators characterizing biodiversity, the country rose in the ranking from 113 to 111 places [4–6]. However, the number of points assigned to the country decreased by 17.6% and as of 2020 amounted to 54.1 [4]. The reason for the decrease in the country’s assessment for this group of problems is the insufficient level of protection of terrestrial biomes, as well as a low value of the Protected Areas Representativeness Index. This indicator characterizes the share of biodiversity that is protected within terrestrial biomes. For the Fishery group, the Russian Federation occupies the 133rd place in 2020, which is lower by 3 sub-rating positions in comparison with the results of the 2018 survey (130th place) [4–6]. The increase in environmental risks associated with fishing is explained by low values of the Marine Trophic Index (the trophic state of the seas), which shows the dependence of indicators of biological productivity of waters on the content of mineral nutrition elements (nitrogen, phosphorus) in them. According to this indicator, Russia has 6.6 points (111 place). Since 2020, a new indicator has been introduced - Fish Trawling, which shows the proportion of fish caught by bottom or pelagic trawling [4].

In the Climate Change sub-rating, Russia is in 57th place, having risen 30 positions in the ranking compared to 2018 [4–6]. In the Ecosystem Services and Air Pollution groups, the situation in Russia has deteriorated, the country has dropped from 96th to 113th place in the Ecosystem Services group and from 23rd to 50th in the Air Pollution sub-rating [4–6].

4 Discussion

To carry out the most effective and reliable assessment of the environmental performance, as well as to strengthen the environmental and, therefore, economic security of the country and individual regions, it seems necessary to adapt the methodology for calculating indicators of the environmental performance at the global, national, regional and industry levels. Based on the structure of the Environmental Performance Index, it is necessary to adopt a single list of indicators, main goals and objectives. In this case, it is necessary to consider geographical, regional and local environmental conditions, environmental policy provisions, economic features, etc. Systematic studies of the environmental performance are important. To monitor environmental safety of the country and regions, an annual assessment is required. Conducting an environmental risk assessment, as well as analysis of environmental risk indicators, will allow timely identification and elimination of environmental risks that have the greatest impact on the country's security. The environmental situation in the country directly depends on activities of enterprises. Promotion of the principles of environmentally responsible business will contribute to improving the environmental situation both in individual regions and at the national level. To increase the efficiency of waste management for some industries (mining, processing, metallurgy, etc.), it is possible to introduce mandatory requirements to process a certain proportion of waste produced by enterprises. Mandatory preparation and presentation of environmental reporting will increase the responsibility of companies in relation to the environmental component. The creation and provision of effective work at enterprises of the internal control and audit service will allow for monitoring compliance with legal requirements regarding the formation and presentation of environmental reporting, as well as timely identification and elimination of possible problems, thereby improving environmental safety of enterprises, the region and the country.

5 Conclusion

Thus, the study of indicators of the Environmental Performance Index indicate a deterioration of the environmental situation in Russia. There are negative trends in indicators of water resources, the quality of drinking water and sanitation, and the solid waste management system is not well established. This situation indicates a decrease in environmental safety of Russia, which results in a weakening of economic security of both the country and individual regions and industries. The prerequisite for the effective development and maintenance of the country's competitiveness, ensuring environmental and economic safety of both individual enterprises and the state, is to follow the principles of environmentally responsible business and systematic monitoring of the environmental performance at the global, national, regional and industry levels. However, the issue of environmental safety assessment remains unresolved. In this regard, the proposed measures, including the development of unified indicators of the environmental performance, which would allow an assessment at different levels, will enhance environmental safety of Russia and strengthen the country's position on the world stage.

Appendix A

See Fig. 3.

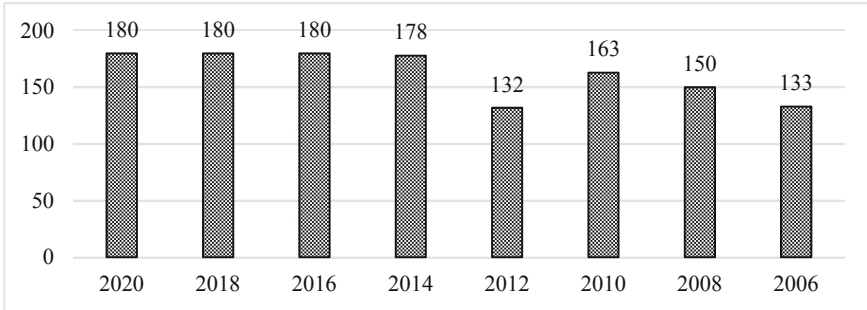


Fig. 3. The structure of the Environmental Performance Index (Source: authors).

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Entrepreneurial Potential of Russian Regions: Comparative Assessment and Development Prospects

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Abstract. Entrepreneurship is one of the key directions of the state development, which forms its competitiveness, security and welfare. The state is interested in developing the institute of entrepreneurship as one of the sources of job creation, production of goods and services. The research purpose is to analyze the regional business environment using the method of correlation and regression analysis, and nonparametric statistical methods. The key hypothesis of this research was the thesis that a positive business environment is typical for regions with a high level of socio-economic development. The authors analyzed indicators of the development state of small and medium-sized businesses in Russia, conducted a multidimensional assessment of business environment in the Russian regions, and made a conclusion about the key role of socio-demographic, general economic and innovative infrastructure conditions of regions in the development of their business environment.

Keywords: Entrepreneurship · Entrepreneurial potential · Entrepreneurial environment · Regions

1 Introduction

Entrepreneurial activity in the Russian Federation is regulated by the Federal law “On the development of small and medium-sized enterprises in the Russian Federation” of 24.07.2007N 209-FZ [3]. Under entrepreneurship, we understand activities of small and medium-sized businesses SMEs, the largest concentration of which is in the Central Federal District (1886670 business entities), while the most poor in this context is the North Caucasus Federal District. Among the total number of entrepreneurs, the most popular type of activity is construction of residential and non-residential buildings. Despite the high number of registered entrepreneurs in the federal districts, this indicator has a downward trend in dynamics (up to 7.5% in 2018), which is accompanied by a reduction in business activity to 22% in 2017.

The formation of a unified management system for developing regional business culture and business environment requires a unified information and analytical model for its assessment. In this work, the authors propose a multidimensional system for assessing the development of the business environment, which should be aimed at identifying and evaluating its current state and development prospects.

The implementation of systematic monitoring of the business environment development in the region will enable to make more informed decisions in the field of supporting measures to strengthen youth entrepreneurship, develop entrepreneurial culture, advance the development of small and medium-sized businesses, and strengthen measures to promote entrepreneurship on the whole.

A comparative analysis of the development level of the entrepreneurial environment of the region (EER) is advisable for comparing regions by the comfort of the business environment. The result of the comparative analysis is a ranking of regions by the development level of their business environment. The integrated assessment of the EER is aimed at identifying potential opportunities for the development of regional business environment.

2 Methodology

The regional business environment is a complex economic phenomenon that characterizes the degree of business development (primarily small and medium-sized) and its activity. The EER is determined by the socio-economic, natural-geographical, demographic, legal and other conditions of the region's development. Due to its complexity and versatility, the EER can only be evaluated by a comprehensive system of indicators. The source of information for our research is data from the Federal State Statistics Service of the Russian Federation. The following research tools were used:

- analysis of distribution series (average values, indicators of variation),
- methods for testing statistical hypotheses,
- econometric modeling (correlation and regression analysis),
- nonparametric statistical methods (multidimensional mean method, rank correlation),
- tabular visualization techniques for of the obtained results.

We have obtained the following system of 11 effective statistical indicators, distributed in 5 blocks and giving a quantitative description of the EER. Indicators are expressed in relative units for convenience and correctness of interregional comparisons.

Block 1 “Development of the private sector of the economy”:

Y1 – share of private organizations, % of all enterprises and organizations;

Y2 – turnover of private organizations, million rubles per 1 private organization.

Block 2 “Small business development” :

Y3 – number of small businesses per 10,000 people of the population;

Y4 – turnover of private organizations, million rubles per 1 small enterprise.

Block 3 “Development of individual entrepreneurship”:

Y5 – number of actually operating individual entrepreneurs (IE) per 10,000 people;

Y6 – amount of revenue of an individual entrepreneur (including taxes and similar mandatory payments) from the sale of goods, products, works, services, thousand rubles per 1 individual entrepreneur.

Block 4 “Business demographics”:

Y7 – “birth rate” of organizations (the ratio of the number of registered organizations for the reporting period to the average number of organizations registered by state statistics bodies in the statistical register in the reporting period) per 1000 organizations;

Y8 – “death rate” of organizations (the ratio of the number of organizations that ceased to exist during the reporting period to the average number of organizations registered by state statistics bodies in the statistical register in the reporting period) per 1000 organizations.

Block 5 “Business activity of enterprises”:

Y9 – number of active enterprises per 1000 organizations;

Y10 – number of fast-growing enterprises (estimated growth by number of employees) per 1000 organizations;

Y11 – number of fast-growing enterprises (estimated growth by turnover) per 1000 organizations.

An enterprise is considered active if its average number of employees and turnover exceed zero values. Fast-growing enterprises are defined both in the employment category (number of employees) and in the turnover category. These include businesses with an average annual growth rate exceeding 20% per year over a three-year period. The minimum threshold for enterprise size is usually set at 10 employees at the beginning of the growth period.

3 Results

The key hypothesis of our research is the thesis that a positive business environment is typical for regions with a high level of socio-economic development. To identify the territorial distribution of indicators of the EER, the above-mentioned performance indicators were used. The largest differences between regions were found in the Y2 indicator (turnover of private organizations), the coefficient of variation of which significantly exceeded 100%. This asymmetry is largely due to the fact that this indicator is cost-based and, accordingly, depends on the price level in this federal subject and its industry specifics. The highest value is in the Yamalo-Nenets autonomous district (232.03 million rubles on average per organization), where enterprises of the extractive industries predominate; the values in the Nenets autonomous district (152.45) and in the Khanty-Mansi autonomous district (145.52) are close. The lowest values are in the Republic of Ingushetia (1.96), in Sevastopol (1.98), and in the Jewish autonomous region (2.09).

At the same time, the regions of Russia are very homogeneous in terms of the number of business entities (Y1 and Y5). In each region, the share of private organizations exceeds 50% (only in the Chukotka autonomous district, it is close to the lower threshold – 50.7%), and the most favorable city for the development of institutional transformations was St. Petersburg, where 92.7% of economic entities belong to “private owners”. In general, in half of the regions of the Russian Federation, the share of

private business exceeds 81.9%. In terms of the number of individual entrepreneurs, the territorial differentiation is somewhat greater, but it does not exceed the critical borders. Thus, per 10,000 people, the number of actually operating individual entrepreneurs is the largest in Sevastopol (339.7), although, as noted above, the financial indicators of the private sector in this city are quite modest. High values of the number of individual entrepreneurs were also noted in other southern regions – the Krasnodar territory (296.7) and the Republic of Crimea (289.2). The leaders also include federal subjects with difficult climatic conditions – the Magadan region (278.5) and the Kamchatka territory (265.5). The smallest number of individual entrepreneurs was registered in the North Caucasus republics – Ingushetia (59.7) and Dagestan (74.7).

There is no universal indicator that allows us to comprehensively characterize the EER in all its various manifestations. The solution of this problem is possible based on the calculation of a multidimensional estimate. Since there are quite a lot of indicators in our source data set, the values of which differ significantly for different regions, we considered the multi-dimensional average method to be the best tool for solving this task. It is based on calculating the arithmetic mean for each of the 11 indicators. To bring the data to a form that allows comparison, it is necessary to normalize them for each i -indicator by dividing by the corresponding average value (formula 1):

$$K_i = \frac{Y_i}{\bar{Y}_i} \quad (1)$$

Since the death rate of organizations has its own interpretation specifics (the higher it is, the worse it is), the normalized value for it is calculated using the inverse formula (1). The result of this normalization is coefficients - comparable dimensionless K_i values that characterize all the features of the considered regions. If all the considered objects are sufficiently uniform, the resulting values will not only be dimensionless, but will also represent a set of numbers close to 1. Indeed, the value of K_i shows how many times the indicator calculated for a given territory exceeds the corresponding average value of this attribute for the entire combination.

After this procedure, each object can be characterized by all the normalized features by the average value – \bar{K} , that is, by a single number. This average value is a multi-dimensional estimate of the EER. Further, it becomes possible to rank regions on the principle of “the more, the better”, since all the considered indicators are interpreted in terms of “maximum = best” value.

Thus, the range of possible EER values has only a lower bound – 0 (the worst value), and the highest (best) value can be arbitrarily large. If the value of \bar{K} is close to 1 for any territory, this indicates its average development level from the point of view of the reference frame. The further the value is from 1, the more the region level differs from the average parameters in one direction or another.

The result of the calculations is the ranking of regions according to the multidimensional assessment of the EER, that is, assigning each territory its own place (rank). The rating results are presented in typological Table 1.

Table 1. Typology of Russian regions based on multidimensional assessment of the EER (2017)

Type	Multidimensional assessment	Number of regions
High level of EER	More than 1,5	5
Republic of Crimea, Yamalo-Nenets autonomous district, Nenets autonomous district, Krasnodar territory, Khanty-Mansi autonomous district – Yugra		
Elevated level of EER	1,1...1,5	15
Astrakhan region, Volgograd region, Krasnoyarsk region, Sakhalin region, Saint Petersburg, Magadan region, Rostov region, Moscow, Tyumen region, Kaliningrad region, Stavropol territory, Kamchatka territory, Leningrad region, Chukotka Autonomous district, Khabarovsk territory		
Average level of EER	0,9...1,1	47
Belgorod region, Komi Republic, Sverdlovsk region, Sevastopol, Republic of Udmurtia, Penza region, Novgorod region, Primorsky Krai, Perm Krai, Pskov region, Republic of Mordovia, Kemerovo region, Kaluga region, Tatarstan, Bryansk region, Novosibirsk region, Republic of Bashkortostan, Samara region, Amur region, Voronezh region, Lipetsk region, Nizhny Novgorod region, Irkutsk region, Murmansk region, Arkhangelsk region, Kirov region, Moscow region, Republic of Dagestan, Kostroma region, Orenburg region, Republic of Mari El, Tambov region, Tula region, Tomsk region, Republic of Sakha (Yakutia), Ulyanovsk region, Vologda region, Chuvash Republic, Jewish autonomous region, Altai territory, Chelyabinsk region, Kabardino-Balkar Republic, Republic of Altai, Republic of Khakassia, Saratov region, Republic of Buryatia, Republic of Adygea		
Lowered level of EER	0,8...0,9	14
Smolensk region, Omsk region, Kursk region, Ryazan region, Zabaykalsky Krai, Ivanovo region, Republic of Karelia, Vladimir region, Karachay-Cherkess Republic, Oryol region, Kurgan region, Republic of North Ossetia-Alania, Yaroslavl region, Republic of Tyva		
Low level of EER	Less than 0,7	4
Tver region, Chechen Republic, Republic of Kalmykia, Republic of Ingushetia		
TOTAL		85

Source: authors.

This typology shows a fairly uniform distribution of the Russian Federation's subjects. This is confirmed by the value of the variation coefficient: it is equal to 22.9%. This is the statistical feature of almost any multidimensional integral indicator (it actually "dissolves" all the partial values, replacing them with normalized coefficients, and levels their large and small deviations from the average level). At the same time, most regions – 50 out of 85 – have a lower-than-average value (i.e. less than 1).

A high level of EER is observed in three Northern autonomous districts and in two Southern federal subjects – the Crimea and Krasnodar territory. The main advantage of the Krasnodar territory is a high level of business survival. This is reflected in the

lowest mortality rate in Russia – 10, 48% (that is, from every 1000 organizations, on average, only one hundredth is liquidated per year). In the Republic of Crimea, on the contrary, there is no clear plus for the development of the EER, but there are several positive aspects associated with the birth and promotion of business: the country's best birth rate and indicators of block 5 (entrepreneurial activity).

The regions at the another pole of the rating are united by low values for the turnover of private organizations, which do not reach even half of the average values for the country as a whole. There is also a low entrepreneurial activity of enterprises in these regions (especially in terms of staff growth). The Tver region has one of the lowest birth rates (51.88%), which indicates difficulties (legal, organizational, psychological, etc.) with starting a business there.

4 Discussion

The entrepreneurial environment is a phenomenon that significantly affects the quantity and quality of business entities in the countries' economy. In order to create favourable conditions in which business individuals and groups can develop their entrepreneurial efforts, policy makers need to know the absolute as well as comparative strengths and weaknesses of territories in the relevant international context [5]. Interrelationships among institutional environment, entrepreneurial activity, and economic growth are explored by Urbano, Audretsch, Aparicio, and Noguera [8]. Value and behavioral aspects of the regional development of small and medium-sized businesses in Russia are considered by Ashmarina and Mantulenko [2]. In an entrepreneurial context, norms and values form social attitude to entrepreneurship as a phenomenon and as profession choice, affecting the entrepreneurial activity in different regions. The contradictory position of entrepreneurs is considered in the context of modern psychology, economic sociology, and management [1, 6, 7].

5 Conclusion

Entrepreneurship is one of the key directions of the state's development, which forms its competitiveness, security and well-being. The state is interested in developing the institute of entrepreneurship as one of the sources of job creation, production of goods and services. All successful governments supported private enterprises not by manipulating, but by making it easier for them to live.

However, according to research conducted by the All-Russian center for the study of public opinion (VCIOM), together with the SKOLKOVO business school, the level of entrepreneurial activity is falling: the share of those who want to open a business is gradually decreasing (from 32% in 2008 to 22% in 2017), but those who assess a prospect to become an entrepreneur as positive one is growing (from 49% in 1991 to 68% in 2017) [9]. At the same time, 7% of the surveyed Russians report that they have their own business (in 1991–2%). Men, middle-aged people with higher education, and residents of large cities are especially interested in this issue.

A significant factor that actively affects the attitude of the population to entrepreneurship is the dynamics of income from entrepreneurial activity, which has a clear downward trend. In the first half of 2016, business income was 7.3%, while in the first half of 2017, the same indicator was already 7.1%. In general, income from business activity is reduced due to individual entrepreneurship. Calculations showed a decrease in business income to the lowest values since 1992 of 7.5% (2018), and the share of social payments (pensions and benefits) increased to a historical maximum of 19.4% [4]. Taking into account the fact that Russian citizens' interest in business activities is decreasing, various measures of support and encouragement are being taken by the state today. An important role in this regard is attributed to the development of youth entrepreneurship, as a support for the development of this institute in the future. The key areas in this aspect are financial, informational, consulting, property and technical support. Currently, the country has an effective infrastructure for business development, which is a group of various organizations, funds, associations, etc., that provide assistance to beginning and existing entrepreneurs in various areas. It should be noted that the infrastructure operates both at the federal and regional levels.

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Legal Regulation of Using the Artificial Intelligence Technology in the Banking

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Abstract. This research is devoted to the formulation of proposals for improving the legal regulation of the artificial intelligence' use in banking activities. The main objectives of the research are: to analyze the possibility of creating a flexible system of legal regulation aimed at stimulation of the development of artificial intelligence as a technology and concept; to suggest reasonable proposals for creating the necessary legal conditions for the effective use of artificial intelligence in the banking sector. A wide range of methods was used to solve the tasks set in the study: formal-legal, system analysis, generalization and analogy. The main results of the research include conclusions about the structure of the regulatory platform for the use of artificial intelligence and the need to introduce special regulation in relation to its subjects and participants, provisions about the tools of "soft" regulation in order to prevent violations as well as the most problematic aspects of the engagement of artificial intelligence in the banking sector, including the need to implement measures aimed at reducing costs and losses, and applied directly in the process of a provision of banking and other financial services by lending institutions.

Keywords: Artificial intelligence · Banking · Financial technologies · Law · Regulatory platform

1 Introduction

In the face of rapid changes and the need to implement innovative solutions, economic entities expect governments to take significant steps to create a favorable legal environment. Only governmental bodies can take measures to promote innovations such as artificial intelligence technology. Creating a flexible and forward-looking regulatory system is a global challenge, as the use of artificial intelligence is rapidly developing in particular all areas of public life. It is important to balance this system in such a way as to stimulate the development of this technological solution and to prevent potential negative consequences in the context of the formation of new public relations in the field of artificial intelligence, robots and robotics objects.

The banking industry is one of the fastest growing, but it is also subject to a variety of risks and dangers. Moreover, in the modern reality, banks play a key role for the functioning of the entire economy: banks perform as intermediaries for transferring money and performance of tax duties by citizens and organizations, banks are main

participants in national payment system, they also implement socially important tasks for concessional lending and a number of other activities that ensure the normal functioning of the economy and both public and private finance. One of the key features for the development of public relations in the sphere of banking in the period of digitalization of the economy, of course, is the implementation of the latest financial technologies in order to achieve a variety of goals, including reducing the costs of credit institutions for servicing premises and other property, optimizing the labor remuneration and reducing staff, improving the quality of risk assessment and credit-worthiness of borrowers. Among the financial technologies that are currently being actively implemented in banking in Russia and foreign countries, we can note the technology of a distributed ledger or Blockchain, which is used, among other things, as a technological base for cryptocurrencies, remote banking services, the latest solutions for making payments (Apple Pay, Samsung Pay, Google Pay), big data analysis technologies, as well as various customer authentication technologies, including confirming payments using a client's photo or "selfie", built-in fingerprint scanners and many other technologies. Most of these solutions has already become a present day for modern banking and are actively implemented in the daily life of citizens or the work of credit organizations. According to the head of one of the largest banks in Latin America, Banco Bilbao Vizcaya Argentaria (BBVA), Carlos Torres Villa, "Millennials are more likely to go to the dentist than to the Bank" - remote service, payments via phones using biometric authentication - this is already an essential part of our life. Some technologies are still being "rolled out", and their potential implementation depends on a combination of factors: the real financial return from the implementation (reducing costs), the improvement of the effectiveness of various mechanisms of banking operation's performance (for example, risk assessment procedures or reporting algorithms), as well as on the favorability and specificity of regulatory framework, which is either already developed or will be developed by the state. The most important is to take into account the latter factor, since it is perceived as a deterrent to more active use of many technologies, including artificial intelligence technology.

It is an artificial intelligence technology that should attract special attention, since if the legal regulation of artificial intelligence' engagement in banking is successfully developed, it will be possible to solve several key tasks at once: to assess more effectively the risks and solvency of customers, to determine customer preferences based on big data analysis and to adapt its product line (in combination with the use of analyzed information about customer's day-to-day activities), to optimize labor costs, to speed up debt collection procedures, as well as to accelerate and automate many routine processes of the bank's daily performance. Solutions based on artificial intelligence technology have a high potential for implementation in the banking sector.

2 Methodology

A wide range of methods was used to solve the tasks set in the study: formal-legal, system analysis, generalization and analogy. The formal legal method allowed us to solve the problem associated with identifying problematic aspects of the use of artificial intelligence in the banking sector. The use of this method has contributed to the

formation of proposals for improving the legal regulation of the use of artificial intelligence. The method of system analysis provided the reliability of the study. This method allowed us to analyze the possibility of creating a flexible regulatory framework that allows market players to test and use it limitedly, guaranteeing the safety of the citizens and aimed at stimulating the development of artificial intelligence. The analogy method is used in the formation of proposals for the structure of the regulatory platform for the introduction of artificial intelligence. This method allowed us to justify the need to introduce special regulation for its subjects and participants, and specific instruments of “soft” regulation in order to prevent violations. The generalization method helped to identify the most important areas of regulation of the use of artificial intelligence in the banking sector. By using this method the authors draw out conclusions about the need and priority to firstly introduce measures to reduce costs and losses (anti-fraud, anti-money laundering), and those that are applied directly with the provision of banking and other financial services by credit organizations (credit scoring, investment consulting). The potential of the methods used allowed us to solve the problems set in the study.

3 Results

In order to create a flexible regulatory framework in the field of artificial intelligence, that allows market players to test and use it limitedly, guaranteeing the safety of the citizens and aimed at stimulating the development of the technology, foreign experience indicates the need to use “regulatory sandbox”, which has already been successfully implemented in several countries around the world (Australia, Canada, China, Singapore, the United States and others). Regulatory “sandboxes” are platforms that are created by initiators (regulators) for the purpose of testing or limiting the use of innovations, providing a special regulatory regime for participants within a controlled environment.

When authorities and different institutes create and run regulatory “sandboxes”, several tasks should be solved: reducing the time and financial costs of implementation of innovative technologies; reducing the risks of violating the law in the absence of legal regulation of this economic activity; the ability to expand the segment of innovative products in the shortest possible time; the ability of the regulator to directly control the actions of market participants and players, to eliminate legal barriers and protecting the rights of consumers of innovative products.

Based on the tasks and purposes of functioning of regulatory “sandbox”, they should have several mandatory components:

1. The arsenal of instruments used by the regulator.
2. The functional basis of the platform, i.e. the rules and conditions that are mandatory for all participants, including the submission of an application for participation, activities within it, and termination.
3. Measures to protect consumers of innovative products.

Thus, the regulatory sandbox must meet the requirements of both parties and initiators of its creation. The regulator needs to work out the system of experimental

legal regulations within the framework of direct interaction with the innovator (participant), as well as to constantly monitor the functioning of the sandbox as a whole and monitor the implementation of measures to protect consumers' rights, taking into account the possible risks of financial losses and entering the market of a low-quality product.

When creating a regulatory platform for the use of artificial intelligence, robots and robotics, special regulation, that will be applied only to its subjects and participants, should be introduced, and it is also necessary to use "soft" regulation tools. The authors suggest the main approaches for creating a flexible regulatory framework that combines both methods of regulation, as shown in Fig. 1. According to the authors, the combination of these two methods of regulation can contribute to flexibility and responsiveness to the appearance of possible barriers to the development of technology and the work of subjects of the regulatory platform. The act of "soft" regulation explains how the subject should act in a given situation, and gives him confidence in the legality of these actions. In addition, the expanded "soft" regulation approach quickly solves the problem of gaps in legislation and loopholes, especially at the stage of their formation, which is currently applicable in the field of artificial intelligence, robots and robotics. The specific set of legal rules depends not only on the technology that is being tested using the regulatory sandbox, but also on the scope of its application.

The areas of development of legal regulation of artificial intelligence in the banking sector can be divided into several key positions: legal regulation of investment activities with engagement of artificial intelligence (including algorithmic trading); the legal status of AI in customer services' provision (chatbots, financial consultants, consideration applications for loans) and the legal consequences of making incorrect decisions or mistakes by an artificial intelligence unit that caused financial or other types of damage; legal regime of information used by artificial intelligence for processing and subsequent formulation of proposals and individual services (Figure 2).

Foreign media most highly assess the economic potential of using AI in the field of countering money laundering (the possibility of saving here is estimated at 217 billion US dollars) and the so-called "conversational banking" (cost reduction for the Bank here is estimated at 199 billion us dollars). The category of conversational banking includes customer identification and authentication procedures, the use of chatbots and voice assistants, speech recognition and its reproduction by a robot, as well as other types of interaction between the customer and banking artificial intelligence [8]. It is also emphasized by increasing popularity of remote banking technologies, which have already become the main channel of banking services provision. It is also a big challenge for labor force engaged in banking services, because they should also adapt to a new reality. The demand of financial sector employers now is mainly focused on digital skills of applicants [6].

Conversational banking with the use of artificial intelligence is an important direction in the development of banking services, opening up space for another key segment - the so-called predictive banking, which is based on predicting the financial behavior of the subject and his personal financial advice based on the internal algorithms and habits of the user.

This technology, in particular, is already being implemented in its banking applications by one of the largest credit organizations in the world, Wells Fargo, which

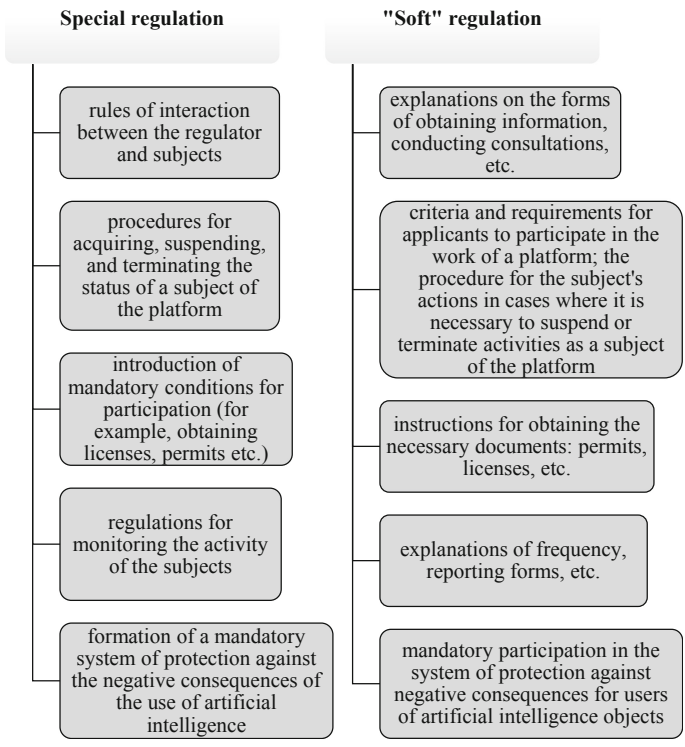


Fig. 1. Approaches to creating a flexible system of legal regulation of the use of artificial intelligence (Source: authors).

offers customers a full-fledged financial assistant and planner powered by AI. Artificial intelligence embedded in the app notifies the customer of unnatural spending above the usual average level (including specific counterparties or segments of goods and services); if the average account balance is exceeded, the app recommends putting some money on a savings account; reminds the customer of the possible need to make payments in the near future (pay for mobile communications, housing and utilities services or other periodic payments); explains its recommendations based on previous periods or transactions [10]. A similar technology is also used in another major global Bank - the universal proactive personal assistant chatbot Erica, created by Bank of America. Similar to the Wells Fargo app, the chatbot generates reports on transactions that exceed the usual costs for similar services in previous periods, reminds you of the need to make periodic payments, and also displays information about the client's credit rating in real time based on a special embedded algorithm (FICO® Score Insights) (only for premium clients of the Bank). Opportunities for integrating such services into banking applications will be implemented in the future by other banks, and the breadth of use of artificial intelligence technology is truly impressive.

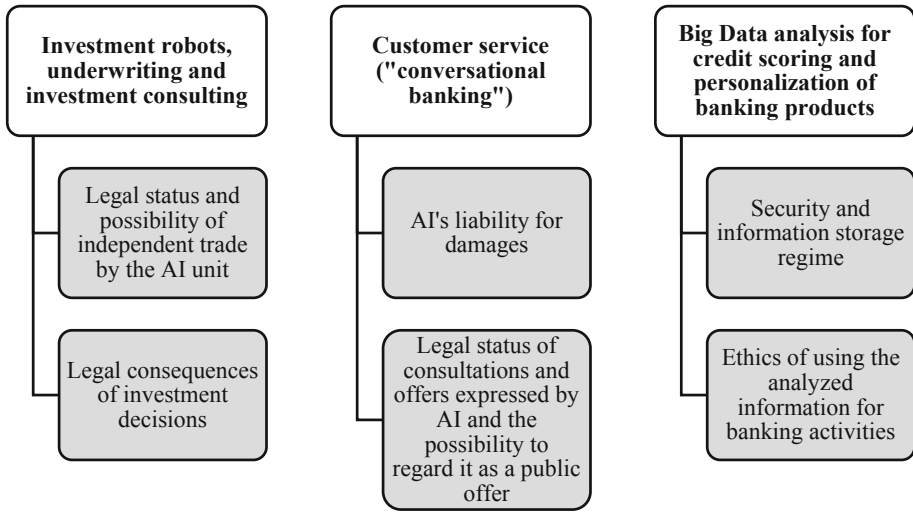


Fig. 2. The main directions of AI's usage in banking and legal problems of its implementation (Source: authors).

4 Discussion

The introduction of innovative solutions in the face of instability and upcoming changes affecting almost all spheres of public relations, including in the sphere of settlement of emerging legal relations, causes quite a wide discussion in the world. Stepanov [9] notes that the future of legal regulation is associated with the need to solve problems to ensure the safe development of complex social and technological processes by legal means. Kim and Choi [5] conclude that the innovation-based approach it seems to be a promising direction for leveling the negative consequences of the economic downturn, as the promotion of innovative solutions it is able to ensure the overall growth of the economy at the state level.

In modern market conditions, banks can use the capabilities of artificial intelligence in a variety of ways - for risk management, for real-time consulting, for investment, and so on [4]. However, the approaches of banks and financial market specialists to the potential use of artificial intelligence technology in their activities, as well as to the possible impact of its implementation, still differ significantly. One group of specialists focuses on reducing costs by replacing human labor with robots and machines, as well as on automating routine processes using artificial intelligence technology without radically reforming the functional architecture itself, as well as the structure of a lending institution; the other group focuses more on the applied perspective of using technology to develop and implement qualitatively different business models, as well as new areas of activity and markets to increase profitability [1]. The difference in approaches to development also determines the horizon of potential implementation: on the one hand, the utilitarian use to simplify specific processes is still dominant in most banks; on the other hand, many specialists share optimism about the complete

transition of some functions to the digital environment. A survey of the business community newspaper *The Financial Times* showed a wide range of opinions among financial market players both on the definition of artificial intelligence and in the aspect of its future in the banking business, highlighting that this is not the future, but has already become the present in the context of using artificial intelligence to communicate with customers (chatbots), analyze their preferences, etc. [7].

The problematic issue of “interpreted artificial intelligence” is currently not resolved, since the logic of making certain decisions is unclear, which is critical for a financial sphere, because customers pay for reasonable and understandable solutions [2]. Moreover, it is still unattainable for manufacturers of robots and computers to launch a machine equipped with AI able to adapt and modify itself according to received experience with respect to internal algorithms, which is sometimes called “strong artificial intelligence” [3].

5 Conclusion

Based on the research, we can also formulate a number of conclusions and identify the most problematic aspects and features of the use of artificial intelligence technology in the banking sector:

1. The creation of a regulatory platform will be an effective mechanism for developing a flexible regulatory system that allows testing and limited use, guarantees the safety of the population and is aimed at stimulating the development of artificial intelligence, robots and robotics objects.
2. It also seems reasonable for the regulator itself to invest in artificial intelligence technologies since the potential for using the technology in the field of supervision is extremely large: from automatic collection and systematization of reporting documents in offline mode to automatically detecting suspicious transactions or capital withdrawal.
3. Special regulation by the initiator (regulator) should include the following main components: regulates the interactions between the regulator and subjects; procedures for acquiring, suspending and terminating the status of the subject of the platform; introduction of mandatory conditions for participation (for example, obtaining licenses, permits, etc.); regulations for monitoring the activities of the site subject; formation of a mandatory system of protection against the negative consequences of the use of AI, robots and robotics objects.
4. Instruments of “soft” regulation contain: the clarification of the forms of information, consultation, etc., criteria and requirements for applicants to participate in the work of the courts, the actions of the subject in cases of suspension or termination of activities as a subject of the platform; instructions on obtaining the necessary documents: permits, licenses, etc.; clarification on the frequency, reporting forms, etc., participation in a mandatory protection system against the negative effects of user objects AI, RT and robots.
5. It should be noted that the most important areas for regulation are those areas of application of artificial intelligence, which, first of all, allow banks to reduce costs

and losses as much as possible (anti-fraud, anti-money laundering), and secondly, are applied directly to the provision of banking and other financial services by credit organizations (i.e. credit scoring, investment consulting).

6. The main obstacles and barriers for a further implementation of artificial intelligence technology are information and technological problems (the disparity of information, complexity in processing large amounts of data and interpreting the results using nonlinear calculation algorithms) and regulatory problems related to banks' doubts about the potential validation of the model by the regulator, as well as purely organizational factors (high cost of solutions and lack of employee competencies).

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Development of Conditions of Innovations Institutionalization Contributing to the Russian Sustainable Development

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Abstract. The purpose and study objectives. Understanding the institutional problems of innovation implementation for sustainable development is relevant. The purpose of this study is to substantiate the institutional conditions and motivational factors for implementing the sustainable development goals (SDG) in the activities of Russian companies. The objectives of the study are to study the implementation of SDG in the strategy of Russian business; compare the motives for the implementation of SDG by large companies with SME (small and medium-sized enterprises); compare Russian practices with foreign ones, identify problems and develop basic measures for the institutionalization of innovations. To identify the integration of SDG in the business models of companies, a study was conducted using a sociological survey of Russian business representatives. It is proved that the factors that stimulate the integration of SDG in the activities of large companies and SME are “transformation of the existing business model”, “increasing environmental and climate responsibility” and “responsible production and consumption”.

Keywords: Competitiveness · Environmental innovation · Institutional context · Sustainable development · Sustainable development goals (SDG)

1 Introduction

The transition to sustainable development is discussed on various platforms from the scientific community to practitioners around the world. Russia adopted the sustainable development goals (SDG) along with other 192 UN countries in 2015. In official documents of strategic planning of the Russian Federation, the terms “sustainable development” and “green economy” have not yet been officially adopted. However, the country’s state development programs largely correspond to the sustainable development goals. An important impact of attention and further implementation of the SDG in the management of the economy at all its levels was given by decree of the President of the Russian Federation No. 474 dated July 21, 2020 “On national development goals of the Russian Federation for the period up to 2030” [8]. Strategic objectives were supported by national projects and state programs aimed at creating new business segments

and creating innovative opportunities for transition to a “green” economy in the Russian regions. SDGs decision requires a kind of “merging” of macroeconomic and environmental policies, as well as combining the efforts of the state and business [17].

A lot of large Russian companies have integrated the sdgs into their corporate social responsibility strategies and policies, and have begun to pay more attention to social reporting, the environment, and green innovation. Integration of SDG into business strategies leads to changes in organizational, managerial and entrepreneurial processes. The purpose of the study was to determine the integration of SDG in organizational strategies and business models, as well as the awareness of employees about the contribution of their companies to solving social and environmental problems.

2 Methodology

The concept of sustainable development has received the status of a scientific phenomenon since 1987, the period of the Brundtland Commission. At the central place to the concept of sustainable development at that time was the problem of global environmental consequences of human activities, which could endanger their continued existence. However, later, the concept of sustainable development became more widely considered, including the social aspects of development. The concept of sustainable development is closely related to the concept of corporate social responsibility. Some researchers say that corporate social responsibility is the achievement of sustainable development at the firm level. The integrated approach was suggested by Elkington [9]. The “trinity principle” of economic, social, and environmental aspects, which he identified, is used in the analysis of a company’s responsibility to society.

Steurer, Langer, Konrad and Martinuzzi divided the concepts of “sustainable development” and “corporate sustainability” [16]. In his view, corporate sustainability means adopting a business strategy and conducting activities that meet the needs of the enterprise and its stakeholders in order to preserve and strengthen the human and natural resources that will be needed in the future.

The difference between the concept of sustainable development and CSR is that corporate social responsibility compensates for the negative impact of the company’s activities on society, and the concept of sustainable development assumes obtaining competitive advantages through innovations and innovative approaches that meet and fully comply with the requirements for environmental protection [1, 5]. According to Wolczek [18], the general concept of sustainable development and CSR is to contribute to improving the quality of life of people on a global scale.

Sachs defines sustainable development as socially inclusive and environmentally sustainable economic development [15]. The condition for achieving sustainable development is the introduction of innovations according to Omid, Shahabadi and Mehregan [12]. The formation and development of an innovative ecosystem is called a condition for sustainable development Carayannis and Campbell [7], Dubina et al. [8], Kozhevina, Salienco, Starozhuk, Klueva and Pavlova [11], etc. The development of innovative entrepreneurship involves the integration of business with academic and research structures [6].

Research on the contribution of Russian business to achieving the SDG was conducted by RSPP (2017) [10], PwC consulting company in (2018) [14], PwC (2019) [13]. Integration of SDG goals into state programs and national projects of the Russian Federation was studied by Bataeva [3]. Practices of corporate social responsibility of SME enterprises were studied by Bataeva, Cheglakova and Melitonyan [2]. However, the integration of SDG in the business strategies of large businesses in comparison with small and medium-sized businesses was not analyzed in these publications. To identify the integration of SDG in the business models of Russian companies, and the awareness of staff about the company's efforts in this direction, the authors conducted a sociological study. The survey of business representatives was conducted using modern information technologies, using social networks and platforms during april-may 2020. The respondents were company managers and key specialists in the field of corporate development, strategy implementation, and interaction with stakeholders.

3 Results

In total, representatives of 102 Russian companies of various organizational and legal forms and forms of ownership were interviewed. Among the companies that took part in the survey, 59 were SME (57.84%), and 43 were large businesses (42.16%). Among the respondent companies, industrial enterprises (23.6%), agricultural and processing organizations (14%), education (12%), energy (9%), companies in the housing and utilities sector, the tourism sector, solid municipal waste management, construction, medicine and healthcare are more represented. The survey shows that company representatives have little knowledge of the SDG. Only 19.7% responded positively. 47.2% have an incomplete views. A large proportion of those who have not heard about the principles of CSR and the SDG, or were not interested in them (this is 33.1%). When asking about the motives for integrating the SDG into business processes, the majority of respondents named the environmental and climate responsibility of business (38.9%). A large proportion of those who believe that SDG integration, and doing business responsibly contributes to improving the company's competitiveness is 36.5%. Almost one-third of respondents identified SDG integration as an important factor in transforming the business model (28.6%) and expanding dialogue with stakeholders (27.0%).

The identification of cause-and-effect relationships in the respondents' answers suggests that most Russian companies perceive the incorporation of the SDG into the current business model not so much as a formal duty or obligation, but rather an awareness of responsible "green" business conduction and strategic competitiveness.

When asking about the most relevant sustainable development goals for the company, respondents named 4 out of 17 goals: Goal 3 "Good health and well-being", Goal 5 "Gender equality", Goal 8 "Decent work and economic growth", Goal 13 "Combating climate change", Goal 17 "Partnership for sustainable development". When analyzing the distribution of responses separately for large enterprises and SME, we found certain differences in the motivating factors for the SDG implementation (Table 1).

Table 1. Comparative analysis of motivating factors for incorporation of SDG in companies' activities

Motivation factor	Large business, in % of respondents by segment	SME, in % of respondents by segment
Expanding the dialogue with stakeholders	17.5	20.0
Responsible production and consumption	27.5	23.3
Environmental and climate responsibility	47.5	26.7
Energy and resource efficiency	30.0	15.5
Important for the sustainable development of cities and regions	22.5	10.0
Transition to lean manufacturing	25.0	11.7
Responsible business conduction is a competitive advantage	15.0	26.7
SDG as a factor of business transformation and business model	25.0	25.0
Required for reporting	15.0	5.0

Source: authors.

As can be seen from Table 1, a common factor for both SME and large businesses is the importance of the SDG for transforming the current business model. The responses are unanimous and make up a quarter of the respondents. Based on the specifics of the functioning of large businesses, it is quite understandable to pay more attention to the factors of environmental and climate responsibility, responsible production and consumption, and increasing energy and resource efficiency. In turn, the most attractive factors for SME enterprises are responsible business conduction from a position of competitive advantage, increasing environmental and climate responsibility, and responsible production and consumption. The most significant differences were found in the reporting factor. Representatives of large businesses are three times more concerned about this issue, which is understandable for formal objective reasons. Thus, the trends for SME and large enterprises are generally consistent with the average survey parameters.

4 Discussion

The results of the survey of Russian companies on the current level and prospects of their involvement in the implementation of the UN sustainable development goals do not coincide with the results of the RSPP study (2017) [10], partially coincide with the research of the PwC consulting company [13, 14]. Thus, according to the 2017 RSPP study, 43% of enterprises showed awareness of the SDG [15], while in our study only 19.7%. According to the results of the RSPP survey, the most popular goals for Russian

business are: health and well-being (goal 3); quality education (goal 4); decent work and economic growth (goal 8); responsible production and consumption (SDG 12); climate change (SDG 13); and biodiversity conservation (SDG 15). Only half of the SDG, namely 3, 8, 13, match the results of our study [10].

In a 2018 PWC survey, only 5% of 41 Russian surveyed companies noted the SDG connection. PWC found that the most popular SDG for Russian businesses are quality education (goal 4); decent work and economic growth (goal 8); and responsible production and consumption (SDG 12) [14]. This data partially matches the results.

According to the survey respondents' answers, out of the 7 environmental goals that are most relevant for Russia, representatives of companies identified climate change (goal 13). While for Russia, seven environmental goals are most relevant: clean water (SDG 6); affordable clean energy (SDG 7); sustainable cities (SDG 11); responsible production and consumption (SDG 12); climate change (SDG 13); saving the oceans (SDG 14) and preserving biodiversity (SDG 15) [4]. Other environmental SDG were not included in the respondents' answers.

5 Conclusion

In Russia, there are positive examples of companies integrating SDG into their strategies. Ambitious goals in the field of sustainable development are typical, first of all, for large organizations, companies with state participation, and system-forming ones. Progressive companies understand that businesses based on the principles of sustainable development are forced to innovate, as this allows them to maintain their competitiveness. Common factors that motivate the incorporation of SDG in the activities of large companies and SME are “transformation of the existing business model”, “increasing environmental and climate responsibility” and “responsible production and consumption”. From the point of view of practical recommendations, we can advise to coordinate the efforts of government and business at the macro level in achieving the SDG, to develop the institutional infrastructure for supporting innovation, to actively motivate businesses to implement “green” innovations through tax incentives, public and municipal-private partnerships. At the company level, it is desirable to raise employees' awareness of their companies contribution to the UN global agenda.

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Formation of Macroeconomic Stabilization While Improving Digital Platforms and Effective Wealth Management

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Abstract. The article analyzes the possibilities of creating a favorable working environment and managing effective well-being in the process of transition to information technologies and digital platforms that have a positive impact on the development of the economy. This goal can be achieved with the close interaction of a favorable working climate, the development of Informatization, and digital algorithms. The tools of the digital platform, based on information technologies, are of great importance in this aspect. They allow to change the development trajectory to the effective improvement of a favorable working environment, increasing the importance of human resources and intellectual potential.

Keywords: Digital platform · Favorable working environment · Human resources · Intellectual potential · Macroeconomic stabilization · Wealth management

1 Introduction

The transition to informatization and digitalization, with a focus on the strategy of innovative breakthrough, implies the formation of prerequisites for macroeconomic stabilization, generating, first of all, the creation of a healthy working environment and effective wealth management. In the past few years, the meaning of “digital platform” is particularly relevant, which is a system of algorithmized relationships between a large number of market participants, which can lead to a reduction in transactional costs due to the use of digital technologies and changes in the labor division system. New business development conditions require improving the quality of human resources management, which determines the need for business structures to consider the possibility of improving the development of information technologies and digital platforms. The uncertainty of economic entities in implementing decisions on financial and economic issues complicates their position in the market, reduces their competitiveness, and leads to the loss of not only income, but also factors of production. Based on the essence of uncertainty in the development of the Russian economy as a consequence of macroeconomic instability. Its reverse side is certainty, the “programming” of entrepreneurs and consumers for a certain result in their decision-making. Macroeconomic stabilization is possible in the interaction of economic development,

digitalization, information technology, and human resources. All of the above factors have a direct or indirect impact on improving well-being and creating an effective working environment. In a real market economy, employers' decisions are related to information technologies in order to create a favorable working climate and obtain effective results. The situation of transition to new digital technologies in the economy implies a fairly broad approach to determining its actual boundaries, from complete ignorance of future institutional changes to the inability to approximately determine the limits of fluctuations and predict their most likely values. In such circumstances, you have to make decisions before getting all the necessary information. Such decisions are based on expectations of future values of prices, revenues, and other variables that may not always be correct. The fact is that the information asymmetry leads to different options for forming expectations by market participants.

2 Methodology

Choosing the M-sequence as a pseudo-random sequence used in the proposed algorithm allows you to exclude situations of false positives on similar keys because all sets of peaks will be poorly correlated with each other. The imbedding key in this algorithm is a set of peaks that are embedded in a black field. When using any other sequences, a collision problem may occur if the embedding keys match each other up to a cyclic shift, or the embedding keys differ in a small number of bits, since detection in the case of rotation will occur by searching for the maximum of the cross-correlation function. When using the M-sequence, this problem will not be observed, since the values of its autocorrelation function (ACF) for any non-zero shift are close to zero, as it was described above.

Standard method for the synthesis of M-sequences is the use of the register with linear feedback shift register (LFSR). The LFSR consists of a generator, an summator and memory cells that are connected in a circuit feedback. An example of a scheme that generates an M-sequence is shown in [6, 9]. The parameter of such a scheme that determines its work is the feedback structure connected to some of the memory cells.

The shift register is a sequence of bits. Their number is determined by the length of the shift register. Feedback is the modulo addition 2 of some bits of the register, such bits are called an indirect sequence. To start the LFSR it is necessary to perform the initialization—filling in all the memory cells by the certain values. Any bit sequence can be used as these values, except for a sequence consisting entirely of zeros [1]. The further shift register work with linear feedback is determined by the pulses of the clock generator. As a result, the contents of all memory cells are updated, and one bit is sent to the LFSR output as the M-sequence bit. You can only extract one bit at a time from the shift register. If it is necessary to extract the next bit, all other bits of the register are shifted by 1 digit. There is an example of the sequence of a linear shift register work [6], which consists of 4 memory cells and whose feedback structure is defined as [1, 4].

The register period is the length of the resulting sequence before it starts repeating. A shift register with linear feedback can be in one of the $2^m - 1$ state, so such a register can generate a pseudo-random sequence with a period of $2^m - 1$. Only in certain indirect sequences, the shift register with linear feedback will go through all $2^m - 1$

states. In this case, the obtained sequence will be an M-sequence. If the generator passes each of the internal states, except for the one in which all memory cells are filled with zeros—this case is considered as “ideal” [8]. It is convenient to describe the entire generator by a polynomial function that describes the indirect sequence of bits for the summator. An example of numbering the LFSR cells for further generator submission in the form of a polynomial function is shown by Varanin [11]. There are tables of the feedback structure for LFSR to obtain the M-sequence of the full period of a given length. Table 1 shows examples of feedback structures that generate a full-period M-sequence.

Table 1. Examples of feedback structures

The length of the sequence	Feedback structure
1	[1, 2]
3	[2, 3]
5	[3, 5], [2–5]
6	[5, 6], [2, 3, 5, 6]
7	[6, 7], [4–7]
8	[4–6, 8]
10	[7, 10], [6, 7, 9, 10]

Source: authors based on [2]

A positive factor in the development of the innovation economy, namely the knowledge economy, is provided by ICTs in education, both at the middle and higher levels. The next suggested model is an algorithm for peaks embedding obtained from the M-sequence in the zero field. First of all, it was necessary to generate a zero field. In this context, a zero field is an image with zero brightness values and sizes $N_1 \times N_2$ equal to the container image. Then the image spectrum (digital watermarking) is formed. The output bits of the M-sequence set the position of the peaks on the spectrum [13]. In polar coordinates, the image spectrum (digital watermarking) will be a zero field with a sequence of peaks embedded in a string. The spectrum of the image (digital watermarking) in the polar coordinate system and a visual representation of a complex number on a plane are shown by Varanin [11]. Using the “magnifying glass”, a fragment of the built-in sequence is moved closer for better clarity.

To speed up the algorithm, the spectrum of the digital watermarking pattern was formed in the Cartesian coordinate system. In the polar coordinate system, there are 2 arguments that determine a position of a point in two-dimensional space:

- angle θ ,
- distance ρ .

In the Cartesian coordinate system, the image spectrum (digital watermarking) will take the form of a peaks ring with a radius that depends on the number of the embedding line. The ring center coincides with the center of the entire image spectrum. The perimeter of the circle is divided into equal blocks, the number of which

corresponds to the number of output bits of the generated M-sequence. If the output bit of the M-sequence is equal to one, then a complex number is embedded in the middle of the current block, the real and imaginary parts of which are set randomly according to the uniform distribution law. If the output bit of the sequence is zero, nothing is embedded in the current block.

These operations are performed for the entire first half of the peaks ring. Since the image spectrum is a Fourier spectrum, and the future spatial pattern is a real one, the second half of the ring is formed symmetrically to the first, and the values of the peaks will be complexly conjugated with the values of the first half. Graphs of the values of the real and imaginary parts of the Fourier spectrum for a certain real signal $S(k)$ are shown by Basalova [2].

To obtain a spatial pattern of a digital watermarking, the inverse Fourier transform, obtained in the previous steps, is applied to its spectrum. It is calculated using the following formula:

$$X_{p,q} = \frac{1}{m} \sum_{j=1}^m \frac{1}{n} \sum_{k=1}^n \omega_m^{jp} \omega_n^{kq} Y_{j,k}, \quad (1)$$

where $X_{p,q}$ is the value of the resulting spatial pattern of the digital watermarking;

n , m -image-spectrum sizes that are received at the function input;

p , q -sizes of the resulting spatial pattern of the digital watermarking;

$$\omega_m = e^{\frac{2\pi i}{m}}; \omega_n = e^{\frac{2\pi i}{n}}.$$

As a result of all the above-mentioned operations, a stable spatial pattern of the digital watermarking is created. Such a restructuring will require major investments in the development of the scientific and educational complex, updating the material and technical industry base, and creating new high-tech industries. New models of the digital economy play a great role in improving well-being, creating a favorable working environment, and managing human resources. The problem of information literacy and the information and communication technologies development were discussed in the works of Feldvari and Varga [4]. In the course of the research, methods of mathematical and statistical analysis were applied. The article used methods of differential, integral and variational calculus. Functional dependencies were used to solve socio-economic problems.

3 Results

Currently, the particularly relevant studies in the field of economics are issues related to the combination of innovative aspects and digital technologies, which are considered in the works of Haltiwanger and Jarmin [5]. As a tool of the development of digital technologies and the transformation of digital platforms that can improve efficiency in the workplace, the authors suggest a method of computer stenography, the main directions of which are: digital stenography methods and methods focused on the data format. These signals include images, video data, and audio files. Nowadays, there are problems with copyright infringement. One of the most popular and effective methods in the field of stenography for copyright protection and protection from unauthorized

copying is to embed the stenography insets, which are marks that carry a certain identifier of the copyright holder in the protected object. These marks are called digital watermarks. Currently, the problem of copyright protection focuses on the protection of intangible property. The main component of intangible property is intellectual property. This problem has become particularly important with the development of digital technologies and the Internet. One of the ways to solve this problem is to embed digital watermarks in multimedia files, in particular in digital images and video data. The level of society development and the economic growth rate depend directly on the nature and directions of the digital economy development. The works of Bulavko, Tuktarova, and Belanova are devoted to this aspect [3].

4 Discussion

The main problem, the economic theory is designed to solve, is the resolution of contradictions between limited resources and unlimited human needs, more precisely, the problem of effective use of resources that are insufficient to meet the needs of society. Economic efficiency, in its classical interpretation, given by Pareto implies a distribution of limited resources in which it is impossible to increase the production of one good without reducing the production of another. Thus, economic theory is looking for best ways to use the available resources [12].

The spread of information technologies in a healthy working environment shows the need to spread and develop scientific and technological developments based on certain knowledges, which are a prerequisite for long-term economic growth and wealth management. At the same time, a synergetic effect can be obtained due to the breakthrough of the fourth and industrial revolution, defined as “Industry 4.0”, which is based on the “digitalization” of industry and production. Schultze in his research proves that “the combination of high technologies and traditional industry in a network of active players grouped around the “authorized” state characterizes the European model [10]. This model is based on elements of reindustrialisation and the sufficient groundwork on additive technologies, digital design and modeling. A technological breakthrough is possible with new breakthroughs in the process of creating a healthy working environment and developing an algorithm for protection using digital watermarks that can increase the importance of intellectual work and copyright. The developed algorithm is based on summing a container image with a noise-like digital watermarking. The main difference between this algorithm and most existing ones is that the container, during the process of embedding the digital watermarking, does not subjected to direct and reverse Fourier transformation. Instead, a ready spatial stable digital watermarking pattern is created, which is then additively embedded in the container with a certain gain α . In this paper, geometric attacks as well as the noise attack by additive white Gaussian noise were considered. For research purposes, the following situation was simulated: the original video sequence was divided into frames (container images), each of which was embedded with a stable digital watermarking pattern. Each frame was then attacked by zooming, framing, turning, and noise-making with additive white Gaussian noise. Finally, after each frame set distortion, they were given to the detector to confirm the algorithm’s performance based on the results obtained. The first step of the proposed

algorithm for embedding persistent digital watermarking is to generate a pseudo-random sequence. Thus, there is a question of choosing this sequence and how to synthesize it. The M-sequence was chosen as a pseudo-random sequence. M-sequences have a number of qualities. First, the M-sequences are balanced. This means that every binary M-sequence of the full period that consists of $2^m - 1$ binary discharges, consists of $2^{m-1} - 1$ zeros 2^{m-1} and ones [11].

Second, M-sequences have balanced series. Each M-sequence of the full period, which consists from $2^m - 1$ binary discharges, contains an equal or different (per one) number of the subchains' length up to and including m . Third, each binary sequence of the full period has a periodic autocorrelation function (ACF) with a zero reading equal to one, and non-zero peaks $\frac{1}{N}$, where N is the length of the M-sequence and $N = 2^m - 1$. It follows from the qualities of the M-sequence that it will have a fixed minimum cyclic distance $\lambda \approx \frac{N}{2}$. It helps to avoid conflicts when determining the authorship of the digital watermarking, and also helps to ensure resistance to a number of attacks aimed at digital watermarking calculations. It is also possible to generate the M-sequence with a fixed weight, which allows for a fixed signal-to-noise ratio. The M-sequence does not resemble a container image and does not "imitate" a natural image. Moreover, an M-sequence of sufficient length will actually represent "white noise". This reduces the possibility of a malfunction, i.e. a situation where the digital watermarking is detected in container images where it was not embedded.

Based on the above, we can conclude that the choice of the M-sequence as a pseudo-random sequence used in the proposed algorithm allows us to exclude situations of malfunction on similar keys, since all sets of peaks will be poorly correlated with each other. The imbedding key in this algorithm is a set of peaks that are embedded in a black field. Also, the sets of peaks will not be similar after the cyclic shift of the M-sequences (turning of a container image with a built-in digital watermarking).

5 Conclusion

Transformational aspects of information nature, as well as issues of technological structure are considered in the works of such scientists as Ioda, Bulavko, and Khmeleva [7]. An important aspect of the formation of macroeconomic stabilization is the improvement of digital platforms, the development of information technologies that can influence the well-being and a favorable working environment. According to the authors of this article, models of digital platforms, one of which is copyright protection, are the tools of the digital economy and intellectual capital implementation. Thus, the economy, information technologies and human resource management are considered in total as the most important factor in the development of digital platforms, welfare improving, and effective human resources management aimed at social and economic results achieving. The transformation of economic relations and the transition to a new technological mode is important, as it allows us to overcome the trends of increasing technological and intellectual lag, reduce the dominance of rent-seeking attitudes in society. For the authors the motivation of choice for the study of transformation mechanisms of formation and development of the digital economy was the complexity

of the topic, covering a wide range of issues related to the implementation model of a digital platform that allows you to transform into a specific type of the development of innovative systems resource, use of human capital in the interests and methods of information and innovation economy regulation, and effective wealth management. The study of these issues allowed us to form a more complete picture of the modernization mechanisms aimed at improving the development of a favorable working environment in the context of improving the development of the digital economy. In the context of increasing Informatization and digitalization of the economy, macroeconomic indicators are becoming much more important. They are expressed in such indicators as: improving the quality of life, improving the use of labor resources, increasing competitiveness, and sustainable economic development.

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Scientific, Technological and Economic Problems of Mechanical Engineering Modernization in Russia

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Abstract. This article discusses the current situation in the engineering industry in Russia. The analysis of scientific- technical, economic problems in the field of modernization of mechanical engineering. The causes of the problems are identified and ways to solve them are considered. A list of promising areas for effective restructuring of the industry has been compiled. The advantages of investment in engineering are identified. Volume indicators of industrial production are given to assess the key impact of engineering in the country's economy. Indicators are named for the objective accounting of the industry without re-calculation of indicators. The state investment policy in the framework of participation in the engineering industry is described.

Keywords: Economics · Engineering · Modernization · Productivity · Scientific and technological progress

1 Introduction

Digital progress does not stand still, new innovative products are created and the latest developments are introduced. Business is constantly evolving and keeps up to date, but the global economy is making a significant contribution. Today there is a period of economic downturn, which directly affects the business environment. Serious losses are the industrial sector, which determines the level of industrial and technical development of the country, as well as the degree of independence of its economy. Engineering industry occupies a special place in Russia, fixed assets are produced in this complex, and the engineering complex is the main factor in the development and modernization of the material and technical base of the economy. Therefore, the implementation of strategic objectives to increase the economic, technological and defense potential of Russia presupposes the consistent development of productive forces based on accelerating the pace of systemic and scientifically sound modernization of basic national economic complexes, among which the main role belongs to the machine-building complex.

2 Methodology

The implementation of the leading areas of scientific and technological progress is impossible without the development of the engineering complex. Today, technological progress and its pace are directly determined by the dynamics of engineering and its sub-sectors. In industrialized countries, engineering is given great attention primarily from the state in the form of support for knowledge-intensive industries. And this determines the competitiveness of enterprises [1]. The industrial sector consists of three groups by degree of novelty:

- old industries (metallurgy, textile, iron ore industry),
- new industries (chemical fiber, automotive),
- attest industries (electronics, microbiology, robotics).

The volume of engineering products in Russia is distributed by sub-sector as follows:

- 27.4% - automotive industry,
- 12.3% - electrical engineering and instrument making,
- 10.3% - heavy, energy and transport engineering,
- 6% - chemical and petrochemical engineering,
- 2.4% - mechanical engineering for the light and food industries,
- 2.1% - road construction machinery.

The share of mechanical engineering in the aggregate is 20%, while in economically developed countries the figure is 40–50%. In terms of budget expenditures, the industry ranks second. More than one billion of the total population of planet Earth is employed in industry. That is, above 17% of the labor force is involved in industrial sectors. Qualified specialists contribute to increasing the competitiveness of the industry and the country in the world market, which means that this is an area that plays one of the key roles.

Industry determines a number of factors that give a vector of development for the country as a whole. First of all, it determines the level of industrial and technical development of the country, the degree of independence of the economy, the level of social division of labor. For their analysis, market conditions, investment opportunities, productivity indicators, enterprise assets and their domestic policies are compared. Therefore, any changes in the economy entail the growth or decline of the industrial sector, which occupies a leading position in the country's GDP. Any crisis situation becomes a serious test for states. What we are observing today.

When assessing the performance of enterprises, indicators of their potential are used, namely, they analyze jobs, indicators of technological progress and the resulting indicators in the form of profitability and labor productivity. It is important to use natural meters in the study of production development trends under the influence of the external environment.

The purpose of modern politics is to expand and strengthen international and interregional scientific and technical cooperation, and promote innovative technologies in domestic and foreign markets. This provides the basis for the creation of effective

digital engineering industries that take into account automation, additive technologies, as well as product life cycle management systems.

For the timely solution of the goal, orientation to large players in the market is necessary. An assessment of industry segments shows that there are five key trends that can drive the growth of the engineering industry. This is the development of business communication models based on big data analysis technologies. This is the development of information technology and autonomous systems. This is the spread of the Internet of things. The increasing importance of cybersecurity and the growth of consumer demand for widespread electrification due to regulatory changes. This can increase the development efficiency of the leading sectors of the country, which is directly related to the sectors that determine the scientific, technical and production potential. Today, more than 4 million people are employed in engineering, nearly 40 billion kilowatts of electricity and almost 37% of the metal produced in the country are consumed [2]. To determine the actual economic situation in the industry, an analysis was made of the technical, organizational and financial and economic indicators characterizing the potential and use of production resources.

3 Results

The engineering industry of Russia consists of more than 200 sub-sectors and industries. It accounts for almost 30% of the total volume of industrial production. And this figure has halved compared to the 20th century. Because engineering provides the creation of fixed assets and determines the rate at NTP. However, the current situation says about the fall of the 9-fold production in machine-tool industries in comparison with 90-mi years. Market aerospace and defense fall occurred 20 times, and on some items 50 times. Current indicators are attributed to the ongoing reforms of the state that do not contain a long-term perspective. Data market of Western countries show that the domestic product is a little competitive, so it's hard rooted in the international arena. This confirms the fact that production and economic ties of the leading engineering centers in the country has deteriorated over the last 17 years. Therefore, an important task for the next 15 years is to mobilize the reserves of the structural – technological and organizational – economic character.

The product on the market in Russia is time-consuming as developing it. All this hinders the quality of innovation in power a long process of approval of this product. Only 2–5% of revenue goes to R&D, and this situation the leaders of the Russian market. The analysis also showed that the leadership understands the importance of innovation, but the practical application of them to the full extent they are not yet ready. This suggests neozelandese effect of innovation. Innovation can reduce development cycle to 60% and be only 6 months. The focus on product quality and technological level displayed on the forefront of using approved tools [3].

Strategic planning takes into account the concept of Industry 4.0, which opens up the possibility of increasing productivity by using the necessary leverage at all stages of the value chain. This will help reduce costs without losing the quality and value of the product. To do this, tools such as “smart irrigation” and remote equipment diagnostics began to be considered. Already today, advanced manufacturers are gradually moving

to a remote monitoring system, which leads to the development of products with improved features.

Studies have shown that there is a shift in points of growth and profitability towards the service business, software and the introduction of additional services. This requires intersectoral and interregional cooperation, which is difficult in Russia. It contributes to the creation of a product with a high margin; it is the junction of industries that allows us to develop the weaknesses of the industry. For this, platforms are being created in Russia - technology parks that unite market players to jointly develop production technologies and find key consumers, as well as to exchange experiences with established industry leaders. So, in the Samara region there is a regional center for innovation and technology transfer, Technopark OJSC, innovative business incubators, centers for innovative development and cluster initiatives, and an innovation and investment fund in the Samara region.

In the region created a system of infrastructural organizations, among which it operates "Zhiguli valley" Technopark as an advanced region. Main areas of specialization are IT, space development, energy efficiency and conservation. It is a platform for innovative development of entrepreneurship, which supports entrepreneurship among community members from inception of idea to implementation of a specific innovation project. This approach reflects the systematic and comprehensive measures of state support of innovative activity in the Samara region. In 2019 "Zhigulevskaya valley" has entered the three leaders of Russia with the highest level of effectiveness (about 110%). This creates a working ecosystem with a high technological orientation.

Privatization has not given the required result and did not ensure the realization of the potential of the military – industrial complex. All this also leads to a decline in capital productivity. In Russia there was a tendency of monopolization, which leads to technical and informational isolation of sub-sectors. All this is reflected in slow pace of implementation of the strategy of conversion of the entire building.

Domestic machinery is of extensive type development. It is caused by high energy consumption and a large expenditure of metal. For comparison, in industrialized countries the share of machinery ranges from 34 to 49%. The reason for high ratings for well-established development process and innovation through flexible and prompt operations in enterprises. They are also important innovative culture with a detailed understanding of customer needs. The vector of development aimed at the introduction of this position into the corporate culture of each organization and translation in the technical specification of this principle for engineers [3].

The Russian government plays a major role in increasing the importance of engineering along with other industries [10]. This is expressed in targeted grants for R&D, the implementation of an import substitution policy, and the creation of cluster initiatives. All this should be the basis in the industry development strategy. However, the investment policy in Russia for a long time did not carry a scientific justification and until 2015 did not provide forecast data on product sales markets. All this has become the basis for the traditional view of the "correct" conduct of machine-building production. Therefore, an important step will be the creation of demand for innovations through state orders, as well as a detailed and detailed study of the industry development strategy, which will include large-scale training and retraining of qualified personnel for companies subject to innovation.

4 Discussion

A comprehensive solution to these measures can create real prerequisites for the stable functioning of mechanical engineering, which requires a strategy to implement national priorities for the country's industry to reach a new level of predominantly innovative development. And under this condition, it is possible to solve the complex problems of modernizing the production potential of the Russian machine-building complex. The automotive industry is built on the principle of oligopoly, where 16% of the total revenue of the entire sector is concentrated. There is a direct correlation between industry concentration and structure parameters. For Russia, this consists of fierce competition from multinational companies, which reduce the attractiveness of the industry. Previously, the industry's sales profitability indicator was 6%, but today it has fallen to 1% on average [5, 6].

Another feature is the large technological gap between domestic and foreign goods, and this fact lays the foundation for identifying opportunities for changing the structure of the economic sector. The created competition in the automotive market leads to the fact that manufacturers need to pay attention to strategic management as a whole, not forgetting the production technology. There is an unwritten rule in the manufacturers' market: in order to be competitive, you need to sell more than 4 million cars a year.

At the regional level, their own acts are adopted, which can also "raise" the engineering industry. But in practice, there is inter-regional fragmentation due to the autonomy of decisions. Russia aims to cooperate with the countries of the West and the USA by creating modernized enterprises. To implement this direction, financial and industrial groups are being created that concentrate financial resources for the implementation of new engineering and technical developments, taking into account market requirements in optimal terms.

5 Conclusion

Thus, the situation in the market of engineering shows the slow pace of restructuring enterprises. The utilization of the main profile production does not exceed 34%, and it is not leading to structural and technological effects, which must be in compliance with the parameters of a comprehensive restructuring of engineering enterprises. Practice shows that there is no complete substantiation of the organizational restructuring schemes, and their implementation should contain scientific rationale based on in-depth studies of potential domestic and international market of engineering products [4, 7].

Insufficient use of the foreign experience of restructuring of sub-sectors. It is necessary to create various associations, alliances that could weaken competition in engineering and ensure the rational use of production capacity. The industry is characterized by sufficient diversification, but in practice, Russia does not occupy a leading position in a certain direction. Therefore, the focus can shift to specialization of specific areas, at the expense of quality investments in key products. This will lead to increased competitiveness [8, 9].

In the era of digitalization of the economy and introduction of advanced technologies, the industry needs to focus on the concept of "industry 4.0". It is aimed at the

development of promising industries through the use of technologies saving data, cloud, Internet of things. However, this requires a self-development program leading industrial complexes of Russia, among which the Central place is given to machinery that contains applicable to the Russian reality of the direction of restructuring. This will allow in the future to significantly improve the economic and social potential of Russia.

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Decarbonization as a Factor of Sustainable Corporate Development Within Climate Change

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Abstract. The article discusses the issue of climate changes and corporate responsibility. Corporate sustainable development imposes attention to environmental problems, that makes companies to switch to environmentally friendly technologies, reducing carbon emission, cutting natural sources' deployment. It was researched that decarbonization of corporations may give not only social contribution, but also financial benefits. The most vulnerable for the "green economy demand" companies of energy industry were put to the sample and the economic effect of decarbonization was computed. The calculation allows to continue discussion about sustainable development of corporations alongside their environmental responsibility.

Keywords: Climate change · Corporates' performance · Decarbonization · Environmental responsibility · Low-carbon production

1 Introduction

Sustainability business strategy is the integration of economic, environmental and social aims into a firm's goals, activities and planning, with the aim of creating long-term value for the firm, its stakeholders and the society. This means that strategy is formulated to satisfy the firm owners and the stakeholders. At the same time, attention to the protection, maintenance and expansion of natural resources that are necessary in the future work is paid as well. The creation of a sustainable, just and equitable growth of a company will require fundamental shifts in the way businesses operate. Businesses, in particular, bear some responsibility for many of the social and environmental problems currently afflicting society, such as exploitative working conditions, or the destruction of habitats.

It is estimated that between now and 2050 more than nine billion people will live in the world. Optimizing resources will be fundamental, as much as being able to guarantee better air, water and soil quality. For this reason, the European Commission proposed new measures as European strategy [8]. A strategy that aims at "smart, sustainable and inclusive growth" with greater coordination of national and European policies. The same Commission today is aiming for growth aimed at the "zero emissions" goal and this represents a recent announcement came that looks at a long-term

strategy to achieve the goal by 2050, in collaboration with all stakeholders. The strategy, called “A Clean Planet for All” [9] and launched in advance of the COP24 Conference on climate change in Katowice (COP, Poland), updates the previous Roadmap 2050 [7] in accordance with the Paris targets, approved at COP21, and with the recent IPCC Report “Global Warming of 1.5 °C” [11, 14, 18].

Moreover, due to technological improvements and more effective subsidies schemes, the net present value of the unit-cost of electricity produced by renewable sources has decreased at an exponential rate. It is clear, that wind farm levelized cost of energy (LCOE) is now comparable to conventional gas combined cycle and coal power plants. Falling clean technology costs, such as solar PV and off-shore wind, are posing a threat to the demand growth for fossil fuels [17]. Annual emissions of carbon dioxide would need to be halved by 2030 relative to 2016 levels, and renewable energy sources would need to supply 70–85% of global electricity demand (and coal’s contribution essentially cease) by 2050 [11].

However, it is of particular importance to consider the most sustainable countries in Europe, according to Country Sustainability Ranking (CSR). It can be defined as a comprehensive framework for analyzing countries’ Economic Sustainable Growth (ESG) performance. By centering on ESG variables such as aging, competitiveness and natural dangers, which are long term in nature, their national sustainability analysis offers a view into a country’s strengths and weaknesses that are not typically covered by rating agencies. The rating is jointly developed by RobecoSAM and Robeco that is an investment specialist focused exclusively on Sustainable Investing [13]. For instance, Sweden and Denmark cover the first two places, followed by Switzerland, and then Scandinavia with Finland and Norway [21]. Italy is only in 27th place, between Portugal and Slovenia, while Spain is in 24th place. Among the members of the European Union, Finland, Holland and Ireland occupy the podium while Spain, Portugal and Italy occupy the second half of the ranking followed in closing by Slovenia, Slovakia and Greece [23]. Anyway, another relevant aspect is represented by the RobecoSAM Corporate Sustainability Assessment (CSA) that is an annual evaluation of companies’ sustainability practices. Each year they assess over 4700 companies around the world. They ask approximately 100 questions focusing on economic, environmental and social factors relevant to the companies’ success, but under-researched in conventional financial analysis. Thanks to this evaluation, we are able to know how many companies can be considered sustainable around the world.

Some countries have decided to introduce new environmentally friendly regulations for capping emission and internalizing social cost created by burning fossil fuels. For example, in 2005 the EU launched the Emissions Trading System, an artificial market for pricing carbon and incentivizing companies to reduce their emissions. Finally, evolving social norms among investors have led to the development of socially responsible initiatives, such as the fossil fuel divestment movement. Started in 2010 in the US, among university students, this movement has rapidly gone global by targeting major institutional investors and persuading them to reduce their fossil fuel related stakes. For example, the Norway Sovereign Wealth Fund, French insurance company AXA and Sweden pension fund AP2 have engaged in the movement by liquidating their stakes in fossil fuels companies [4].

These trends are rising a concern for traditional energy companies, that have become increasingly more vulnerable to the risk of stranded assets. The technologies of renewable energy generation may substitute conventional energy production with fossil fuels. In fact, due to these factors, environmentally unsustainable assets of oil and gas companies and coal mines might be subjected to unanticipated write-offs, downward revaluations or converted into liabilities [3]. But the question is what if companies all over the world will decide to refuse from carbon emission? What will be the market response? The pressure of the social demand for “green economics” is significant, especially for energy companies, which are in the first turn will be make transit to low-carbon production.

2 Methodology

Using the Bureau van Dijk’s Orbis database, the full population of active, listed and traditional energy and mining companies was selected [16]. More precisely, based on the NAICS 2017 industry classification, we have selected oil, gas and coal companies such as: oil and gas extraction, coal mining, drilling oil and gas wells, electric power generation, transmission and distribution, natural gas distribution oil and gas pipeline and related structures construction, etc. The query yielded 2,824 fossil-fuel related companies from 114 different countries. The Orbis database was merged with the Thomson One database to identify which of these companies have announced a divestment from fossil fuels or investment in renewables between January 2011 and March 2019. It is interesting, but the starting date of our sample coincides with the December 10, 2010 United Nations Climate Change Conference held in Cancun. In this occasion, 197 countries have agreed to hold the increase in global average temperature below 2 °C above pre-industrial levels, by limiting greenhouse gas emissions. McGlade and Ekins found that for meeting this ambitious target emissions should not exceed 1,240 GtCO₂ between 2011 and 2050. However, they also showed that global fossil fuel reserves are estimated to be about 11,000 GT of CO₂, which means that a substantial amount of these resources should not marketed [20].

Rather than trying to change the actions of the companies at the heart of the climate crisis, most green investment seeks to reward and encourage companies in all sectors which either emit less than they might or help others so to do [22]. It appears that 322 companies, from 69 different countries between January 2011 and March 2019, have announced a corporate restructuring which is consistent with a low-carbon future. While some energy companies such as Eni (Solar and Biomass RandD centre in Novara) and ExxonMobil have expressed a commitment to a low-carbon future by means of internal capabilities, we only focus on companies transitioning using inorganic means, i.e. trough activities in the capital markets. Throughout the paper we have assumed that each of these events represent a credible commitment to a low-carbon future. Out of a population 2,824 companies, only 322 (11%) have initiated transitioning towards low-carbon energy sources by divesting their fossil fuels assets or incorporating renewable energy divisions. Since our sample contains missing value for certain variables, our final sample consists of 1379 companies.

3 Results

As a result, short-term performance of companies was analysed after having announced a low-carbon transition strategy, despite of ways how it would be done in practice: to acquire assets for low-carbon production, various spin-offs and split-offs according to shifts in a corporate's strategy for climate issues, to divest from businesses with a high level of carbon emission and so on. In other words, there was the test of the market reaction to announcements of energy companies to transit to low-carbon generation. Cumulative abnormal return (CAR) ratio was chosen as an indicator of companies' performance, that reflects their willingness to switch to environmentally friendly production. For the events selected, several multiple event windows were determined. The windows were of $[-1; +1]$, $[-5; +5]$, $[-10; +10]$, $[-15; +15]$, $[-20; +20]$, $[-30; +30]$ days around the deal announcement. Then, an estimation window of 254 days prior the event window was taken, that corresponds to the number of trading days in a year. Then the continuously compounded stock returns for each company i were calculated by the formula:

$$R_{i,t} = \ln\left(\frac{P_{i,t}}{P_{i,t-1}}\right)$$

The forward-looking expected returns for the securities were estimated using the global CAPM, by regressing stock returns on the selected index returns. Since our sample consists of companies from 69 different countries around the world, the returns over the MSCI World Index were used as an explanatory variable:

$$R_{i,t} = \alpha_i + \beta_i R_{Market,t} + \varepsilon_{i,t}$$

After having estimated the parameters for each company i , fitted values in event window $[t_1; t_2]$ were compared with observed ones. The difference between the two components is known as abnormal returns:

$$AR_{i,t} = R_{i,t} - \widehat{R}_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{Market,t} + \varepsilon_{i,t})$$

Next, the abnormal returns obtained were aggregated for each event window $[t_1; t_2]$ for obtaining the cumulative abnormal returns:

$$CAR_i[t_1; t_2] = \sum_{t=t_1}^{t_2} AR_{i,t}$$

Finally, by averaging CAR across all N companies, the average cumulative abnormal returns is as follows:

$$\overline{CAR}_i[t_1; t_2] = \frac{1}{N} \sum_{i=1}^N CAR_i[t_1; t_2]$$

To test whether average CAR is statistically different from zero the following parametric t-test statistics was computed.

$$t_{\overline{CAR}} = \frac{\sqrt{N} \overline{CAR}}{\sigma_{CAR}} \sqrt{N} \frac{\overline{CAR}}{\sqrt{\frac{1}{N-1} \sum_{i=1}^N (CAR_i - \overline{CAR})^2}}$$

For analysing company performance, a t-test on average CAR for the event windows [-1; +1], [-5; +5], [-10; +10], [-15; +15], [-20; +20], [-30; +30] was calculated. Mean estimates are reported below in Table 1.

Table 1. “Summary Mean estimates for CAR”

$[t_1; t_2]$	\overline{CAR}
[-30; +30]	6.33% ***
[-20; +20]	6.86% ***
[-15; +15]	6.31% ***
[-10; +10]	4.06% ***
[-5; +5]	3.03% ***
[1; +1]	3.13% ***

Source: authors.

The results confirm the suggestion that, on average, initiating a transition towards low-carbon energy sources generates significant positive cumulative abnormal return for shareholders. Following the methodology of Brown and Warner [5], the event window [-20; +20] days around the announcement is the most significant, in which shareholders expect around 6.87% increase in wealth. This finding is not only consistent with past empirical literature on corporate restructuring, but also with the evidence on superior performance of environmentally friendly firms. In fact, divesting carbon intensive assets and acquiring a stake in alternative energy are seen as socially responsible conduct and will be priced positively by the market [19].

4 Discussion

It is believed that environmental protection is not unrewarding and that companies with higher environmental responsibility have more financial performance [16]. Environmentally friendly enterprises are more likely to obtain better bank loans, environmentally responsible companies are more likely to reduce the risk of bank default, and society may also benefit. Similarly, environmentally friendly enterprises are better able to reduce the volatility of the company’s stock, thus reducing the cost of the companies’ equity and possibly improving business performance. The voluntary assumption of environmental responsibility by companies is helpful to improve the competitiveness of enterprises. It is found that the environmental awareness of a company’s board will help enterprises incorporate environmental protection in its processes and operations and attract more

consumers to buy green products. Manufacturers' adoption of green supply chain management for suppliers and/or customers can improve their operational performance and their benefits from it [1]. Therefore, corporate environmental responsibility (CER) enables enterprises to further obtain external financial support and obtain intangible assets, such as reputational assets. Companies are more likely to abandon some profitable investment projects due to financial constraints, resulting in underinvestment. CER activities are likely to improve financial performance and operating income by changing the enterprises' financing situation and attracting the attention of consumers, thus increasing companies' available resources and improving the underinvestment phenomenon. The research results show that environmentally friendly companies have easier access to financing and reduce their equity costs [10].

Other benefits of CER that can be listed include improving brand image, since standing out as a green corporate can improve reputation; customer loyalty – people prefer brands who have environmental concerns and they are more inclined to buy from them in the future; and differentiation – face to increasingly demanding customers and aware of environmental issues, gaining a green reputation can help a business differentiate. For the younger generations in the current society, socially and environmentally responsible companies are even more important. They believe companies should be invested in improving society and look for solutions that will assist in those improvements. Companies should share how they are trying to make a positive impact on the world, so the public can see the pro-social initiatives they are making. Showcasing efforts is important to target millennials because these efforts will sway the choices millennials make as consumers. As more and more companies begin to see the impact their socially and environmentally conscious efforts have on a consumer's perception, the more chance that they will begin initiatives of their own.

The environmental issues have been global concerns thus the corporate sector also focuses on finding sustainable solutions for natural resources and to reduce companies' impact on environment. So, not only energy companies are responsible for the air and water contamination. Energy companies are suppliers of energy and electricity according to the demand of all other energy consumers, that may decide what type of energy production (conventional or low-carbon) they want to get and pay for.

Having been established several years ago and up to present moment, the scope of environmental responsibility has changed tremendously. Now the term of environmental responsibility consists of not only following different ecological laws and regulations or waste recycling. It must be much more rigorous, targeted and lasting actions, that will help to create environmentally friendly conditions for business, living conditions and to form sustainable behaviour for future entrepreneur and generations of people concerned with climate changes and nature security.

Examples of CSR in action come in many forms, namely:

- reducing carbon footprints,
- corporate policies that benefit the environment,
- socially and environmentally conscious investments.

An excellent example of CER is global giant Johnson and Johnson. It has focused on reducing their impact on the planet for three decades. Its initiatives range from leveraging the power of the wind to providing safe water to communities around the

world. Its purchase of a privately-owned energy supplier in the Texas Panhandle allowed the company to reduce pollution while providing a renewable, economical alternative to electricity. The company continues to seek out renewable energy options with the goal to procure 35% of their energy needs from renewable sources [15].

Siemens is chasing down new carbon emissions goals, hoping to erase its large carbon footprint and aid in our planet's recovery. But there are certain benefits to chasing sustainability as well: creating more sustainable systems can reduce spending. At Siemens, for example, sustainability efforts could slash costs by \$20 million per year. Some experts also note that increased sustainability efforts can improve recruiting, adding to employees' sense of contributing to a better world.

Coca-Cola's massive fleet of delivery trucks contributed 3.7 million metric tons of greenhouse gases to the world. They have made major changes to their supply chain practices including investing in new alternatively fueled trucks. Their initiatives are intended to create a 25% reduction in their carbon footprint by 2020.

Ford Motor Company plans to reduce their greenhouse gas emissions using their EcoBoost engine to increase fuel efficiency. It also plans to introduce 40 electrified vehicles (electric and hybrid) by 2022, in an investment of \$11 billion. In addition, American Ford dealerships rely on wind sail and solar PV systems to power their locations greatly reducing their use of electricity [12].

The Walt Disney Company is committed to reducing their carbon footprint with goals for zero net greenhouse gas emissions, zero-waste, and a commitment to conserve water. They are actively ensuring that they set strict international labor policies to protect the safety and rights of their employees. They are also active in the community and encourage employees to do the same [6].

Lego will invest \$150 million over the next 15 years with a focus on addressing climate change and reducing waste. It has reduced their packaging as well as investing in an alternative energy source and plans to source 100% renewable energy by 2020. To accomplish this, the company will hire a team to support its commitment to using sustainable materials and plans to reach a 90% recycling rate [2].

The list abovementioned is just a small illustration of how companies are using corporate social responsibility to protect the planet and make a commitment to improving the quality of life for the communities they impact every day. For brands of all sizes it's a key to pay attention to the issues that customers are interested in and the impacts a company can make at a community and a global level.

5 Conclusion

Obviously, decarbonization is a widespread trend for many companies. But it is also a corner stone for sustainable growth and development that make corporations adopt their strategies to new business conditions due to climate issues. The antecedents of this adoption are clear: the market, investors appreciate corporates' low-carbon transition due to the social demand of environmentally friendly technologies, businesses, etc. The behaviour of world-famous corporations, described in the article, may serve as an approval of necessity of such sort of changes within business maintenance and is an evidence of corporates' responsibility for climate changes.

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From Import Substitution to Export Orientation in the Regional Agribusiness

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Abstract. During the years of import substitution, Russia has significantly increased food self-sufficiency. The implementation of the import substitution policy in agribusiness allowed to create export potential in the industry. On the other hand, a number of challenges related to the dependence on imports of equipment, seeds, and breeding animals remain. World experience proves that import substitution should be timely transformed into export expansion of competitive products and the development of export-oriented production. The authors studied the main stages of Samara agribusiness development in recent years from the introduction of import substitution to the building of export orientation. The purpose of the study is to analyze the role of the import substitution policy and the consequences of its implementation in Samara region agribusiness, and assess the export orientation of the regional agrifood industry. The authors analyzed the implementation of the import substitution policy in the agricultural sector in Samara region, identified ways to build export potential, and assessed the main trends in the development of export orientation in the regional agribusiness. General scientific and special methods and techniques of the economic research, such as theoretical analysis and economic and statistical methods, were used in the study.

Keywords: Agribusiness · Exports · Food · Import substitution · Sanctions · Self-sufficiency

1 Introduction

The issue of import substitution has become particularly relevant in Russia after 2014, when the country faced economic sanctions. Import substitution is a process of gradual replacement of foreign goods with domestic production. Due to the government's import substitution policy, the food commercial balance is steadily improving, and the share of imported food at retail markets is declining. Russia has entered the international scene as a food exporter, and it is now one of the leading exporters of wheat and vegetable oil [11].

Samara region is actively involved in the implementation of the import substitution policy, which affected agribusiness enterprises. As a result, the region has achieved self-sufficiency of residents with grain, vegetables, and potatoes. The main kinds of products with the low self-sufficiency level are livestock industry products. The food processing industry has launched import substitution processes in the production of

juice, cheese, fish products, vegetable oil, confectionery and bakery products, and mayonnaise.

The large-scale state support to entrepreneurs of the agricultural and food industry, the development of entrepreneurial competencies by Russian agricultural producers, and investments increased production and competitiveness and created export potential in the industry. As a result, since 2015, there has been a trend of increasing exports of food products and agricultural raw materials. The state economic policy transformation emphasized new strategic goals in 2018: to supply more agricultural products to the world markets than the country imports and get rid of dependence on the production of seeds and breeding livestock. As a part of the Federal Project “Exports of Agricultural Products” [2], the Russian government has set a goal to double agricultural exports by 2024 and reach \$45 billion on a nationwide scale.

The current exports of \$200–300 million per year does not match the regional capabilities. That is why, Samara region is able to significantly increase exports of agricultural products through the active development of farming, investment promotion in agribusiness, significant improvement of exports infrastructure, and building of logistics facilities and storage for agricultural products. The purpose of the study is to analyze the role of the import substitution policy and the consequences of its implementation in agribusiness of Samara region, and assess the export orientation of the regional agrifood industry. The tasks of the study are the following: to analyze the implementation of the import substitution policy in agribusiness of Samara region, identify ways to build export potential, and evaluate the main trends in the export orientation development in the regional agribusiness.

2 Methodology

The authors used a wide range of general scientific and special methods and techniques of an economic research in the course of the study. A theoretical analysis allowed to assess the features of the import substitution process in the regional agribusiness. Economic and statistical methods made it possible to analyze the sequence of the import substitution policy implementation in the region and the dynamics of the import substitution results in the agrifood industry of Samara region. These methods also allowed to assess the export orientation degree of the agrifood industry in the region. The official statistical data of Federal State Statistics Service of Russia (Rosstat), Federal Customs Service of the Russian Federation, the Ministry of Agriculture of the Russian Federation, as well as the academic papers, devoted to import substitution and development of the country’s export-oriented economy and agriculture, became the informational background of the research.

3 Results

Agribusiness of Samara region has significantly increased production and diversified the product portfolio after the introduction of the import substitution policy in 2014, which was based on the gradual replacement of imported food at the domestic market

through increasing domestic production. Owing to the reciprocal sanctions imposed by Russia and the imports ban on agricultural products, raw materials, and food in the country and its regions, the volume of imported food has sharply decreased, and Russian agricultural business has begun to conquer new commodity markets.

In order to avoid a shortage of imported goods and in accordance with the order of the President of the Russian Federation, the government has restructured the economic development model, aimed at moving to import substitution, and elaborated regulatory legal acts. The government of the Russian Federation is planning to implement measures to promote demand for domestic products, attract investments to strengthen existing manufacture and create new production facilities, and reduce dependence on imports [6]. In accordance with the Government Decree of Samara region, the Plan to promote import substitution in Samara region for 2015–2016 was approved [3]. In order to implement the Plan, 17 projects, including 10 projects in agribusiness, were approved for the period of 2015–2020: production of trailer-type agricultural machinery (JSC Evrotekhnik), building of raw materials base to produce apple juice concentrate and juice products (LLC Nectar Company), design and construction of Samara agro-industrial park (LLC Samara Agro-Industrial Park), reconstruction of greenhouses on the area of 1.05 ha and equipment assembly (LLC Greenhouse), construction of a complex of sites for feeding broiler chickens (LLC Timashevskaya Poultry Plant), construction of a dairy livestock complex for 400 cattle stalls with a dairy milking block and administrative premises (CJSC Niva), construction of a vegetable storehouse of 3 thousand tons per day in Olgino village (LLC Scorpio) and in Pesochnoe village (LLC Spring) in Bezenchuksky District, building a pond farm to produce valuable fish species (LLC UK Aquabiotech), construction of a farm to produce and process poultry meat in Samara region (LLC Development Corporation of Samara region). As a result, Samara region entered the Top-5 regions of the Russian Federation that received subsidies for import substitution. The launch of import substitution processes in agribusiness of Samara region led to positive production dynamics (Table 1, Table 2).

Table 1. Production of agricultural goods in farms of all categories of Samara region

Indicator	2015	2016	2017	2018
Cereals (in weight after processing), thousand tons	92.9	115.0	100.9	99.6
Sunflower (in weight after processing), thousand tons	537.2	714.8	674.8	965.7
Potatoes (in weight after processing), thousand tons	379.3	332.6	302.9	274.4
Vegetables (in weight after processing), thousand tons	313.1	310.1	298.4	330.3
Meat in live weight, thousand tons	157.8	152.1	152.0	152.0
Meat in carcass weight, thousand tons	114.5	111.5	112.3	102.5
Milk, thousand tons	87.3	126.3	100.9	100.5
Eggs, million units	100.8	100.1	100.9	98.0

Source: authors based on [5].

Table 2. Food and beverage production in Samara region

Indicator	2016	2017	2018
Sausage products, including sausage products for baby food, tons	30,696.7	33,014.5	36,540.1
Meat, meat-containing, refrigerated, and chilled semi-finished goods, tons	13,188.9	16,298.4	16,123.5
Fruit-and-vegetables preserves, thousand cans	325,028.5	279,282.2	291,492.4
Vegetable fat and unrefined fractions, tons	184,483.5	229,878.3	254,799.7
Milk, except for raw milk, tons	59,906.8	55,031.9	51,274.3
Butter, tons	6,569.7	6,399.4	8,133.1
Cheese, tons	5,831.0	8,049.7	4,623.8
Fermented dairy food, except for farm cheese and cottage cheese products, tons	64,820.7	67,679.3	50,772.4
Ice cream, tons	5,449.1	4,927.0	5,785.6
Flour from cereals, vegetable and other plant crops, mixtures, tons	214,669.4	239,027.6	303,233.0
Cereals, tons	1,726.0	5,309.3	4,972.5
Bakery products of short-term storage, tons	104,949.8	106,667.6	106,362.6
Bakery confectionery products, cakes, and pastries of short-term storage, tons	4,625.9	6,069.4	4,819.8
Cookies, gingerbread, waffles, cakes, and pastries of long-term storage, tons	36,692.2	45,184.7	42,323.4
Pasta and identical flour-based food, tons	7,145.6	7,774.3	13,805.3
Chocolate and sugar confectionery products, tons	78,396.7	72,025.1	66,117.2
Beer, except for brewing waste, thousand decaliters	53,158.5	45,037.1	44,883.6
Natural mineral water and drinking water, thousand half a liter	288,697.8	262,611.7	325,662.4
Nonalcoholic beverage and other, thousand decaliters	30,353.7	33,873.9	37,349.0

Source: authors based on [5].

The region continues to provide residents with grain, vegetables, and potatoes. A project for mushrooms production was developed. Livestock production is lagging behind in terms of import substitution, but it shows some positive dynamics. In addition to the main groups of food products in the region, new projects for the production of juice and cheese, and processing of fish products were implemented, which led to a production increase.

Enterprises engaged in the production of vegetable oil, confectionery and bakery products, and mayonnaise have increased production and improved technologies. The implementation of the import substitution policy in Samara region agribusiness has led to the development of traditional types of food business and creation of new industries and competencies. At the same time, Russia's dependence on foreign suppliers of equipment, feed, seedlings, and seeds remains. According to some estimates, 50% of added value in the agrifood industry is created through foreign participation [1].

The agribusiness trends reveal the fact that it is necessary and timely to switch from import substitution to export orientation. The Russian authorities have set a plan to double non-resource and non-energy exports by 2024. This growth is also expected in food-producing industries, and exports should reach \$250 million by 2024.

Exports of agricultural products fluctuated significantly in 2012–2018 in Samara region. On average, the index ranged from 2.0 to 4.2% of total exports. However, in the past three years, there has been a trend of increasing exports of food and agricultural raw materials. According to Volga Region Customs Administration, exports of agricultural products amounted to \$218.5 million in 2018, which is 22% higher than in 2017 (Fig. 1) [12]. In 2018, 157 companies exported agricultural products from Samara region, but only 38 companies belonged to agribusiness.

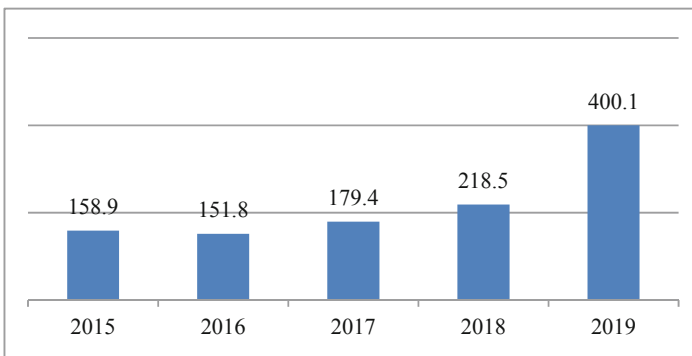


Fig. 1. Dynamics of exports of agricultural products of Samara region, million US dollars (Source: authors based on the [12]).

The exports of agricultural products from Samara region amounted to \$400.1 million in 2019 (the rate set by the Ministry of Agriculture of the Russian Federation was \$220 million). The exports structure is still dominated by fat-and-oil products (\$252.3 million). Grain products, that is wheat and barley, are also in high demand. Grain production in Russia has significant growth potential and opportunities to increase export supplies [7].

The exports of food and processing industry amounted to \$57.9 million in 2019, which was 76% higher than the planned value. The largest export items of food and processing industry are confectionery and chocolate (\$25.2 million), and alcoholic and non-alcoholic beverage (\$16.1 million) The largest export supplies are made to Iran. Turkey goes second, followed by neighboring countries, such as Kazakhstan and Uzbekistan. In total, the products of Samara region agribusiness are in demand in 50 countries all around the world. To expand exports, logistics and storage facilities for agricultural products are being built in the region. A well-functioning logistics environment is a key to the country’s trade, growth, and employment opportunities [13].

The Federal Project “Export of Agricultural Products” [2] was elaborated to stimulate further growth of food exports. The project provides state support for

agricultural exporters with preferential loans, allowance for transport costs, subsidies for land amelioration, measures to control Russian products quality and quarantine weeds, and building a system for promoting agricultural products. In addition, farmers can count on state support under the state program for agriculture development [8]. The implementation of these two state priorities is intended to increase production and sale of agricultural products, improve their quality and, as a result, create additional exports potential [4].

4 Discussion

Despite the evident success, the implementation of the import substitution policy has faced a number of problems. Insufficient national production and poor product quality retard import substitution. To develop production, Russian agribusiness has to import foreign equipment and machinery, as there are no local analogues. Import substitution of seeds, breeding animals, and forage in such a short period of time is not possible, because these areas require time and significant investments in domestic breeding, microbiology, etc. The growth of Russian suppliers in production chains and added value chains, as well as increasing competitiveness, are the modern guidelines of the exports strategy. The experience of South-East Asian countries is especially noteworthy. It shows that the timely transition from the import substitution policy to the export-oriented strategy allowed the countries to significantly expand their presence at the international market, successfully compete with the world's leading manufacturers, and increase their role in the world economy [14].

In addition to increasing the potential of agricultural production, it is also necessary to strengthen the geographical market efficiency in the agricultural sector in order to increase export potential of Russia's agriculture and the country's prominent role [10]. The issues of exports efficiency should accompany all stages of expansion to the world market and play a dominant role in the market selection, in accordance with the rule of the world's export leaders. Changes in Chinese agricultural exports to ASEAN have always depended on intensive margins [9]. The experience of foreign countries proves the fact that import substitution should be replaced by an active expansion of the most competitive agribusiness sectors beyond the national market and further exports development. Import substitution can be considered not as a spontaneous response to global challenges, but as a part of the consistent agricultural policy of the country, aimed at developing sustainable competitive agribusiness at the national and world markets.

5 Conclusion

The study revealed the fact that Samara region was involved in the implementation of the import substitution policy, which affected agricultural enterprises and was a response to the economic sanctions imposed against Russia. As a result, the region has achieved a significant increase in the production of grain, vegetables, and potatoes and built conditions for import substitution of the main kinds of crop production. Import

substitution of livestock products is more slowly. The result of import substitution in the food industry is the development of production of juice, cheese, vegetable oil, confectionery and bakery products, mayonnaise, and processing of fish products. The implementation of the import substitution policy in combination with the state support for agribusiness resulted in production and competitiveness increase, formation of exports potential in the industry, and export growth of food and agricultural raw materials. The defined export orientation of Samara agro-industrial business, which is a result of successful import substitution, serves to increase the share of Russian suppliers in the production chains and build the regional sustainable competitive agribusiness at the national and world market.

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Tariff Policy in the Electric Power Industry of Russia: Methods, Problems, Prospects

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Abstract. The article explores the problems of pricing and tariffs for electric energy. Particular attention is paid to state policy in the field of tariff regulation in the context of a serious transformation of the global economy. The state continues to consistently pursue a policy of containing tariffs, expanding the range and improving the quality of services of regulated companies, including services in the field of energy efficiency and energy conservation, development of distributed generation. The authors focus on problems of non-transparency of regulation, cases of unjustified understatement and overstatement of tariffs, high spread of tariffs, and imperfection of the regulatory framework in the field of tariff formation. To solve the above problems, a full-scale modernization of electric power facilities is required, the replacement of economically inefficient obsolete equipment with innovative equipment that supports the principle of smart energy systems.

Keywords: Digital technology · Power industry · Power grid complex · State regulation · Tariffs · Tariff policy

1 Introduction

Under the conditions of the global crisis and economic restrictions on Russia, the effectiveness of the state and regional economic policies in the electric power industry, which forms a significant share of the costs of producing goods and providing services, is crucial for the development of the national economy and creating a sustainable business environment. An indispensable condition for the growth of the competitiveness of domestic products is the provision of acceptable and predicted levels of tariffs for electric energy (power) and infrastructure services for potential investors and industrial consumers. The crisis in the world economy that has developed due to the COVID-19 pandemic and falling oil prices is likely to require a revision of the forecast scenarios for the socio-economic development of our country. A decrease in business activity and a well-founded increase in costs for most Russian companies will lead to a change in the economic situation of infrastructure organizations. The predicted deterioration in the situation will require a review of investment strategies, and at the state level decisions will be required aimed at updating the basic principles of tariff regulation, curbing tariff growth in the electric power industry, heat and water supply, and

sanitation. The problem is finding efficiency reserves and forming a model for making effective anti-crisis decisions on regulating prices and tariffs in the entire infrastructure sector of the economy.

2 Methodology

Since 2002, the directions of the tariff policy have been formed in accordance with the scenario conditions of the Forecasts of the socio-economic development of the Russian Federation, and specific parameters for changing tariffs throughout the country are set taking into account macroeconomic priorities and tasks for the forecast period and the current state of the economy. Since 2017, the growth of regulated tariffs has been limited on the basis of the adopted inflation minus rule. The long-term tariff indexation policy is focused on the level of forecast (target) inflation and is developed based on the use of industry-specific efficiency factors. Tariff growth should support inflation within the framework of target parameters that ensure the achieved standard of living of the population with a weak increase in income (Table 1).

Table 1. Key scenario conditions and indicators for forecasting socio-economic development (baseline scenario, September 2019)

Index	2018	2019	2020	2021	2022	2023	2024
	Fact	Assessment	Forecast				
Consumer price index, (December / December)	104,3	103,8	103,0	104,0	104,0	104,0	104,0
Average annual consumer price index	102,9	104,7	103,0	103,7	104,0	104,0	104,0

Source: authors based on [15].

The approach adopted by the Government of Russia suggests the predictability of the formation of prices and tariffs for the long term (5 years). The annual refinement of the parameters of the macroeconomic forecast practically does not affect the growth rate of prices and tariffs and allows you to create a stable investment business environment not only in the infrastructure sector, but throughout the national economy. In accordance with the adopted regulatory methodology, the principle of “moderate growth” of tariffs should, on the one hand, help maintain inflation in the target parameters, and on the other hand, provide incentives for optimization and moderate cost growth. For regulated companies, the application of this approach is a serious economic problem, since it implies «no tariff growth in real terms» [11].

In the basic scenario “Forecast of the socio-economic development of the Russian Federation for the period until 2036”, a 3% inflation rate is adopted [8]. Tariff decisions were made within the framework of the indicated restrictions: gas price indexation for 2020 will be 3%, tariffs for electric grid companies – 3%, electricity tariffs for the

population – 5%, and utility bills – 4%. Despite the sharp negative changes that took place in the world economy in the first half of 2020, tariff decisions made at the federal and regional levels generally correspond to forecast industry-wide parameters [4].

The methodology of tariff regulation allows the possibility of deviations of individual tariff decisions (both “plus” and “minus”) from the average rate of tariff growth while maintaining the specified industry-wide tariff growth parameters. Such practice, on the one hand, provides protection of the interests of consumers, on the other hand, it is difficult to evaluate the effectiveness of the tariff policy, since there are no methods of stimulating regulation of the growth of operational and investment efficiency of regulated organizations [5].

The methodology of incentive regulation of network tariffs is based on three main theoretical approaches:

- regulation based on the determination of the maximum amount of revenue or prices of a network company (revenue/price cap regulation),
- regulation by reference indicators (yardstick regulation or yardstick competition);
- hybrid methods of stimulating regulation.

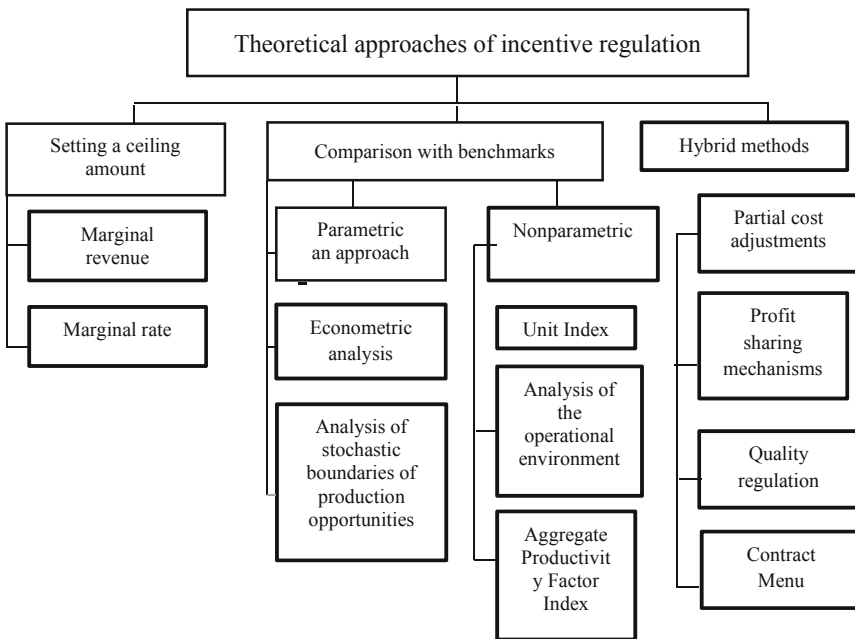


Fig. 1. Methods of incentive regulation used in accordance with these approaches. (Source: authors)

Figure 1 shows the incentive regulation methods used in accordance with these approaches.

State tariff regulation based on incentive methods is theoretically developed and successfully applied in many foreign countries. The main objective of incentive regulation is to stimulate the optimization (reduction) of operating costs of organizations of the electric grid complex, and to restrain the growth rate of tariffs for electricity transmission services to consumers. In Russia, according to the results of reforming the electric power industry, these methods began to be applied in order to increase the efficiency of the distribution electric grid complex, and the following are the main methods of tariff regulation:

- method of return on invested capital (RAB - regulation),
- the method of long-term indexation of the necessary gross revenue.

The method of regulating the return on invested capital (RAB), in essence, includes both elements of incentive regulation and cost-based regulation. The introduction of regulation based on the RAB methodology was aimed at attracting investment into the electric grid complex. The regulatory mechanism allows you to adjust the current costs of the regulated organization, taking into account the index of efficiency of operating expenses (the index is established by the regulator), which guarantees the return and ensuring return on invested capital [6].

3 Results

In general, the introduction of long-term tariff regulation methods had a positive effect on the volume of investment in the country's electric grid complex. However, the introduction of these methods did not allow us to solve the goal of reducing the growth rate of tariffs for services for the transmission of electricity through distribution networks, the growth of tariffs significantly outstripping the rate of inflation. In 2019, compared with 2009, tariffs for electricity transmission services increased 2.16 times, while consumer prices in the country over the same period increased only 1.91 times.

Partial liberalization of the electric power market has determined the specifics of its price regulation, which is carried out at the federal and regional levels, has a well-developed legal and regulatory framework and a complex pricing system. The Federal Antimonopoly Service makes tariff decisions in relation to the wholesale electricity (capacity) market and infrastructure organizations, sets limit tariff levels for electricity transmission services and maximum tariffs for electricity for the population [7]. Regional tariff regulation bodies establish fixed differentiated prices for electricity for the population, approve uniform (boiler) tariffs for electricity transmission services, sales allowances and the planned gross revenue of guaranteeing suppliers. The price of electricity over the past ten years has been growing at a rate close to average annual inflation (Figure 2).

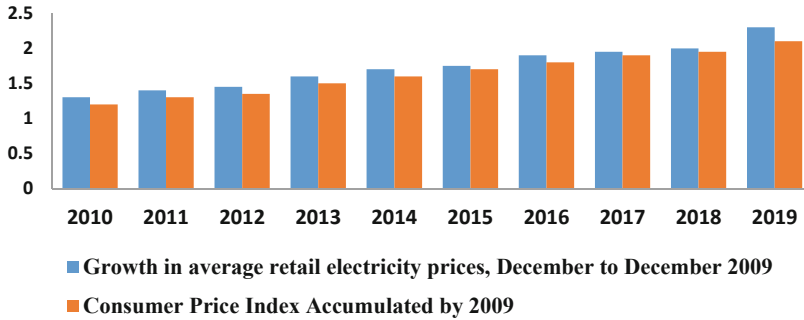


Fig. 2. Growth in electricity prices in Russia compared to inflation (cumulative total since 2009) (Source: authors based on [18]).

The main problems of the Russian energy sector remain:

1. Cross-subsidization and reduction of the network component in the final price for electricity, since a significant network component becomes the cause of a steady increase in tariffs, a factor hampering the development of the entire national economy.

2. Reserve capacities - inefficient use of capacities occurs against the background of a chronic lack of investments in the electric grid complex, significant physical and technological deterioration of electric networks.

3. The “last mile” mechanism - as a form of hidden industry tax when large consumers connected directly to the networks of the Federal Network Company (high voltage networks) additionally pay the costs of territorial network organizations (lower voltage networks), the services of which are not actually used [14].

Losses of industrial production growth in Russia as a result of the historical practice of cross-subsidization have long remained a problematic issue in the field of tariff regulation. Cross-subsidization is when some groups of consumers pay part of the cost of electricity consumed by other consumers. As a result, prices are rising, and the rates of growth of industry and the economy as a whole are falling. The volume of cross-subsidization annually amounts to hundreds of billions of rubles, the difference in tariffs in individual regions of the country is on average four times, which significantly increases the final price of electricity for consumers. Thanks to government measures to reduce cross-subsidization, electricity prices for the population grew more slowly than for other consumers. The annual loss of gross domestic product from cross-subsidization is from 0.6 to 0.8%, which amounts to approximately 450–500 billion rubles and is potentially comparable with the annual increase in industrial production. Russia is practically the only G20 country in which the electric intensity of gross domestic product is growing. The proposal of the Federal Antimonopoly Service on the possibility of evenly distributing cross-subsidies between consumers of the distribution and backbone grid complex is likely to lead to the fact that tariffs at low voltage levels will increase and at a high level will decrease. The proposal of the Ministry of Energy of Russia to entrust payment of the increase in cross-subsidization to large consumers in the amount of 197 billion rubles by 2022 provoked a negative reaction from medium and large businesses. The additional cost burden on consumers connected to the backbone

grids of FGC UES, PJSC will limit the payback of existing and the construction of new energy-intensive consumers [3, 14].

The proposal of the Ministry of Energy of Russia for new consumers joining the networks of PJSC FGC UES after 01.01.2023 to pay for electricity transmission services at the boiler tariffs of distribution networks will lead to the same negative consequences. According to estimates of the Association of Energy Consumers, given that 2/3 of cross-subsidization is paid by large-scale “high voltage” businesses, these measures will cost the country’s economy up to 2.5% industrial growth and up to 0.5% growth in gross domestic product [4]. For example, for the most energy-intensive iron and steel companies that are most sensitive to the cost of electricity, the share of cross-subsidization in the final price will increase on average to 18%, and for non-ferrous metallurgy enterprises, the increase will be 20–30%. For comparison, the energy consumption of “non-energy-intensive” consumers is 2–2.5% of the cost of production and services. Undoubtedly, minimizing cross-subsidization in the electric power industry will create favorable conditions for the development of energy-intensive industries [9, 15].

An important decision in the field of tariff regulation was the adoption of a new approach to accounting for cross-subsidization based on the implementation of the “principle of uniform distribution”:

- the concept of “cross-subsidization rate” is introduced, which is taken into account in single and double-rate tariffs for electricity transmission services,
- the distribution of cross-subsidies should be carried out only in accordance with the guidelines approved by the Federal Antimonopoly Service [7], for the transition to a new order, a transitional period is envisaged - until 2025%,
- in case of violations by regional authorities, budgetary compensation is provided.

Switching to a new mechanism for accounting for cross subsidies will require a substantial “rebalancing” of electricity transmission tariffs in most constituent entities of the Russian Federation, the development of new regulations and methodologies that determine the procedure for calculating tariffs.

An important issue for the industry remains the rational use of infrastructure and the planning of real needs for technical connection. For ten years from 2005–2015 A major problem in reforming the Russian electric power industry was ensuring the accessibility of technological connection of consumers to electric networks. In 2015, a number of significant changes were introduced at the legislative level, aimed at simplifying procedures and reducing the time for technological connection. As a result, according to the Russian Ministry of Energy, in 2012, Russia ranked almost 184th in the World Bank Doing Business ranking by the criterion for accessibility to the electricity grid infrastructure. In 2018, according to this indicator, our country took 12th place [13].

Along with the positive result of simplifying the procedure for technical connection, the problem of optimizing network capacity reserves has sharply become aggravated. During the years of reforms in the electric power industry in the whole country, the useful energy consumption did not increase by 1 kWh, but at the same time, the installed capacity of the electric substations increased so much that they were unclaimed (there are over the necessary reserves) over 30 million kW of generation. The total maximum power of consumers with a maximum power of at least 670 kW, which are connected to the electric grids of distribution subsidiaries of PJSC ROSSETI, is 87 GW, and is used by consumers at about 44% [17].

The main opponents of the introduction of fees for the reserve of network capacities are large consumers who are willing to pay the capital costs for the construction of the necessary network section. The construction and maintenance (maintenance) of excess capacity requires appropriate operating expenses, which are included in the “general boiler tariff”. The maintenance of electric grid facilities that are used in the “reserve” mode for some consumers is paid by other consumers. As a result of inefficient use of capacities in the electric grid complex, the deficit of investments is growing, and the physical and technological deterioration of electric networks is increasing. A positive aspect of introducing a “fee for capacity reserve” is the possibility of redistributing the already existing costs of network organizations for maintaining the network infrastructure between consumers in proportion to the maximum capacity that consumers declared during technical connection, and network organizations undertook to ensure the transmission of electricity at any time. The lack of unused redundant power at the consumer reduces its payment for electricity transmission services. The negative consequences include potential conflicts between industry technical requirements and regulations (rules) of accounting for the reserve in order to pay it. In addition, a decrease in maximum power will be accompanied by expensive technical measures.

4 Discussion

The solution to the above problems and the need to search for internal reserves for increasing efficiency (dictated by the processes of economic transformation) and the growth of investment activity in the electric power industry are clearly accepted by the expert community. Unresolved questions remain about the role of the state and the mechanisms of tariff regulation in the infrastructure sectors of the economy [1, 2, 12]. Analyzing the transformation of the tariff regulation system, most authors note the following main achievements in this area. The share of liberalized markets and the long-term nature of the parameters for changing regulated tariffs at the macro level and tariffs set by specific organizations have increased; formed a multi-level system of protecting income from “tariff surges”; significantly increased the availability of information about the activities of regulatory bodies, increased consumer involvement in the regulatory process; the methodological base of regulation has been expanded, incentive tariff regulation tools are being introduced.

The noted transformations are accompanied by the introduction of digital technologies, the development of intelligent control systems, the formation of automated data centers, the development of intelligent electricity metering [16]. Digitalization of energy is not an end in itself, but is an effective tool to reduce operating costs, reduce the cost of electricity, improve the quality of services provided, and increase labor productivity. The insufficient economic efficiency of the use of digital technologies for electric power industry organizations depends on both the organizational structure of building the market and the efficiency of the tariff setting system. A distinctive feature of the foreign practice of tariff regulation is the more intense stimulating actions of regulators [10]. The highest effects of the introduction of digital technologies are possible in regions with a greater share of cross-subsidization (the presence of large consumers and a large population). However, in such regions, electricity tariffs are

already quite high, and investment programs, respectively, are limited. It is necessary to assess the financial and cost implications of digitalization for a wider range of energy companies.

5 Conclusion

In connection with the foregoing, we can conclude that over the past decade, significant positive changes have occurred in tariff regulation. Despite the emerging positive trends, there remains a significant range of issues that need to be addressed. The social orientation of state policy suggests that the “soft” policy regarding electricity prices will continue. The main problems in the medium term will remain the need to reduce administrative pressure and ensure consumer confidence in the stability of the current tariff policy, strengthen the stimulating function of tariff regulation and consolidate at the legislative level the right to preserve the economic effect of the implementation of digitalization measures in the tariffs of energy companies.

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Joint-Stock Property Governance in State-Owned Companies in Conditions of Uncertainty

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Abstract. The purpose of this study is to effectively manage joint-stock property in state-owned companies in conditions of crisis uncertainty. The tasks are to study the issues of optimizing the management of joint-stock property, improving corporate governance mechanisms, including the use of automated systems in state-owned companies. The study uses both theoretical (analysis, synthesis, modeling) and empirical research methods (the use of existing experience in managing joint-stock property in state-owned companies embodied in reference sources; experience in managing specific enterprises). The main result of the study is the conclusion on the necessity to optimize and automate the joint-stock property management in state-owned companies, in which directive management methods are replaced by corporate ones, and the process of making managerial decisions is simplified through digitalization.

Keywords: Corporate governance · Directive · Joint-stock property · Management automation · State-owned company

1 Introduction

The large-scale spread of the new coronavirus infection has made significant changes in the functioning of local and national markets, the activities of organizations and its employees. The phenomenon, which for obvious reasons economists were not able to predict, made a change in the life routine rhythm of almost the entire planet population. The idea that the development of the economy, management and other spheres of society occurs through fundamentally unpredictable, but changing events, which Taleb called “black swans” [9] now do not seem irrational. Therefore, the question is not to predict these events, but to be ready for them, to create the necessary flexible management structure.

The problem of effective management in conditions of rapidly changing and unpredictable circumstances is particularly relevant in state-owned joint-stock companies, the management mechanism of which is difficult to call flexible. This is due to the following:

- most state-owned joint-stock companies are transformed unitary enterprises that have not had time to adapt to the corporate governance model,
- decisions on key issues of state-owned joint-stock companies are performed with the help of directives, the process of issuing which is not operational [8],
- the state has an excessive number of share blocks, the quality of management of which decreases due to volume.

It will not be easy to find positive incentives in the conditions of new challenges faced not only by Russian companies, but also by all global companies due to the coronavirus pandemic. Corporate governance tools at this difficult stage can become an important strategic advantage and help in making the right management decisions. The most important auxiliary role in this will also be played by informatization and automation of management, which can not only simplify decisions, but also minimize the negative impact of the human factor.

2 Methodology

This article is based on a large-scale study conducted in 2018 and expressed in the form of an analytical report of the Center for Strategic Research “Effective management of state property in 2018–2024 and up to 2035” [7]. The authors have thoroughly studied the efficiency of the public sector of the economy as a whole and given suggestions for its optimization. The article uses these developments, as well as empirical methods (experience in state property management at specific enterprises, options for making management decisions within the Board of Directors) and theoretical methods (analysis of the situation on the Russian market, synthesis of author’s ideas with the ideas of other researchers, statistical data analysis). It offers a qualitatively new look at the management of joint-stock property in state-owned companies. In particular, the PWC report “Russian companies after IPO: A comparative analysis of quotations and liquidity”, conducted in 2016 [6], provided data on how the entry of state-owned companies to IPO (increasing the corporate governance component) and their automation have improved the management efficiency and capitalization of these companies in general.

3 Results

In the historical perspective, state-owned joint-stock companies in Russia are transformed by unitary enterprises and inherit all their advantages and numerous disadvantages. It should be noted that a significant number of authors consider unitary enterprises as an outdated form of organization that does not meet modern realities, given the complex management mechanism [2]. Practitioners also agree with this position. Thus, at the government level, the need to liquidate unitary enterprises as an organizational and legal form was fixed by 2018 [7].

The inability to completely abandon the unitary enterprise as an organizational and legal form was due to both objective circumstances (a large number, a significant

amount of assets that were not properly registered, confidential activities) and subjective circumstances (disinterest of officials and enterprises management). Therefore, the issue of unitary enterprises liquidation before 2018 was a very ambitious and therefore unrealized plan.

Funding of unitary enterprises is one of the most common methods of privatization. At the end, we get a corporate organization, but with the same management. Therefore, in the short term, new joint-stock companies are doomed to the same level of management efficiency as unitary enterprises, by the state. In this regard, the recommendation of the researchers of the Center for Strategic Research “Effective management of state property in 2018–2024 and up to 2035” on the need to privatize these organizations in one stage seems reasonable [7]. Indeed, there are no obstacles to the implementation of shares of an enterprise subject to corporatization at the same time, without additional evaluation of shares and their inclusion in the forecast plan (program) of privatization. In this regard, the sale of companies and the refusal to incur additional management costs looks like a successful solution, requiring a minor change in the legislation on privatization.

Privatization of unitary enterprises at one stage and the sale of state shares will reduce the number of such shares to the necessary minimum, but will not allow the state to completely abandon such ownership. In particular, Tanzi points out the need for governments to manage various types of organizations, not only for security reasons, but for the reason that state-owned companies insure the “short-sightedness of citizens”, and also ensure the demand meeting for specific goods and services [10]. Thus, improving the management efficiency of state-owned joint-stock companies is an urgent task. Its relevance is increasing due to market volatility, changes in supply and demand, and the population’s ability to pay caused by a new coronavirus infection. We need a management that is able to make decisions quickly in a rapidly changing environment. And in this regard, directive management becomes an obvious problem [11].

Of course, the presence of directives is a way to minimize the risks of activities in state-owned companies, but it distorts the very essence of corporate governance. The need to move away from directives is becoming more urgent in the conditions of growing uncertainty. In this regard, operational management decisions are required. These decisions cannot be achieved within the framework of directive management. In this regard, and taking into account the views of a number of researchers [2], the state may be recommended to minimize or completely exclude directives in joint-stock companies. The directives can be retained by the attorneys who take part in general meetings of shareholders. This issue is completely eliminated in companies with 100% state participation, since such decisions are made solely in the form of an order from the management authority.

As for directives to members of the board of directors, their retention does not contribute to effective collegial resolution of issues on the agenda, dilutes the responsibility of decision-makers, and is a source of corruption risks. In a fast-changing environment with limited physical interaction, such decisions cannot be made quickly. It is important to notice that such rule does not apply to independent directors for obvious reasons. Thus, in order to improve the operational management of state-owned joint-stock companies, it is necessary to exclude directives to members of the board of

directors of joint-stock companies, retaining them or minimizing them to attorneys at general meetings of shareholders.

The above method of improving the efficiency of joint-stock property management in state-owned companies can be considered quite innovative, but given the current conditions of crisis uncertainty, large corporations, as leaders in creating economic trends, need to implement and adapt new management processes. To successfully adapt to such new management processes, it is advisable for corporations to use modern information technologies, applying them to the processes themselves, automating management activities. Traditionally, information systems are defined as an interconnected set of tools, methods and personnel used for storing, processing and issuing information in order to achieve the goal [5]. Corporations adhere to their principles of working with corporate property, which are necessarily correlated with the legislation of the Russian Federation, local documents of the corporation, and with the norms of international law. Automation of such management usually significantly simplifies and integrates the main tasks of corporate property governance – defining management processes and establishing links between them, monitoring the effectiveness of management, identifying and preventing risks, and managing the legal regulatory framework of this issue.

Implementation of information technologies in the process of corporate property governance allows creating uniform rules for data integration. Thus, it becomes possible for the corporation to use unified normative reference books and classifiers that take into account economic, legal and technical aspects of corporate property, maintain an electronic database and electronic document flow within the company, maintain reference books and registers with up-to-date information and the ability to learn historical data, monitor changes, status and parameters, form management reports on current activities and a common vision of all management participants on the amount of work, preconditions, restrictions and risks [4].

Since corporations currently use a huge variety of information systems, it is more appropriate for the corporate property governance process to implement a solution that would integrate different information technologies of the company. The standard way of such integration can be represented as follows: corporate property of a corporation is defined as three parts – fixed assets, business projects, and objects subject that are to be registrated. Using a methodology (developed with the needs and capabilities of the corporation), the above-mentioned areas are combined using a unified classification, legal acts, and data comparison algorithms. Then, information is accumulated in different information systems by their type (bookkeeping system, information and analytical systems, corporate data storage systems, control and accounting systems, project and program management systems, document management systems and normative reference information) and is output using a BI-system (information visualization and display system) to a single distribution platform. Thus, the manager has a tool with which you can quickly see the results of current activities in a convenient form, conduct a comprehensive analysis of decisions, optimize the use of resources, reduce time and manage risks and costs, clearly distribute responsibilities among participants in the corporate property governance process and improve the effectiveness of management as a whole [3].

It is important to note that despite the different roles of information systems, by combining and adapting them, it is possible to develop your own corporate property governance system based on existing solutions. This will allow the corporation to bring the corporate property governance system to a high level, where different roles and functions will be integrated into a complex interconnected information system that could provide a number of goals and objectives of corporate governance [1].

4 Discussion

The “weight” of the state in the Russian economy determines the relevance of the problems raised in this article and the need for their further understanding in subsequent research. Despite the steady scientific interest in these problems and the current fairly good level of theoretical development of approaches and methodological tools for managing joint-stock property, there are still no generalizing theoretical developments in this area in the conditions of crisis uncertainty. The practice of corporate governance in state-owned companies indicates the need to create an effective model and optimize the mechanism for managing state-owned property. There is a need to develop approaches and tools to assess the quality of management of joint-stock property in state-owned companies in order to provide potential investors with the necessary information when making appropriate decisions about a particular company. The more efficient the checks and balances mechanism within the company, transparent performance and accountable actions of the management bodies of the company, the better the rights of shareholders are protected, corporate governance in general is effective, and the higher the interest of a potential investor. The relevance of this research allows us to analyze the problem of effective management solution of joint-stock property in state-owned companies as a complex independent scientific task that requires deep theoretical and practical justification.

5 Conclusion

The high share of state participation is associated with the need to combine the development of market mechanisms with state support of the economy during periods of instability and business activity decline. The significant weight (over 60–70%) of the state as a shareholder in companies of strategic industries and the financial sector of the Russian economy allows to influence the decisions made by top management, to make the most effective use of state assets in accordance with the solvable socio-economic tasks. The tendency to strengthen the regulatory component and state control creates a certain dependence of shareholders and companies top management on state structures, strengthens the position of the state in solving socially significant tasks.

The most important element for the growth of efficiency and investment appeal of joint-stock companies with state capital and increase their value along with the fundamental factors is the availability of quality management mechanism of joint property, ensure openness and transparency of the company, the protection of shareholders and potential investors.

Described in this article problems of directive management in state-owned companies that do not allow to make decisions quickly and effectively in a rapidly changing environment, should be solved using modern information technologies that will minimize or completely eliminate directives in joint-stock companies. The introduction of digitalization will allow you to make balanced and objective decisions, set real goals and methods to achieve them in the management of joint-stock property in state-owned companies in the conditions of crisis uncertainty.

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Bioinformatics and Issues of Conclusion a Contract for Provision of Medical Services

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Abstract. The article analyzes the possibilities of commercialization of scientific research results of the human genome and its positive impact on research activities, provided that the information is properly protected. As shown by the legal regulation of scientific research of the human genome in certain states, the secret of private life (privacy) is the main content of the contract practiced in the field of medical services. Genetic information, although similar to medical secrecy when entering into a contract for the provision of medical services, differs in a public element in connection with the use of digital technologies in scientific research. The requirement to protect genome privacy is a mutual obligation of the parties in the contract. This parties do not always give proper attention to such issue. Legal regulation of genomic research will help to formulate a pragmatic attitude to the problem and find a balance between the risk and benefits of human knowledge.

Keywords: Biomedicine · Contract for the provision of medical services · Genome privacy · Protection of genome privacy

1 Introduction

The new service contracts are related to the research of the human genome in biology through biotechnologies. “One of the main features of our genome is its amazing regulating. Just as some computer folders are inside other folders, and those are in the next ones, and so on, the human genome consists of three billion so called building blocks, which are called nucleotides (there are four types A, C, G and T)” [11]. The comparison of nucleotides with computer folders used by Spencer Wells is not accidental. The fact is that genomic research has helped many sciences, including bioinformatics in developing. The capabilities of biological engineering can be applied to almost all types of cells, providing the creation of genetically modified plants or animals, as well as the creation of cells of adult organisms, including humans. This significantly differs from modern genetic engineering. The practice of research in the eighties of the last century differs in increased accuracy, efficiency and use simplicity. The list of potential applications of biological engineering is almost unlimited: from the ability to modify animals to grow them on a more economical diet adapted to local conditions, to the creation of food crops that can withstand extreme temperatures or drought.

As research in genetic engineering progresses are developing (for example, the development of the CRISPR/Cas9 method in gene editing and therapy), delivery and specificity constraints will be overcome. We will only have to find an answer to the most difficult question from the point of view of ethics, namely: how does gene editing revolutionize medical research and treatment procedures?

Different technologies are merging and enriching each other, and new ways are being developed to implement and use technical devices that track our activity levels and blood chemistry, as well as the impact of these factors on a person's physical condition, mental health, and productivity at work and at home. According to this statement, 3D production can be combined with gene editing to produce living tissues for the purpose of their recovery and regeneration (this process is called "bioprinting"). This technology is already used to create skin, bone, heart and muscle tissue. One day, printed cell layers of the liver will be used to create organs for transplantation [3].

Researchers have already started creating pig genomes for the purpose of growing organs for human transplantation (a process called "xenotransplantation", which could not be considered before due to the risk of immune rejection by the human body and transmission of the disease from the animal to the person). Plants and animals can be engineered to produce medicines and other forms of treatment. The day when a cow will be created that produces milk containing the element of blood coagulability, which is absent in people with hemophilia, is on the horizon. In fact, science is developing at such a pace that it is no longer technical, but legal, regulatory, and ethical constraints that stand in the way of progress.

The demand for genomic research in the field of law is evident in the commercial sphere and in the field of criminology. However, the search areas often complement each other. In addition to law enforcement, biological research has become widely used in commercial activities. Commercial genomics is a rapidly growing consumer services industry. It offers its clients a sample of their DNA (a little saliva) to restore their origin, find distant relatives, assess the risks of various diseases, choose a diet and sport. This innocent activity, however, can be a powerful force and lead to violations of human rights. People's genetic differences are quite diverse, but two main parameters are used to compile databases. The first of them is SNP, or "single-nucleotide polymorphisms", they are simply "substitutions". There are about 3 million points in the human genome where different individuals may have different "letters" (nucleotides). The totality of data on these points is a unique genetic portrait of a person. This portrait is made up when genotyping using a DNA chip. Such data is collected in the databases of commercial companies.

In order to avoid human rights violations, according to Fyodor Konovalov, head of the "Laboratory for clinical bioinformatics" (a Russian company engaged in medical genomics), genetic information should be subject to the law on personal data. According to this law, personal data is what makes it possible to identify a person. Previously, it was not possible to identify an individual by genotype, but if such a possibility exists, a legal problem may arise. This opinion, however, is not shared by all participants in commercial relations. So, Colin Fitzpatrick, director of the DNA Doe Project California company, believes that the fears are exaggerated: genomics data is not fundamentally different from all other information that is legally used by law enforcement, and there is no reason to treat genetic tests more scrupulously than, for

example, to publications in social networks. As the number of genetic tests for relatives searching increases, the threat to human rights in the forensic use of genomic research results increases. In this regard, the question of forming the Institute for the protection of genome privacy is increasingly raised [12].

2 Methodology

The methodological apparatus of the presented research consists of the following general and special methods of scientific knowledge successfully tested in the course of fundamental and applied research: philosophical method based on the dialectical method of knowledge; formal logical method that includes analysis and synthesis, induction and deduction, abstraction and generalization, analogy and comparison; system-structural method; historical method; formal legal method of analysis; dogmatic method (study of the dogma of law based on the provisions of existing legal norms, legislation, by-laws and international treaties); methods of interpretation of law, including lexical, systematic, teleological, doctrinal and authentic methods of interpretation; content analysis. The use of philosophical, formal-logical, system-structural and historical methods was a necessary condition for the scientifically justified and methodically verified implementation of scientific research. It was impossible to conduct scientific research of a legal nature without using the formal legal method of analysis, dogmatic method and method of interpretation of law.

3 Results

Bioinformatics is usually understood as the use of computers to solve biological problems. Nowadays, this is almost exclusively the task of molecular biology. The reason for this is that over the past 20–25 years, a truly colossal experimental material has been accumulated on the structure and functioning of biological molecules (proteins and nucleic acids), as an example, it is enough to cite the human genome [17]. Bioinformatics in its current state is a set of quite voluminous sections, as in any other science. If you compare it, for example, with physics, it is quite obvious that a specialist in theoretical mechanics is likely to have some difficulties in understanding the latest articles on quantum physics, and moreover, he probably will not have time to read these articles. The situation is similar in bioinformatics. There are a lot of topics in bioinformatics: 1) the evolution (and not only in the form of “first there were the pithecanthropuses,” but also lesser known issues, such as developments in cancer); 2) search for genetic variants that lead to diseases; 3) fabrication and selection of drugs that bind to certain types of “hazardous” proteins; 4) to study the genes functions, their annotation; 5) structural bioinformatics (manipulation of 2D and 3D structures, such as, for example, proteins or RNA); 6) assembly of genomes; 7) mapping of how all this aspects of proteins/RNA/DNA/fat/clever ideas/workout/Kremlin diet and other react between each other; 8) modeling of complex systems (such as the development of an organism from embryo); 9) neurobiology (or rather the analysis of the data collected by neuroscientists).

The development of bioinformatics as a new branch of knowledge was facilitated by the creation of an international research project that brought together the efforts of scientists from various countries, just as the “Apollo” program provided space research. Laboratories all over the world worked to create a genetic map of a person, to determine the sequence of nucleotides that make up DNA [13]. The project began in 1990, under the leadership of James Watson under the auspices of the US National Health Organization. A working draft of the genome structure was released in 2000, and the full genome was released in 2003, but even today additional analysis of some sections is still incomplete. Two main tools were used to implement the project: DNA sequencing and computer technologies for combining and analyzing (interpreting) of the received information in a database system [14].

A private company Celera Corporation launched a similar parallel project that was completed a little earlier than the international one. American researcher Craig Venter and his firm Celera Corporation launched a similar study in 1998. Unlike the international project, the Craig Venter project was funded by private capital. The parallel project was only for commercial purposes. The firm used a more risky variation of the genome fragmentation method (the shotgun method), which has previously been used to sequence bacterial genomes up to six million pairs of nucleotides in length, but never for anything as large as the human genome, consisting of three billion pairs of nucleotides. Additional legal support was required to achieve commercial goals. The firm has filed preliminary patent applications for 6,500 whole or partial genes. Celera Corporation Celera Corporation has also promised to publish the results of its work under the terms of «Bermuda Declaration» of 1996, releasing new data quarterly (the “Human genome” project released new data daily), but, unlike a publicly funded project, the firm does not grant permission for the free distribution or commercial use of its data. In March 2000, US president Bill Clinton stated that the genome sequence could not be patented and should be freely available to all researchers. After the president’s announcement, shares of Celera Corporation fell sharply, dragging down the entire Nasdaq biotechnological sector, which lost about \$50 billion of market capitalization in two days.

Competition in researches between the private and public sectors, as shown by the example of genomic research, has had a very good effect on the obtained results. In a public-funded project, competition has forced participants of the public project to modify their strategy to speed up progress. Firstly, the competitors agreed to merge the results, but the union broke up after Celera Corporation refused to make its results available through the GenBank public database with unlimited access for all users. Celera Corporation included data from the “Human Genome” project in its own sequence, but prohibited attempts to use its data for all third-party users. The main sequencing was performed at universities and research centers in the United States, Canada, and the United Kingdom. In addition to its obvious fundamental importance, determining the structure of human genes is an important step in the development of new medicines and other aspects of health care. The results of scientific research conducted within the framework of the international project gave an impetus to the development of a huge segment of market relations, covering various types of medical services. The existence of an active demand in this market raised the question of the

need to form a contract for the provision of medical services using genetic information, as well as a special type of contract for the protection of the genome privacy.

Currently, the list of services provided to consumers in the field of biological information includes services for preimplantation genetic testing, prenatal diagnostics, paternity testing, oncodiagnosics, diagnostics of inherited diseases, chromosomal matrix analysis, and other services. Commercial genomics is a rapidly growing consumer services industry. The basis for providing such services is the relationship between the doctor and the patient. There is little change in the legal regulation of contractual relations between two subjects of civil law. However, the emergence of genomic research introduces its own peculiarities in terms of the formulation of rights and obligations, as well as responsibility for their implementation.

The provision of medical services is associated with obtaining the patient's consent to perform certain operations, the success of which is associated with the preparation and correctness of decisions made by the doctor. Personalized medicine sets out its requirements for the contractual relationship between the doctor and the patient. One of these requirements is to obtain *informed consent* from the patient to conduct certain genomic studies [15].

The doctrine of the informed patient consent, developed in UK jurisprudence provides for the doctor's liability of physical harm caused to the patient if he did not warn the patient of a specific risk of adverse consequences. Traditional civil law institutions are used to ensure responsibility to the patient. For example, the basis of liability is the doctor's fault in the form of negligence and the relationship between awareness of the risk and the occurrence of the risk. The so-called "causation" of adverse consequences and lack of warning are the criteria for determining the doctor's negligence. When assessing the availability of informed consent, the English court is guided not only by the fact that the doctor must warn the patient of possible consequences, but also by the fact that the patients must fulfill certain requirements for providing their consent in accordance with the established procedure, i.e. the procedure for providing informed consent by the patient. The emergence of the procedure for obtaining informed consent of the patient is due to the fact that the increasing complexity of medical research changes the criteria for assessing guilt in the form of negligence in medical practice. The change in the assessment of guilt in medical practice is due to a change in judicial practice regarding the standard of information disclosure requirements. Thus, the right, based on the principle of patient autonomy in making decisions and expressing consent to certain actions from the doctor, has become more focused on the details of obtaining a safe and effective medical service. If previously the procedure for obtaining the patient's consent was based on a simple agreement with the doctor's recommendation, now this is no longer enough. For a patient to make an informed decision, they need to make an informed decision on all the issues raised as a result of their dialogue with the doctor. This helps to form a contract for the provision of medical services of a new type.

The patient's obligation to comply with the procedure for providing informed consent to the actions of a medical professional corresponds to the duty of the medical employee to maintain confidentiality with respect to information on the patient's health obtained as a result of treatment. Judicial practice has introduced the concept of "reasonable expectation" in terms of ensuring the human right to privacy. A reasonable

expectation of patient privacy has become a kind of criterion for evaluating the behavior of a doctor who violated confidentiality and a way to protect the patient's rights. The duty of a doctor is to keep medical privacy. Only the patient's expressed or implied consent to the disclosure of information about their health status. The patient's consent may be the basis for excluding such medical obligations under the terms of the contract [12]. In the practice of concluding contracts for the study of the human genome, the question of the patient's implied consent arises most often in connection with the widespread use of computer technologies and modern communication technologies, including the internet.

The legislation of some countries where the commercial practice of providing genetic information has been the most developed is aimed at protection of genome privacy. This applies, in particular, to US legislation: in the field of health insurance and in terms of protection against discrimination based on genetic information.

National legislation on the protection of the patient's genome privacy in the provision of medical services. The law on identity and liability in health insurance [6] and the law on non-discrimination based on genome privacy [7], adopted in the United States at the beginning of the 21st century, indicate the creation of control over genetic information present in commercial circulation. The literature notifies that the law pays little attention to the protection of genome privacy in the database of commercial organizations. The diversity in the categories of actors in "genetic" relationships and the goals pursued by participants in these relationships makes it difficult to work on general principles for the protection of genome privacy [4]. In the United States, where the volume of accumulated information allows you to formulate specific requirements for participants in the commercial turnover of genetic information, two laws were adopted at the federal level, the analysis of which showed that for the purpose of individual protection of the patient's genome privacy, the requirements for the protection of ordinary medical information are equally applicable. At the same time, it was noted that the peculiarity of genetic information is the presence in it of not only the interest in its protection of individuals, participants of commercial relations, but also public services and society as a whole. "DNA is the concept of a unique human identifier, and on the other hand reveals information on biological relatives" [2].

The presence of a public element in the information itself that allows the use this information for the bad purposes not only of the owner of such information, if it is provided without his permission, but also of a wider range of persons, primarily law enforcement agencies and the entire commercial turnover of genetic information in general. This creates a positive perspective for the legal regulation of scientific research of the human genome through the improvement of the system for collecting, storing and protecting of genome privacy. As stated in foreign literature, "in our media age, the very concept of legal protection of information secrets, or "Privacy", has changed and become more intense [12]. The Internet does not require people to consent to the dissemination of information about them, but it is thanks to new communication technologies and the activity of citizens, using these technologies, the information is widely distributed. New theories regarding the definition of "Privacy", as the right of an individual to control the use of personal data in commercial circulation, is only a prerequisite for the formation of contracts for the provision of medical services that include genetic information on the patient.

Since we are talking about contracts for the provision of medical services, the question arises on the nature of people right to control the use of their genetic information. State common law courts analyze claims for infringement of the right to protect genome privacy either as a claim for infringement of proprietary rights or as a claim for damages, but the public nature of the offense is not excluded.

The experience of legal regulation accumulated in foreign legislation is useful for the construction of a new medical care system, which was launched in Russia due to the danger of a pandemic that occurred on the basis of COVID-19. The program for the development of genetic technologies in Russia includes scientific developments that will prevent serious diseases, increase life expectancy, improve the environment, etc. To fulfill these tasks, three world-class genomic centers are being created, representing a consortium of universities, research institutes, and manufacturing innovation companies. Medicine is one of the main directions developed by genomic centers. The question of the legal regime of accumulated genetic information is certainly a central issue in the development of a promising direction of genomic research.

4 Discussion

The problem of involvement of the researcher in the process of conducting scientific work is very important in the regulation of scientific research. Solovyov drew attention to the fact that “the mind or meaning of knowable things and phenomena can be known only by intellect or sense of the cognizing subject, the relation of the subject to everything can exist for us only because we ourselves have an intellect [10]. Otherwise our knowledge would not differ from animals, affecting us reality of private objects and phenomena [10]. To a certain extent, the idea of Solovyov was reflected in a thought experiment of the Austrian scientist Schrödinger, described in the framework of the work “The current situation in quantum mechanics” [9] published in 1935. This work was devoted to the study of the problem of so-called “quantum entanglement” (a term introduced by Schrodinger himself), which allowed the simultaneous existence of several realities.

The uncertainty of quantum reality in a certain extent makes the problem of the cognizing person relevant, since “a person perceiving or passively experiencing this reality as a subject of sense, when a subject of reason determines the meaning of this reality, evaluates it in relation to the principle of unity that he has in himself as his mind” [10]. The Schrodinger cat experiment draws attention to the problem of observer morality in physics, but these principles are even more important in research of biology and in genetics, in particular. Compliance with ethical principles in scientific research should be reflected not only in legislation as formal requirements established by mandatory legal norms, but also in contractual practice (genomic contracts).

5 Conclusion

In 1866 Mendel [8] suggested that the characteristics of organisms are determined by inherited units, which he called elements. Later they were called “factors” and, finally, genes; it was shown that genes are located in chromosomes, with which they are passed from one generation to another” [5]. In the early decades of the 20th century, geneticist Thomas Morgan, who worked in a laboratory in Chicago, used fruit flies as an experimental model for his groundbreaking study. The result of scientific research is the conclusion that the genes are located in the chromosomes located in the insect germ nucleus. By the early 1930s, biologists and medical researchers were able to claim that genes were physical objects, the chemical information blocks strung on chromosomes like beads on a fishing line. The current level of genomic research allows us to suggest a program for the development of scientific research in this area based on the best practices of international research organizations, which meets the requirements of the new concept of the precision medicine development [1].

The US program for the development of research in the field of genomic medicine, presented by Jim Vaught, the president of the International Society for Biological and Environmental Repositories (ISBER), at the 3rd International conference on genomic medicine in Jeddah (Saudi Arabia) on November 30-December 3, 2015, provides a systematic approach to the collection, processing, storage and analysis of bio-samples [15]. The program is particularly important in the transition from the health care system to the precise medicine, because it is with no doubt associated with the transition from the study of diseases as such to the study of specific features of the body of a particular patient [16]. The conditions for the development of modern medical services set the legal experts the task of forming a commercial contract for the provision of medical services that meets the requirement of protecting the individual genome privacy of the patient, which is the basis of the contract.

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Foreign Law in the Relations Paradigm Involving a Foreign Element

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Abstract. Foreign economic activity is carried out by performing actions by its participants aimed at the emergence and fulfillment of obligations. The purpose of the study is to establish the moment of conclusion of a foreign economic transaction by determining the competent legal order and establishing the content of the norms of Russian and foreign law applicable to disputed relations. During the research, such methods as analysis, synthesis, comparison, and generalization were used. The result of the conducted research is the establishment of the applicable law to relations concerning the conclusion of a foreign economic contract, the grounds and conditions for recognizing the contract as concluded, and the consequences of not recognizing the fact of concluding an international commercial contract. The conclusions and results of the conducted research can be used for further research and as educational material, in legislative work and in law enforcement practice.

Keywords: Arbitration process · Applicable law · Conclusion of an agreement · Competent legal order · Foreign economic activity · International commercial contract

1 Introduction

An international commercial contract, as a type of agreement that binds the parties to such a transaction with mutual obligations, creates for the parties both rights and obligations, the failure of which entails liability established by the agreement and (or) the legislation of the state whose law is applicable to the agreement. But what to do in a situation where there is no legal certainty about the existence or absence of an agreement concluded by the parties? Is it possible to enjoin someone on enforcing obligations arising from an unsigned agreement between the parties, in case if the parties have corresponded in relation to the agreement terms? Is it possible to recover for performance that was not transferred, but allegedly carried out in order to implement agreements or discussions related to the conclusion of a foreign economic transaction? The moment of an agreement conclusion is an event that creates rights and obligations for its participants, both provided for by law and established by the parties agreement. However, the agreement qualification as concluded is often a difficult task for the courts and individuals involved in the dispute. This issue was the subject of decision of the Eleventh arbitration court of appeal of June 5, 2020 N 11AP-2139/20 the case of N A55-205/2019 [3]. The determination of the fact of the agreement conclusion, the

presence or absence of the rights and duties of legal relations participants, as well as the possibility of applying measures of liability for agreement breach, if signed, were the circumstances subject to establishment in this business. The resolution of these issues within the national legal system, taking into account the diversity of judicial practice in the qualification of disputed relations, would create certain difficulties, but the participation of a foreign element in the disputed legal relations created the need to establish the applicable law, as well as the application of the Italian law norms. The provisions of the doctrine of the foreign law application as evidence, included in the latest Russian arbitration procedural legislation, made it necessary for the parties of the dispute (at the court suggestion) to provide a legal opinion on the foreign law. The performance by the parties of the procedural obligation dispute to prove the circumstances relevant to the case was complicated (identification of individuals entitled to issue a legal opinion, formulation of issues that are to be resolved, conclusion of a relevant foreign economic transaction, payment from a currency account, etc.), and costly. And the costs of legal expenses may not be reimbursed to the Russian side, since the reimbursement of legal expenses, including expenses related to the establishment of foreign law content, can be carried out only after the consideration of the case on enforcement of a Russian court decision by an Italian court. The need to obtain a second judicial act that allows the execution of a judicial act of another state can be associated with the instability of the international environment, which creates additional difficulties for participants in foreign economic activity in carrying out economic activities that go beyond the borders of one state. Given the above, the Russian participants of foreign economic activities should pay particular attention to the legal issues of conclusion and execution of international trade contracts, including the negotiation of agreements, correspondence with foreign partners and obtaining data on the content of the legislation, with jurisdiction over the candidate of the Russian organization contractors.

2 Methodology

In the process of research, the following methods were used: general scientific – analysis, synthesis, comparison, generalization, historical method; private-scientific: formal-legal, comparative-legal, allowing to consider the choice of applicable law and its content on the issues of concluding a foreign economic transaction. The purpose of this research is to analyze the grounds and conditions for applying the rules of foreign law to relations concerning the conclusion of a foreign economic transaction by a Russian organization, and to establish the content of the rules of foreign (Italian) and Russian law.

This study answers the following questions:

1. What rules of Russian law are applicable in determining the law competent to settle a dispute on the qualification of a foreign economic transaction as a concluded agreement?
2. What is the meaning of the fact that the parties have signed a legal relations agreement, or the actions of the parties without an agreement?
3. Is it possible to meet the requirements of the contractor in the absence of the fact of transferring the executed agreement under the norms of Russian and Italian law?

3 Results

The application of foreign law is based in the legislation of each state on a set of conflict of laws rules. The legislation of the Russian Federation is no exception to this rule. Section 6 of part 3 of the Civil Code of the Russian Federation contains provisions on conflict of laws regulation, rules for choosing foreign law and restrictions on the operation of the laws rule conflict [2]. Thus, when considering cases involving a foreign element, the primary issue (in the absence of an international agreement that would regulate the disputed legal relations) is the establishment of a competent legal order.

However, the resolution of a dispute on its merits may precede not only the establishment of the applicable law, but also the preliminary qualification of the disputed relationship in order to choose the applicable law. The arbitration court of the Samara region in the case no. A55-205/2019 considered the claim of an Italian company against a Russian organization “on recovering about one million euros for non-fulfillment of the terms of the research activities contract [3].

The plaintiff’s position was based on the existence of an agreement (contract), the conclusion of which was questioned by the defendant. The contract signed by the respondent, who was the customer under the agreement, was transferred to the contractor in March 2015, and after 2 weeks, the customer withdrew the signature on the contract, notifying the contractor. A copy of the contract signed by the contractor was never submitted to the customer. The plaintiff also attached a copy of the contract signed only by the Russian organization and not signed by the plaintiff to the court where the Italian company applied for recovery of the debt under the agreement. However, later, when the defendant pointed out that the plaintiff did not sign the agreement, the Italian company attached the already signed contract to the case file, explaining to the court that the agreement was signed by the customer earlier, in 2016. The court’s judicial decision was a technical examination of documents, for which the plaintiff had to provide the original of the contract and other documents necessary for experts to establish the limitation period for signing the contract by the contractor. The plaintiff did not provide either the contract or the requested documents, making it impossible to establish the date of contract signing, which confirmed the fact that at the time specified in the draft agreement as the end of the agreement (31.12.2015), the contract was not signed by the contractor.

The very fact of signing the contract was significant. The plaintiff tried to force the defendant to pay for the work that was not transferred to the customer by him as a performer, but allegedly performed by the customer in compliance with the terms of the contract that he received in March 2015 from the defendant. Thus, until the establishment of the fact of works and their quality performance, the court had the task of establishing whether the parties have obligations from the agreement (in the absence of an agreement, there are no obligations in documentation developing), as well as the possibility of obliging the defendant to pay for the work not transferred to them by the plaintiff. The preliminary question of law choice has had a significant impact on the basis of the fact that provisions on the time of the conducting agreement and

establishing the fact of its existence in the legislation of the Russian Federation and Italy (competing in the relations of the legal system) differ from each other.

According to article 1326 of the Italian civil code, the agreement is considered concluded at the moment when the offeror learns about the acceptance of the offer by the other party. The offer acceptance must be notified to the offeror within the time limit set by the offeror or normally required in accordance with the nature of the transaction or in accordance with the use. The offeror may consider a late acceptance to be effective, in case if the other party is immediately notified. According to article 1327 of the Italian Civil Code, if, at the request of the person making the offer, or because of the nature of the transaction or for other reasons, the service is rendered without a prior response, the agreement is considered concluded at the time and place of its execution. However, the last paragraph of article 1327 of the Italian civil code requires the receiving party (Contractor) to immediately notify the other party of the work that has begun, under the threat of an obligation to compensate the possible damage that the customer may have suffered as a result of delay in notification. The offer may be withdrawn before the agreement is concluded. However, if the acceptor entered into performance in good faith before it was informed of the withdrawal of the offer, the offeror is obliged to reimburse it for expenses and losses incurred during the initial performance of the agreement. (article 1328 of the Civil Code) [4]. Thus, the presence of offer revocation from the plaintiff, directed to him by the defendant within 2 weeks after the offer transfer for signature, prior to acceptance, gave rise to the plaintiff's obligation in case of execution to notify the defendant under threatened obligation to compensate any damages that customer might incur as a result of the delay in notification. From the mentioned we can conclude that the Italian law for the contractor actions, not notified the offeror on agreement conclusion on the early action set in the offer, loses the right of recovery of damages and risks related to the non-receipt of payment for completed and not transferred work.

Let's see how the disputed legal relations is regulated by the norms of Russian law. Due to a direct indication of the norm of paragraph 1 of article 425 of the Civil Code of the Russian Federation, the agreement enters into force and becomes binding to the parties from the moment of its conclusion. This norm is mandatory. The parties may extend the terms of the agreement to the relations arising between the parties before the agreement (paragraph 2, article 425 of the Civil Code), however, it is the time of the agreement determines the start of its validity period as the period of time within which the conditions of the agreement, in particular, contractual liability, fulfilling the established obligations of the parties [2].

The agreement is considered concluded if the parties reached agreement under all essential terms in the required form (paragraph 1 of article 432 of the Civil Code). If the agreement is not subject to state registration and its conclusion does not require transfer of property, it is deemed concluded at the time of receiving its acceptance by a person who sent the offer (article 433 of the Civil Code). When concluding an agreement in simple written form by drawing up a single document signed by the parties (paragraph 2 of article 434 of the Civil Code), this moment coincides with the date of signing the agreement by both parties [2].

Thus, if the failure to observe reasonable care when the contractor begins to perform actions under an non-concluded agreement creates risks of failure to compensate

him the losses in the absence of immediate notification that the contractor has started to perform work, then Russian law provides the possibility of performing work under the agreement only if the parties sign the agreement and reach all the essential terms of the agreement. The claims were not related to losses compensation, but were aimed at receiving payment for the performed works. Considering that under Russian law, in contrast to Italian, to answer the question on necessity of payment you must see the obligation foundation for the payment making (from the agreement, from the caused harm, from losses, etc.). In this dispute the key question was the question on the fact of the agreement conclusion.

Applicable law to legal relations in dispute, the choice of the competent legal order was the law of the Russian Federation (paragraph 1 of article 1186 of the Civil Code), i.e. the establishment of the applicable law enforcement is applied by the *lex fori* [2]. This rule indicates that the application of a conflict of laws rule that refers to the domestic or foreign legal order in resolving a dispute depended at the stage of choosing the law on resolving the question of whether the disputed legal relations related to contractual, conditional or relations of compensation for harm, compensation for losses, etc. Qualifying the relationship as a contract would lead to the application of Italian law by virtue of article paragraph 5, part 2, article 1211 of the Civil Code of the Russian Federation, which contains the connecting factor “the law of the seller’s country” (*Lex venditoris*). On the contrary, the assignment of the disputed non-contractual relations would apply the provisions of part 1 of article 1219 of the Civil Code or article 1220 of the civil code, the basic rule of which is the application to disputable relations of the state law in which there was unjust enrichment either harm (*Lex loci delicti commissi*) [2]. Such state is the Russian Federation, so if the disputed relationship is classified as non-contractual, resulting in enrichment on the defendant’s side, the dispute would be subject to consideration under Russian law.

The Russian court considered the disputed relations in accordance with the provisions of both Russian and Italian legislation. When resolving the dispute, he disclosed the content of the agreement concept and the procedure for its conclusion based on the norms of both Russian and Italian law and concluded that the agreement cannot be recognized as concluded, and the plaintiff and the defendant are bound by obligations both to perform work and to pay for it. Thus, the consequences of non-conclusion of the agreement were established according to Russian law, which does not make the existence or absence of the rights and obligations of the parties under an unsigned (non-concluded) agreement dependent on the notification by the contractor of the beginning of works performance covered by the agreement offer. In addition, the court took into account the failure of the contractor to provide the result of the work to the customer, pointing to this circumstance as the absence of grounds for collecting the claim from the defendant.

According to article 1655 of the Civil Code, a works contract is a contract in which one of the parties undertakes to perform a certain amount of work or provide services using its materials, equipment and tools, acting at its own risk in response to monetary remuneration [4]. According to the above-mentioned Civil Code norm, the contractor takes the risk of performing work without advance payment. For the customer’s obligation to pay for the work, the contractor must first provide its own funds: 1) execution of works; 2) allow verification and acceptance of works; 3) ensure that the

work can be transferred to the customer; 4) guarantee the final delivery of the work. If none of the four stages has been completed or can be completed (since the work has never been completed), the customer is not obligated to pay the cost either proportionally or fully. Thus, under Italian law, the contractor can not claim payment for the results of work until the work is properly handed over and the customer checks it. The customer is not responsible for non-payment of the services cost that results from the contractor's failure to fulfill its obligations. As far as executor in dispute did not prove that he commenced work and did not send the results to the reconciliation and not handed over the results of such work to the customer for the final delivery and the subsequent signing of the Act on work completion, according to the Italian legislation he has not received the claim right from the defendant.

The Russian legislator also links the right to receive payment under the contract with the fact that the contractor has performed the work. Moreover, the subject of the contract is the result of the work, which is subject to transfer by the contractor to the customer. The obligation of counter-performance (payment for the result of performed work) arises from the customer when accepting from the contractor due the agreement (articles 702, 711, 769, 773, 774 of the Civil Code of the Russian Federation) [2]. Thus, the plaintiff's claims for payment of the work cost, the result of which was not transferred to the customer, are not based on the norms of Russian legislation.

These were the conclusions of the court, which refused to satisfy the Italian company's claims for an outstanding contract and for the non-transferred result of work. It is impossible not to agree with this conclusion and not to note an important feature of the given incident. The court considered the disputed relationship taking into account the content of the norms of two legal systems and pointed out that the plaintiff's claims were unfounded under the law of each of the applicable laws: Russia and Italy. It seems that this approach of the court fully meets both the doctrine of international comity and the principles of international private law, through which the rules of both the law of the court's country and the foreign legal order competent to regulate a particular legal relations can be applied to relations with a foreign element.

At the same time, it should be noted that the parties have difficulties in qualifying concepts and categories of foreign law, the practice of applying the provisions of foreign legislation by courts. Obtaining a legal opinion has become a difficult task due to the lack of information and knowledge on the regulation of the procedure and conditions for providing a legal opinion on the territory of the Italian republic, due to the high cost of such a conclusion, the need to make another foreign economic transaction - a agreement for the provision of paid services with an Italian lawyer. Given the above, the Russian participants of foreign economic activities should pay particular attention to the legal issues of conclusion and execution of international trade contracts, including the negotiation of agreements, correspondence with foreign partners and obtaining data on the content of the legislation, with jurisdiction over the candidate of the Russian organization contractors.

4 Discussion

In Russian and foreign literature the study of international commercial contracts, including the setting of time and circumstances, indicating the conclusion of an agreement involving a foreign element, the determination of the law applicable to the conclusion of foreign trade transactions, the content of the rights and duties of participants of relations on the conclusion of international commercial contract carried out in publications of Komarov [5], Prokushev and Kostin [10], Mazhorina [6], Muratova [8], foreign authors –Moreno [7], Bantekas [1] and Sigala [12], etc. Despite the presence of international acts of a recommendatory nature (Principles of international commercial contracts (UNIDROIT Principles) [9], recommendations of the Supreme court of the Russian Federation, clarification of similar provisions in foreign law, as contained in the conclusions on the content of foreign law is provided by experts in the field of foreign law and practice of foreign courts, the question of the foreign law and its application, information on the content of foreign law is causing problems in the legal profession. Other authors, such as Rogerson, have also tried to analyze the problems of applying foreign legislation on the example of a specific court case, and such research based on the method of induction, in the author's opinion, is both informative and practically significant [11]. The study of norms aspect of foreign law application to the question of the transaction qualification as concluded and analysis of the consequences of such qualifications to establish the content of rights and duties of participants of legal relations carried out for the first time and is relevant and topical research problem of the application of conflict rules and regulations of the Russian and foreign legislation applicable to this disputes category.

5 Conclusion

At the beginning of this article, the authors raised questions that can be answered based on the results of the study. When determining the right competent to settle a dispute on the qualification of a foreign economic transaction as a concluded agreement, it is necessary to follow the norms of Russian legislation by virtue of part 1 of article 1186 of the Civil Code of the Russian Federation [2]. The fact that the parties of a foreign economic transaction have signed an agreement (contract) is essential in determining whether or not there are a conducted by the parties agreement. The lack of works result shows the lack of the customer's obligation to pay the contractor that indicates that claims for the cost of work performed in the event of alleged or initially unjustified and unreasonable, or a mistake in the requirements that might be qualified as relations of damages and apply to the disputed relations (the basis, conditions, damages, etc.) the legal order of the country in which the damage was caused or harmful consequences of the caused damage occurred (*Lex loci delicti commissi*).

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Modern Ways to Achieve Sustainable Company Growth

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Abstract. In the conditions of sufficient openness of the Russian market, factors such as a decrease in demand and in investment activity, exchange rate fluctuations, economic sanctions against companies and other unstable conditions lead to a slowdown (sometimes to a decrease) in the growth rate of the turnover of Russian companies, and a deterioration in their financial situation and decrease in the degree of financial stability. Therefore, it seems necessary to study the conditions and opportunities for achieving sustainable growth carried out on the example of Russian airlines using econometric modeling methods. Solving this problem requires studying the system of financial and non-financial factors for achieving sustainable growth and also identifying key financial indicators of growth based on an analysis of industry-specific features of the airline passenger transportation market.

Keywords: Airlines growth · Risk factors · Revenue growth · Sustainable growth

1 Introduction

Unstable business conditions significantly reduce the economic potential of Russian companies, which in the long run may deprive them of the opportunity to achieve sustainable growth regardless of the field of economic activity. Airlines are no exception. Despite the annual increase in passenger traffic in recent years, in the current economic situation this growth cannot be described as sustainable, and the airlines themselves are experiencing financial difficulties. Over the past five years such major Russian airlines as “Transaero” Aviation Company JSC and “VIM-Avia” Airlines LLC have gone bankrupt. A difficult situation in the Russian aviation industry has developed since 2014, when Russian carriers began to suffer losses due to a decrease in passenger traffic and a general recession in the Russian economy, which had a negative impact on stability and prospects for their further development.

2 Methodology

The research is aimed at quantifying the opportunities for achieving sustainable growth by Russian airlines. Descriptive and comparative methods of general scientific knowledge, methods of financial analysis and econometric modeling, in particular, regression analysis using the R statistical package, were used as research methods. The regression analysis method allows to determine the significance of selected factors included into the model, as well as the degree of influence of each factor on the resulting feature. A dependent variable that characterizes the quarterly revenue of Aeroflot Group is modeled. Based on the data of operational statistics and artificially simulated dummy variables, a multiple linear regression model of the revenue dependence on financial and non-financial factors of sustainable growth is constructed. The main non-financial factors are the volume of passenger traffic, aircraft load level, seasonality. The model considers sales profitability, current liquidity ratio, asset turnover ratio, financial dependence ratio and the volume of non-current assets as financial factors. The information base is presented by the financial statements of Russian airlines for the period 2014–2019. The research methods and results can be used to develop a mechanism for airlines to achieve sustainable growth.

3 Results

For many companies, regardless of the field of activity, achieving sustainable growth is an important factor for existence and development in the face of falling demand, decrease in the investment activity, currency fluctuations, etc. The lack of sustainable growth in the face of a general economic slowdown has a negative impact on the development of companies and leads to a decrease in shareholder income, which can lead to bankruptcy in case of a combination of adverse factors.

The long-term strategy of many companies involves the development of the company, which is aimed at shareholder value growth by increasing economic efficiency, staff development, which affects labor productivity as well as the growth and increase in business activity. However, not every type of growth leads to the creation of additional value for the company and increase in the welfare of owners. As practice shows not every corporate growth contributes to the prosperity of the company in the medium and long-term time horizons. Thus, unbalanced growth contributes to the accumulation of risks [5]. High growth rates with insufficient level of resources can lead to depletion of company resources, loss of financial stability as a result of debt increase and reduced liquidity. On the contrary, a slowdown in the presence of great potential can make a company a takeover target. Therefore, the actual growth of the company should match its financial capabilities.

To solve this problem, the concept of sustainable growth developed by Higgins can be applied. If a three-factor model of Thompson, Higgins and Howell [11] is used for a comparative analysis of the potential of the regions, which includes GDP per capita, disposable income per capita, unemployment rate, then at the level of corporate structures the model correlates the growth rate of company sales with return on equity and retention ratio [3]. The essence of the concept is to calculate a company's sales

growth rate that is achievable, on the one hand, with an unchanged operating policy, and, on the other hand, with a stable financial structure of the company.

Thus, «sustainable growth is the ability to generate a constant revenue growth rate with the same operational strategies and financing sources over a long period of time for all interested groups of people» [9, p. 106]. In other words, it characterizes the maximum speed with which a company can increase sales without depleting financial resources [7]. Sustainable growth rate is a possible estimated growth rate of revenue or profit, which is provided with resources, provided that the key indicators of the operating, financial (including dividend) policy of the company are constant [14].

Sustainability of companies can be assessed using models of sustainable growth by Higgins [4], Zakon [15], van Horn and James [13], Ulrich and Arlow [12] and others. Analysis of sustainable growth factors using various models allows to identify the relationships between key indicators, make forecasts and choose the best scenario activities in the forecast period. However, these models take into account only the financial factors of the company. Sustainable growth is influenced by both financial and non-financial factors. Financial indicators of sustainable growth are:

- profitability and cost-intensity indicators, which characterize the financial performance of the company,
- indicators of business activity, evaluating the intensity of growth,
- the higher the turnover rate of assets, the higher the efficiency, solvency and financial stability of the company,
- by analyzing the efficiency of the use of assets it is possible to evaluate the relationship of the company's commercial revenue with various operating assets [6],
- indicators of liquidity and financial stability of the company, reflecting its financial independence,
- the level of interest rates of commercial banks that affect the value and capital structure of companies,
- inflation and economic growth as exogenous growth factors. Inflation affects corporate financial decisions regarding debt policy. Therefore, during a period of high inflation, companies will have a lower debt ratio, which may lead to underfinancing of operating activities [8].

In our opinion the main non-financial factors for studying endogenous growth are:

- the results of company's operations depend on the industrial specifics (for airlines it is the level of aircraft loading, the volume of passenger traffic, the composition of the fleet, the number of flight directions etc.),
- the structure of a board of directors and the number of independent directors,
- seasonal dependence of flight direction, which has an impact on company's results.

Regression analysis is used to assess the impact of both financial and non-financial factors on sustainable growth achievement. It implies development of an econometric model, which describes the relations between company's sales and different sustainable growth factors. This method makes it possible to assess the influence of different factors on the company's sustainable growth and find the most important growth factors which will be used in further rational company's strategy development.

Activities of airlines are related to the passenger transfer, aircraft fleet management, etc. It has a lot of technical and economic features and carries a large number of different types of risks. Socio-economic situation in the country, interest rate and law risks could be defined as non-specific risks for airlines, while seasonal dependence of demand, sensitivity to jet fuel price volatility, which takes a significant part in operating costs of airlines, high operational and foreign exchange risks are specific types of risk for airlines. Moreover, the constant need for renewal of formed assets and technological progress have a significant impact on changing of economic structure, strengthening of potential and accelerating of company’s economic growth [10]. All these risks should be taken into account when assessing the sustainability of economic growth.

The air transportation market is quite concentrated: as of the end of 2019, only 15 out of 107 registered airlines carried 92.6% of passengers and made 93.9% of the passenger turnover. At the same time, the four largest players (8 airlines) of the 15 airlines are Aeroflot Group (Aeroflot, Rossiya, Pobeda, Aurora), S7 (Siberia, Globus), Ural Airlines and UTair occupy 75% of the air transportation market share. Moreover, Aeroflot Group has almost half of the market - 41.2% [2].

Financial and economic analysis of the annual reports of the leading Russian airlines (Aeroflot Group, S7 Airlines, Ural Airlines) for the period 2017–2019 showed that the expansion of their activities was achieved mainly due to the growth of liabilities (the share of borrowed capital in the aggregate capital on average is 63%), which indicates instability of growth. Debt is mainly represented by accounts payable, which forms the main part of the company’s liabilities. As a result, the balance sheets of the company, as shown by current liquidity ratios, during the analyzed period are mostly illiquid while increasing the risk of default on current liabilities.

According to the financial statements, revenues of companies are constantly growing in recent years. However, operating expenses have a higher growth rate, which have a significant impact on profit margins. As a result, lower profits and higher costs leads to decrease in company’s free cash. Based on the estimation of key financial performance indicators, the steady growth rates of Aeroflot Group and S7 Airlines for 2017-2019 were calculated (Table 1).

Table 1. Estimation of the actual and sustainable growth of Russian airlines, %

Sustainable growth models	Aeroflot Group			S7 Airlines		
	2017	2018	2019	2017	2018	2019
Revenue growth	4,4	13,0	9,3	31,5	8,9	23,3
BCG model	18,6	4,5	8,1	26,4	54,9	31,6
Higgins model	18,2	4,6	7,6	26,1	42,5	29,8
Van Horne’s model	22,3	4,9	8,2	35,3	73,8	42,5
Ulrich-Arlow’s model	34,4	6,7	10,8	30,7	44,2	22,0

Source: authors.

A financial analysis of the activities of Russian airlines showed that a feature of the airline industry is a consistently significant share of debt in total capital (from 2014 to 2019, from 65 to 85%). Therefore, the criteria for sustainable growth for airlines is the

ability to generate a stable revenue growth rate with the same operating strategy. The results of calculating the rates of sustainable growth using the main models show that airline revenue growth is not sustainable in the analyzed period. The growth is not provided by company's own sources of financing, and in the last two years the activities of airlines are characterized by extremely low profitability. Moreover, the constant growth of short-term accounts payable and a slowdown in its turnover negatively affect liquidity and the possibility of achieving sustainable growth. Airlines need higher revenue growth, which will allow them to become profitable in the case of constantly growing operating expenses and debt.

Regression analysis methods were applied to measure the impact of non-financial factors of sustainable growth, along with financial methods. The determinants of sustainable growth were identified using the regression analysis and their significance for company's revenue growth was proved. The results showed that the main non-financial factors for the steady growth of airline revenue are the growth in passenger traffic and the seasonal factor characterizing the systematically increased demand for airline services in July-September. The management of these factors can positively affect the growth rate of airline revenues. The research on the possibilities of achieving sustainable growth on the example of Russian airlines showed that the main financial factor for growth is the profitability of sales, as one of the parameters of the effectiveness of the pricing policy of companies. The stable positive financial result indicates that the company is conducting efficient activities, generating profits for distribution and reinvestment. Retained earnings can also help companies mitigate the negative effects of critical situations or loss-making activities.

4 Discussion

The extrapolation of the results obtained to the activities of airlines in 2020 seems to be incorrect. With the development of the COVID-19 pandemic, the cessation of international flights and a significant reduction in the number of domestic flights in 2020, airline operations may be unprofitable. For example, Aeroflot Group revenue for the first three months of 2020 was 11.5% lower than the same period in 2019. The cumulative decrease in passenger turnover in the first quarter was 17.9%. At the same time, cost of sales decreased by 7.4% in comparison with the first quarter of 2019, mainly due to lower variable costs. The fixed costs of the airline almost did not change [1]. Despite the fact that at a complete cancellation of flights to other countries, airlines will not face the same variable costs as before (kerosene, airport taxes, passenger services, air navigation services), international air transportation is still the main source of airlines profit and allows them to cover losses that arise on domestic lines. Also, the termination of international air traffic leads to a decrease in transfer passenger traffic within the country. In order to increase airline sales, possible measures were proposed to influence the factors of sustainable revenue growth; the possibilities of changing the pricing policy of airlines (financial factor) and ways to increase the volume of passenger traffic (non-financial factor) were evaluated. Under the current conditions, a decrease in ticket prices is not possible, because in terms of falling sales, operating expenses reduce slightly and have only a little dependence on company's operational

and financial policies. Consequently, the volume of activity becomes the main instrument for achieving sustainable growth in 2020. The ways to increase the passenger flow of companies can be the increase of the number of destinations, expand of the air fleet and increase the load of airplanes, and change the baggage tariff policy as a sales incentive.

5 Conclusion

To effectively manage the growth of the company and increase its value, it is necessary to match key indicators of its operating, investment and financial activities, as well as to ensure the required level of profitability and financial stability. The study of key financial and non-financial factors for the sustainable growth of companies involved in air transportation of passengers shows their practical significance, both for individual companies and the entire air transportation sector. The research confirms that, despite the positive dynamics, the growth of Russian airlines in recent years is not sustainable and will not become such in prospect, which is due to the peculiarities of companies operating in the field of air transportation, as well as to the impact of the pandemic. In 2020, the situation in the aviation industry is characterized by an extremely difficult state in which airlines cannot function without financial support from the government as well as new measures to increase revenue by making impact on sustainable growth factors by all possible means in the face of a significant decrease in demand. This requires an increase in airline operating income by influencing the volume of passenger traffic as a key factor in sustainable growth. Implementing the proposed ways to attract new customers can help the airline increase sales.

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Analysis and Cost Estimation Algorithm as a Tool for Industrial Enterprise Management

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Abstract. An effective cost management system at industrial enterprises determines the level of their competitiveness, contributes to the formation and development of new markets for innovative products, which is relevant in the context of modern economic instability. At present, when the whole world faces the limitations of business activity caused by COVID19, not only small and medium-sized, but also large enterprises are experiencing problems associated with the organization and implementation of production and marketing of products, works, services. Gaps in many production chains lead primarily to increased production and marketing costs. Therefore, the formation of the algorithm for their estimation will allow the manufacturer to identify and evaluate possible changes in production costs and develop measures to optimize them. The starting point of cost management is the analysis of financial, production and administrative processes at the enterprise. Performance indicators depend on the level of costs at the enterprise. Features of the production structure of the industrial enterprise, the nature, type and scale of production have a significant impact on the magnitude, structure of costs and the procedure for their accounting.

Keywords: Analysis · Costs · Cost estimation algorithm · Industrial enterprise · Quality characteristics

1 Introduction

Important indicators characterizing the work of enterprises are the costs of production, work, services and the level of costs per 1 ruble of marketable products, which determine the financial condition of business entities, and the results of enterprises. To form an effective cost management system at industrial enterprises, it is necessary to analyze the qualitative characteristics of costs, which allows us to identify trends in their costs, identify key factors affecting their value, establish reserves and planned reduction indicators, and evaluate the performance of the enterprise. An effective cost management system refers to a set of tools and principles aimed at analyzing, accounting for costs, optimizing organizational, economic and production processes to reduce current expenses, increase the company's profit and improve the quality of products.

An important tool of the system is the analysis and cost estimation algorithm, which should be comprehensive, informative and understandable for any level of enterprise

management, cover the qualitative characteristics of the occurrence and change of costs to produce products, works, services. When analyzing the costs of the enterprise, many authors pay attention to certain aspects of their formation. Most authors, including Berdnikov [6], Asaul and Kvinitsiya [3] suggest analyzing the costs of elements in dynamics and assessing the magnitude of deviations and their causes.

Savitskaya proposes a more in-depth cost analysis, evaluating both the dynamics of cost elements, the total cost of production, the cost indicator per 1 ruble of marketable products, the value of variables and fixed costs [13]. Ageeva and Pavlova offer a system of coefficients for analyzing the dynamics of changes by elements [1]. Perroni, Gouvea da Costa, Pinheiro de Lima and Vieira da Silva consider the relationship between the market life of the enterprise, the resources expended and the enterprise's efficiency, using non-parametric and parametric methods, least squares methods for estimating costs, quantile regression [11]. The authors concluded that the most efficient enterprises with a higher level of analytical practice in the field of cost research have been in the market for the longest time. Chofreh, Goni and Klemeš assess the impact on the efficiency of the enterprise and the level of costs of the ERP-system and road mapping of production processes but do not disclose questions: how the costs of the enterprise are analyzed, which algorithm or elements are used [8]. Steinhäusser and Reinhart emphasize the need to conduct a more thorough comparative assessment of planned and actual cost indicators at the enterprise, identify the causes of deviations and improve the planning of costs and enterprise performance indicators in total [14]. Analysis of the works of domestic and foreign authors allows us to conclude that at present there is no single algorithm for analyzing and estimating costs at industrial enterprises. Meanwhile, for industrial enterprise management, as the authors' experience shows, it is important to have a universal and easy-to-use methodology for analyzing and evaluating costs.

2 Methodology

The methodological and theoretical basis of the study are:

- a method of complex analysis, which made it possible to cover a wide range of issues, problems and solutions in the field of cost management at Russian industrial enterprises,
- a system analysis method, which analyzes the issues of the influence of types, nature, features of the production process and applied technologies at the level of formation and change of costs in production of industrial products, works, services at Russian industrial enterprises.

When forming the algorithm for a qualitative analysis and cost estimation, the provisions of the tax code of the Russian Federation regarding the classification and accounting of enterprises' costs are considered. The forms and items of costs proposed for analysis correspond to both the Russian and international accounting systems, which greatly simplifies the process of identifying variances and reserves for reducing these costs.

3 Results

When analyzing the qualitative estimation algorithm of the costs at industrial enterprises, it is necessary to consider the stages of the production process and the nature of business processes carried out in each of them. When manufacturing products there are usually three stages at most industrial enterprises - procurement, processing and assembly, which are distinct in the technological applicability of equipment and the nature of business processes.

Each stage of production is complex. For example, at machine-building enterprises at the procurement stage, the metal entering the enterprise is cut into billets, which represents the initial stage of cost formation for products, then in the forge shop (hot stamping) or in the press shop (cold stamping) the costs of forging are formed, in foundry - the cost of manufacturing castings. The processing stage can also vary by the formation of costs to produce finished parts for various types of processing: mechanical (turning, milling, etc.), galvanic, heat treatment. At the assembly stage, assemblies, connections and the product are assembled from parts of own production and other components. At this stage, assembly costs are initially generated, and after completion, finished products are tested and, accordingly, test costs are generated. The presence of such a complex, multi-stage process, from the point of view of cost management, implies the need to highlight individual cost centers or responsibility centers [16]. However, when we use the information received only from responsibility centers (places of origin) in the cost analysis, it does not allow us to assess the degree of cost increase for individual stages of the manufacturing process of a particular product.

It should also be borne in mind that at the end of each technological stage, and even substage, unfinished production (semi-finished products) can be partially sold to other enterprises. Therefore, in addition to the costs of manufacturing finished products, there is a need to analyze the costs of semi-finished products intended for sale to third-party customers. In addition to finished products and semi-finished products, orders can be received for the implementation of services and works of the industrial nature. Accordingly, they also become the subject of cost research. Costs should be analyzed, not expenses. This is due, firstly, to the type of production, the system of in-plant, operational-production planning. So, for example, when using the operational planning system "at the warehouse", which is used less often in single production, widely - in serial, some parts (unified and general) can be used in the assembly of many different types of products [9]. They are manufactured according to a certain planning system in a pre-calculated volume and their stock is kept in the finished goods warehouse. Their subsequent use for individual products in the production is not known. The costs of their manufacture are recorded separately, recognition of their expenses is carried out after completion of the assembly of those products into which they will be included.

Secondly, it should be borne in mind that most industrial enterprises, especially engineering, are characterized by a long production cycle. This leads to the presence of a large volume of stocks (production, finished products), backlogs of work in progress. In this regard, the issues of cost accounting for their formation, the distribution of generated costs between finished products and work in progress become very important. Moreover, the methods for evaluating work in progress in accounting and tax

accounting are somewhat different. The allocation of the object of study of costs is largely affected by the specifics of the production structure of enterprises. For example, three of its options are possible at machine-building enterprises: substantive, technological, and mixed. For the subject type, the production structure is characterized by the specialization of workshops to manufacture a limited product range, while in the technological type, equipment dedicated to performing homogeneous operations is concentrated in separate production units (forge, press, turning, milling sections, etc. can be formed). At most industrial enterprises, a mixed production structure prevails, in which procurement workshops and sections are built according to the technological principle, processing and assembly - according to the subject. The considered structure options determine the allocation of possible centers of responsibility (cost centers) [2].

In addition to the stages of the production process, its individual varieties can be distinguished. According to their purpose and role in production, processes are divided into main, auxiliary and service ones. From the point of view of cost formation, a few functional services also play a significant role: units that carry out technical preparation to produce new products, enterprise management structures, etc.

The specifics of industrial enterprises determine the following areas of analysis and the subsequent formation of measures for cost optimization:

- by cost centers of the main production (plots, workshops, etc.), with the corresponding allocation of responsibility centers and cost centers,
- by certain varieties of the production process (auxiliary, serving) and functional areas of activity (technical preparation of production, structural divisions of management, etc.) also with the allocation of responsibility centers and cost centers,
- by accounting objects (semi-finished products for sale, finished products, individual products, orders, work in progress, a technological process or part thereof),
- by type of cost (elements and costing items, capital costs and costs not included in the cost of production).

To assess the quality characteristics of costs at the industrial enterprise, considering the specifics of its production, the authors propose the algorithm for analysis and cost estimation, which is a key and a starting tool of the cost management system. The stages of the analysis and cost estimation algorithm are presented in Fig. 1.

The analysis of the environment, including using methods of positioning the enterprise on the market, and the selection of criteria for matching costs with the existing strategy of the enterprise, is the first stage of the cost analysis algorithm at the industrial enterprise [4]. Moreover, the comparison criteria should be the general level and dynamics of costs and their size and tendency to change in individual components, areas of research, information sources which should be formed at the next stage. Its main sources are accounting, tax and management reporting [5]. It should be borne in mind that in the manufacturing industry, the largest share of costs in the cost structure of production is occupied by material costs and labor costs. According to the international labor organization [10] and the statistical collection [12] Industrial production in Russia the level of wages is currently low at most industrial enterprises in Eastern Europe, including Russia and Ukraine, the share of wages in the cost of production does not exceed 20% at most industrial enterprises in Russia.

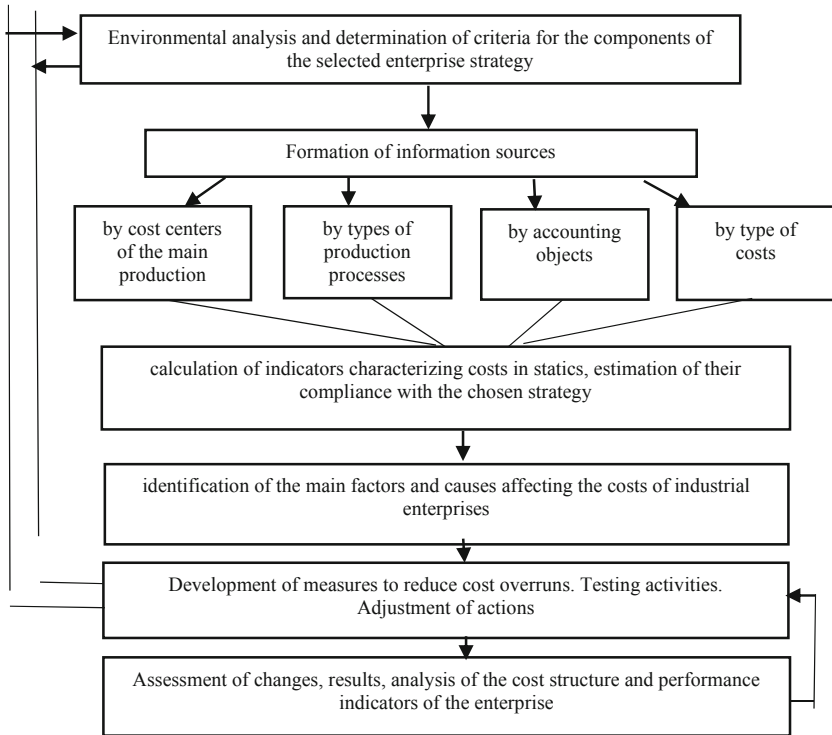


Fig. 1. The cost analysis algorithm at the industrial enterprise (Source: authors).

Therefore, the greatest cost reduction can be achieved mainly based on lower material costs. The composition of material costs attributable to the cost of products, works and services includes, according to the tax code of the Russian Federation [15], the following costs:

1. To purchase materials used while producing products and forming its basis, or which are a necessary element in its production.
2. To purchase materials used for packaging and pre-sale preparation of products; for other production and business needs.
3. To purchase tools, inventory, laboratory equipment, not related to fixed assets.
4. To purchase components, related to the maintenance and operation of fixed assets.
5. To purchase fuel, water, energy of all kinds spent on technological purposes, the generation of all types of energy, heating buildings, the costs of transformation and transmission of energy.
6. To purchase works, production services performed by third parties, for the performance of these works by structural units of the enterprise itself [15].

An important element is the analysis of the composition and structure of material resources. For this, the composition of material costs based on the above list can be enlarged into the following elements: raw materials and materials, purchased components and semi-finished products, work and services of a production nature performed by third parties, fuel, energy. To study the composition, dynamics and structure of material costs, it is advisable to compare, over time intervals (years) of the study period, changes in their absolute amount, specific gravity in the total result of material costs, and their level per ruble of products. This will reveal costs due to which there was an increase (decrease) in material costs. The value of the costs themselves in monetary terms does not allow us to evaluate the effectiveness of the enterprise due to changes in sales and the range of products, high dynamics of prices for raw materials, materials and other resources. In this situation, it is advisable to analyze changes in specific gravities of individual elements, as well as in the levels of elements of material costs per 1 ruble of output. It is important to identify factors that influence the amount of costs.

A comparative analysis of the growth rate of output with the growth rate of costs allows us to identify how the change in production and sales of products at one enterprise affects the level of costs (all and/or individual cost items) per 1 ruble of commodity output.

To do this, you need to calculate:

The growth rate of output according to the formula:

$$\Delta V = V_{i+1}/V_i, \quad (1)$$

where ΔV - the growth rate of manufactured products, thousand rubles;

V_{i+1}, V_i - volumes of released products (works, services) in the reporting and base years, respectively, thousand rubles;

- The growth rate of costs (all and/or individual cost items) according to the formula:

$$\Delta C = C_{i+1}/C_i, \quad (2)$$

where ΔC - the growth rate of costs;

C_{i+1}, C_i - costs in the reporting and base periods, thousand rubles;

- The ratio of the obtained values:

$$K = \Delta V/\Delta C, \quad (3)$$

where K - a coefficient reflecting the ratio of the growth rate of output to the cost growth rate.

If the coefficient value is greater than unity, then this indicates that the change in output volumes favorably affected the level of costs per 1 unit of production, i.e. relative cost savings occurred, if less than one - relative cost overruns.

When performing calculations, it is important to evaluate and analyze the effect of prices on resources used on the level of costs at the enterprise. To do this, we should

compare the growth rate of material costs, including for their individual elements, per 1 ruble of production, with the growth rate of prices for relevant resources. The resulting ratio reflects the impact of rising resource prices on cost dynamics.

It is also important to analyze the relative savings or cost overruns in absolute, cost terms:

$$EL = (C_{i+1} - C_i) * \Delta V, \quad (4)$$

where EL - savings or cost overruns in absolute, cost terms, thousand rubles.

It is advisable to carry out this calculation not only by the total volume of material costs, but also by their individual elements.

Private indicators of the efficiency of material costs are indicators of material consumption and material output. For a more complete assessment of the efficiency of material costs, it is advisable to detail them, highlighting the total material consumption, as the ratio of all material costs to the cost of production, private material consumption, as the ratio of a specific element of material costs to manufactured products, the material consumption of an individual product (work, services).

Assessment of the rational use of material resources involves identifying the fulfillment of the norms of consumption of certain types of material resources. The products of many industrial enterprises, such as engineering, have a rather complicated technological structure, which is the composition and number of parts, assembly units, units of which the product consists. Therefore, when rationing basic materials, use is made of sub-detailed, sub-node, sub-parts standards. They are interconnected in a certain way based on the norms of applicability of parts in units (assembly units), the latter in the product. Thus, it is possible to aggregate and monitor the implementation of standards, starting from individual parts and ending with a finished product, including intermediate assemblies. Since most industrial enterprises cannot recognize the level of wages as high, rationalization and reduction of these costs should be approached with great caution. At the same time, we are to analyze their level, since the cost of labor, the complexity of products, and the degree of organization of labor significantly affect the overall size and dynamics of costs in general.

The analysis of labor costs in the cost management system should be inextricably linked with the assessment of the impact of labor resources on the cost of production, analysis of the use of working time and labor productivity. The study of changes in the wage fund must be carried out for separate time periods based on two factors: the average number of employees and the average wage of a worker. The main trends of changes allow us to identify the method of chain substitutions. For a more complete study, it is necessary to assess the influence of factors on the change in the wage fund for certain categories of personnel. Labor costs can also be analyzed based on their presentation because of the multiplication of two factors - the volume of production and the salary intensity of products. This will reveal not only the main reasons for the absolute change in the wage fund for certain time periods but will also provide an opportunity to explore the direction of change of the most important factor - the salary intensity of products.

The salary level of products is influenced by such factors as the number of required personnel, the schedule and mode of work (shorter working hours, overtime pay, work

on holidays and weekends, etc.), features of labor incentive and promotion systems used at the enterprise, salary level and others. Other factors related to the planning and forecasting of production, maintenance of production facilities, production technologies, sales of products, after-sales service and repair, and others, also affect the level of costs. Their share varies greatly depending on the size of the enterprise, type of product, its life cycle [7] and other factors.

The most important element of the analysis is the assessment of deviations of actual values from planned and normative. The identification of such deviations allows us to identify the ineffective management of individual departments and services of the enterprise. The assessment of the identified causes of deviations makes it possible to develop measures and actions to correct existing problems.

4 Discussion

Currently, considerable attention in the economic literature is paid to the analysis of the financial results of the enterprise, reflected in the reporting forms. Such an analysis, of course, allows you to find out problems and outline ways to solve them in terms of cost management. But the approach to cost analysis should be comprehensive, systemic and deeper, considering the characteristics of manufacturing enterprises, multi-stage production processes. Not quite enough attention is paid to those indicators and algorithms that are traditional for estimating costs in domestic developments. Therefore, characterizing the sources of information in certain areas of analysis as a starting element of the study in relation to industrial enterprises, it is necessary to analyze the cost of commercial products by costing items, estimates of production costs, estimates of indirect costs, unit costing by types of products, costs per 1 ruble of commercial products.

These forms are relatively simple to compile and analyze, correspond to both the Russian and international accounting systems, which greatly simplifies the process of identifying reserves and variances. Analysis of the cost of production by costing items or cost elements allows you to explore its structure; the use of functional-cost analysis, principles and tools of lean manufacturing - to build a value chain and develop measures to reduce unnecessary losses.

Analysis of the costs per 1 ruble of commercial products of industrial enterprises in the context of cost items, separate accounting of conditionally fixed and conditionally variable expenses allows us to develop strategies for their reduction, draw conclusions about the profitability of products, and develop measures to improve our product policy. Unfortunately, lately insufficient attention has been paid to the technological features of production at industrial enterprises, to the search for reserves to reduce costs within production processes. At that time, the largest share of costs of industrial production was made up of costs of raw materials and materials, fuel and energy for technological needs and salaries of the main and auxiliary production personnel. The search for opportunities to reduce material consumption, labor intensity and salary intensity of industrial products are key areas in the development of measures to reduce costs.

5 Conclusion

The proposed algorithm for analysis and cost estimation at industrial enterprises allows us to identify the main factors that influence the level of enterprise costs. It should be borne in mind that not all of them have the same significance for individual time periods, not all are managed by the management, their accounting and “neutralization” require different resource support. Analysis of the cause-and-effect relationships between factors that influence the amount of costs and costs themselves is the basis for the development of measures to reduce costs. The application of the analysis and cost estimation algorithm proposed by the authors under modern conditions, when their level can significantly increase for quite objective reasons, will allow enterprise management to identify negative deviations in their size and adjust the corresponding business processes.

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New Reality of Directional Drilling Services During Production Decline and Coronavirus Pandemic

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Abstract. The year 2020 introduced unexpected critical structural changes into a rather conservative sector of drilling services. In a situation where the confirmed volumes of work are unpredictably transferred, postponed, halted, or renegotiated, the leaders of high-tech service companies providing technical and technological support for oil and gas drilling, had to make a number of strong-willed decisions in order to continue to support the telemetry equipment fleet and retain a team of engineers by staying in the market. Of course, there are those who are not ready for this. In this article, we will look at the technical side of this reboot through a careful optimization of resources used by drilling service companies.

Keywords: Directional drilling · Telesystem · MWD · Measure while drilling · LWD · Pandemic

1 Introduction

Drilling is a technologically continuous process within the framework of the construction of one separate well, well pad or field development, including drilling of exploration and sidetracks. However, the intellectual and technical progress is even more continuous, implying the solution of problems dictated by the need to increase the drilling speed, the increasing complexity of the borehole trajectories, and the acquisition of more and more log data in real time directly in the process of deepening. In turn, solving these problems imposes a framework on directional drilling services, within which each promising player in this market must solve internal problems of increasing the reliability, autonomy, versatility of their equipment, saving costs for its modernization and maintenance, and expanding the fleet. On many issues, the vector of development of telemetry systems is quite unambiguously defined for a decade ahead, and companies often use the fruits of this evolution, successfully buying technological innovations that are offered by foreign and domestic developers. However, what if there was a drastic reduction in resources for this work? If it concerns one company or services that provide any non-unique or not advanced services, the question would not be so interesting, and would be limited to simply leaving the market of these

counterparties, in our case the entire industry was subject to this shock. Even strong players could not survive without making super-operational management decisions aimed at optimizing costs and a new approach to the distribution of financial and human resources. Let us figure out what is happening on the ETTS (engineering, technical and technological services) drilling market, and how companies are solving issues dictated by the new reality.

2 Methodology

Continuous analysis of the directional drilling market situation cannot be overstated. This is one of the most technologically advanced, expensive, innovative, socially significant markets on the planet. The financial well-being of hundreds and thousands of families depends on the success of each player in this market. With each new or first-time applied technology on this market [4], the efficiency of resource costs, the safety of human lives, the birth of new hypotheses, new professionals, new scientists are growing. We can consider this model from a million angles of view, but it is of particular interest in a period of unstable equilibrium, when it needs to self-organize, become self-reliant, independent, give up excesses and devote all efforts to improving efficiency. Each such shake-up gives rise to new opportunities, opens the eyes of conservative engineers to how it was possible before, but now it is already impossible without it. Being at the junction of fields of activity between science and drilling itself, researching this is not only my profession, but I am the sphere of my hobbies.

3 Results

3.1 Technical Equipment Directional Drilling Services

At present, the telemetry equipment market in Russia and in the world is very close in terms of manufacturability. The regional leadership of manufacturers on it is conditional and is dictated primarily by the cost of purchase and maintenance. Of course, there are certain geological features and requirements of subsoil users in terms of the volume of logging data provided for each individual project, but in general, the technical equipment is the same for all manufacturers. A huge amount of research and pilot testing of exotic communication channels of downhole devices with ground decoders has not yet provided a cheap and reliable mass solution for obtaining data from the bottomhole zone. Therefore, the most popular in the market are telesystems with a hydraulic and, especially in the regions of operation of Russian companies, an electromagnetic communication channel. Moreover, the number of common schematic diagrams of downhole devices is also no more than a dozen.

Telesystems with a hydraulic communication channel [1], which have gone through the path of long experiments on a positive or negative impulse, stopped their evolution at the ubiquitous choice of the former, so we will not even consider the latter. This will allow them to be divided only according to the principle of operation of a hydraulic pulser: with a rotating and so-called “poppet” flow shut-off mechanism.

Rotary - rotating pulser, according to experience, is more reliable in terms of the quality of data transmission in the conditions of imperfect drilling mud, but has a more complex design of the working section, which requires qualified service work with a shorter overhaul interval, low versatility in the context of application in the BHA (bottom hole assembly) of different standard sizes (that is, the use of the same pulser is possible at any standard size, but only after visiting the service, to replace the “cup” - the stator and rotor plates), and, most critical for operation, higher power consumption [9]. A large number of companies are experimenting with the installation of turbo generators into the downhole complex, which generate energy by rotating a screw or vane flow of drilling fluid, but their resource does not exceed 300 h before the next service and introduces another mechanical element into the BHA (bottom hole assembly) [3] that is subject to erosion, clogging, mechanical failure, therefore, it does not completely solve the issue of reliability and uncompromising autonomy of the downhole telemetry complex. Rotary pulsers are, as a rule, top-mounted, allowing them to be connected with any number of collar and non-collar logging tools. The advantage of “poppet” pulsers with a progressive stroke is autonomy due to the principle of its operation: redistribution of the flushing fluid flow by closing the valve inside the pulser. This makes it possible not to waste energy on direct action on the working elements that create a positive pressure impulse in the discharge line, the pulser will close under the action of the power spring when the flow of drilling fluid presses on the upper part of the rod, and will open when the passageway inside the pulser is closed, lifting the rod by force accelerating flow at the point of narrowing of the flow area between the pulser tip and the mounting sleeve. An additional advantage of this design, as a rule, is the versatility when using the same telesystem string in non-magnetic drill collar of different standard sizes with different inner diameters [11]. To drill the next section, it is enough to simply use a locating sub of the required diameter with a suitable locating sleeve, and change the commutating centralizers on the string itself to damp vibrations and tightly fix the devices inside the drilling tool. Moreover, such pulsers are easy to maintain and adapt to any flow rate of flushing fluid by selecting the flow area between the tip and the diaphragm of the mounting sleeve [6]. Such telesystems, as a rule, have a non-collar design, and the installation process in the non-magnetic drill collar consists in lowering the string with force to fix its bottom in the installation sleeve of the circulating sub. This is also a disadvantage of the design: the string is fixed in the working position with the help of spacer half-rings, implying its retrievability in the event of a loss of BHA mobility (sticking, tool breakage), which in turn carries the danger of the instruments “surfacing” during aggressive descent, especially in the absence of check valve below the set sub, limiting the run speed, increasing the run time. Poppet pulsers usually have a bottom position, which complicates their use in BHA with a wide range of logging tools, especially those using collar design.

The knowledge and reliability of these designs provides them with wide popularity among “alternative” manufacturers of telemetry systems. The scenario for their implementation is always the same: the manufacturer commutes its inclinometers, gamma modules, resistivity meters and other necessary devices with the original pulser of the famous brand, conducts a series of tests, and then begins to produce its own with varying degrees of localization, using original, copied and elements of its own

production. As a rule, the reliability of such solutions is lower than the original one, a strict binding to the manufacturer's service complicates their use by third-party companies, but their cost can become a key factor in order to give them preference when expanding the fleet. In turn, this state of affairs allows "alternative" manufacturers to use their developments in their affiliated directional drilling services, significantly reducing their costs of purchasing and maintaining their fleet. The negative factor of this approach is the low level of RandD (research and development work), and, consequently, work with equipment of "past" generations of relatively current developments of manufacturers, whose devices have been localized for the needs of an "alternative" developer.

Telemetry systems with an electromagnetic communication channel [7] are traditionally the largest number of Russian manufacturers. As has been said many times in our works, this is an underestimated type of downhole telesystems in the world. Of course, it has a number of disadvantages depending on the geological section, vertical drilling and well waste, but it is incomparably cheaper to buy and maintain. Such telemetry systems always have a very reliable generator on board, which makes it possible to achieve autonomy of 300 h or more.

3.2 Work with Telesystem Park Under Restricted Possibilities Delivery of Spare Parts and Large-Unit Elements from Abroad

The uncontested popularity of foreign TV systems and the lack of production of hard alloy and non-magnetic elements in Russia played a cruel joke on companies whose fleet is not diversified by alternative devices or suppliers of localized spare parts (spare parts, tools and accessories). No, of course, the market did not get up, but the foreign exchange rate and a certain deficit caused by the difficulty of delivering to Russian sellers have significantly increased the cost of owning a fleet for organizations operating this equipment. Moreover, the specificity of these services is such that savings on materials can lead to drilling failures, which in turn carries fines and reputational risks. The last factor is especially important now, when some companies have "free" equipment, planned for the contracted volumes, which have been postponed indefinitely. These organizations can afford to dump in the market, just not to lose their engineering staff, technicians, ensure leasing payments and not send half of the technical fleet to idle. Because long-term forecasts are now more uncertain than ever, losing a customer can be fatal for any organization.

The paradox of the moment also lies in the fact that companies that have not adapted to the new realities end up selling their TV systems and spare parts at affordable prices, which creates fierce competition with official suppliers, further complicating the situation with the purchase of new equipment. Suppliers of refurbished devices, companies engaged in connecting elements of telemetry systems from different manufacturers, and, of course, domestic developers of telemetry systems have become in demand again [8]. For example, a well-known Tyumen manufacturer of drilling equipment completely covers the high demand for neutron types of logging and geosteering. He, in cooperation with a well-known Moscow integrator of drilling components and software for ground-based decoding complexes, provides their commutation with «APS» telemetry systems widespread in Russia. This scenario is

beneficial to everyone, except, perhaps, «APS Technology» itself, but they cannot compete either in price or in terms of delivery.

The absence of official profile events, exhibitions, conferences has created a kind of information vacuum in the industry, but, obviously, in this situation, the issue of survival is more relevant. It is also interesting to look at the market of domestically produced electromagnetic telesystems. The well-known Samara manufacturer of Bitas telesystems has fully loaded production from the beginning of the year. This was largely facilitated by the significant modernization of the generators feeding the downhole equipment and the method of their fastening and switching to the electromagnetic separator. This made it possible to increase the overhaul interval from 300 to 450 h and significantly reduce the risk of flushing the mounting flange and the upper cross of the probe.

That is, the demand for electromagnetic kits has increased, and confirms the thesis about the underestimation of these telesystems and the services that can be provided with their use. Particularly interesting is the direction of development of logging tools integrated into this equipment [10, 12]. Its potential is undoubtedly great, since this telemetry system is not tied to the use of batteries, and is capable of operating under conditions of high autonomy even with the largest energy consumers at the bottom. In addition, given the low comparative cost, it will clearly find its consumer in the domestic and, perhaps, foreign market.

3.3 Peculiarities of Work of Field Parties During Pandemic, in Conditions of Reducing Costs

The first wave of self-isolation revealed the same bottlenecks in the provision of engineering personnel for all enterprises in the oil and gas industry. The main reason for this was the rotational work method at remote construction sites. The standard schedule “30 days on duty, 30 days at home” has been significantly modified due to foci of spread of infection, since people from different regions work at the facilities and from time to time move between jobs, creating many contacts, exacerbating the problem. In the second wave of self-isolation, observers were set up in every major city for staff flying into the region. This forced measure, of course, is effective and justified, but it leads to a loss of flexibility in transferring people from one object to another and increases the wage fund, since the employee on the shift must receive a salary, but he cannot work during the observation. This gives rise to a scenario of work with a reduced composition of field parties. This is personal daily fatigue, general fatigue from a long stay on duty - a huge burden on engineers, not always fairly compensated by employers. Moreover, the risk of errors and equipment failures due to the human factor increases.

The situation with the rules for organizing observatory is also not ideal. Each region and even the customer independently sets the duration and conditions of stay of employees in them, which often leads to excesses in the field. As elsewhere, there is another side of the coin, which forces companies to modernize their approach to work. Operation centers are being set up that remotely monitor drilling processes. This leads to a change in the information infrastructure, modernization of the software of the ground telemetry complex, and the development of systems for automatic data analysis.

All this will be in demand and after the removal of restrictions on the delivery and removal of personnel from work sites, it will bear fruit in the automation of script processes and help to more effectively manage the resources of companies.

4 Discussion

In this article, I want to raise a large layer of problems at the junction of technological progress, the economic situation in Russia and in the world, the energy market, research and integration of technical devices into existing procedures, a thrifty attitude to any resources, and, most importantly, safety and health drilling facility personnel. Based on this small text, we can continue to explore ways of transferring data from the bottom, and, perhaps, we will be able to abandon the word “exotic”, describing new efficient data transfer channels. We can continue to search for the optimal technical and financial integration of telemetry components, creating new effective industrial designs [5]. We can develop measures to counteract the growth of morbidity in teams working autonomously at remote sites and much more. Of course, in each of the above areas there is a certain amount of scientific materials, articles and textbooks. However, I see the value precisely in how complex self-sufficient systems interact, each of which is in the zone of its interests, but, nevertheless, forced to use, manage, invent, produce something really new.

5 Conclusion

Any owners of business processes strive for a stable balance and stability of their course, however, the highly competitive market of high-tech services sets the rules of survival, in which the main condition is constant movement forward. The redistribution of emphasis on the telemetry equipment market can also be viewed in a positive light: domestic developments are being reassessed and evolving to meet the usual requirements of telemetry users. They successfully deal with the initial flaws and features of their designs, and remain the most financially available to purchase and own.

Combinations of well-known commercial solutions give a serious advantage to companies providing engineering, technical and technological support for drilling, allowing them to get only the best from each telemetry system [2], saving on spare parts, increasing their autonomy and stability of their work at the bottom. Continuous development, automation, modernization and expansion of the list of services provided with minimal investment, cost optimization and other solutions that require rethinking in times of crisis are essential for the industry to reach a new level. Despite the critical situation for many companies, this stress will definitely bear fruit, because technological progress cannot be stopped.

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Stochastic Risk Factors to Capture Tendencies in Business and Economy

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Abstract. The article is pointed to draw attention for the stochastic risk factors and how to use those to analyze tendencies in business and economy. The method of stochastic risk factors (SRF) is based on separating the company's cash flows into a basic business project and a growth project, and on applying stochastic discount factors to the company's basic cash flow based on the current company value. The research was conducted on two samples of companies – the oil and gas sector (presumably with zero growth) and digital economy. It was concluded that prospects of oil and gas sector looks rather poor and the assumed average growth rates are close to zero. On the contrary, growth rates for IT sector may be estimated as higher than average growth rates for economy. It is very likely, that IT sector sustain all crisis events, overcome all the risks and troubles and will play dominant role in the future development.

Keywords: Enterprise value · Financial risks · IT sector · Stochastic discount factors

1 Introduction

Miller implies that in order to get the enterprise value, the weighted average price of capital is the proper discount rate applicable to the free cash flow to the company (hereinafter it is called the MM model) [10]:

$$EV = \sum_{t=1}^{\infty} FCF(t)/(1+r)^t \quad (1)$$

The main shortcoming of MM theory, which its critics immediately drew attention to, is ignoring the costs of a possible default and financial instability of the company [14]. Idealizing assumptions about market excellence and the rationality of investors leads the economic theory to the conclusion that bankruptcy may be represented as option for owners and it does not change the value of the company's assets.

Contrary to the outcomes of MM, the level of debt and the risk of a default of a company with high level of debt can be significant [3] and are usually taken into account by company managers and banks providing loans [9]. If companies begin to increase their debt uncontrollably, literally following the conclusions of the MM theory, then the risk of bankruptcy becomes high, and that certainly impairs value as the

experience of the 2008 crisis showed, when a number of major companies were on the verge of bankruptcy [13].

The works of the scientific school of Brusov, et al. [5], consider a different approach to forming the optimal capital structure of the company, taking into account the finite life term of the company, and offer an alternative mechanism for this, different from theories of compromise and preferences. Zhukov [16] constructed a theory that is similar to the theory of MM but subject to adjustments for the risk of default and transaction costs. But the financial leverage is not the only factor affecting the risk of default [3], and the capital structure in reality largely depends on such factors as the industry, features and prospects of the company's, as well as macroeconomic, country and other risks, and the major part of these risks may not be reflected in asset price volatility [17].

The results of Cochrane's research [8] showed that the volatility of a company value is influenced to a much greater extent by the volatility of discount rates applied by the investor, rather than by the volatility of expected cash flows. On the other hand, it becomes apparent that the risks investors take into account are not always reflected in the WACC or cost of equity.

The corresponding definition of SDF may be found in the monograph by Cochrane [7]: (hereinafter the Cochrane SDF model): SDF is such stochastic process $\{M_{\tau, \tau + t}\}$ that for asset price $V(\tau)$ at time τ with revenue $CF(\tau + t)$:

$$V(\tau) = \sum_{t=1, \infty} M(\tau, \tau + t) E_{\tau} (CF(\tau + t)) \tag{2}$$

Here E_{τ} is a Borel measure depending on the moment of estimation τ . The Cochrane SDF model (2) is equivalent to the MM model in the infinite limit if:

$$M(\tau, \tau + t) = 1/(1 + r(\tau, \tau))^t$$

This expression can be written in tensor form (2), or in the scalar form:

$$V(t) = E_t (M(t; t + 1)CF(t + 1))$$

From the point of view of the SDF model, this means that the investor actually uses only one future (average) cash flow and only one stochastic factor, which has the meaning of the price multiplier.

In the work by Borovička, Hansen, and Scheinkman [4], SDFs are considered as the sum of an objective risk assessment (long-term profitability) and the martingale that reflects the subjective component introduced by investors, and it is argued that the Perron-Frobenius theory can be successfully used to statistically soundly isolate this martingale. A similar approach to the decomposition of SDF into semi-martingale and a long-term growth rate was used in a number of other works [6, 12]. SDFs are widely used for analyzing stock market behavior - Abhakorn, Smith, Wickens [1] employed SDF for explaining the cross-section of equity returns, and Almeida, Ardison, Garcia, developed SDF method for assessment of hedge fund performance [2].

In the latest work by a number of authors [11], a local correlation method with a normal distribution is used to study the relationship between financial and commodity markets. An alternative view of SDF as empirical risk indicators (developed further in the present research) was proposed in the theoretical work of Tran [15].

2 Methodology

The company may be represented as the sum of two investment projects - the basic project of the current business and the development project.

$$FCF(t, \tau) = CF_0(t, \tau) + CF_1(t, \tau)$$

Expression (2) takes the following form:

$$EV(\tau) = \sum_{t=1}^{\infty} CF_0(t, \tau)/(1 + r(t + \tau, \tau))^t + \sum_{t=1}^{\infty} CF_1(t, \tau)/(1 + r(t, \tau))^t \quad (3)$$

The key concept is - the cash flow from the current business $CF_0(t, \tau)$ has zero growth rate (with time t) at any fixed moment of appraisal (e.g. $\tau = 0$). If business grows, that may turn into permanent long-term growth rate with the next moments of appraisal (e.g. basic cash flows for $\tau = 1, 2, 3, \dots$).

The present value of the development project is denoted by $PV(\tau)$, and the base value of the company in case of the minimum investment is denoted by $EV_{\min}(\tau)$. Thus:

$$EV(\tau) = EV_{\min}(\tau) + PV(\tau) \quad (4)$$

For the base project in (4), cash flows are constant, current business with zero growth rate can be represented in the form of a simple expression:

$$EV_{\min}(\tau) = CF(\tau)/R(\tau) \quad (5)$$

Here $CF(\tau)$ is the basic cash flow, and $R(\tau)$ is the average discount rate corresponding to the average cost of capital. Assuming that for the growth project, cash flows become positive after the investment period, one can write down the development project in (3) with a single discount rate:

$$PV(\tau) = \sum_{t=1}^{\infty} CF_1(t, \tau)/(1 + R(\tau))^t$$

Expression (3) is the model of the company as an investment project, including a basic project and real options for business development. As the result (3) turns into:

$$EV(\tau) = FCF(\tau)/R(\tau) + PV(\tau) = FCF(\tau)/(R(\tau) - g(\tau)) \quad (6)$$

In the (6) $R(\tau)$ is the stochastic discount rate (SDF), which reflects the weighted average cost of capital. This rate (similarly to WACC) reflects interest rates and

macroeconomic risks common to this industry, while idiosyncratic risks are reflected in g – stochastic growth rate.

The main factor reflecting the volatility of the company's value is $g(\tau)$ - the estimated average growth rate for business. If $g(\tau)$ is less than zero, the development project must be rejected by the investor. However, it depends on the availability of real options. The investor may consider the possibility of changing these estimates in the future, and therefore, to support the development project for some time. This is consistent with Cochrane's results [8], since volatility is reflected in discount rates. Expression (6) is the simplest version of the SRF method for the enterprise value based on free cash flow.

3 Results

Two samples of companies were considered. The first sample included several companies in the oil and gas sector (BP, Shell, Rosneft, Novatek, Lukoil, Gazprom); the second included companies in the digital economy that have exactly the opposite properties in terms of macroeconomic risks and future growth prospects.

The choice of the oil and gas sector was because these companies should presumably have low growth rates in the long term, and their growth rates, due to the planned transition of cars to electric motors, should tend to zero (or even negative values). Thus, the average cash flows of these companies should be close to the base cash flow, and their value to the value of the base business. The exception is the Russian gas company Novatek, which has fast growth rates.

Table 1 shows the results of a study comparing WACC and the stochastic discount rate SRF for Methods (14) and (16) for a sample of oil and gas companies. At the same time, two types of flows were taken as the basis - the average operating cash flow (CFO), or the average free flow to the company (FCF) for the study period. The SRF discount rate was calculated for the enterprise value by Method (6).

The estimation of the growth rate for oil and gas companies is not distinguishable of zero. It is further assumed (simplified scenario) that all investments of digital companies comprise investment in development (no investments are required for the core business). In addition, these companies are characterized by a low level of debt, and the full price of the company almost coincides with their capitalization (net of cash and securities).

Example 1. Microsoft

For Microsoft, from 2008 to 2019, WACC ranged 9%–10%, and the EV/CFF ratio 15–25, which corresponds to a stochastic rate of SRF 4%–7%.

The company's capitalization experienced severe fluctuations, dropping to 200 bil. USD (2003–2005), then soaring up to 700 bil. USD in 2017 and reached 1 tril. USD at the end of 2019. The average growth rate for 10 years (2008–2018) is approximately 12%. The result of the end of 2019 was 20%, but this is presumably due to overvaluation. This is evidenced by the fact that the company's cash flows grew quite stably – at the rate of 10% for CFO and 8% for FCFF.

Table 1. Comparison of WACC and stochastic discount rates for CFO and FCF for BP, Shell, Lukoil, and Gazprom from 2000 to 2018

	WACC	CFO mln.\$	FCF mln.\$	R _{cfo}	R _{fcf}	EV mln.\$	Mcap mln.\$
BP Median	0.088	539	135	0.012	0.003	144000	111000
St.Var.	0.19	1.84	0.46	0.21	0.21	0.27	0.38
Shell Median	0.085	795	3.43	0.05	0.0019	18000	161000
St.Var.	0.136	0.4	1.04	0.34	0.33	0.27	0.38
Lukoil Median	0.098	2490	577	0.05	0.012	51600	45700
St.Var.	0.35	1.84	0.46	1.34	1.11	0.4	0.43
Gazprom Median	0.114	539	135	0.077	0.0068	152000	115000
St.Var.	0.2	0.62	4.71	0.64	0.47	0.7	0.56

Source: author.

Example 2. Google (Alphabet)

For Google, the growth rate of value has changed the trend five times over the past fifteen years. In the past three years, the growth rate of capitalization and company value has been 15% and 16%, respectively. Over the past four years, the average growth rate of cash flow to the company according to Method (16) was 12%, which seems reasonable for a long-term trend. This roughly corresponds to a change in the stochastic discount rate of SRF from 2% in 2004 to 7% in 2019. At the same time, Google's stochastic discount rate in 2019 was very close to Microsoft's indicator in 2017 (8%) when its price was at a rational level. Their value multiples were close due to similar investor ratings. Table 2 below shows the estimated SRF data for the IT companies.

Table 2. Preliminary assessment of stochastic discount factors according to SRF Model (14) for the value of companies in the IT sector and the digital economy (August 30, 2019)

Company	EV/CFF 2019	Stochastic discount rate R (2019, %)	CFF average cash flow, %	SRF cost of capital, %	EV for 08/30/2019 (bil. USD)	Estimated SRF valuation in 2019
Microsoft	23.7	4.2%	10%	14.2%	1000.7	778
Google (Alphabet)	13.72	7.3%	12%	19.3%	720.7	685
Facebook	14.5	6.9%	14%	20.9%	489	540
Amazon	23	4.3%	12%	16.3%	914	867
Apple	14.5	6.9%	6%	12.9%	842	869
Alibaba	20	5%	19%	24%	420	418

Source: author.

When analyzing the EV in Table 2, the SRF method was used in Model (14), the cash flow of the base project (with a general average growth trend) was taken as the basis. Data on the stochastic discount rate are given at the current level on 08/30/2019.

4 Discussion

From the analysis of Microsoft on SRF Model (14), the following conclusions are drawn:

1. Average growth rate for Microsoft (2008–2018) is 10%.
2. Stochastic rate of SRF according to Model (6) is 4%–7%, which with an average growth of 10% corresponds to the cost of equity 14%–17%.
3. At the same time, the SRF rate of 4% corresponds to periods of atypically high growth rates (above 13%); therefore, an assessment of the required return on equity of 17% seems to be most reasonable.
4. The current annual average operating cash flow to the company is approximately 54.5 bil. USD. Thus, the value of the company should be 778 bil. USD when estimating the required return on equity of 17% and the average growth rate of 10%.
5. Unlike oil and gas companies, the assessment of the required return on equity is significantly higher than CAPM and WACC. This, apparently, means that CAPM and WACC underestimate the systematic risks of the company. At the same time, the company's growth rate is significantly higher than CAPM and WACC, calculated by traditional methods (8–10%), which makes conventional DCF methods inapplicable.
6. The main conclusion is that the real value of Microsoft, apparently, is closer to 778 bil. USD. It is likely that the market is inclined to overestimate it.

For Google, risk-adjusted capital costs (alternative return on investment) are approximately 19%, which is much higher than the WACC estimate (approximately 10% in 2017). Thus, risks are estimated to be slightly higher for Google than for Microsoft (19% versus 17%). The reason for this is probably because although Google's upward trend does not change, growth trends are unstable and have often changed over the past 10 years.

A preliminary review of the data of other companies in the IT sector as of August 30, 2019 showed that with an increase in the growth rate of the company, its risk assessments also grow. In general, it seems that companies in the sector (with the exception of Microsoft) are correctly priced by the market, but new risks may introduce corrections in these estimates. As already noted, the main source of volatility in the SRF model is the assessment of the long-term growth rate of the company. Table 2 allows assuming that the growth trend for various companies may change, but on average is about 10–14%. Exceptions are Apple – 6% and Alibaba – 19%.

5 Conclusion

In the future, correction of the company's value to a reasonable level (approximately 778 bil. USD) is most likely, at which it becomes a very attractive investment target with an expected average long-term growth rate of 10% per year. Rather, it can be assumed that investors overestimate the expected growth, driven by the general mood of euphoria regarding the growth of the IT industry (as has already happened before).

Apparently, Apple has relatively low growth rate is because a significant part of its business is associated with production and not with the digital economy. On the contrary, Alibaba is a purely digital company, but its growth rate is declining, and it can hardly be assumed that 20% is a long-term trend. Presumably, in general, the digital economy is characterized by an average long-term growth rate of about 10–12% (similar to the industry leader – Microsoft). The method of stochastic risk factors (SRF) is based on separating the company's cash flows into a basic business project and a growth project, and on applying stochastic discount factors to the company's basic cash flow based on the current company value.

The main outcome is - the stochastic risk factors captures tendencies in the risk and growth rates perceptions of investors and therefore may be good indicators to analyze tendencies in business and economy. The research was conducted on two samples of companies – the oil and gas sector and digital economy. It was concluded that prospects of oil and gas sector looks rather poor and the assumed average growth rates are close to zero. On the contrary, growth rates for IT sector may be estimated as higher than average growth rates for economy. It is very likely, that IT sector sustain all crisis events, overcome all the risks and troubles and will play dominant role in the future development.

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EU Cohesion Policy 2021–2027: New Tools to Foster European Integration?

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Abstract. Several recent political crises represented a setback for the European integration process. In a face of rising Euroscepticism European Commission is looking for ways to foster integration by promoting European identity among citizens in EU regions. In this respect EU Cohesion policy is thought to have potential to be instrumental in achieving this goal. The aim of the paper is to assess the Commission proposals for Cohesion policy within MFF 2021–2027 in this context. The paper analyses new measures introduced by Commission proposal in view if they can deliver to better EU image in the regions. The proposal to change cohesion funds allocation methodology by adding into calculation more social factors can potentially be counterproductive as it leads to funds' re-allocation compared to the current status. Evaluation of bringing into Cohesion policy smaller social and values oriented programs is more positive. Detailed analysis of the Justice, Rights and Values program shows high potential as a source for experience-based driven identification with Europe and can be instrumental in fostering European integration.

Keywords: Cohesion · European identity · European Union (EU) · Integration · Regional policy

1 Introduction

European integration has long been considered as a reference example for a successful regional integration model and is therefore attracting global attention of regional studies researchers. Driven primarily by economic factors it evolved over decades to a highly economically integrated common market of goods, workforce, services, united by common currency etc. However at political level the European integration process has experienced a number of setbacks and basically failed to achieve the same level of integrity that could be expected based on economic developments. Even more surprising [16] was the first crisis with the failed European constitution back in 2005 when the integration process was effectively torpedoed by referendums in two countries that were part of the very inception of European integration process: Netherlands and France. The rise of Euroscepticism in the following years was reinforced by financial

and economic downturn in 2008 and associated European sovereign debt crisis, followed by immigration crisis, Brexit process and finally the recent EU high-level standoff over help to severely hit by COVID-19 European countries.

Being far from a “failed mission” these setbacks in European integration nevertheless reflect deficiencies in dedicated EU policies aimed at strengthening the cohesion among EU members and what’s more important their citizens [15]. Because it is actually citizens who ultimately make their decision on crucial referendums and thus jeopardize political integration efforts. This understanding leads to a shift in EU cohesion policy what can be seen in EU Commission proposal [10]. This paper analyzes the changes in EU Commission approach to fostering European integration by means of investment policy resulting in formation of European identity.

2 Methodology

The paper is based on the analysis of the European Commission proposals [10, 11]. By bringing together Cohesion policy and smaller values-oriented programs the Commission intends to reinforce social spillover effects of regional investment policy resulting in a better EU image among citizens and their stronger commitment to identification as Europeans. In order to test the hypotheses comparative analysis has been done based on preceding periods regulations. The paper uses results of PERCEIVE [17] and COHE-SIFY [7] projects for evaluation of EU Cohesion policy spillover effect. For factors determining correlation between European integration and European identity explications of theoretical model by Bergbauer [4] are implied. More specifically the paper utilizes the “experience-based mechanism” that considers personal experience to be at the roots of European identification. This method is applied to analysis of smaller programs in European Commission proposals.

3 Results

Cohesion policy dates back to the very inception of European Economic Community and since then has played a central role in European integration by levelling economic and social disparities between the regions of the member countries and promoting economic growth. It is in fact an investment allocation policy facilitated through European Structural and Investment (ESI) Funds. From financial perspective, it represents a significant part of the EU budget: around a third of the total 2014–2020 Multiannual Financial Framework (MFF) with impressive 352 bln Euro. Taking into account that the EU funds are usually released as co-financing in a range of 40–70%, the actual investment volume amounts to even higher figures. Cohesion policy is focused on regions structured in Nomenclature of Territorial Units for Statistics (NUTS) levels rather than on countries what makes it more addressed. The evaluation of NUTS regions is GDP per capita based and defines three categories: less developed (under 75%), transition (75–90%) and more developed regions. The EU investments are channeled through specific structural and investment EU funds, the number and composition of which varies, but the most financially strong are three: European Regional Development Fund (ERDF), Cohesion Fund

(CF) and European Social Fund (ESF). Each of the funds has its own specialization with ERDF and CF aimed at primarily at economic cohesion while ESF, being the oldest of the three, is focused at social dimension “to improve employment opportunities for workers in the common market and to contribute thereby to raising the standard of living” (Article 123, Treaty [19]) by means of investing in education, promoting social inclusion, combating poverty and enhancing public administration.

The Cohesion policy is active in Europe for over 60 years. In this timeframe, it continuously evolved to tackle new challenges like EU enlargement or structural changes. It’s overall efficiency and whether it has achieved the desired results is hard to estimate [12] and thus under constant scrutiny [1]. Part of the problem is that despite cohesion policy efforts the inequality among regions has increased [13]. Leaving out the question what would be the result without the European regional policy, the significance of cohesion financing for less developed regions cannot be denied. Nevertheless, the number of recent EU crises and increasing Euroscepticism raised a question whether the financial allocations to the regions actually contribute to the development of European identity or more positive attitude towards EU. The general expectation would be a positive correlation between absorption of cohesion funds and a more positive perception of the EU.

Recent studies [6, 8] of this issue seem to support that idea, providing evidence that more positive EU image in the regions is dependent on the size of ESI funds allocations. The EU Commission has launched two special studies to investigate this relation namely projects PERCEIVE (Perception and Evaluation of Regional and Cohesion Policies by Europeans and Identification with the Values of Europe, [17]) and COHESIFY (Understanding the impact of EU Cohesion Policy on European Identification, [7]) under Horizon 2020 program in 2016–2019. Both projects provided similar results, supporting the idea of positive correlation [5, 17]. However, both studies provided feedback on Cohesion policy shortfalls and ways to improve its efficiency in achieving a better EU attitude in the supported regions of which better communication of the cohesion policy to the public is the most obvious. One of the outcomes is the idea, that the planning and evaluation of the Cohesion Policy should overcome the solely financial performance measures and embrace social indicators. In fact, they pointed out, that smaller EU investment programs with social dimension also play an important role in shaping EU image and help EU citizen cohesion [3].

The reason for that is likely to be the experience-based mechanism [4] of citizens’ identification with Europe: personal experience benefiting from EU integration advantages is an important source of identification with Europe. Under this category fall such EU programs that facilitate interface and cultural exchange with other Europeans (Erasmus, European Solidarity Corps, Creative Europe, different volunteers programs etc.). Another important source of positive identification with Europe based on positive experience is the promotion of EU-wide area of justice and rule of law. The inclusion of the latter into this category may not be obvious but will be examined later.

Analyzing the proposal of the EU Commission [10, 11] we can make a conclusion, that the Commission has taken the recommendations of the studies on European identification impact into account. The most visible change is that the cohesion policy is now united with social programs under one heading “Cohesion and Values”. It reflects the fact that the Commission gives credit to the previously overseen function of

cohesion policy to promote European values and identity among citizens. As can be drawn from the proposal, Commission shifts more emphasis on social cohesion. It includes social programs, that are currently dispersed across several EU policies like Erasmus+, European Solidarity Corps, Fund for European Aid, Youth Employment Initiative, Creative Europe, Justice, Rights and Values Fund.

It is not uncommon for EU cohesion policy to accommodate separate assignments in addition to its main function to reduce regional disparities across the EU [14]. As an investment policy, it can easily incorporate different agendas by prioritizing funds allocation to individual projects and by doing so complement other EU policies. For example, in 2014–2020 clean energy transition associated projects received additional support and were favored by EBRD and CF [21]. However, cohesion policy in 2021–2027 incorporates the social dimension in a new way. First, it adds social dimension to funds allocation to the regions that for a long time was based solely on GDP per capita. Second, it envisages necessity of promoting EU values and European identity within cohesion framework by incorporating smaller programs that are thought to facilitate EU citizen cohesion.

With the proposed modification of the allocation method, the Commission claims to pursue a more tailored approach to regional needs [6, 8]. The change can be found in. The new allocation method does not affect the Cohesion fund and is relevant for jobs and growth goals, i.e. ESF and EBRD. It does not depart from the ‘sacred’ GDP per capita based Berlin formula but now takes into account new criteria like youth unemployment, low education level, reception of migrants and CO2 emissions levels. While CO2 per capita factor inclusion is clearly driven by climate change policy, the other newly incorporated criteria deal with social development in the regions. By factoring them in the Commission hopes to further enhance proper allocation of the funds to the most deprived regions. Now the question is whether this change will result not only in just reallocation of spending but also in better EU image in the regions. In this aspect, the Berlin formula modification can be potentially counterproductive.

The problem rests not with the formula itself but with the redistribution of funds compared to previous budgeting periods. When the Berlin formula was adopted back in 1999, the allocation was made among only 15 EU member states. At that time the lesser developed south European countries were the main beneficiaries of the cohesion policy. With later enlargement of the EU, there was a shift in allocations towards East European newcomers. To soften that re-allocation for old EU low-income states the Commission added certain coefficients into Berlin formula calculation so that the cohesion financing would diminish not so drastically. So, the Berlin formula today is not what it used to be back in 1999 and incorporates leverages to soften changes in funds reallocation. The Commission is certainly aware of possible negative effects induced by proposed changes to current methodology. Therefore, it also included a mechanism to cap potential increases/decreases in allocations providing a safety net. Nevertheless, the calculations [2] show that, compared to 2014–2020, new methodology will result in significant change in funds’ allocations where the ‘older’ EU members of the Southern Europe (Greece, Italy, Spain) are the relative beneficiaries but at the expense of the newer EU members like Estonia, Lithuania, Czech Republic, Hungary. Same results can be seen in terms of intensity of support (per capita per annum). It can be suggested that this shift of funding from newer EU members to older

southern countries may contribute to the rise of tensions or may be used as an argument by national Eurosceptic populists, and may ultimately result in deterioration of EU image and European identification in affected countries. It should be noted that the new allocation method has already led to a standoff at EU Summit in Portugal in February 2020 when EU failed to pass MFF.

Coming back to the second tool, we have taken Justice programme as an example of such a smaller program to examine the expected outcome whether they are a proper tool to foster European integration by promoting European values and identity. It would be of a particular interest to take Justice Programme as an example of a smaller program in terms of allocated funds (EUR 378mIn in MFF 2014–2020, EUR 305mIn in MFF 2021–2027) to examine the expected outcome and assess whether this programme is a fit-for-purpose tool to foster European integration by promoting European values and identity.

4 Discussion

One of the pillars of the Treaty of the EU is found in Art. 2 [20] which states that ‘the Union is founded on the values of respect for human dignity, freedom, democracy, equality, the rule of law and the respect for human rights, including the rights of the persons belonging to minorities. These values are common to the Member States in a society where pluralism, non-discrimination, tolerance, justice, solidarity and equality between women and men prevail’. It is a fundamental premise of the EU that the Union is a community of law and its values have a vital importance to its very existence. As follows from the Treaty, promotion of the Union’s values is per se the aim of the EU. This conclusion is further proved if Art. 3 of the Treaty [20] which contains the statement that the ‘Union’s aim is to promote peace, its values and the well-being of its peoples’ and that ‘it shall respect its rich cultural and linguistic diversity, and shall ensure that Europe’s cultural heritage is safeguarded and enhanced’. The Union’s value-focused aim does encompass fundamental rights, the rule of law and the independence of the judiciary, non-discrimination and equality, anti-racism and tolerance, access to justice and judicial co-operation in civil and criminal matters. It is worth noting that Justice Programme and the Rights and Value program have the same range of visible objectives which are aimed at promoting the rule of law, respect for human dignity, freedom, equality, the respect for human rights and, ultimately, promote cohesion in these common European values and rights across the Union.

In the current MFF cycle (2014–2020) at least three funding programs have had a clear focus on European values: the Rights, Equality and Citizenship programme, the Europe for Citizens programme and the Justice programme. Looking back at how well each of these programs made progress in promoting common shared European values, the assessment by the EU indicates that such programs worked towards the objectives set forth and promoted cross-border cooperation within EU, contributing to further understanding of and respect for a determined set of recognized human rights, independent and effective judicial systems, and respect for the concept of the rule of law thus bringing cohesion framework to a degree that can be described as shaping the

European values and identity. Awareness of rights and values, understanding of the EU identity has increased across the EU from 2014 onwards [9].

The proposed budget cut in the next MFF cycle (2021–2027) for Justice programme at 19,31% rate gives rise to a very specific challenge: amidst the Brexit case, migration crisis, national EU member states judiciary challenging the EU programs and measures (e.g., German Constitutional Court challenging the German government (in action to fund and support European Stability Mechanism), coronavirus-related pandemic measures and restrictions of varying degrees in different EU member states in 2020 and beyond timeframe and, as a result, the EU member states' economies slowing down which are likely to accompany the EU into 2021 era and onwards, there is no simple answer to the question whether EU cohesion policy in the field of judicial co-operation and access to justice has or does not have a clear and achievable mission. The message that the EU appears to give in its proposed MFF 2021–2027 is that there is no way other than to foster cohesion, promote the EU values and identity. Yet, European Parliament in its position on 2021–2027 MFF proposal [18] objected to the funding cut and requested to maintain the financing of Justice Programme at current level.

It is true that the state of perfection where all EU citizens fully enjoy their rights, have access to justice, there are no inequalities and discrimination on the grounds of gender, racial or ethnic origin, religion or belief, disability, age or sexual orientation, there is an efficient and smooth judicial co-operation is far from being achieved within the EU. This conclusion may be viewed as a revelation, especially given the common shared assumption that the judicial co-operation and access to justice in the EU are the most unified and advanced multilateral examples of how well the unification and harmonization of laws worked and work in the EU for decades.

Justice Programme in 2014–2020 demonstrated that the rule of law, access to justice, the independence of the judiciary were not the concepts and values that were free from challenge. Judicial cooperation in civil and criminal matters and access to justice across the EU member states were and still are in the stage that require further development. It can be argued that the decisive factor in the judicial cohesion policy clashes with the national sovereignty paradigm that is becoming more and more vocal in the contemporary world where slogans of making one single country great again is viewed as a viable alternative to the conglomerate of states working together to achieve the common objectives while being divided internally by different class of actors and interests that have no unification and/or harmonization as the ultimate target.

When cross-border matters within the framework of Justice Programme are examined, it is difficult to deny that judicial co-operation on civil and criminal law matters, access to justice as a common EU value at national level only is not a fully-rounded and adequate architecture for the multimember states' Union. It is at the heart of the matter that the elements of judicial co-operation and access to justice require supranational, EU-wide unified and harmonized legal framework which works on the basis of values that underpin the policies of each individual EU member state and promote the effectiveness and transparency of national judicial systems.

Structurally, the MFF 2021–2027 in the context of Justice Programme envisages building on activities that add value on the EU-wide scale to individual actions of any individual EU member state. The spirit of the Justice programme is to continue promoting the mutual trust between the EU member states while further increasing cross-

border cooperation and networking and achieving correct, unified, harmonized, predictable and consistent application of the EU law. With that in mind, the EU proposal at the Union level cannot be underestimated as it provides for a unique role of the coordinated activities that are aimed at reaching all EU member states. The EU wide initiative to promote the rule of law, access to justice, mutual trust to national judicial systems, judicial co-operation on civil and criminal matters via Justice programme is still a much better starting position than any single EU member state trying to resolve cross-border issue on a bilateral or multilateral basis within the EU. It remains to be seen whether a new MFF in 2021–2027 will foster cohesion within the updated Justice programme but it is of particular significance that European common values and identity will benefit from continuing the journey that will result in the great degree of self-identification of citizens as EU citizens who enjoy the supremacy of the rule of law, access to justice, independence of the judiciary and a tighter and smoother co-operation in civil and criminal matters.

5 Conclusion

Bringing together Cohesion policy and promotion of common European values the EU Commission makes a clear step towards exploring untapped potential to foster further European integration by developing stronger European identity among citizens in the regions. As the Commission claims, the 2021–2027 Cohesion Policy stands for a Europe moving closer to citizens. To achieve this, it proposes a ‘more social’ allocation methodology and puts more emphasis on smaller social programs enhancing citizen interaction. Nevertheless, the outcome of the Cohesion financing allocation can be controversial in terms of achieving more positive attitude towards EU. In this aspect, smaller social programs like Justice, Rights and Values are more experience-oriented and effective in promoting European identity and thus foster European integration. Being promising, these new policy tools are not groundbreaking and represent a rather cautious but important step. However, as can be seen in case of clean energy transition measures in Cohesion policy, initially small and indecisive steps can evolve with the time to mainstream policy directions. Fostering European integration will require support and new approaches by different European policies, cohesion being one of the most significant among them.

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The Future of Retail: Innovations and Basic Trends

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Abstract. Modern economy conditions are so-called Industry 4.0 affected all the sphere as of humans' life. One of the main among them is retail. Retail is a last link between manufacturer and consumer which gain profit for all the supply chain. Technological development became a key factor to succeed nowadays but today global economy is slouching through the recession during COVID 19 pandemia and there are many thoughts about the future of retail. As a pioneer of digital transformation, retail already has been adapting to modern clients' queries and transition to e-commerce or mobile commerce. But not even e-commerce is a key factor to overcome difficulties. The main goal of the study is to analyze innovative models and technologies in retail and an experience of the most efficient implementation models worldwide.

Keywords: Digital economy · E-commerce · Live commerce · Omnichannel · Retail

1 Introduction

Modern economy conditions change rapidly and retail is one of the most vulnerable to its' influence spheres. The point is that retail adjusted to customer's needs faster than other industries, it means that transformation influences marketing, channels of sales and communication, supply chains and in-store operations. Brick and Mortar Stores have been replacing by on-line stores step-by-step for almost 30 years. But now they are at risk for one more global danger – pandemic of COVID19, which faces the world retail with new challenges. Thus the research goal is to analyse the main retail evolution directions and to find out does it mean global changes in the modern paradigm or not, the way retail could survive in the modern conditions while state borders are closed and small business incur losses. The importance of the study goes to the attempt to figure out theoretical basis and application of retail development in the new era of the world evolution.

2 Methodology

The study is based on the theoretical and methodological issues of the European, Russian and American scientists and experts [2, 3, 5, 7–9, 12–14] who made a contribution to researches of the digital economy development and evaluation of

innovative applications in retail. A number of general scientific methods and particular scientific methods were used, basically methods of comparative and system analysis, expert methods, statistical methods, system approach. The chosen methods confirm the result's objectivity and relevance.

3 Results

Both offline and online retail nowadays are slouching through the recession worldwide. Scientists and analytics all over the world are trying to find the way to overcome this situation and increase stores turnover and profit. At the same time, retail is a pioneer sphere of modern technologies implementation and a lot of specialists see the way out of recession via digitalization. The main reason is that a lot of services such as social commerce are available for free to business. During the COVID19 pandemia some technological platforms support business and provide discounts or provide free access. Thus they make boards between offline and online vanished retail and help to develop an omnichannel sales strategy one of the main trends in future retail. One more important trend based on D2C model and social commerce and realized in "live commerce" which will be a kind of consumers' habit in the future.

Innovations in retail change all the procedures through retailers supply chains including marketing, logistics and in-store operations based on the "smart" technologies and one of the most perspective in retail is IoT which is giving a huge field for research analysis of retail processes and procedures. The development of theory lags far behind practice that's why it's important to observe and summarise an experience of retail digitalization and optimization to adopt retail to modern world conditions. All aspects mentioned below are considered as a main goal of this study.

Retail transition to the virtual space began in the middle of 1990's with the Amazon start. In Russia the first online book store was opened in 1997 in Moscow. The most active growth of the online retail was observed 10 years later with increasing of internet penetration. Nowadays e-commerce retail sales continue to rise all over the world and has already riched \$25 trillion in 2019 [11], but the rate of growth is slowing down from 27% in 2017 to 20% in 2019 [11]. In Russia total retail sales've been rising for last 3 years in rubles but not in USD. This is due to the weakening of the ruble against the USD (Fig. 1). Comparing worldwide and Russian e-commerce market tendencies, we found out that the share of e-commerce in the total retail sales is much more different but has shown the similar growth rates both in Russia and in the rest of the world (Fig. 2). There should be mentioned that 2020 retail sales indicator value was forecasted in the end of 2019. Thus there weren't predicted any kind of changes assumed with COVID19 which has a strong impact on the retail sales now.

The positive tendency of retail sales growth rate will be changed in 2020 and later on. But there could be suggested an e-commerce share in total retail sales will be increasing due to importance of contact free shopping and delivery services. That's why it's important to understand what kind of tendencies and innovations will be actual. During last few years a number of new e-commerce models appeared. The first of them is C2B (Consumer-to-Business) which means that consumers set prices for services and products. For example, Priceline.com (USA) allows customers to set the price

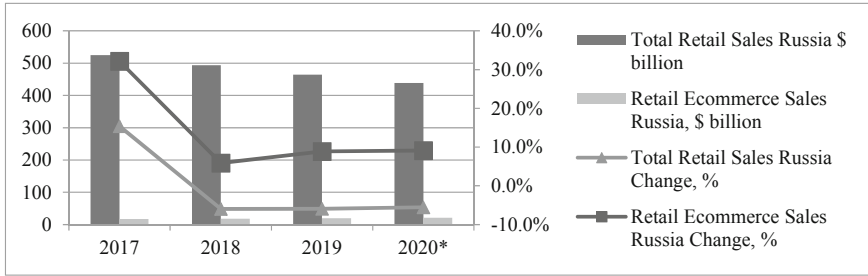


Fig. 1. Total Retail Sales and Retail E-commerce Sales Russia, 2017–2020 (Source: author based on [1, 10, 11]).

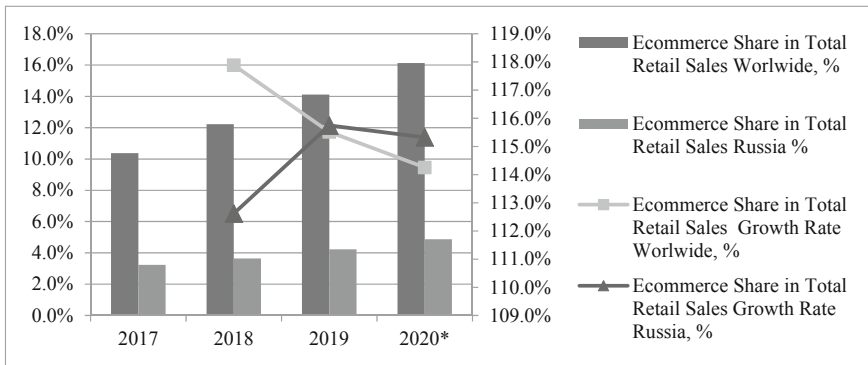


Fig. 2. E-commerce Share in Total Retail Sales Worldwide and Russia, 2017–2020 (Source: author).

for the product they would like to purchase. The company itself acts as a broker. It finds a supplier of goods or services that is ready to sell them at the price offered by the buyer. However, this does not mean that the sale is made at the requested price. The seller using the data of the current demand makes the final decision and builds a strategy.

The second model is D2C (Direct-to-consumer) which means that producers contact with their clients directly and become a new player at the e-commerce market. According to the market survey using of D2C model 82% of producers have improved relations with customers and 76% have improved the quality of customer service. Due to D2C model producers get the full profit and control value chains. Such companies as Mercedes, Boeing, Ford, Adidas, Nike, Canon, Samsung and others sell directly to consumers via Internet. About 27% of dealers suppose to get the profit by concentrating on high-margin goods and about 14% see the success of this model in market tests provided by producers before these products reach retailers [1].

The third model is O2O (Online-to-Offline) which means on the one hand that online retail start to buy and open offline stores and on the other hand it means that

offline retail giants are also start online stores providing not just similar but the same service level to customers in the digital space. In common this model provides omnichannel sales. The idea of omnichannel is not just to maintain a certain uniformity in the operation of various sales channels (which multichannels sales are), but to ensure that these channels work as a single unit.

There are already a few examples of omnichannel sales implementation. For example Marks and Spenser or Next already have special stands in offline stores in the UK with an open site where customer can order delivery to his home or to a suitable store for the missing product. Most major retailers all over the world have implemented this model, also in Russia, for example, Inditex (Zara, Massimo Dutti, Bershka and other brands) and Wildberries as the largest representatives of the industry already implement omnichannel strategy.

An omnichannel strategy is also related to ROPO rule which means “Research online, purchase offline”. According to market analysis about 82% of users’ research information about retailers via mobile gadgets and 18% from them make purchase during 24 h after research. Such a strategy is one of the most actual and prospective sales strategies in further retail development.

Both offline and online retailers operate with modern digital technologies implementation nowadays. And there is one more model M2M (Machine-to-Machine) which based on IoT technology. It was forecasted that in 2026 people all over the world will live in high-speed connected world where the IoT become an everyday reality. The IoT will be developed most actively in the context of a “smart store” with “smart shelves” with the ability to place or replenish goods, a “smart warehouse” with the ability to reduce transport costs, as well as for behavioral analytics [6].

For offline retail, IoT could be used to provide “smart fitting room” which will recommend similar stile and size things and allow combining them into set [15]. IoT provide systems that send personalized digital coupons to customers who enter the store, and sensors that monitor the condition of perishable products and other benefits. IoT also changes retail supply chains by using RFID technology and helps track goods under delivery. IoT could be used in omnichannel sales. Karia calls that IoT omnichannel evolution. Definitely IoT may inreach data about customer journey thus a synergistic effect could be reached and seamless contact with customer could be achieved. Karia proposes 3P for IoT and omnichannel success collaboration: Proactive experience, Predictive experience, Personalized experience [9].

4 Discussion

Online retail has a number of competitive advantages over offline retail in the innovations application field. For example, some innovative technologies such as AR and VR technologies, chat-bots, multimedia and other technologies generating a “playful” content are unobtainable for offline retail. This is especially important for millennials who are by far the majority consumers now. Moreover offline retail can’t survive without any kind of modern retail models or technologies such as mobile commerce and social commerce.

Modern technologies help to overcome difficult time such as worldwide retail suffers during quarantine. This statement is much more actual for offline retail, but we should divide grocery stores and supermarkets and non-food products retail. Non-food products Brick and Mortar Stores suffer from the crisis most of all especially beauty and fashion retail. But that doesn't mean that offline retail will sink into oblivion. Crisis is a period to start implement digital technologies. For example, during quarantine in China for a few weeks life became digital only. The most successful communication channel was online translation. According to iiMedia Research in 2019 the number of viewers of online broadcasts increased by 10.6% - to 504 million people, this is more than half of the total number of Internet users in China—854 million. At the same time, 71% of users watch the broadcast in real time at least once a week. Experts suggest that in 2020 the number of users of "live" broadcasts will increase to 526 million people, and Covid-19 will accelerate this trend. Thus e-commerce become "live commerce" which means combining online shopping and direct interaction with potential customers. Broadcasts are usually stream via popular applications such as WeChat, Xiaohongshu, Weibo, Taobao Live. An audience of these channels is more than 600 million people. During the COVID19 pandemia offline retail mostly closed thus manufacturers start using streaming services which provide free service to support brands' sales [4].

Streaming services are used by food and non-food goods retailers and manufacturers. Thus "live commerce" helps to develop D2C model of e-commerce in different ways. Broadcasts became a popular instrument for farms to sell their products. Alibaba in February 2020 launched a program to support rural areas in China, turned off the commission on the Taobao Live platform and opened a foodie livestream channel for farmers. Its' broadcasts are watched by 41 million followers. On Valentine's Day, Taobao held a charity concert that attracted 4 million users, helped sell 380 tons of farm fruits and vegetables, and raised \$81,500 in donations for Wuhan [4].

Traditionally offline businesses such as restaurants, car dealers, travel agencies, real estate agencies and others start to sell online via live broadcasts. About 30 restaurants start using the Taobao platform in February 2020. Users watch night broadcasts mostly, for example the midnight stream of the network of hot food outlets Xiaolong Jan sold several tens of thousands of servings within 10 min on February 17. Sales increased for the one day by 1200% compared to a month earlier.

Car sales stores conduct about 300 broadcasts on Taobao Live every day and in total, more than 80% of car brands in China are connected to online platforms.

Representatives of Taobao Live said that more than 15 thousand car broadcasts were placed on the site. On March 21 a group auction brought together more than 10 thousands dealers of 40 car manufacturers such as Maserati, Audi and Volvo. Some models offered discounts of up to 40%. This way brands want to compensate for an expected 80% year-on-year drop in sales.

Fashion industry is one of the most affected areas of the economy. Brands start to represent new collections and fashion shows via live broadcasts. Dior and Chanel cooperated with celebrities to advertise on Chinese social networks WeChat and Weibo and IKEA launched a live stream for the start of its store on the Tmall, in the first 10 min, the stream attracted 27 thousand of viewers and 300 thousand people have watched it totally.

To evaluate the live commerce market potential there could be mentioned that during the Singles Day in 2019 the total turnover of goods in the Taobao video service owned by Alibaba was 20 billion yuan (\$2.86 billion), about 7.5% of the company's total sales. "Live commerce" market in China was estimated at 440 billion yuan (63 \$billion) in 2019 which is 220% more than in 2018. And at the same time according to the Conversation research the real-time sales conversion rate is much higher than on conventional retail platforms [4]. The main reasons to suppose the "live commerce" is a main trend in retail that according to analytics the demand for broadcasts will not decrease after the pandemic. Customers will rely more on live broadcasts to buy things and this will become their habit.

5 Conclusion

Total digitalization of the economy expand over all business spheres and at the first sight it regards to retail as a driver of the economic development. Retailers' goal is to achieve competitive advantage and gain profit using modern technologies. Nowadays there is no need to argue about modern technologies efficiency. Companies which use only one communication and sales channel with their customers can't succeed on the market. Thus according to research we can state that efficient retail models have a technological basis. Thus Brick and Mortar stores can't exist without e-commerce combination in any way. Most perspective innovations in retail are IoT, AR and VR technologies, chat-bots, AI and others implemented in most popular models of online retail such as D2C and "live commerce". Definitely offline retail era is not over but it won't be the same as it has to be. And all these processes we can observe are just a transition to a new paradigm and economy digitalization consequences.

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Institutional Environment Development of Innovative Economy of Russia: Problems and Solutions

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Abstract. The article is devoted to the development of methodological approaches to the formation of the institutional environment for innovative development of the Russian economy. In this regard it was essential to analyze the current state of technological development of the Russian economy based on the interpretation of economic and static indicators and expert assessments, to identify barriers to the transition of the Russian economy to the way of innovative development as well as to find methods to create favorable conditions for interaction between large businesses and innovators to provide necessary tools and infrastructures for their productive dialogue. The basis of the institutional environment of the innovative economy is such a system of effectively functioning institutions as an innovative cluster, an innovative network, and a digital platform. It is concluded that the development of the institutional environment of the innovative economy of Russia will lead the country to a way of sustainable economic growth and rank it among the technologically advanced development powers.

Keywords: Digital platform · Innovative network · Innovative economy · Innovative cluster · Institutional environment · Technological development

1 Introduction

In the context of deciding large-scale tasks for the innovative development of the Russian economy the problem of creating the favorable institutional environment for the implementation innovative decisions in all spheres of the Russian economy is becoming increasingly urgent. The new rules for the functioning the institutional environment should provide the coordinated and effective development of institutions in the situation of limited human, technological and financial resources as well as an extremely unfavorable artificially created external environment. It can minimize the crisis of the Russian economy by reducing dependence on the energy and raw material

sector eliminating accumulated structural imbalances in economic development, and implementing breakthrough (“critical”) technologies. Building the architecture of innovative development of the country is impossible without overcoming existing barriers one of which should be considered the lack of innovative qualities and mechanisms as tools for transition to an innovative economy [15]. The creation of innovative mechanisms that provide the transformation of closed into open models of the innovation process [10], is impossible only in an institutional environment that encourages the generation and commercialization of innovative ideas [24]. The formation of such a quality of the institutional environment should keep the status of priority in the implementation of state innovation policy and high importance for economic growth through the introduction of achievements in research, scientific and technical activities and development [2].

2 Methodology

Development of innovative theory at present stage is reflected in the scientific proceedings of some foreign and Russian scientists. First of all, we should mention outstanding German scientist Mensch who attempted to find a correlation between the rate of economic growth and the cyclical appearance of basic innovations [14]. In research of such American scientists as Westerman, Bonnet and McAfee [24], Freeman, Clark and Soete [4], Nelson and Winter [10], Santo [20], etc., attention was focused on the scientific explanation of branches development innovative mechanism determining their considerable growth and influence on the economy as well as making an attempt to reveal factors promoting the activity of innovative processes. In the field of new society institutional basis research we should mention scientific trends of Kastels [10], Makhlop [17], etc. At the same time the study of foreign authors devoted to the research of innovation development of different countries economy are characterized by ambiguous assessment of their relevance, the possibility of transfer and implementation of domestic practice due to the specific properties and differences in mentality and approach to the architectonics and the management of innovation development as well as lack of considering the influence of institutional environment on economic outcomes of innovative activity in the industry.

Indicated disadvantages are absent in the research of such Russian scientists as Anchishkin [1], Glazyev [6], Idrisov, Knyaginina, Kudrin and Rozhkova [9], Morozuk, Sharkova, Merkulina, Vasilyeva [17], etc. In scientific proceedings of these scientists innovation and innovative activities arrangement under Russian conditions have been considered taking into account its specifics, the analyzes are conducted of Russian approaches to the elaboration of the innovative development strategy. Scientific approaches to the management of innovation and its financing, economic effectiveness methodology assessment of innovative transformation are presented in the scientific proceedings of Gorokhova and Sekerin [7], Shelomentsev, Doroshenko, Kozlova and Mingaleva [21], Kuzyk and Yakovets [12], etc.

Recognizing and highly appreciating the scientific contribution of the abovementioned scientists to solving the problem of national economies innovative development it should be accepted that the issue of methodology to creating an institutional

environment that can provide the growth of the scientific development effectiveness and its implementation remain relevant.

The methodological basis of the research is based on systematic and dialectical approaches, general scientific and special methods. The main methodological principles are: 1) the principle of evolutionism, in according to which the process of developing the institutional environment of innovative development should be viewed through the prism of progressive changes in the qualitative and quantitative characteristics of this process; 2) the principle of organicism which allows only a systematic approach to the formation of the institutional environment of innovative development at the stage of the digital economy formation.

3 Results

Russia has not reached the appropriate rates of production and implementation of innovative technologies in the context of solving ambitious tasks to become one of the world leaders in technological development. Thus, at the end of 2017 only 9,6% of Russian enterprises implemented innovation which is significantly lower compared to other countries, for example, in Germany, 59% of industrial enterprises introduced actively innovation, in France – 47%, in the UK – 46%. In 2018, only one Russian company is represented in the Global innovation 1000 [23] ranking, which represents the world's leaders in research and development spending, while the USA is represented by 340 companies, China – 133, and Germany – 44, in 2019 Russia was ranked 46th in the Global innovation index which is maintained for the second year in a row. The main reason of the technological lag is associated with the lack of favorable conditions for establishing cooperation between the innovative and industrial sectors of the economy [4]. Scientific organizations, small innovative enterprises, and IT- startups are experiencing an acute shortage of financial and infrastructure resources, while large businesses which have the necessary resource base and should be the main consumer of domestic developments are quite inert in relation to their creation [21]. This is confirmed by the low share of Russian business in domestic research and development costs – in 2017 it was only 30%. For comparison, business spending on innovation in Japan is 78%, in China – 76%, and in South Korea – 75% [13].

The reasons for the low involvement of Russian businesses in innovation activity are the following. First, the low level of information awareness of large businesses about the generated and implemented innovation in the country. Second, there is a lack of analytical tools to understand the adequacy of innovative decisions offered by the market to business challenges. Third, there is no expertise that precedes the introduction of a new product into production. All this hinders the rapid technological development of the country, hinders the entry of competitive innovative developments to the global market [6]. In the total volume of shipments for 2017, the share of innovative products in Russia was only 7%, while in the UK – 44%, in France – 24%, in Germany – 9%.

Thus, a review of the innovative activity of Russian companies in comparison with their foreign counterparts actualizes the task of removing all constraining its innovative development factors including by establishing a consolidated horizontal linkages

between traditional business and technology service providers – these are well-built institutional environment of innovative development providing for interaction of big business and innovators, and give them all the necessary tools and infrastructure for productive dialogue [12].

The development of the institutional environment of the innovation economy is associated with the effective functioning of a number of institutions among which it is proposed to consider an innovation cluster, an innovation network and a digital platform. These institutions are included in the system of interacting economic entities involved in the process of creating an innovative product which can be called a digital good in the digital economy.

The innovation cluster as an institution of the institutional environment is purpose-oriented at stimulating the production of innovative products based on the introduction of new technologies [8] (Fig. 1).

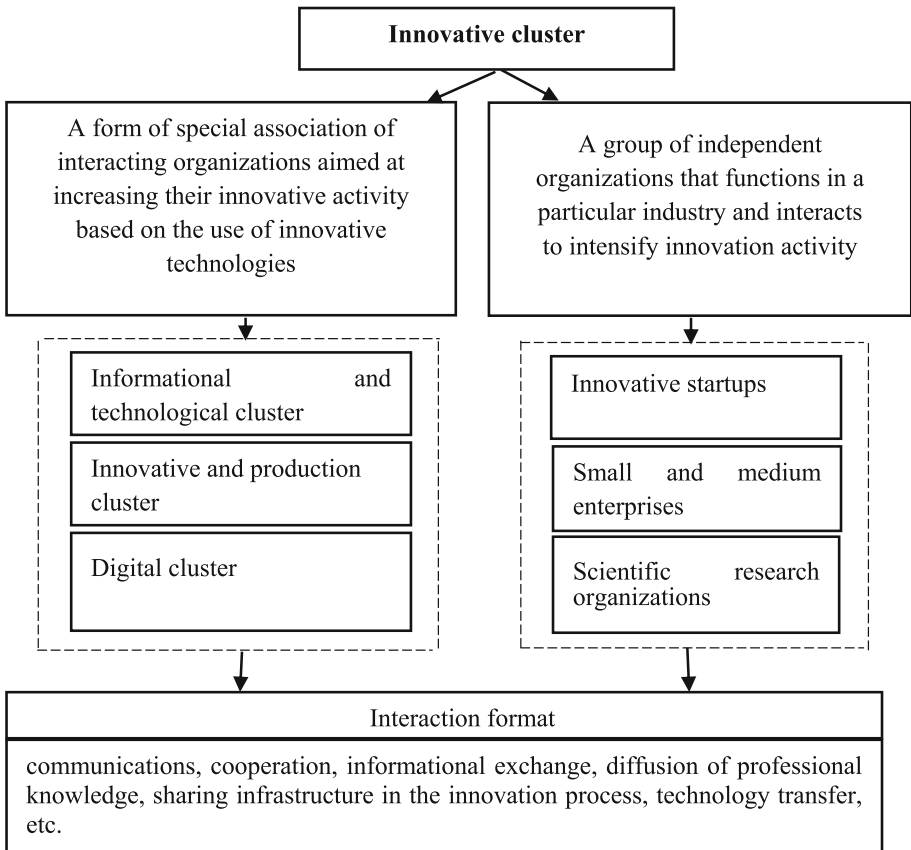


Fig. 1. Innovative cluster: mental model (Source: authors based on [8]).

One of the most important tasks of the innovative cluster is to build mutually beneficial cooperation in the innovation sphere between small and medium-sized innovative enterprises and large businesses, including multinational corporations that provide the entry of innovative enterprises into the global market [20]. At the same time, you should keep in mind not only the positive aspects of the cluster form of the organization, but the existing risks as well (Table 1).

Table 1. Effects of concentration on innovative activity of clusters

Effects of concentration on innovative activity	
Positive	Negative
Minimizing the cost of access to new knowledge; The generation of innovations due to diffusion and concentration of new knowledge carriers; Increasing the speed of new solutions implementation at the expense of innovative environment creation; Increasing of organizations innovativeness degree at the expense of “incoming” innovations of organizations-partners; Increasing the innovative activity through the influence of the growing competitiveness	Risk of blocking effect: over time, intelligent behavior models of cluster participants demonstrate convergence, focusing on a proven trajectory and successful experience

Source: authors

Analyzing innovative clusters in Russia it should be noted the quick growth of their amount. Thus, at present there are about 200 amalgamations which can be considered as clusters in according to the content of their activities. However, in accordance with the project “Development of innovative clusters – leaders of investment attractiveness of the world level” [19], working out by the Ministry of economic development of Russia only 27 Russian clusters can be considered as innovative [1] ones and one of them – the city of Moscow – is included in top-100 of the global list of the most active innovative clusters (amount of scientific publications – 52 000, patents – 2000) [3]. Evaluating the quality of key problems solution facing innovative clusters at the present stage including mass, industry-wide development of innovative digital products with high added value and mass market introduction, we can state the presence of only a few success stories. As example is the best experience of the Kama cluster (Republic of Tatarstan) in creative innovative digital product, in particular, software for intelligent control of robotic systems – this is an example of development in the direction of robotics and “artificial intelligence” as a general trends in the development of digital economy of Russia [7]. In this regard it can be concluded that at present the Russian institute of innovative clusters only partially justifies the hopes placed on it essentially inferior to its foreign counterparts. We should call experience of Great Britain as the best experience of functioning cluster forms of organization in the field of digital development: the institute of regional digital clusters established by the government indicates on the priority of policy “digital; economy” regional development providing

collaboration of highly technological companies in the field of research conducting on actual subject of digital development [17].

Innovative clusters can be considered not only as separate institute of innovative development, but as an element of innovative network as well [9] which represents an autonomous participants interaction mechanism of innovative production on the basis of contract of relations (Fig. 2).

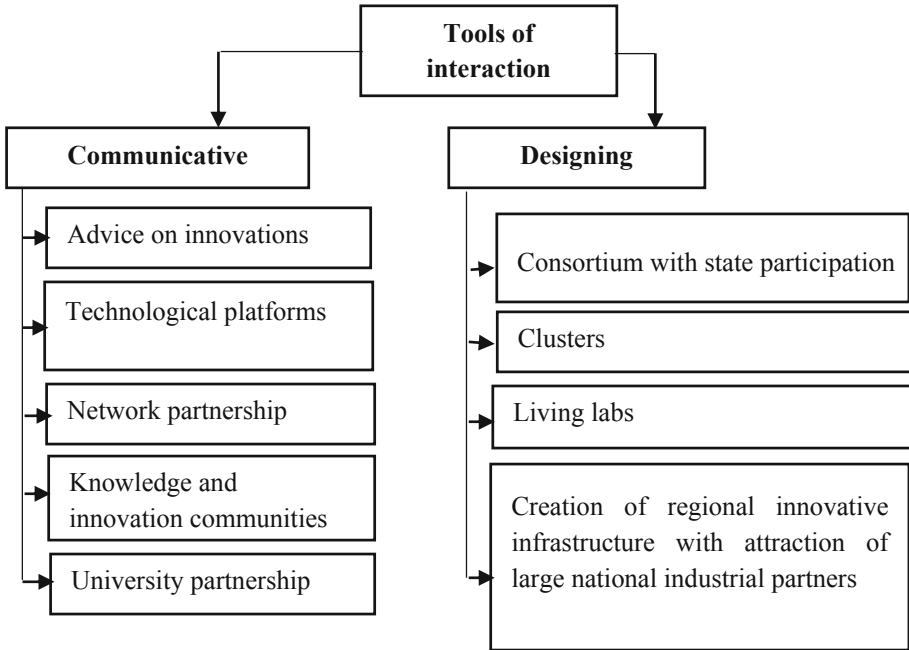


Fig. 2. Tools of interaction within innovative network. World experience (Source: authors).

The main principle of innovative networks functioning should be considered to maximize the effectiveness of each participant and the entire network as a whole. Distinctive features of the innovative network as a self-organizing institution are: unlimited space; virtual interaction with the use of information and communication technologies which do not exclude real interaction through conferences, workshops, focus groups, etc.; voluntary and active participation of economic entities in partnership to create an innovative product; interaction of designers and consumers at all stages of production of an innovative product [16]. The innovative network as an institutional mechanism for innovative development multiplies the opportunities for creating added value as it gives network participants access to the necessary resources and competencies [14], for example, to stimulate innovation, prevent reduce financial risks, and develop flexible and operational solutions in response to changing market conditions [18]. In addition, this mechanism reduces the costs of participants in the innovation network. At the expense of the rational use of labor, optimization of

management and production processes the level of transaction costs for network participants is considerably decreases compared to the costs of conducting transactions in the market, and at the same time it is not allowed to increase transformational and intra-work transaction costs [22].

The third institute of innovative development considers digital platforms whose role in the formation and development of the digital economy is becoming key. Digital platforms in institutional research are interpreted as hybrid structures (systems, organizations, technologies) whose active is based on direct interaction and resource exchange between groups of external users within the boundaries of a common digital ecosystem of algorithmized relationships and it is aimed at creating a digital good [5]. The most important advantage of digital platforms is their assistance in reducing a number of costs – this is achieved by including digital technologies in the mechanism of their operation which expand the possibilities of maximizing the use of economic entities resources that are part of the digital platform.

Digital platforms in Russia are most popular in the areas of e-Commerce, finance, tourism, employment, education, and passenger transportation, but the most popular are digital communication platforms and search systems (Fig. 3).

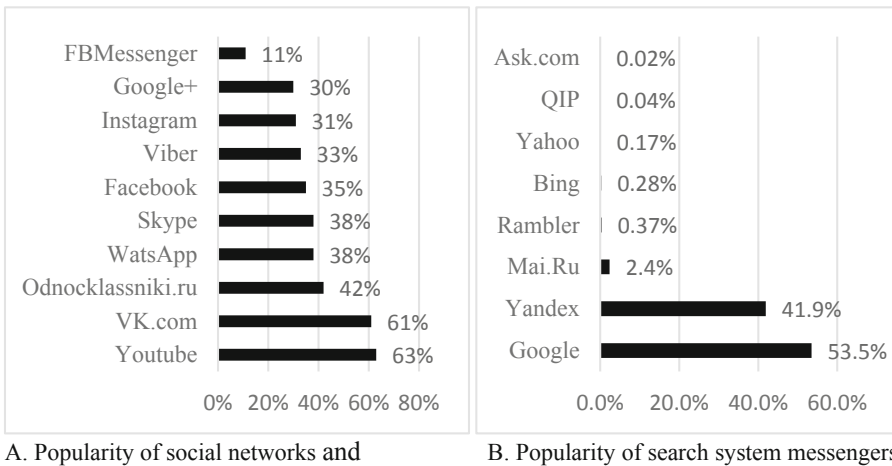


Fig. 3. The most recallable digital platforms in Russia (Source: authors).

It should be recognized that domestic digital platforms have a lower capitalization compared to banks and commodity holdings. At the end of 2017 only 2 platform companies entered the top 100 most expensive companies in the world – Yandex and Mail.Ru Group (12 and 23 positions, respectively). The share of global digital platforms in the total volume of the Russian market of digital platforms reaches considerable values – 30%, but in a number of areas – social networks, messengers, search engines – Russian platform leaders compete with the world [11].

The trend and rate of digital platforms development in Russia should be linked to both national programs for the digitization of the economy and global documents

including the recommendations of the World Bank according to which digital platforms development is recognized as one of the four main directions for the implementation of the Strategy for the formation and development of the digital space in the Eurasian economic space until 2025. This fact confirms the important role of digital platforms in activating innovative development and obtaining positive effect, the so-called digital dividends at all levels of the economic system: accelerating economic growth, improving the quality of public services, stimulating cross-border business by minimizing the cost of international transactions, expanding entrepreneurs' access to more potential customers, creating new jobs, and so on.

4 Discussion

In spite of the existing variety of scientific research of foreign and Russian scientists on different range of problems of innovative development it is necessary to note some narrow tendency of research on certain aspects of innovation in different economic systems without covering the entire spectrum of multidimensional problems of implementing innovative technologies which are aggravated by factors of economic and non-economic nature. Comprehensive research is necessary to link all aspects of institutional influence on the implementation of innovative technologies in the context of economic crises triggered by factors of different origins and provides for the development of a mechanism for extrapolating individual positive experience of innovative development to Russia as a whole.

Perspective trends of further research will inevitable be associated with the analysis of existing approaches to the formation of the institutional environment of the digital economy as the main trend of technological development of the entire global society and as a system-forming factor in the innovative development of national economies separately. The study and critical evaluation of the features of the existing institutional infrastructure of the digital economy in the countries that are leaders of innovative development will allow to work out a Russian model of the scientific and technical center as a new institute of the digital economy.

5 Conclusion

Accelerating the transition of the Russian economy to the model of innovative development, providing the continuity of the innovation process and improving its efficiency becomes possible if the appropriate institutional environment is formed. This problem fits the development of the Russian economic system and its decision should be aimed at modernizing the industrial base and putting the entire economy on an innovative way of technical and scientific development, elimination of raw material imbalance in the sectoral structure of the national economy, building an innovative and active business system at the level of the country and region.

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Relationship Between Economy and Sports in Society

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Abstract. This article investigates the interaction of the economy and sports. The authors analyze needs and interests, as well as the penetration of market forces in the field of sports, identifying positive changes in the sports life of the country. At its core, business and sports have similarities. There is competition between individuals and groups, which is the basis of business competition. This is also observed in sports. The motivation for activities in both areas is the desire of participants to win, to prove to everyone, not only to themselves, their importance, and to gain respect. The research material was obtained based on the study of special literature sources. The research purpose is to identify the main patterns of interaction between the economy and sports in modern society. The authors used theoretical analysis and generalization of special scientific literature on the topic. The conducted research allows us to conclude: the economy and sport are linked: the development of the sports sector has a positive impact on the economy, not only in the production of sports goods, but also on the economy as a whole, providing more workers, due to the fact that involvement in sports increases the quality of life.

Keywords: Economy · Health · Relations · Sports

1 Introduction

At present, the topic of sports has become very important not only in our daily life, but also in the economic context. For the global economy, it is more important to maintain the pace of production of goods and services to meet the ever-growing consumer demand, including in the field of physical culture and sports [5, 8]. New models of sports management and its financing are constantly being improved and developed. For a long time, sport and economics were separated from each other, it was believed that sport is just a hobby, occupation, type of human activity, and that it has nothing to do with business and economy. But now we are experiencing great changes in our lives, when all areas of our life are closely linked to the economy, digitalization and economic indicators [7]. There are more opportunities to earn and implement the own ideas in almost any sphere, so now we can combine these two seemingly unrelated branches. In sports, you can earn money, of course, without contradicting the laws of

economics, acting honestly. Thanks to the ongoing economic processes, it is clear that sport needs not only coaches and professional athletes, but also professional economists, lawyers, managers and other representatives of economic sectors will be useful in this case. This applies to various fields, not only professional sports, but also sports clubs, various sections, commercial offers or public administration. This also involves sports viewers, fans and those, who actively spend their free time. Sports is also linked to economy when we consider the work of specialists who make estimates for the construction of a stadium, organize a sport game or major sport events. These people should not only have knowledge of finance, management, marketing, but also understand sports products, organizations, sports culture, development specifics of this sphere, actual needs and possible directions of change. Professional sports is pretty much just another form of business, it has a number of special functions that require an individual set of methods to ensure it works effectively [9].

2 Methodology

As it was noted above, business is similar to sports in some ways. For example, the basis of business competition is competition between individuals and groups, and the same is true in sports. The motive of human activity in both areas is the desire of participants to win. The purpose of this research work was to analyze the interaction between economy and sports. The methods of theoretical analysis and generalization of data were used to solve the research tasks. Scientific works of domestic and foreign specialists were studied.

3 Results

1. The state promotes innovations and sports research to help athletes achieve the best results in sports and engage more people for these activities. Maintaining and developing the sports sphere have a positive impact on citizens, bringing them various social benefits. For example, the analysis of foreign experience shows that the achievement of high indicators in the economy largely depends on the number of citizens who are engaged in physical culture and sports, especially on the involvement of middle-aged and elderly people in physical culture and sports [2]. This indicator in some countries is 40–48%. In the Russian Federation, the percentage of the above-mentioned involvement in physical culture and sports is significantly lower – 25%, since only about half of the country's regions hold mass sports events with the above-mentioned contingent of citizens.
2. The influence of physical culture and sport is positive not only for social and health care sector, but also for the economic life of the state and society, external relations, the workforce development, tourism and other indicators of economic system. The idea of the economy of sport would be difficult to follow without an analysis of citizens' needs and interests. Needs are what the economy is based on. They act as a driving force that generates internal motivation to achieve a goal. Then the needs turn into an interest that extends to objects of needs [1].

3. The mutual influence of the economy and physical culture and sport increases the demand for goods and services related to sports activities and contributes to a response from producers. This gives an impetus to manufacturers to develop, improve the quality and sales of their products to be able to fully meet the customers' needs. Manufacturers of goods and services create an offer. Demand and supply volumes are formed as a result of market mechanisms, the most important of which is the law of supply and demand.

The desire and need to buy sports goods is not atypical for all, but only certain representatives of our society, such as: athletes, both professional and beginners, sport teachers and trainers, fans of active hobbies and sports tourism.

4. Regular physical activity is the key to a healthy lifestyle and the absence of many diseases at all ages. In addition, such a load helps not only to strengthen and maintain people' health, but also to increase the working age, make a person active at work and in public life. At the same time, the economy is not only interested in generating income in this area, it is also interested in the development and popularization and sports development [10]. Among human needs, we should also note the need for entertainment and pleasure. Rest in this case should be understood as active, relieving fatigue, relaxing rest. Sport also affects the social capital of the country, contributing to the development of clubs and associations. It has been found that its influence reduces addictions to harmful habits such as alcohol and smoking, as well as reduces the level of poverty and crime, and this in turn leads to the economic growth on the whole.

4 Discussion

From the economic point of view, the usefulness of sports and maintaining a healthy lifestyle can be divided into 3 components:

- people who are engaged in physical activities, take a break from daily routine work and restore strength and mental health,
- active recreation excludes sedentary lifestyle and bad eating habits,
- people who spend their free time at various sports events, even as fans, are charged and get a boost of energy and emotions, which is also an integral part of health and productive work.

Making payments for all the above-listed ways of involvement in physical culture, we contribute to the sports development, invest in the economy of sports. At the macro level, individual demand is transformed into aggregate demand. The state enters into economic relations in the field of sports, it is directly interested in the development of such relations and their support from all sides. The state thus regulates the market demand for sports products and information in the related field, and influences the supply expansion. State assistance in the field of physical culture and sports contributes to the development of the sports industry and entrepreneurship. This is reflected both in the form of tax regulation and other benefits, and in the form of direct financing from

state budgets. It is worth noting that the faster the economy development level increases, the faster market forces penetrate into sports, which allows increasing the composition of sports goods and services.

For a relatively long time, in the sport and economic literature, the researchers have considered a question of what economic factors in the country help to achieve success. The most important of them are the income of the population, the share of the population employed in the industry, and the urbanization degree. All these factors do not operate isolated from each other, but in a close connection with the existing economic order and political system of the country. Therefore, the higher the internal stability is in the country and the older the dominant political system is, the greater success in sports should be expected.

The dynamics of attendance at sporting events may vary in different markets. In addition, when a new sport enters a new market, the organizers of sports events mistakenly set high prices, focusing on conditions in more developed markets. That sometimes makes the situation worse. Therefore, we need an economic assessment of this event because of the the growing budget deficit and competition for public funds. Playing sports, attending sporting events require time and money. A lot of money is also spent on project ideas, construction, equipping, operation, reconstruction of sports facilities. In modern conditions, economic relations in the field of sports on a market basis are at the initial stage of their development and we can note a positive aspect: there is a sports industry, sports business, tourism and infrastructure that need to be developed. However, in practice, there is often a discrepancy between goals of sports policy in the private and public sectors.

In addition to significant revenues, elite sports produce significant political and social effects. National sports achievements arouse a sense of pride and unity of the nation, raise the country's prestige at the world level [3, 4]. As for mass sports, its macroeconomic contribution is primarily determined by investment in human capital through its impact on health and work productivity.

5 Conclusion

In our society, there is a close relation between the economy and sports. The development of the sports sector has a positive impact on the state and the economy. Athletes participating in other countries, international and world competitions enhance the country's image, which also affects trade and the economy, in this case more companies want to cooperate with representatives of the sports sector, sell more their products and various goods, perhaps, not even related to sports. For example, if the champions of the country will appear in ads of the world's most famous companies such as Nike, Adidas, Puma and others, it will bring profit not only to the nation that the sportsman represents, but the athlete himself will become one of the objects of market relations. Investments will also make changes in the tourism business, expanding it and presenting it on a global level. The number of those who want to visit a country with a developed sports structure will grow, and this in turn increases funding and revenues, and the state will be able to direct investments to the development of other areas. Physical culture and sport intensely affect the economic life of the state and

society: physical-sport activity helps to minimize economic losses practically in all spheres (an alternative to bad habits); 2) this sphere is a major component of training high-quality human resources; 3) it is an important field of extensive business activity which provides, on the one hand, the employment of many people in the fields of sports industry and tourism complex; on the other hand, these business sectors supplement federal and local budgets with tax revenues; 5) it provides everyone with tremendous opportunities for self-expression, self-improvement, and self-affirmation. The interrelations between sports and economy have their risks. A lot of factors have to be considered by highly skilled specialists in sports and economics. But the development of this sphere can bring the country to a new development level and turn it to a leading sports power. Integration of results collected from active participants and organizers of sports events provides better understanding of a business model concept as a whole [6].

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Enterprise Knowledge Base Based on EDM System

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Abstract. In the context of rapid development of digital technologies, systems that form the knowledge base become an integral part of the infrastructure of organizations. With their help, the efficiency of industrial and commercial enterprises is increased. The article explores the practical aspects of the use of digital technologies in the process of managing organizations that allow optimizing the process of collecting, processing, storing and exchanging information and interact in solving functional tasks. The practical features of the introduction of electronic document management systems are studied, and the assessment of the applicability of EDM in creating a corporate knowledge base is carried out. Considered submitted in the Russian market the EDM of their adaptation to the company's knowledge, proposed mechanisms to make a decision on expediency of introduction of information systems in the enterprise.

Keywords: Automated management system · Corporate knowledge base · Electronic document management system (EDM)

1 Introduction

Knowledge is a strategic resource that ensures the development of the company's competitive advantages and contributes to the achievement of statutory goals and objectives. Properly organized corporate knowledge becomes the intellectual capital of the enterprise, contributes to the development of organizational culture, encourages staff to take more active actions and increases the level of intelligence of the enterprise management system as a whole. Knowledge management is a system of interrelated processes and procedures that recognize, create, store, distribute and apply the knowledge necessary for the business activity of the enterprise [7]. The main goal is to turn the accumulated experience of the company's employees into the intellectual capital of the organization.

Corporate knowledge base is a unified system for storing, processing and exchanging information, an organized set of knowledge related to a specific subject area. The knowledge base of a particular organization is information accumulated by the company and available to users of the system that affects all areas of the company's activities. Such a system can be described as a set of software tools that provide search, storage, transformation and recording of complex structured information units [1].

The strategic direction of development of such systems is their intellectualization, which consists in building formalized procedures for processing, interpreting and

presenting information in the form of certain knowledge that allows them to be used directly for making management decisions. Implementation of the corporate knowledge base allows the organization to reduce costs and increase profits by reducing the time associated with storing, searching and using information [13].

Market development factors include: the development of the digital economy, business development and experience accumulation, replacement outdated solutions, the maturity of organizations and the need for further development, the emergence and development of remote data storage and service centers, technological progress, the growth of stored content and the complexity of information processing tasks, unification of the ways of collecting, storing, processing and exchanging information between individual structures of organizations, companies and government agencies [8].

Basic requirements for corporate knowledge bases are: storage and processing of information; ensuring the implementation of tasks, adapting to the particular organization; intelligent (semantic) search; speed; stability and fault tolerance; safety and security; regulation of access mode; mobile availability and remote access; backup of information and infrastructure solutions; the availability of the service; possibility of optimization and development; integration with existing systems managing and storing information; effectiveness of implementation and payback [11].

The growing popularity of electronic document management systems (EDM) can be used to create a corporate knowledge base. It should be noted that initially such systems were considered as a tool for automating tasks of classical office management. Over time, EDM began to cover an increasingly wide range of tasks. Currently, developers of electronic document management systems position their products not only in the segment of working with correspondence and organizational and administrative documents, but also with various internal documents. Given the availability and dissemination of EDS, with a certain adaptation of the functional, the electronic document management system can form the basis for building a corporate knowledge base, which will subsequently solve a number of functional tasks set by the customer in front of the corporate knowledge base [5].

2 Methodology

In the course of the study of the problems of choosing and adapting software for creating a corporate knowledge base, comparative analysis methods were used to ensure a multi-criteria choice of alternatives in the presence of a significant number of ready-made solutions for creating information systems and the need to adapt them to the specifics of a particular organization.

Using the integrated object assessment method when selecting software tools allows us to fully identify the needs of customers and determine the goals that software developers face during the development and implement such systems. Comparative analysis methods speed up the search for a solution, contribute to more complete data collection and consideration of the impact of factors on the results, and ensure comprehensive compliance of the results with the customer's technical task [6]. The combination of comparative analysis tools allows us to avoid significant computational costs and at the same time improve the accuracy of the assessment.

Expert evaluation methods (direct evaluation method, paired comparison method, group expert evaluation of objects) are used to process expert opinions about the importance of criteria in the process of finding a solution. These methods are intended for solving unstructured problems when the mathematical description of the problem is difficult [12]. Information received from experts is processed using statistical methods. Evaluation using expert assessment methods includes the following main stages:

- determining the purpose of the examination,
- the formation of a group of expert assessments,
- analysis of expert information,
- information processing,
- presentation and generalization of the result.

3 Results

The lack of generally accepted standards is a problem not only for developers, but also for customers, as the choice of requirements for the EDM becomes a subjective task. Rules and regulations for working with documents may differ from company to company, not only within the same industry, but even within the same group of companies [9]. The analysis of compliance of electronic document management systems and their adaptation to the creation of a corporate knowledge base is carried out on the example of electronic document management systems such as DocsVision, PayDox, Directum, EVFRAT, Motiw presented on the Russian market [14]. The analysis of EDM systems is carried out from the point of view of the key functionality involved in creating a corporate knowledge base. The analysis considered the following groups of EDM functions:

- registration and entering documents (global weight of the group criterion $W1 = 0.1$),
- working with documents (global weight of the group criterion $W2 = 0.2$),
- searching of the information (global weight of the group criterion $W3 = 0.2$),
- workflow and control (global weight of the group criterion $W4 = 0.15$),
- information security (global weight of the group criterion $W5 = 0.2$),
- standard configuration tools (global weight of the group criterion $W6 = 0.1$).

The total weight of the global criteria's of the submitted assessment groups is determined by summing the global weights of the group criteria's and equal 1:

$$\sum_{g=1}^6 Wg = 1 \quad (1)$$

Within each group of functions, the main EDM functions that are used in creating the corporate knowledge base are selected. The local weights of the criteria's (kW_j) are set for each function within the listed groups in an expert way, so that the sum of the local weights of the established criteria's is equal 1 for each group of functions:

Table 1. Registration and input of new documents

Function (j)	Criterion weight	Directum	Docs Vision	Pay Dox	EVFRAT	Motiw
The documents registration	0,1	v	v	v	v	v
File attachment	0,1	v	v	v	v	v
Document Templates	0,02	v	v	v	v	v
Copy a document from an existing one	0,02	–	v	–	v	v
Registration from email	0,1	v	v	–	v	v
Registration from WEB	0,1	–	v	v	v	v
Registration from local applications	0,08	v	v	v	v	–
Registration by electronic means	0,08	v	v	–	v	v
Stream input documents	0,03	v	v	–	v	–
Document Directories	0,09	v	v	v	v	v
Setting up registration templates	0,05	v	v	v	v	v
Checking documents for duplication	0,1	–	–	–	v	v
RKK filling control	0,05	v	v	v	v	v
Automatic content parsing	0,08	–	–	–	v	v
Summary (kW1j, kW1i)	1	0,7	0,82	0,59	1	0,89
Ngi		0,07	0,082	0,059	0,1	0,089

Source: author.

$$\sum kW_j = 1 \quad (2)$$

If the software implements the functionality in question, the software is assigned the maximum value corresponding to the local weight of the criteria. If there is no functionality in the software, the local weight of the criterion for this software product is equal 0. In each function group, the sum of the local criteria's weights for each software product (kW_i) is determined. Expert evaluation of software compliance with the specified criteria (N_{gi}) is obtained by multiplying the obtained values of the sum of the weights of local criteria's for each software product by the global weights of the group criteria's W_g :

$$N_{gi} = \sum_{i=1}^5 kW_{gi} * W_g, g = \overline{[1, 6]} \quad (3)$$

Table 2. Dealing with documents

Function (j)	Criterion weight	Directum	Docs Vision	Pay Dox	EVFRAT	Motiw
Built-in Viewers	0,05	–	v	–	–	–
Mailing lists	0,08	–	v	v	v	v
Change attachments	0,07	v	v	–	v	v
Development of draft documents	0,1	v	v	–	v	v
Registration of documents	0,02	v	v	–	v	v
Deadline monitoring	0,02	v	v	v	v	v
Responsibility	0,04	–	–	–	v	v
Interim Execution	0,01	–	–	–	v	v
Reports	0,02	v	v	v	v	v
Document Versions	0,08	v	v	v	v	v
Storage structure	0,1	v	v	–	v	v
Optimize for customer use	0,03	v	v	v	v	v
Link with documents	0,01	v	v	–	–	v
Off-line mode	0,02	v	v	v	v	v
Document Sight	0,03	v	v	v	v	v
Document Approval	0,03	v	v	v	v	v
Reconciliation Sheets	0,1	v	v	v	v	v
Creation of orders	0,02	v	v	–	v	v
Order Delivery Control	0,1	v	v	v	v	v
Remote access	0,07	v	v	v	v	v
Summary (kW1j, kW1i)	1	0,9	0,95	0,58	0,94	0,95
Ngj		0,18	0,19	0,116	0,188	0,19

Source: author.

The final assessment of the ability to adapt the selected EDM to create a corporate knowledge base on it is determined as the sum of expert assessments of the compliance of each software with the specified criteria ($K(i)$):

$$K(i) = \sum_{g=1}^6 Ng_i \quad (4)$$

If the costs associated with the implementation and adaptation of the electronic document management system when creating a corporate knowledge base do not exceed 10% of the base cost of the EDM (the value of the expert assessment of the possibility of adapting the EDM should not be less than 0.9), such a system can be used such as a corporate knowledge base. The results of the study are presented in Tables 1, 2, 3, 4, 5 and 6.

The final assessment of the possibility of adapting the considered EDM to create a corporate knowledge base is summarized in the Table 7.

Table 3. Document search

Function (j)	Criterion weight	Directum	Docs Vision	Pay Dox	EVFRAT	Motiw
Document Search	0,2	v	v	v	v	v
Event Search	0,015	v	v	v	v	v
Advanced Search	0,25	v	v	–	v	v
Combining Search	0,13	v	v	v	v	v
Types Search Templates	0,02	–	v	–	–	v
Document Logs	0,02	v	v	v	v	v
Reporting by users	0,04	v	v	v	v	v
Analytics	0,2	v	v	v	v	v
Search Reports	0,05	–	v	v	v	v
Report Export	0,075	v	v	v	v	v
Summary (kW1j, kW1i)	1	0,93	1	0,73	0,98	1
Ngi		0,186	0,2	0,146	0,196	0,2

Source: author.

Table 4. Workflow

Function (j)	Criterion weight	Directum	Docs Vision	Pay Dox	EVFRAT	Motiw
Creating Typical Routes	0,02	v	v	v	v	v
Free routing	0,1	v	v	v	v	v
Expandable Routes	0,01	v	v	v	v	v
Conditional jumps	0,05	v	v	v	v	v
Deferral of execution	0,05	v	v	v	–	v
Link to document types	0,03	v	v	–	v	v
Automatic processing	0,08	–	v	–	v	–
Execution control	0,09	v	v	v	v	v
Stage automation	0,1	v	v	v	v	v
Group tasks	0,09	v	v	–	–	v
Delegation	0,05	–	v	–	–	v
Territorial distribution	0,04	v	v	v	v	v
Smart search	0,15	v	v	–	v	v
Automatic performance acceptance	0,04	v	v	–	v	v
Notification mailing	0,01	v	v	v	v	v
Distribution of documents	0,09	v	v	v	–	v
Summary (kW1j, kW1i)	1	0,87	1	0,56	0,72	0,92
Ngi		0,1305	0,15	0,084	0,108	0,138

Source: author.

Table 5. Security

Function (j)	Criterion weight	Directum	Docs Vision	Pay Dox	EVFRAT	Motiw
Different authentication methods	0,05	–	v	–	–	–
Assigning Permissions	0,04	v	v	v	v	v
Group rights	0,03	v	v	v	v	v
Role support	0,02	v	v	v	v	v
Differentiation of access rights to objects	0,05	v	–	v	–	v
Differentiation of access rights to actions	0,06	–	v	–	v	–
Assignment of temporary rights	0,01	v	–	v	v	–
Encryption	0,15	v	v	v	v	v
Activity Logging	0,15	v	v	v	v	v
Event monitoring	0,08	–	v	v	v	v
Using an electronic signature	0,11	v	v	v	v	v
Crypto Protection	0,1	v	v	v	v	v
Dynamic lock	0,03	v	v	v	v	v
Document Integrity Control	0,02	–	v	–	v	–
Backup	0,1	v	v	v	v	v
Summary (kW1j, kW1i)	1	0,79	0,94	0,87	0,9	0,86
Ngj		0,158	0,188	0,174	0,18	0,172

Source: author.

Table 6. Standard customization tools

Function (j)	Criterion weight	Directum	Docs Vision	Pay Dox	EVFRAT	Motiw
RKK Design Tools	0,05	v	v	v	v	v
Flexibility in RKK settings	0,03	v	–	–	v	–
Use of elements	0,06	–	v	–	v	–
Typical Route Development Tool	0,1	v	v	v	v	v
Design Tools	0,25	v	v	v	v	v
Adaptation to the structure of the organization	0,1	v	v	v	v	v
Creating Directories	0,1	v	v	v	v	v
Template customization	0,08	v	v	–	v	v
Using plugins	0,03	v	v	–	v	v
Interface flexibility	0,2	–	–	v	v	v
Summary (kW1j, kW1i)	1	0,74	0,77	0,8	1	0,91
Ngj		0,148	0,154	0,16	0,2	0,182

Source: author.

Table 7. Summary

Electronic document management system	Directum	Docs Vision	Pay Dox	EVFRAT	Motiw
K(i)	0,8725	0,964	0,739	0,972	0,971

Source: author.

As can be seen from the results of the study, such electronic document management systems as EVFRAT ($K = 0.972$), Motiw ($K = 0.971$), and Docs Vision ($K = 0.964$) can be adapted to create a corporate knowledge base with minimal costs associated with the implementation and adaptation of software. Such EDM in terms of “optimal price/functionality” were included in the group of leaders, as they have a balanced ratio of price and functionality [2]. They are most attractive for implementation in enterprises, provided that 20–100 open licenses are purchased. At the same time, systems, whose expert assessment of the ability to adapt to the knowledge base is in the range $\{0,7 \leq K \leq 0,9\}$ can also be used in the role of a corporate knowledge base, but their implementation will require additional costs from companies related to adaptation.

4 Discussion

Issues related to the spread of information technologies, as well as their impact on the development of organizations in modern business conditions are considered by participants of the Russian market of automated information management systems at various levels. Integrators and software vendors are similar in their assessments of trends in the development of electronic control systems: The expansion of mobility, the use of elements of artificial intelligence and the transition to paperless exchange are particularly notable, there is centralization (combining all tasks into one system, up to its replacement), modernization and unification of systems (transition from narrowly targeted systems to a single platform, which can be based on EDMS/ECM system) [10]. It is possible that the boundaries between the classes of systems are blurred, business needs complex solutions. At the same time, preferences are given to convenient systems and powerful unified platforms that minimize the costs of implementing and maintaining many systems of different classes, as well as reduce the number of integration solutions [11].

The leading trend is the transition from unstructured to structured information exchange, as well as the development of digital assistants, which with the help of augmented reality help to find the necessary information in the EDMS [10]. In the author’s opinion these trends of development of systems of electronic document flow in much conducive for adaptation to the global challenges facing organizations in the development of digital technologies and creation on their basis of corporate knowledge bases.

5 Conclusion

In a modern organization, electronic document management systems are becoming a mandatory element of the it infrastructure. With the development of information technologies, the use of such systems becomes one of the key rules for the proper functioning of a modern organization and conducting economic activities [4]. With the development of digital technologies, the availability of such systems for organizations is increasing.

Modern electronic document management systems are information content management systems of the organization, structured information content storage systems. Thus, the EDM can be used as a kind of knowledge base of the company, for those data that fall into it [3]. As can be seen from the results of the study, a number of electronic document management systems can be adapted to create a corporate knowledge base with minimal costs associated with the implementation of software. The main criteria for choosing a software product for creating a corporate knowledge base are the optimal system functionality and compliance with the set tasks, information security, stable operation, cost of implementation and operation, economic efficiency, experience in the industry, after-sales technical support, updating, etc. [6]. Adaptation of the electronic document management system to the creation of a corporate knowledge base on its basis is possible if architectural changes are made to the EDM and the main aspects of compliance of electronic document management systems and the knowledge base are agreed upon:

- compliance with the information access paradigm (transformation of regulated access rights in the EDM to open information in the knowledge base),
- optimization of the content structure (transformation of hierarchical EDM information into a flexible structure of the knowledge base),
- optimization of the interface (adaptation of the conservative SED interface optimized for solving certain tasks of electronic document management to a free and intuitive knowledge base interface),
- achieving a critical amount of knowledge (increasing the amount of information contained in the EDM, provided that the necessary amount of knowledge is sufficient, accumulated, and relevant to the information and knowledge base),
- proper moderation and maintenance (knowledge base management, updating and filling).

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Infrastructure Platform for Creating and Distributing VR/AR Solutions

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Abstract. The purpose of the work is to develop a solution to increase the number of companies involved in the digital economy markets formation, to assist in accelerating of new products and services based on virtual and augmented reality technology introduction, to ensure their competitiveness and to overcome technological barriers. The authors analyze the current situation in the Russian digital economy, related to the end-to-end technology of virtual and augmented reality, technological barriers that hinder the economy development. The problems reside in low digital literacy, lack of understanding of VR/AR using possibilities in a professional environment, shortage of developers, lack of VR/AR content in consumer and specialized fields, the long alignment process of pilot projects for implementation in state corporations and industrial enterprises, as well as the lack of Russian industry standards for design systems (CAD) and universal VR/AR devices. To address the identified barriers, the authors describe the concept of digital online platform for creating and distributing VR/AR content and services.

Keywords: Augmented reality · Digital economy · End-to-end digital technology · Online platform · Virtual reality

1 Introduction

Every year, the Russian and foreign economy is subject to changes under the influence of scientific and technological progress and introduction of the latest technologies in the real sector of economy (artificial intelligence technologies, blockchain, VR/AR solutions, etc.). The massive modern technology introduction is a necessary factor contributing to a significant increase in productivity and efficiency at production enterprises on the way to Industry 4.0 and in the field of education and healthcare. Technologies of virtual and augmented reality (VR/AR-technologies) are a fundamental and promising trend in a globalized economy. Currently, VR/AR technologies have received the most widespread use in leisure and entertainment markets, however, these technologies can be effective in the field of industrial production, education, healthcare, and consumer services [2, 5]. An analysis conducted by the Ministry of Digital Development, Telecommunications and Mass Media of the Russian Federation showed that Russian companies and research and educational organizations have significant technological reserves that allow them to claim leadership positions in a number of segments of the world market. The support of Russian companies creating

products with virtual and augmented reality technologies will make it possible to create world-class industry products, achieve technological and economic advantages in the most important segments of the Russian market, and also take a significant share of the world market [4, 9].

This article proposes tools that increase the efficiency of implementing “end-to-end” digital technology “Virtual and Augmented Reality Technologies”, aimed at developing breakthrough projects in the fields of industry, healthcare, education, transport and energy infrastructure, and creating feedback devices. The use of new tools will help to overcome the following barriers: low digital literacy of the working-age population; insufficient understanding of the features and possibilities of using VR/AR in a professional environment, insufficient number of specialist developers for projects with VR/AR and the high cost of creating high-quality VR/AR content; lack of VR/AR content in consumer and specialized fields; a long process of coordination of pilot projects for implementation in state corporations and industrial enterprises; lack of domestic industry standards for design systems (CAD) and universal VR/AR devices [3].

2 Methodology

The authors analyzed the development roadmap of “end-to-end” digital technology “Technologies of virtual and augmented reality” (hereinafter - the roadmap). In particular, the subtechnologies and their level of development in the world and in Russia, risks and limitations of the development of backlogs for VR/AR subtechnologies were identified, the state of technological and economic development indicators was investigated. The experience and results of the work of scientific and educational centers, centers of competence of the ANCO “Digital Economy”, research and commercial organizations involved in the development and implementation of solutions based on VR/AR technologies were also analyzed.

3 Results

The study of the fast-growing market for virtual and augmented reality technologies led the authors to conclude that currently there are separate tools to support innovative enterprises that are developing high-tech solutions based on VR/AR technologies, but there is a lack of a unified system that allows the most efficient use of the potential of existing tools [1, 8]. Considering the peculiarity and specificity of the studied market, the authors consider the most effective form of combining existing institutional resources within a single ecosystem as an infrastructure digital platform, which is an expression of a new managerial model in the studied industry.

A digital platform is a system of algorithmic mutually beneficial relationships of a significant number of independent participants in an economic sector (or field of activity) implemented in a single information environment, which leads to a reduction in transaction and costs due to the use of a package of digital data processing

technologies and changes in the labor division system. This definition allows us to identify at an abstract level the criteria for classifying an entity as “digital platform”:

1. Algorithmization of the interaction of the platform participants: the interaction procedures of the participants are determined and implemented within the established algorithm. The multiple of these interaction procedures is limited and described.
2. Mutually beneficial relations between participants of the platform (“win-win” principle). Moreover, the benefit may not only be of an economic nature.
3. The significance of the number of participants in the activity (scale) using the platform for interaction. The significance is evaluated in relation to the entire set of potential platform participants: community, industry, country, world.
4. The presence of a single information environment in which the interactions of participants are carried out, and the corresponding information technology infrastructure.
5. The presence of an effect in the form of a reduction in transaction costs during the interaction of various platform participants – in comparison with the same interaction without a platform. Moreover, this effect should be achieved through the use of certain technologies for working with data and/or through the reorganization of business processes.

When discussing certain types of digital platforms and examples of their implementation, it is important to single out and evaluate the following characteristic features of digital platforms (participating in the general definition given above):

1. The purpose of the platform is the main activity that is carried out using a digital platform.
2. Groups of participants, or parties using a digital platform, as well as the main beneficiary of the existence and use of the platform, contributing to the digital economy with the results of activities using the platform. Beneficiary’s purpose and requirements that such a beneficiary makes to the platform.
3. The level of information processing in the platform. To achieve the effect of what level is the processing of information coming to the platform from the participants aimed:
 - to perform a specific technological process of information processing (aggregating the implementation of a number of technical operations specific to a particular information processing technology),
 - to obtain information for decision-making (aggregation of the use of a number of technologies use within the automation of an individual economic entity business process),
 - to obtain a business effect from the provision of goods/services to the consumer (aggregation of the use of a number of separate automated business processes as part of an economic transaction between economic entities).
4. Infrastructure digital platform. What the “single information environment” is and what it consists of with the usage of which activity of the subjects of the digital economy is carried out.

An infrastructural digital platform for research and development, as well as the use of the results of intellectual activity, will be an effective tool to ensure the collection, validation and processing of information (including big data), cooperation and cost reduction for key market participants in solving the problems of transformation of the digital economy as a whole, including development and testing by the professional community of the necessary standards, development of draft legal and regulatory instruments, and training of personnel [6].

The participants and beneficiaries of the platform may be: customers of products and services for consumers, research, including testing products in the relevant field; development team of VR/AR solutions; testers of products and services (both individuals and legal entities, networks of these individuals); investors in the development and commercialization of relevant solutions (federal and regional development institutions, venture funds, etc.); vendors of educational programs/services for platform participants; manufacturers/sellers of necessary equipment; external “service” specialists for development teams: engineering and technical workers providing specific services to development teams, technology brokers, scientific, technical and economic experts, fundraising specialists, including foreign ones, lawyers, translators, foreign market specialists, patent attorneys and others; organizations involved in monitoring the implementation of the roadmap for the development of end-to-end digital technologies, development of priority sectors of the economy and social sphere (centers of competence of the national program “Digital Economy” [7], federal and regional executive authorities).

The ecosystem solution in the form of the Platform should include integrated modules that ensure the operation of the Platform as a whole, as well as the ability to freely and quickly connect external modules and resources (including independent information systems), for this an API (program interaction protocol) should be implemented, as a key element of the Platform (Fig. 1).

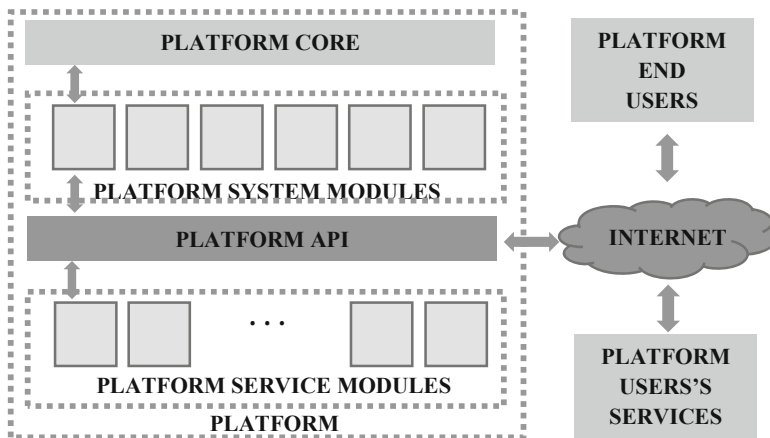


Fig. 1. The functional architecture of the Platform and the connection of external modules and resources and the work of the end users of the Platform (Source: authors).

The protocol of the program interaction should provide simple and fast communication of all modules of the Platform (including not only system and service modules, but also user ones), flexible functionality for integration with new services (including external independent information systems), and also provide a simple way to implement the client-server communication model through REST-services [10]. This component of the Platform should have sufficient documentation to build new modules of the infrastructure solution and ensure uninterrupted operation of existing services with the core of the Platform. The digital infrastructure research and development platform should be placed on the global Internet with free access for potential users of the system, and therefore, a solution in the form of a web interface should be provided for end users of the platform. The Platform's web interface should work with the Platform's API protocol for system and continuous updating of the functionality provided to users, including the possibility of controlled access to protected system modules. Platform system modules ensure the overall operation of the Platform and its integrity, in fact being the main mechanism that controls the work of the Platform.

External to the platform architecture will be end users and user services. End users are the direct beneficiaries of the Platform products (individuals or legal entities). Their interaction with the Platform can be carried out through a web interface that provides access to all the functionality of the Platform depending on access rights, or directly using the Platform API, bypassing the web interface, or using user services. By user services are meant those services that use the resources of the Platform in their work (data, methods of processing and analysis, libraries of objects, etc.), but which are neither a service nor a system module of the Platform. User services can act as an add-in on the Platform, expanding the functionality of the Platform, providing users of these services with additional features. These services can be represented in the form of independent digital solutions with their own architecture, information storage and processing system, billing and other attributes. In the interaction of user services with the Platform, they must not violate the terms of use of the Platform, in particular regarding the processing of personal data of the participants of the Platform, the work of the billing service and interfere with the performance of the Platform as a whole.

In addition to the technical support of standard services of this type for a digital platform (a service store (marketplace), a billing subsystem, systems of a guaranteed level of fault tolerance and data safety, physical protection of data from transmission outside the system), aimed at ensuring the successful functioning of a distributed trust system between participants during implementation joint activities and mutual settlements, the task of the platform is to provide participants with access to unique information (including predictive analytics), to reduce the transaction costs of access to specialized information as a whole.

4 Discussion

The platform is able in the medium term to collect a critical amount of data on:

1. Technological trends in the development of markets for products/services based on the use of digital technologies "Virtual and Augmented Reality Technologies", to

reveal new niches for their application (analysis independently recorded by profiles participants of the orders for the development, testing, services of “service” specialists analysis of used technologies and etc.).

2. Requirements for “digital” skills for employers and for developers of digital solutions and “service” specialists.
3. Highly qualified specialists available on the specialized market, companies-customers, investors, including the formation of the specialization of these companies.
4. The variety of existing technological systems for the division of labor (used to produce products (services), obtain new knowledge, engineering solutions and technologies), as well as information on options for constructing new CPT that arise when solving common problems by heterogeneous participants in the platform.
5. Used (demanded) by developers and customers of the subject-technological variety (a set of products and technologies on the market), options for the use of its specific components in existing systems of division of labor.

The data collected in this way can become the basis for creating the Platform services using other end-to-end digital technologies (distributed registry systems, wireless technologies, robotics and sensor components, neurotechnologies and artificial intelligence, quantum technologies, new manufacturing technologies), which will increase competitiveness of the Platform participants in the domestic and foreign markets. In addition to the significant socio-economic effects indicated above, the creation of the Platform will have an impact on:

1. The scaling of existing businesses and creating new businesses in the market of products and services based on the use of end-to-end digital technology “Virtual and Augmented RealityTechnologies”, the formation of a soft infrastructure to support these activities, which provides a business advantage for such companies compared to their foreign competitors.
2. Formation of cooperation of existing and new market participants (building technological consortia), the formation of flexible technology transfer mechanisms that facilitate the effective translation of business requests for scientific and technological developments.
3. Promotion of Russian technologies and innovative products to new markets by lowering the threshold for entering the market, the ability to scale business and achieve synergies between different market participants, and, as a result, the competitiveness and global technological leadership of Russian companies.
4. The diffusion of new technologies and the formation of new technological systems for the division of labor.
5. Ensuring a full cycle of acquiring new knowledge, developing qualitatively new technologies, creating innovative, breakthrough products and services, creating new markets.
6. Acceleration of the development and implementation by the professional community of the necessary standards, draft legal and regulatory instruments (platform ecosystem being a platform for teamwork and testing of developed standards and piloting the use of normative legal acts developed for approbation of the use of NAP).

7. Formation and approbation of new effective mechanisms for training/retraining of specialists taking into account their digital profiles and the requirements for their “digital” skills presented by employers (platform ecosystem being a platform for obtaining the necessary data from participants and piloting the developed mechanisms).
8. Formation and approbation of new mechanisms for financing the development and implementation of end-to-end digital technologies, management of these processes (platform ecosystem being a platform for obtaining the necessary data from participants and piloting developed mechanisms).
9. The development of the specialized market as a whole, reducing the cost of its monitoring and monitoring the implementation of the roadmap in the relevant area of end-to-end digital technologies on the part of competence centers, development institutions and authorities.

5 Conclusion

The ecosystem tool for transforming the digital economy proposed by the authors, an online platform for creating and distributing VR/AR solutions, will allow cooperation and cost reduction for major market participants while overcoming the following technological barriers: low digital literacy of the working-age population; lack of understanding of the features and possibilities of using VR/AR in a professional environment, insufficient number of specialist developers for projects with VR/AR and the high cost of creating high-quality VR/AR content; lack of VR/AR content in consumer and specialized fields; the long alignment process of pilot projects for implementation in state corporations and industrial enterprises; lack of domestic industry standards for design systems (CAD) and universal VR/AR devices.

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The Role of Environmental Security in the Country's Economy

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Abstract. The article analyzes the main internal threats to Russian environmental security, identified in the development strategy. A comparative analysis of the world's countries on the pollution index and climate index is conducted. The position of the selected countries according to the values of these indexes is shown. The importance of environmental security in the economy of the country is noted. The economic component is considered in terms of the industrial enterprises activities, as well as in terms of the impact on the population as a working economic resource. Conclusions on the current situation and dynamics of key indicators of Russian economic security and the significance of these parameters for the country's economy are drawn.

Keywords: Climate index · Economic well-being · Environmental security · Pollution index

1 Introduction

Nowadays, environmental security of the country becomes more and more important. This trend is primarily related to ongoing global climate changes and the current pandemic situation. On the one hand, it should be noted that most industrial enterprises have to make significant efforts to meet all the environmental requirements [2, 10]. This means a significant cost in the activities of Russian enterprises, which affects the volume of profits and, as a result, the contribution of these enterprises to the country's economy. On the other hand, the well-being of the population depends on the level of environmental security of the country [4, 7]. This facts show the economic component of the situation. This affects the quality of life and well-being of the population, which affects one of the main economic resources of any country-the state of the labor force. In this regard, we can draw a conclusion on the importance of studying environmental security factors in the context of studying economic issues of the country.

2 Methodology

During the study, considerable attention is paid to the issues of the environmental security assessment of various countries. The analysis of the current legislation of Russia on issues of environmental security is carried out. Currently, this document is “The strategy for environmental security of the Russian Federation” for the period up to 2025. The study also compares the indicators of the pollution index and the climate index of specific selected countries and compares the Russian indicators with them. Russia’s position on the pollution index over the past 9 years is analyzed.

3 Results

Nowadays, one of the main documents regulating the development of environmental security in Russia is the “The strategy for environmental security of the Russian Federation” for the period up to 2025. Under the strategy, some of the internal challenges are aspects of high degree of environmental pollution, air and water pollution, waste increasing, and threats to security related to the environmental impact of enterprises and the population [8]. The main goal of this strategy is to achieve the country’s environmental security by eliminating external and internal threats. It should be understood that the elimination of threats is possible only with an objective assessment of the current state of the situation.

In world practice, two main indicators are used to assess the level of environmental security: the pollution index and the climate index. The pollution index shows the level of pollution in the country. The climate index shows the degree of variation in temperature indicators in terms of deviations from the average values on specific territories.

In this study, the situation will be considered based on the ranking of countries on the pollution index. Three countries with the lowest level of environmental pollution, three countries with the highest level of environmental pollution, and Russia have been selected for the analysis. Thus, the selected countries included Finland, Iceland, Sweden, Russia, Vietnam, Nigeria and Lebanon. These countries were used to compare the position in the ranking and the value of the pollution index with the position in the ranking and the value of the climate index (Table 1).

Table 1. Countries position on the pollution index and climate index in 2020.

Country	№ in the ranking on the pollution index	Pollution index	№ in the ranking on the climate index	Climate index
Finland	1	11.55	10	58.87
Iceland	2	16.21	21	68.81
Sweden	3	18.09	29	73.97
Russia	49	62.79	4	40.36
Vietnam	78	86.47	24	71.24
Nigeria	79	87.63	12	60.75
Lebanon	80	88.37	71	94.74

Source: authors based on [5].

As you can see from the table, Finland is on top of the ranking on the pollution index, which has the lowest level of pollution among the 80 countries included in the ranking, and is 11.55. At the same time, Russia ranks 49th out of 80 in the ranking on the pollution index. The Russian pollution index exceeds the minimum value of Finland by more than 5 times. The most polluted countries according to the ranking are Vietnam, Nigeria and Lebanon, which occupy the last places in the rating. Moreover, the pollution index of Lebanon exceeds the pollution index of Finland by almost 8 times, and it exceeds the pollution index of Russia by 40%.

Next, analyze the values of the climate index. It is easy to see that among the analyzed countries, the value of the climate index is minimal in Russia, it is 40.36. In other words, temperature fluctuations in Russia are minimal compared to other selected countries. At the same time, Russia ranks 4th in the global ranking on this indicator. The leader on the pollution index, Finland, takes only the 10th place on the climate index, its value exceeds the value of Russian indicator by more than 45%. Lebanon also takes the last place among analyzed countries on value of the climate index. However, globally, it is only 71 out of 80. The values of the climate index of Lebanon exceed the Russian values by more than 2 times. We can say that the level of environmental pollution can affect the climate situation in the region, but there is no direct relationship that would affect the indicators of the pollution index and the climate index. Since the value of the pollution index was chosen as the main one, it makes sense to analyze the value of this index in Russia in dynamics (Table 2).

Table 2. Dynamics of the Russian pollution index

Year	Place in the rating	Pollution index
2012	45	104.67
2013	55	78.2
2014	60	76.45
2015	62	72.7
2016	40	64.44
2017	43	63.04
2018	44	63.26
2019	47	62.8
2020	49	62.79

Source: authors based on [5].

The tables show that Russia's position in the ranking has been changed a lot over the past 9 years. This is due not only to changes in the index values, but also to changes in the total number of countries in the ranking. At the same time, the index value kept decreasing. This trend is primarily connected with changeable requirements to environmental security in the world. There is an increasing understanding of the need to improve environmental security, analyzed from the one of the main aspects of ensuring the population activity. An irresponsible attitude to environmental security can lead the

country to bad consequences, such as species extinction, fresh water disappearance and much more. Thus, all threats identified in the strategy require careful assessment, consideration and elimination. It makes sense to pay attention to the policy of countries regarding the environmental security issues that are higher than Russia in the ranking. The directions of the development strategy can significantly affect the situation of the country.

4 Discussion

Dunaev, Leont'yev, Repkina, and Marti note the importance of studying the issues of environmental security of the country from the point of view of ensuring the high-quality functioning of the tourism industry as a country's economy component [1]. In their work, Tian, et al. analyze environmental security issues in the context of land use and health risks for people who work on the land [9]. It is expected that this study will draw attention to the issues of ensuring and controlling the country's environmental safety. Kofanov, et al. using mathematical modeling, predict the impact of industrial enterprises on the environment and environmental security of the country [3]. The results of this research are used to modernize the environmental risk management system in industrial activities. Piskorskaya and Malanina analyze in detail the issues of ecologization of the economy, analyze the environmental condition of the largest industrial facilities, and note the importance of environmental management and environmental consulting for the country's economy [6].

5 Conclusion

The environmental security strategy is the main document regulating environmental security issues in various countries. Requirements, standards and measures that make it possible to increase the level of environmental security and, as a result, the level of well-being of the country are comprehensively written in this document. There is no doubt in importance of environmental security for the country's economy. This is due to the fact that the country's population, enterprises and other economic entities carry out their activities within the framework of environment. These subjects have a significant impact on each other, and it is impossible to imagine any economic aspects of the enterprises functioning without the influence of environmental security. This is confirmed by the fact of a detailed joint study of these issues by domestic and foreign researchers.

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Statistically Based Development of Corporate Innovation Metrics System

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Abstract. Performance assessment of any company is a complex process that includes a comprehensive analysis of its market position, opportunities and threats from the external environment, and weaknesses and strengths within the organization. To make a competent management decision related to the innovative activity of an enterprise, company managers must have appropriate information. There are no universal metrics to measure innovation. The aim of this paper is the formation and adaption of statistical market indicators to assess innovation efficiency. These indicators are benchmarks that help identify key factors and aspects of innovation. The evidence is from consumer goods industry. The proposed metric is applied in IMS Company. Statistics indicate a decline in innovation activity in the industry. That indicates the need for the development of programs to support innovative entrepreneurship.

Keywords: Dynamics · Innovation · Metrics · Statistics

1 Introduction

Traditionally, to assess the company's performance, experts use three methods: cost-based approach, comparative (market) and income approach, which are used to determine the current market value of the company, to offer options for improving the management mechanism and increasing the company's value. Using classical methods of evaluating any type of company property, they refer mainly to the reasonable costs resulting in a new product. The application of all these practices is based on the analysis of retrospective indicators, i.e. all factors that affect the feasibility of activities and possible development of the company, or on the contrary, on the expected deterioration of its position. The reasoning below all these approaches is that the activity under study already exists in the market. Therefore, as a result of comparison with similar existing companies the experts form their recommendations. The comparison is traditionally based on the data of companies' profitability, number of sales, quality of services, analysis of assets and liabilities, capital turnover, accounts payable and receivable, and other business activity indicators. The recommendations are related to forecasts of the company's activities, transactions, and decisions about development,

building cash flow, building partnerships, risks, and the likelihood of mergers or acquisitions.

All of these methods can only be used partially and with high professional judgment to measure innovation, since they measure past, and therefore delayed, performance, rather than future opportunities and potential, which is an anticipatory indicator. However, for most firms it is very important to monitor existing benchmarks and create a system of supporting or forward-looking performance indicators. Without such actions, it is impossible to determine how successfully the company's work is being organized, make competent management decisions, predict the future, and consider and implement special financial mechanisms aimed at innovations, supporting and commercializing them. There is a growing opinion in the academic community, that an assessment of a company's innovation activity is possible based on an analysis of the market situation and the current state of the company, with the ability to predict its position, anticipate and prevent risks.

The issue of innovative activity metrics for enterprises and industries is debatable in the academic papers. For example, in [2], a methodology for RandD innovation indicator, which is based on an empirical assessment of the market by interested investors, is suggested. At the organizational level, the methods are developed for assessing company's innovative potential based on its organizational and financial positions [1, 5]. The industry assessment of technological innovations (on the example of risky activity) based on the effectiveness of market instruments for their financing is considered in [3]. A new procedure based on a multi-criteria taxonomic method is proposed for assessing the innovative level of the territory [13]. The variety of approaches to measuring the effectiveness of innovations encourages the search for the best practical application in a particular company.

2 Methodology

This study is aimed at formation and adaptation of market statistical industry indicators for evaluating the effectiveness of innovations. It is hypothesized that there is a direct correlation between innovation efficiency and corresponding summarizing indicators. The research is based on the data published in international databases, materials from the Federal Statistics Service database, observations and evaluations of the authors [4]. Research methods applied in this paper are the following ones: analytical and statistical generalization and analysis, trend analysis, tabular and graphical methods. These methods allowed revealing the core of certain innovations and their practical application to a specific branch of the economy (consumer goods industry or light industry); they allowed quantifying the dynamics of innovation processes and visualizing it. The study was initiated by Innovative Management Systems (IMS), the company that operates in consumer goods industry.

The concept «light industry» or «consumer goods industry» has not been used in the Russian Federation for 15 years. It is connected with the introduction of Russian Classification of Economic Activities [11]. In part D «Processing Industries» of this Classification two subsection are determined:

- DB – «Textile and clothing industry»,
- DC – «Leather goods and footwear industry».

The term «consumer goods industry» or «light industry» is an umbrella term for those types of economic activities. IMS, which is an innovative research and technology laboratory at Peoples' Friendship University of Russia, aims to organize processes that support the development and introduction to the market of new goods and services for the consumption of citizens and the continuous improvement of their quality of life. The company organizes training programs and courses focused on the development of professional competencies and training of specialists for the sectors of the national economy and small business, the implementation of research and development. The company supports invention, international cooperation with foreign universities, experimental and design laboratories, technological and manufacturing companies. Since the company is a young one, it can be noted that at this stage, almost all areas included in the portfolio are at the stage of development and implementation, or preparation for implementation. Constant analysis of each segment in the product portfolio, the company's development strategy, and the commercialization project require constant research, design, marketing, scientific and technological strategy of innovative, and practical nature.

3 Results

In this section one the activities of IMS from the company's product portfolio is analyzed. Namely, it is an organizational innovation processes aimed at supporting the innovations for the free market in the form of consumer goods. This activity is important and connected with:

- a wide range of products for everyday consumption, produced by small and medium-sized enterprises,
- the dynamics of changes and new offers in the market,
- rapidly emerging demand from consumers, which is the result of increasing information transfer in the era of digital space formation and social change,
- the improvement and acceleration of the technological process aimed at automating production enterprises.

Since IMS is a small innovative enterprise its priority is represented by design and development of new consumer products and services, organization of processes for creating and supporting innovations, training the specialists for different segments of the consumer goods market (from ideas and design to implementation and work on constant updating of the product range). Taking into account the professional and practical experience and scientific potential of IMS, an important direction of the company is the implementation of research and development, design works, description of technological processes and introduction of new consumer goods at light industry enterprises.

IMS aims to evaluate the effectiveness of its innovation efforts. In its "pure" form, such an assessment is difficult, since innovation is not always expressed by a

fundamentally new product, the profit from the sale of which is easily measurable. In this case, it is necessary to turn to the statistical analysis of the market situation in the industry, to the dynamics and forecasting of innovation processes.

It should be noted, that innovative activity of the companies in consumer goods industry (subsections DB and DC) relative to other processing industries (part D) is quite intensive. In the list of all manufacturing innovation-active enterprises, the DB and DC subsections have high values - 13.1% and 8.5%. This is both due to the support for the development and introduction of new consumer goods in Russia and due to the activation of the import substitution program in recent years (Table 1).

Table 1. Innovation-active DB and DC companies in the processing industries (%)

Types of economic activities												
DA	DB	DC	DD	DE	DG	DH	DI	DJ	DK	DL	DM	DN
12,2	13,1	8,5	7,1	3,1	25,0	12,1	9,7	13,4	14,3	25,9	19,0	16,6

Source: authors based on [4].

Light industry enterprises are quite active in the innovations. Products are developed and implemented in the industry very quickly, as they require constant updating, and are characterized as products for the free market and for active consumer consumption. Moreover, all of them are subject to rapid change and adaptation in the market in accordance with many factors. Among those factors the following are: the geographical location, seasonality, cultural characteristics, gender and age characteristics of consumers, their income, social level, demographic characteristics, anthropometric data, requirements for the operation of products and their purpose.

Different requirements for the quality and quantity of finished products from different groups of consumers cause manufacturers to constantly think about the need to develop new business processes. They must comply with sales forecasts and analysis of consumer expectations. This situation is relevant both in the B2C and B2B markets, in various price segments, from the democratic “mass market” to “De Luxe” and “Haute Couture”. In this area, they form a constant demand for various innovations: marketing (focused on constant demand and supply), technological, and organizational. Various types of innovations in consumer goods industries are analyzed further in this section.

Marketing innovations are focused on the analysis of supply and demand, product positioning, forecast of future consumer expectations, as well as methods for introducing new types of goods and services into the market space, expanding their promotion and sales opportunities. Research and statistical analysis of the market of consumer goods industry products are carried out by many analytical and marketing agencies, as well as sales departments of manufacturing and trading companies.

Technological innovations in the industry occupy a leading position considering the progressive movement towards the digital space and automation of industry enterprises with a focus on the “Industry 4.0” program. A significant share of consumer goods industry enterprises carry out innovative activities using information technologies aimed at improving methods and techniques for designing and manufacturing new products, and ways of their high-tech mass production. On the other hand, innovations

may concern the “Haute Couture” segment of high fashion. This is the sphere of high-quality and labor-intensive production, which includes a large share of manual operations that are the embodiment of art, and the basis of the brand.

Organizational innovations in the industry are necessary, as they are the basis for organizing business processes starting from the formation of a knowledge complex necessary for the emergence of an idea, to the possibility of its implementation and commercialization. They determine the main algorithm for the development of the company’s business processes in the future, because consumer goods industry products are fast-changing and dynamic. They require a variety of approaches to their development, pilot cycle, production, and implementation methods. Trends in consumer goods move in waves, i.e., they quickly fill the demand space and just as quickly leave it. Therefore, business processes are very dynamic. That requires constant development of strategy, individuality and flexibility in making management decisions, as well as dynamic functions of transaction organization and control. Based on this, the main participants in this segment are small businesses that are increasingly uniting in communities.

The share of innovative activities in the overall structure of innovative-active companies in Russia, including IMS, is insignificant. It is equal to 6.3%. Speaking about the commercialization of all scientific developments, it is worth noting the position of innovative enterprises associated with research and development in the territory of the Russian Federation. Their share in the total structure equals to 30.7%. Unfortunately, the dynamics of this indicator shows a sharp decline after 2014 (Table 2).

Table 2. Innovation-active companies operating in research and development, 2011–2018 (%)

Years	2011	2012	2013	2014	2015	2016	2017	2018
%	29,8	30,1	31,0	33,3	32,2	30,7	29,8	27,5

Source: authors based on [4].

There can be different reasons for this decline. Most likely, the priority innovation areas and the ways to support them were chosen incorrectly, and the methods of commercialization were not correlated with the real needs of the market. Therefore, it is necessary to carry out constant work related to market forecasts, its prospects and expectations, and then develop and implement the most popular innovative processes and support them in the market.

In this study, the forecast based on the time series model shows the value of 25.1% in 2020. Stagnation in the field of innovative scientific activities is likely to continue in the near future. The innovation activity of enterprises in each DB and DC subsections by the type of innovation is shown in Table 3.

The results of statistical analysis demonstrate that the enterprises in the DB subsection have become innovation-active in recent years. In 2017, the share of enterprises with technological innovations exceeded 14%. In terms of marketing and organizational innovations, there has been a decline in activity in this group of enterprises. There is a lack of innovations in leather and fur companies (DC) after the successful 2014. The downward trend is observed in the share of organizations in this subsection

Table 3. The dynamics in the share of DB and DC innovation-active companies in 2010–2018 (%)

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018
Technological									
DB	7,5	7,2	7,3	7,0	7,5	9,0	11,4	14,9	12,9
DC	8,1	5,8	3,8	10,8	11,7	11,1	7,5	6,7	6,5
Marketing									
DB	2,1	1,2	2,8	2,8	3,1	4,0	4,3	4,0	2,8
DC	2,2	2,2	2,3	1,5	1,8	2,0	0,9	1,1	1,8
Organizational									
DB	2,1	2,2	2,8	3,0	3,5	3,3	2,8	2,5	2,8
DC	4,4	3,6	3,0	1,5	1,8	2,0	1,9	1,1	0,9

Source: authors based on [4].

of consumer goods industry. At the same time, the companies of this group have been more active in the field of innovation in relatively recent times than the enterprises of the DB group. Thus, in general the statistical data supports the hypothesis that there is a slowdown in the innovation activity of consumer goods industry.

4 Discussion

The most common and traditional way to measure a company’s innovation performance is to create a chart that shows what percentage of revenue for the current year was derived from the sales of products and services that were introduced to the market over the previous few (usually four to five) years. Indicator systems determine whether the focus will be on products and processes or on the changes in the business model. Indicators (metrics) of innovation help to analyze the organization’s ability to innovate. They also serve as a measure of success by expressing the company’s strategic interests, for making competent decisions aimed at long-term prospects and careful consideration of risks. They help in advance to identify weaknesses and processes that are not funded in accordance with the goals, and direct employee motivation mechanisms to be active and entrepreneurial, encouraging them to create innovations and strive for high-quality completion of their tasks.

The research, in which the development and effectiveness of innovations is evaluated in correlation with the external environment, has recently begun to appear, but is not yet widespread. In the literature, the main attention is paid to such an aspect of the business external environment as greening [7, 14]. The most interesting study that has analyzed a set of factors is [10]. In that study the intensity of a firm’s innovation activity is strongly and statistically significantly related to the sector in which the firm operates, but the correlation is insignificant with the level of competition. The impact of digitalization of the economy and the creation of appropriate infrastructure are considered in [6, 9], and state support in the field of innovation is analyzed in [8]. A number of works, for example, [12], analyze the factors of influence of the world

economy, which are manifested in the influence of the type of economic system and cross-country cooperation on the level of innovation activity in the state. This research focuses on the case study of a company from consumer goods industry and evaluates innovations under the influence of the market situation in the Russian Federation.

Since it would be problematic to develop an ideal innovation metrics, analytics and researchers could offer their ideas. Indicators used to measure and evaluate innovation should be carefully considered, recognized as objective and understandable to all employees involved in creating innovations. The rationale for those indicators should be justified and based on the situation in the industry, the position of the enterprise in the market, existing problems or unsolved problems, the company's own internal capabilities, its competitive environment, and the formulation of the strategy as a whole. Statistical analysis of the external environment plays an important role in this process. The analysis provides information for evaluating the effectiveness of innovation activities.

5 Conclusion

It was found that the tense situation in the innovation activity of enterprises in the Russian Federation is largely due to weak organizational processes and a lack of tools for their development. It is obvious that high-quality organizational innovations, that are scarce in the industry, can reorient the market to the growth of economic indicators in the country as a whole. In this regard, there is a need to create a favorable environment for creating and implementing innovations, improve legislation and develop programs to support innovative entrepreneurship. These programs can be considered as the main element in the tools for developing innovation in consumer goods industry in the country.

Continuous analysis of quality characteristics of consumer goods industry enterprises is necessary to determine the timeliness of development and implementation of organizational, marketing and technological innovations in IMS. Those guidelines should comply with the company's mission, goals and strategy. Such guidelines help to identify key factors of innovation (metrics), based on which the company's management makes decisions on the feasibility of a particular type of activity, developing a direction, investing in business processes, creating an effective innovation environment, methods and forms of motivation for participants in the innovation process. The definition of metrics in IMS, is based on the characteristics of innovation, and is defined as a system of indicators that gives an understanding of whether the company's efforts will be focused on minor improvements or on major achievements; on products and processes, or on changing the business model.

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Effectiveness Assessment of Russian Special Economic Zones of Industrial and Production Type

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Abstract. The purpose of this research is to evaluate the contribution of industrial-type special economic zones (SEZs) to the economy of the home regions and assess the effectiveness of their activities. Despite the fact that special economic zones have proven their effectiveness in many countries of the world, their functioning in Russia is evaluated ambiguously. The article analyzes the development dynamics of nine special economic zones of industrial and production type in Russia on the basis of socio-economic indicators, and identifies leaders and outsiders of the rating. It is shown that the role of special economic zones in the economic development of Russian regions is insignificant: the share of SEZs in the total number of employees in the studied regions does not exceed half a percent, in investment – one percent, in shipment – three percent.

Keywords: Development · Economic growth · Investment · Special economic zones

1 Introduction

Nowadays, the competitiveness of the Russian federal subjects depends largely on their investment attractiveness. This is determined by the fact that attracting investment resources to the economy of the region contributes to technological renewal, redistributes the structure of activities in favor of high-tech industries, information and communication networks, which has a positive impact on the socio-economic development of a territory. Special economic zones are one of the forms for attracting investment to regions.

The first official definition of the concept of “free economic zone” was given in May 1973 in the framework of the Kyoto International Convention on the Simplification and Harmonization of Customs Procedures [9]: a free economic zone is a part of the territory of a single state where imported goods are usually considered as goods that are outside the customs territory in relation to the import right and related taxes and are not subject to normal customs control.

The International Association for the Development of Free Economic Zones (IAD-FEZ), established in 1990, defines free economic zones as a special territorial and economic entity, usually open to financial and economic activities of any country, conducive to economic, scientific, technical, environmental and social development, specially

created by additional delegation of rights and powers to it by federal bodies, bodies of federal subjects and municipal bodies with strictly fixed and observed borders, free zonal legislation, budget, tax system, and management bodies [11].

The interpretation of special economic zones as international economic formations that acquire a global character and cover all countries of the world, both developing and developed, is found in the works of Dhingra [5]. These zones are used for intensive integration of entire regions into the system of world economic relations, which significantly contributes to the development of the economy of individual territories [15]. Special economic zones are considered as a complex multidimensional phenomenon, the defining features of which are: a innovative, global character, and a positive impact on the regional development.

In accordance with paragraph 1 of article 2 of the Federal Law No. 116-FZ of 22.07.2005 [6], the SEZ is a territory defined by the government of the Russian Federation, where special business conditions and the procedure for a free customs zone can be applied [16].

The mechanism of public-private partnership in the SEZ is implemented as follows: the state invests money in a certain SEZ, creates the necessary conditions for business, research, tourism activities, namely, finances various infrastructure objects: roads, heating, electricity, and water supply systems, works out a concept for the development of this zone, etc. Private investors build the infrastructure of the SEZ through financing commercial facilities. The state also provides SEZ's residents with significant tax and customs preferences, guarantees protection of their rights and interests from adverse changes in the legislation of the Russian Federation. Another favorable factor for residents is a special administrative regime, which involves reducing bureaucratic barriers and quickly resolving all sorts of procedural issues.

The main competitive advantage of the SEZs is a possibility of a significant (up to 30%) reduction in the initial costs of the investor for the implementation of investment projects due to the availability of a new ready-made modern infrastructure and, of course, tax, customs and other preferences [13].

Special economic zones have proven their effectiveness in some countries: both in Asia [8, 12] and in Europe [4, 7]. In Russia, despite functioning of special economic zones since 2005, a number of researchers note that the feasibility of their operation is still a debatable issue [3, 13, 14]. In 2016, 8 SEZs were closed as a result of an audit check conducted by the Audit Chamber of the Russian Federation [18].

2 Methodology

The theoretical basis for the study of special economic zones is based on the concepts formulated in the fundamental scientific works of foreign and domestic scientists. The sources of statistical data are official data from the Federal State Statistics Service of the Russian Federation, the Ministry of Economic Development of the Russian Federation, and information from websites of operating special economic zones of industrial and production type.

One of the key research methods was the method of multi-dimensional ranking of SEZs by effectiveness indicators and the contribution of SEZs to the economy of the

region. For the analysis, 2 blocks of indicators were formed. The obtained values of indicators allowed to form a rating of SEZs, on the basis of which a matrix is constructed that characterizes the SEZ's effectiveness.

The following methods were also used in the study: methods of comparative analysis of socio-economic processes, generalization and systematization of facts, logical and historical methods of scientific research. In general, the choice of research methods was based on a comprehensive analysis of Russian and foreign experience in studying special economic zones. The use of all the above methods ensured the objectivity of the obtained results and the validity of the made conclusions.

3 Results

At the beginning of 2020, there were 28 special economic zones in Russia, including 10 industrial SEZs, five of which are located in the Central Federal district (Kaluga region, Lipetsk region, Moscow region, Tula region, Voronezh region), two are located in the Volga Federal district (Republic of Tatarstan, Samara region), one in the North-Western Federal district (Pskov region), in the southern Federal district (Astrakhan region) and the Ural Federal district (Sverdlovsk region). Their priority areas of their activity are: automotive industry and production of automotive components, production of construction materials, production of medical equipment, pharmaceutical production, shipbuilding, instrument making, production of household appliances. Let's analyze the performance of residents in special economic zones of industrial production type in Russia as it was at the beginning of 2019. The SEZ "Center" of industrial and production type was not included in the analysis, since in 2018 there were no residents in it (Table 1).

The leader in the number of newly created jobs (more than 8000 new jobs) with the involvement of more than 126 billion rubles of extra-budgetary funds of residents is the SEZ "Alabuga". Alabuga also achieved the highest labor productivity – 11.6 million rubles and the maximum number of residents – 66. Lipetsk is a fairly well-functioning SEZ. In terms of the number of created jobs, labor productivity, and the number of residents, this SEZ is on the second place. Outsiders are SEZ "Uzlovaya", SEZ "Mogolino", and SEZ "Lotos", with a minimum level of labor productivity and a number of residents.

Next, the authors evaluated the effectiveness of special economic zones and their contribution to the economy of the home region, using socio-economic indicators for existing SEZs of industrial and production type in 9 regions of the Russian Federation based on open data from the websites of regional development corporations, special economic zones, and official statistics. To assess the effectiveness of SEZs, indicators proposed by the analytical center "Expert" were applied [1] (Table 2).

The effectiveness of considered SEZs was evaluated by two groups of parameters: activity scale (the SEZ's contribution to the regional economy is estimated by four indicators); efficiency (labor productivity, ratio of investment by residents and number of created jobs). List of indicators used to characterize the contribution of SEZs to the regional economy includes: Indicator 1 – created jobs (total)/number of people employed in the region; Indicator 2 – volume of investment by residents 2017–

Table 1. Performance indicators of Russian SEZs of industrial and production type

Indicators	SEZ «Alabuga» (2005)	SEZ «Kaluga» (2012)	SEZ «Lipetsk» (2005)	SEZ «Lotos» (2014)	SEZ «Mogilino» (2012)	SEZ «Stupino Quadrat» (2015)	SEZ «Titanium Valley» (2010)	SEZ «Togliatti» (2010)	SEZ «Uzlovaya» (2016)
The number of jobs created since registration of the SEZ, people	8041	1784	4364	752	119	420	431	1321	708
Labor productivity, million rubles/person (2018)	11,6	2	5,1	0,5	1,3	4,7	4,5	3,4	0,4
Extra-budgetary funds of residents for the accumulated total, million rubles	126395,2	18713,3	61036,2	1190,9	1526,1	4984,4	6952,5	12361,2	6945,2
Regional budget funds accumulated in total, million rubles	8626	948,3	3140,5	290,4	311,9	0	2120,6	585,8	925,1
Federal budget funds accumulated in total, million rubles	17078	3384,3	7928,9	482,7	2184,4	0	983,2	4780	0
Number of registered residents (at the end of 2018)	66	16	62	11	12	12	16	22	11
Priority development areas	Polymer processing, automotive, building materials, composite materials	Production of auto components, production of wood products, pharmaceuticals	Energy equipment, automotive, home appliances, medical equipment	Shipbuilding, mechanical engineering, instrumentation, oil and gas equipment	Automotive components, electrical engineering, railway equipment, construction materials	Food, light industry, electronics, medical equipment	Equipment for metallurgy, energy equipment, construction materials, medical devices	Automotive components, chemicals, building materials, pharmaceuticals	Machine tool construction, production of auto components, construction materials, specialized equipment

Source: authors based on [7].

Table 2. Indicators characterizing the contribution of SEZs of industrial and production type in the regional economy

№	SEZ	Created jobs (total)	Number of employees in the region in 2018 (thousand people)	Resident investments (total), mln rubles	Volume of investments in fixed assets, 2017, mln rubles	Volume of investments in fixed assets, 2018, mln rubles	Resident revenue, 2018, million rubles	Shipment volume of the region, 2018, million rubles	Amount of tax deductions in 2018, mln rubles	Own tax revenues of the budget for 2018
1	SEZ «Alabuga» (Tatarstan)	8041	1963,5	126395,2	637612	629731	93114,4	689 612	8916,3	281304,4
2	SEZ «Kaluga» (Kaluga region)	1784	527	18713,3	89030	86508	3523,6	3938	86,6	63577,7
3	SEZ «Lipetsk» (Lipetsk region)	4364	577,7	61036,2	142407	128533	22228,6	7052	1176,42	62766,4
4	SEZ «Lotos» (Astrakhan region)	752	473,6	1190,9	146660	106674	347,4	346022	13,87	42847,3
5	SEZ «Moglino» (Pskov region)	119	300,8	1526,1	29267	31351	153,1	1959	33,2	22438,7
6	SEZ «Stupino Quadrat» (Moscow region)	420	4032,2	4984,4	699918	897801	1959,6	12744	127,1	619887,8
7	SEZ «Titanium Valley» (Sverdlovsk region)	431	2042,2	6952,5	320111	318008	1949	76538	158,9	276608,4
8	SEZ «Togliatti» (Samara region)	1321	1647,4	12361,2	259544	259152	4475,8	368183	242,7	179766,6
9	SEZ «Uzlovaya» (Tula region)	708	759,7	6945,2	128564	154752	297	6153	48,1	76822,4

Source: authors based on [1].

2018/volume of investment in fixed assets in the region 2017–2018; Indicator 3 – resident revenue 2017–2018/regional shipment volume 2017–2018; Indicator 4 – amount of tax deductions (total)/own tax revenues of the budget for 2018. Then special economic zones are ranked according to each of these indicators, after which the average rank is calculated. As a result of the calculations, special economic zones are distributed according to the contribution to the regional economy as follows (Table 3):

Table 3. SEZ's contribution to the economy

Regions	Indicator 1	Indicator 2	Indicator 3	Indicator 4	Rank
SEZ «Lipetsk» (Lipetsk region)	9	9	9	8	1
SEZ «Alabuga» (Tatarstan)	8	7	6	9	2
SEZ «Kaluga» (Kaluga region)	7	8	8	6	3
SEZ «Lotos» (Astrakhan region)	6	2	1	2	8
SEZ «Uzlovaya» (Tula region)	5	5	4	4	5
SEZ «Togliatti» (Samara region)	4	4	2	5	6
SEZ «Mogilino» (Pskov region)	3	6	5	7	4
SEZ «Titanium Valley» (Sverdlovsk region)	2	3	3	3	7
SEZ «Stupino Quadrat» (Moscow region)	1	1	7	1	9

Source: authors.

The Lipetsk SEZ took the first place among industrial and production SEZs, since it provides almost 1% of the employed people in the region's economy, which is the best indicator among the analyzed SEZs. By the ratio of resident investment in 2017–2018 and the volume of investments in fixed assets of the region 2017–2018, Lipetsk SEZ also occupies a leading position. The 2nd and 3rd places were divided respectively by Alabuga SEZ and Kaluga SEZ, which are the oldest on the market. The low positions of SEZ “Lotos” and SEZ “Stupino Quadrat” are explained by the low values of the following indicators: created jobs, investment volume of residents and revenue of residents. The following indicators are used to assess the economic effect of SEZ's operation:

Indicator 5 – resident investment (total)/infrastructure investment (total).

Indicator 6 – revenue for 2018/jobs (all time).

Indicator 7 – number of created jobs (total)/investment in infrastructure (cumulative).

Then special economic zones are ranked according to each of these indicators, after which the average rank is calculated. As a result of the calculations, special economic zones were distributed according to their performance as follows (Table 4):

Table 4. The effectiveness of special economic zones of industrial and production type

Regions	Indicator 5	Indicator 6	Indicator 7	Rank
SEZ «Stupino Quadrat» (Moscow region)	9	7	7	1
SEZ «Lipetsk» (Lipetsk region)	7	8	4	2
SEZ «Alabuga» (Tatarstan)	6	9	3	3
SEZ «Kaluga» (Kaluga region)	5	4	6	4
SEZ «Togliatti» (Samara region)	4	5	5	5
SEZ «Uzlovaya» (Tula region)	8	1	8	6
SEZ «Titanium Valley» (Sverdlovsk region)	3	6	2	7
SEZ «Lotos» (Astrakhan region)	2	2	9	8
SEZ «Mogolino» (Pskov region)	1	3	1	9

Source: authors.

According to the efficiency of the SEZ “Stupino Quadrat” took the 1st place. The key role was played by the fact that in terms of the ratio of total investment by residents and total investment in infrastructure, it is the undisputed leader, taking into account that investments in its development were not made from the federal and regional budgets, while other SEZs received significant budget injections for their infrastructure development. The first three ranks also belong to SEZ “Alabuga” and SEZ “Lipetsk”. Based on the ratings, the authors created a matrix that characterizes the effectiveness of SEZs and their contribution to the region’s economy (Table 5).

Table 5. Matrix describing the effectiveness of SEZ’s activities and its contribution to the region’s economy

Contribution to the regional economy/efficiency of SEZ’s activities	1 rank	2 rank	3 rank	4 rank	5 rank	6 rank	7 rank	8 rank	9 rank
1 rank		Lipetsk							
2 rank			Alabuga						
3 rank				Kaluga					
4 rank									Mogolino
5 rank						Uzlovaya			
6 rank					Togliatti				
7 rank							Titanium Valley		
8 rank								Lotos	
9 rank	Stupino Quadrat								

Source: authors.

SEZs that demonstrated high values for their contribution to the region’s economy and efficiency of functioning were SEZ “Lipetsk” and SEZ “Alabuga”. The outsiders of the rating include SEZ “Lotus”, which took the 8th place both in terms of efficiency and contribution to the economy of the region, and SEZ “Titan Valley” - the 7th place in both parameters.

Of interest is SEZ “Stupino Kvadrat”, which ranks the 1st in terms of its contribution to the region’s economy and last in terms of its efficiency. The leading position is primarily determined by the significant amount of private investment in this territory (the project is implemented on the initiative of private investors and does not have any state participation). It should be noted that most SEZs have not yet become engines of regional development. Their share in the total number of employees in the region, as a rule, does not exceed 0.5%, in investments – one percent, in shipments – three percent.

4 Discussion

Assessment of the role of special economic zones in the country’s economy is characterized by various approaches and studied aspects. Thus, Kapustina proposed a method for evaluating the effectiveness of special economic zones in Russia, which contains only quantitative indicators provided at the end of the reporting period [10]. The proposed methodology for calculating qualitative indicators of the SEZ’s functioning efficiency in Russia characterizes the payback and place of the corresponding projects in the Russian economy [10]. In the article by Bozhko and Menshchikova, these researchers proposed a method for evaluating the annual budget economic effect of creating special economic zones of different types [2]. Development problems of special economic zones were investigated in the work of Vylkova and Tarasevich [17], based on the analysis of SEZ’s indicators and their comparison with the average Russian indicators, results were obtained that are consistent with the research conducted by the authors of this publication.

5 Conclusion

As a result of this research, the authors conclude that despite the fact that in economic systems of many developed countries and emerging markets, the availability of special economic zones is a factor of accelerated economic growth through expanded international trade, increase in investment and deepen economic integration processes, Russia’s special economic zone of industrial and production type have not become drivers of economic growth in most regions. We should recognize the need to improve the SEZ institution in order to improve its functioning and increase the contribution of special economic zones to the regional economy.

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Digital Media in Higher Education: Disruptive or Sustaining Innovation?

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Abstract. This article is an attempt to consider the application of digital media in education from the perspective of Christensen's concept of disruptive and sustaining innovations. At the initial research stage, the hypothesis was formed that digital media as one of the main innovations in the educational sphere of recent decades play an auxiliary role in organizing and realizing the educational process. The authors have reviewed over 500 scientific works published in the period 2019–2020 and devoted to the issue of innovations in the educational environment. The analysis of their content was directed to identification of innovation types used in the higher education of various countries and consideration of digital tools and resources used for educational purposes from the standpoint of the concept on disruptive and sustaining innovations. The methods of synthesis and generalization were applied to build a picture of most popular digital solutions in the sphere of higher education and their innovative nature.

Keywords: Digital media · Disruptive and sustaining innovations · Education · Higher education · Innovations

1 Introduction

Transformations taking place today in the field of education are not so much evolutionary in their nature, as they are related to the global leap that our society is currently making, moving from industrial and post-industrial development type to the cognitive world, a world built on knowledge, information, and over-subject competencies of the future. This transformational process, in turn, is linked with innovation as driving factors of the socio-economic development. Innovations allow us to see, find and use new opportunities that are beyond the currently available resources, opportunities for development in a variety of its directions, forms and manifestations.

Innovations can be different: disruptive and sustaining, scientific, technological, educational, etc., pseudo and real. Each type has its own functional load. Moreover, all types of innovation are closely linked. Living in an innovative society requires a new culture of behavior, entrepreneurship, and understanding of the quality and value of information and knowledge. Innovation itself is impossible without a close link between science, education, and business. This is why there is a need for interdisciplinary research, educational courses and programs nowadays. The purpose of this

article is to consider modern innovative processes in the field of higher professional education in terms of the nature of innovative solutions that exist here. In particular, digital and non-digital innovations in education were considered and an attempt was made to apply the idea of breakthrough and supporting innovations [1] to them in order to analyze their functional load and focus on solving current educational problems.

2 Methodology

The research work was divided into three stages:

- at the first stage of our research, the hypothesis was put forward about the supporting (auxiliary) nature of digital solutions used in education,
- at the second stage, scientific works were analyzed to find out what types of innovations are considered by contemporary researchers, which of these innovative solutions relate to digitalization of education,
- at the final research stage, the authors tried to systemize the considered innovations and divide them into two groups (disruptive and sustaining).

The review of educational innovations was conducted by authors based on their assumption that disruptive innovations in education change the value basis of this system, its foundations, philosophy and main strategic development goals. At the same time, sustaining innovations ensure the viability of the educational system, providing it with opportunities and tools to adapt to rapidly changing external environment, meet new requirements of the socio-economic sphere and face actual challenges.

It is worth noting that both types of innovations are not considered as “good” or “bad” ones. In this context, the authors share the opinion that disruptive and sustaining innovations are essential for any organization [5]. The level of professional education was chosen as it has a lot of interrelations with the socio-economic sphere. For instance, in higher education we can often see significant “nonconsumption” of educational services worldwide [5]. Besides, in our opinion, the higher education is more open for innovations of various types compared with the primary or secondary educational levels. The research material included 500 scientific works published in the period 2019–the beginning of 2020 in journals and conference proceedings and indexed by worldwide popular databases. The search of articles and conference papers was conducted using search registers “keywords” and “titles”. 500 works were chosen based on their topic “innovations in the sphere of higher education” which is relevant for our research.

3 Results

Innovations applied in the educational sphere, we divided into two main groups: innovations based on digital media and non-digital innovations.

The first group is presented through a wide range of technical tools, information resources and technological solutions developed on their ground for educational purposes. Digital innovations range from a simple list of available technical capabilities for

performing traditional educational/teaching tasks (videogames in education, virtual reality technology, playing and educational video in future teachers training, etc.) to fairly complete concepts for learning using of information and communication technologies (blended learning, flipped learning) or applied tools (digital storytelling, artificial intelligence in learning skill assessment) that allow to process new educational tasks or functions or improve the performance of traditional ones.

Conditionally, the most popular digital innovations can be divide into three groups (according to the conducted word analysis of the search results): digital media can be used for teaching or learning, as well as for organizing an educational environment, realization of the educational process as a unity of learning and teaching activities (Table 1). This division is quite conditional as some of technical tools may belong to different categories at the same time. The Table 1 contains only the most frequently used words and word combinations (mention at least 3 or more times).

Table 1. Educational innovations based on digital media

Teaching	Learning	Educational process management
Videogames in education, Gamification approaches for education, Gamified classroom, gamification as a methodological complement to flipped learning		
Playing and educational video in future teachers training	Web-based learning <i>strategies</i>	<i>Interdisciplinary</i> web-based video series
Developing an <i>interactive</i> environment through teaching with small robots	Instructional digital badges as <i>effective</i> learning tools	Innovative learning environment
	Mobile learning	Digital education resources, simulation resources, You Tube as a resource for education
	Tablet learning in higher education	Blended learning
Virtual reality technology, e-library, videoconferencing, augmented reality (as a didactic resource), blockchain and Internet of Things in higher education, multimedia technology, robots, virtual museums as learning agents, artificial intelligence in <i>learning skill</i> assessment, VR technology perspective, smart technologies for developing <i>critical thinking</i>		
		Education and management based on Big Data; data analysis, data-driven <i>decision making for quality education</i>
		Simulation-based education, potential of simulations for developing <i>multiple learning outcomes</i>
Digital storytelling		

Source: authors.

The analysis of tasks that these media allow solving in the educational context corresponds with the authors' position formulated in the framework of previous research, according to which, the potential for using digital media in the educational system lies in 3 different areas:

- ensuring continuity and integration of educational levels,
- organization of the educational process,
- management of the educational system [9].

There are the following application ways of digital media in education process:

- as tools for processing traditional tasks in a special form,
- as a teaching assistant tool,
- as a communication tool,
- as a reality modeling tool [4, 8, 10].

The conducted analytical work shows that the purpose of digital technology or resources application is not always clear. In other cases, it is possible to consider them as instruments that enable to realize the well-known didactic principle on visibility in teaching reflecting Comenius's belief that learning begins with senses (his concept "world in pictures" was itself a pedagogical innovation that opened today's opportunities for digital media use in education). There are a number of other functions that digital innovations provide for learning and teaching. All of them also correspond with the traditional pedagogical principles (developing learning; consistency of training; compliance of learning with life and practice; accessibility; consciousness and activity of students; combinations of different teaching methods and tools depending on the tasks and content; creating the necessary conditions for learning etc.). The essential features of digital media make it possible to implement all these principles in the education process. Digital media act as a comprehensive tool for human development, and their specific features, such as multimedia, interactivity, ability to model reality, communication and productivity, get a functional load in the educational process that allows to develop educational media products and resources on this basis.

Another aspect is orientation of media usage to solution of principally new or relatively new tasks for the modern systems of higher education, these tasks are determined by the requirements of employers, governments and the society development on the whole. Needs for strategic approach, interdisciplinary character of education, high quality and efficiency of education, new learning outcomes expressed in required on the labor market skills and competences (marked in Table 1 *in italics*) are also presented in research of educational innovations based on digital media.

However, the modern requirements of the labor market to the higher education system are more clearly seen in the second group of innovations in education – non-digital innovations. These innovations can be divided into three blocks (Fig. 1):

In this context, we can see intersections with digital innovations rather often, for example, students' critical thinking is developed through "digitizing learning assessment", "smart technology usage", and collaborative education is realized with networking tools and digital platforms. These blocks relate, in our opinion, to current trends in the labor market and reflect the link between economic and educational



Fig. 1. Non-digital innovations divided into thematic blocks (Source: authors).

systems and the direction of educational innovations to meet requirements to future competences of specialists.

Besides, there is an interesting aspect related to multidirectional character of some trends of innovative activity in education. Quite often, we can see in the analyzed sample of works innovative ideas that contradict each other, for example, “challenge-based education” vs. “sustainability”, and “individual educational trajectories” vs. “collaborative, community-based education”. In our opinion, this aspect could be explained through the Riemann-Thomann model, which originally arose as a concept of personality types and is used in psychology and management. Based on 4 basic human fears (values): nearness vs distance, change vs continuance [14, 16], this concept shows which orientations, needs, values, life philosophies prevail and manifest themselves in human behavior. This trend in educational innovations shows a dependence of higher education on possible development scenarios of the world economy and labor market [12]. The relation to values, that is to strategic orientations and mission of modern educational systems, brings non-digital innovations closer than digital ones to the disruptive category.

4 Discussion

Some authors also try to summarize research on implementation of innovations in education. Siddhpura, Indumathi and Siddhpura made an attempt to study this topic in the field of engineering education [15]. Disruptive technologies are considered as a promising tool for ensuring the sustainability of future education by Gejendhiran, Arokia Anicia, Vignesh and Kalaimani [3]. Digital transformation of higher education through the prism of innovative changes is analyzed by Jackson [6]. Disruptive innovations in the context of MBA programs are investigated by McHenry [11]. Innovations in teacher’s education are studied by Ellis and Childs [2].

Considering innovative process in the European higher education Lašáková, Bajzíkóvá and Dedze, tried in 2017 to find answers to the following questions: what are the main difficulties faced by higher education institutions by development and implementation of educational innovation, how they can be categorized; how can the innovative activity be enhanced/improved in universities [7]. The impact of the collaboration “higher education and innovation” on the quality of life and the local development is analyzed by Reyes [13].

These and a lot of other aspects are considered, reviewed, analyzed and investigated in the scientific literature today in order to categorize educational innovations, try to

understand their nature and functions, impact on the development of educational institutions, socio-economic development of regions, countries and the world as a whole. In our opinion, a complex, integrated approach is needed to study innovations in education from the point of view of different disciplines (psychology, pedagogy, management, economics, sociology, philosophy etc.), to be aware of their essence, goals and consequences.

5 Conclusion

Historically, the innovation process in education has always been accompanied by fears that the implemented innovation will replace and devalue the work of a teacher. This was the case with books, computers, robots, and the Internet. Today, artificial intelligence raises similar concerns. However, actual practice shows that this has not yet happened and is unlikely to happen in the near future. Even the unpredictable global crisis caused by the pandemic in 2020, the isolation regime and the forced measure to switch to a distance learning format confirmed this. In our opinion, this situation clearly showed that it is impossible to completely switch to a distance format in education, replacing real human communication with virtual, transferring it completely to online mode. Difficulties and shortcomings of digital education, which were discussed earlier only in theory, suddenly became obvious. Analysis of the situation, the own pedagogical work before and during COVID-2019 quarantine, as well as analytical work conducted in this study allow us to conclude that first of all digital innovations in education are a support tool, allowing to solve a number of educational objectives more effectively than traditional methods, forms and technologies of work. There is no doubt that we get unique opportunities in terms of ensuring the visibility of the educational process, and we can largely solve the problem of accessibility and continuity of higher education through digital technologies, in particular, in times of crisis, when the usual format of education is impossible or difficult for one reason or another. However, it is important to remember that there are a number of functions that cannot and should not be completely given over to digitalization. In addition to digital solutions, there is a wide range of other innovative ideas that are closely related to current requirements to the system of higher professional education, values and strategic goals of our society development. In our opinion, close cooperation between these (non-digital) innovations and the technical capabilities of digital solutions can really provide the desired stability, sustainability, competitiveness, high quality of education and the “breakthrough” in the development of society, which is so much talked about today.

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Person as an Ontological Reason of Instability in the Global World Development

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Abstract. The article considers person existence as a main cause of the global problems in the modern civilization development. In this context the person is interpreted as a kind of worldview construction. According to this the human perceives himself as someone equal to the transcendent Absolute. He thinks he can break out of nature bounds. He seems to be an independent creature and opposes himself to his own nature, society, and the world around him. In these conditions, the existence of nature, including the human nature, becomes possible through the prism of human life only. The human gives himself an exclusive right to change and to transform absolutely everything that opposes his life desirers. Thus, human existence becomes the reason of the main problems in the modern civilization development. These problems have got a global character not very long ago. But they form an important part of civilization development in the XXI century.

Keywords: Absolute · Being · Global world development · Human · Person · Worldview

1 Introduction

Modern humanity is actively searching for the main causes of instability in the global world development. Increasing of such an instability can lead to a full-scale global crisis, civilization collapse, and, consequently, to disappearance of the humanity itself [3]. Unfortunately, modern humanity is unable to overcome the set of global problems. So, its future becomes unclear and uncertain. Solving the global problems needs understanding of their basic causes. So, it's necessary to revise a number of leading civilization values determining the modern world's existence. They all seem to be an important object of analysis. But we are talking, first of all, about such a fundamental value as a human person [12].

The concept of «person» is an important attribute of the modern worldview paradigm typical for the technically oriented civilization. In the framework of the global society it's used to define the human essence: every human should be a person, first of

all, and only then a human in general. «Person» is a concept that fixes a special human view on himself as a master and the owner of nature. Every «person» has an exclusive right and abilities to transform nature [1], to conquer it or to exploit it endlessly. This situation is, certainly, unacceptable. It leads to a global catastrophe [11].

In this regard, the words of the famous Russian philosopher Stepin seem us true and fair. He noted that the modern humanity «needs to revise the previous attitude to nature, the ideals of domination, focused on the forceful transformation of the natural and social world, it's necessary to develop new ideals of human activity, new understanding of human perspectives» [13, p. 19]. Perhaps, a new model of ecological ethics should be created. It can be interpreted as an axiological foundation of human existence in the global world [6]. The similar conception concerns formation of a special ecosystemic approach for the environment [10]. In general, we won't be able to understand the cause of instability of the global world development without studying the specificity of the «person». It's a fundamental worldview construct and the most important value of the global civilization.

2 Methodology

Methodology of the present research is based on such principles as objectivity, historicism, system and scientific principles. From the set of scientific methods, the leading role in the research is played by axiological, hermeneutical, system, comparative, dialectical, ontological, phenomenological, existential methods and a method of situational analysis. The complex using of these methods is necessary because of the various interpretations of the «person». It isn't only the main concept for human definition, but also a practical requirement for every human to be a person. In our everyday practical life we can see a kind of ontological proof of human existence through the worldview concept of the «person». Every human needs to be a person, – and this turns his existence into a really perfect state. All human predicates, including the basic predicate of being, can be formed only within the worldview concept of the «person».

That's why the most important methodological principles of the research are the following ones:

- «person» is a worldview concept describing civilizational and value character of human being,
- person is the most widespread phenomenon for understanding the human essence in the modern global civilization; it's also the way of human being in the technical society and its specific culture,
- person is a fundamental ontological cause of the global world formation, changing and development.

3 Results

3.1 «Person» as a Worldview Concept for Describing the Human Being

«Person» is a worldview construction. It doesn't characterize the culture of the traditional society. It was formed later, within the framework of the technical civilization. Here the «person» has begun to describe an essence of the human, and his special relations with nature and society. That's about the time the human as a «person» has got a meaning of Absolute, a closed Universe, and an independent totality. His relations with the surrounding world have become problematic because of the powerful opposing feeling. Everything outside of the person is perceived as another totality alien to the human nature.

This leads to a special mental attitude forming in the worldview tradition of the Western civilization. Here the human gives himself a unique right to be a master of nature. In its turn, the nature is considered as an available material only [6]. With its help the person can create a new reality and everything he wants according to his various material needs. Thus the person forms a sincere belief that he is an Absolute; and he is able to create his own destiny. With a help of science and rational knowledge he can also change the laws of the universe; he's able to overcome the mechanical determinism, and even to surpass the natural necessity.

3.2 Person as an Ontological Basis of the Global Civilization Development

In the system of worldview values of a globalizing technical civilization the «person» is an ontological basis of human self-understanding. In this regard, his life activity is based most of all on his own rational thinking. And his relations with the surrounding world and the social environment are based on the scientific and technical decisions. Within this model the person forms an idea of scientific and technological progress that has an absolute character in the process of the global world development [2]. The last one causes the infinite development of the human and the world he's living in.

At the same time, the harmonious unity of human and nature becomes quite unnecessary in this worldview structure. Here the personal interests and the personal needs play the most important role. A special egoistic morality is a real basis of the modern civilization and its value system. It teaches us that the basis of moral behavior of the human should be his personal interests and nothing else.

Such a worldview position is continuously fixing by the modern person already at the level of the mental traditions. According to it the main aim of human life is to become a «person». And development of personal qualities isn't only the sense of individual human existence, but also the goal of the world development. In this sense the «person» isn't only a worldview construct having a historical meaning and forming in the certain historical circumstances. In the modern context it's closely related to the human essence. It can also be qualified as a universal determinant of the human nature.

3.3 Person's Being as a Main Cause of Instability of the Global World Development

Such an understanding of human essence makes personal existence the main cause of instability in the global world development. And this is primarily connected to the fact that existence of the «person» as a special worldview construct is considered more important than the real existence of the «human». The modern person can transform or even cancel the real human nature, but it can't allow the slightest change of the worldview construction of the personality itself. The modern anthropological crisis is a good example of this. Its overcoming allows transformation of human nature [5], but doesn't concern understanding of the «person» as a worldview concept. A human can be changed in any way, but at the same time he must always remain a person. If he hasn't become a person yet, he must try to do it.

In these conditions, requirements of the person to transform the surrounding world and the human nature lead to a complete and absolute changing of their essence. Within this worldview conception the human loses finally his identity: he can be constructed from the suitable genetic material, he can be added or removed, and he can also be changed in different ways [5]. These efforts of the person to transform the human nature can be considered as a main ontological cause of instability of the world development. Besides, the human loses his ontological basis in the worldview concept of the «person». Therefore the world around him, as well as the society defining his social essence, seems to be alien and even hostile to the human nature.

3.4 Person's Transformation as a Necessary Condition for Overcoming Instability of the Global World Development

If the person is a main cause of instability of the global world development, overcoming of this cause requires the most significant transformation of its ontological basis. It's quite possible here to use an experience of the traditional society development. Within its framework the worldview concept of the «person» is simply absent. In this cultural tradition the human doesn't see himself as a completely individual Universe, autonomous and self-sufficient. If a human isn't a person, he feels himself a harmonious part of nature and society. All three of them have the same ontological basis. For example, the Eastern culture traditions promote an idea of natural world's development in the likeness of a great living organism. So, the humanity must treat it carefully, on the base of the non-violence principle. The modern human activity should be minimized, and the sense of human belonging to the destiny of the whole world must be developed widely. These are the most actual strategies of life, accepted in the modern East.

It's also necessary to mention that the purposeful and the value-rational forms of human activity are united in the Eastern culture. And it's only the moral perfect actions of the human that can bring social relations to a state of harmony and contemplative balance. Human self-improvement is connected, first of all, with the moral qualities and the virtues' development. The last one include humanity, duty, sincerity and wisdom as the ideal elements of morality. They are significantly different from the moral requirements to a person in the Western global civilization. Here the three main

resources are the most important: they are power, wealth and knowledge [8]. We are sure, using of traditional society values of Eastern cultures can help to prevent and then to overcome the instability of the global Western world development.

4 Discussion

Studying of the «person» is always connected with understanding of human essence, expressing the infinity of its content. So, the final definition of this concept is very far from us, just like it was centuries ago. At the same time, this makes studying of the person as a worldview phenomenon more attractive. A large amount of material is already accumulated by previous scientific researches [7, 12, 13]. Besides, person is a subject of interest for many sciences, such as philosophy, sociology, psychology, history, etc. Most of them accent the relation between this concept and the process of socio-economic development [4], as well as its role for the global world existence [9].

The most popular among the modern researchers is understanding person as a social being of the human. In another words, person is a higher step in human's development connected with his individual qualities perfection. Every human should try to realize himself as a person, but not everyone is able to do it. It's well known that the human isn't born as a person; he becomes a person in the process of the social life. However, despite of this famous characteristic, the person hasn't been considered yet from the point of worldview – as a concept for interpreting human essence in the system of specific civilization values.

The present research is an attempt to consider the person as a special civilization-value model using for understanding of human essence. That's why appearance of the «person» in the structure of the worldview wasn't possible until the basis of technical civilization was formed. Civilization of nowadays also has a decisive impact on the personal development. At the same time, modern person is an ontological basis, and, consequently, the main cause of instability in the global world development. Overcoming this instability requires radical changing the content of this fundamental worldview concept.

5 Conclusion

Modern civilization forms a special system of values. In its frames the person has got an active and a very aggressive character. It gives human the priority to realize his personal interests before any other. This leads to a number of serious problems of the modern civilization development. These are the most actual problems of nowadays, such as environmental or anthropological problems. This is indicative, but all these problems aren't able to destroy an absolute value of the person as a worldview construction. Certainly, someone may recognize that the global problems are the logical result of the incorrect and even wrong personal actions [3]. But the other one will have to admit immediately that it's only a person who can overcome these problems in future by correcting the way of his behavior and activity.

Unfortunately, the modern humanity doesn't know any precedents of solving such problems from the standpoint of the anthropic principle. The current reality demonstrates us an opposite image: the problems are totally deepening, and there are no visible results of their overcoming. That's why we must qualify the person as a main reason of the global problems of the modern civilization development. In this case situation is non-alternative: the person understands all these problems, but he can't solve them, because he is their real reason. Therefore, all decisions and actions of solving have a palliative character only. The person can't destroy himself as a worldview value – one of the most important for the modern civilization development.

Today we must clearly realize that absolutization of the Western value system and rejection of other (for example, Eastern) cultural traditions leads humanity to the end of its civilizational development. To prove this statement we'd like to cite the words of Losev about the «personal titanism» as one of the most essential characters of the modern human: «Every Titan wants to own everything that exists. But during this search, he faces other titans... And as all titans, generally speaking, are equal in strength, it turns out that each of them can only kill the other» [7, p. 604]. These titanic pretensions of the person are the main reason of instability in the modern world development.

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Specific Features of Organization Performance Management at Stages of Its Life Cycle

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Abstract. The problem of efficiency management on the stages of organizational lifecycle, which is actual to any company, was considered in this article. The authors introduced empiric research, based on correlation analysis, to determine factors, which affect organizational efficiency the most on different stages of its lifecycle. The novelty of paper is explained by shortage of empiric researches, based on economic-mathematical methods, in the field of organization lifecycle, especially, in connection with organizational efficiency. As a result, the most important indicators were determined for every stage of organizational lifecycle and the instruments for improvement of efficiency management system were offered.

Keywords: Correlation analysis · Efficiency management · Organizational lifecycle · Organizational efficiency · Return on equity

1 Introduction

The problem of performance management is relevant for any enterprise in any industry at all times, since efficiency describes how the organization copes with its goals and objectives. Since goals and objectives of an organization differ at different stages of its development, it is advisable to consider performance management from the point of view of the organization's life cycle theory. Since the 60s of the XX century, the concept of the life cycle has been actively developed by researchers and represented by a fairly large number of models, but they are usually descriptive in nature. Some specific features of changes at various stages of the organization's life cycle were considered by Pavlova [7]. Despite the fact that such scientists as Miller and Friesen [5], Shirokova [9] conducted empirical studies of the organization's life cycle, there are few empirical studies based on economic and mathematical methods, in particular, regarding the effectiveness of the organization performance and indicators affecting it. This is largely determined by the practical complexity of forming a sample for conducting such a study, correctly identifying a stage of the life cycle for each enterprise in the sample, as well as determining performance indicators which will be studied. In this paper, we present an empirical study on features of organizational performance management at different stages of its life cycle. The research purpose is to determine factors that have a greater impact on the organization's effectiveness at various stages of its life

cycle. The hypothesis is that at different stages of the organization's life cycle, the key factors that affect the effectiveness of the organization will differ. It is assumed that the identification of the most important factors for each stage of the life cycle will contribute to improving the effectiveness of the organization and the performance management system.

2 Methodology

The research results were obtained through the correlation analysis. This method was used to evaluate the relation between indicators that characterize the performance effectiveness for each stage of the organization's life cycle. First, it was important to define variables for which the results will be obtained. Since the goal for any commercial organization is usually to make a profit or increase the value of the company [8], the authors chose an indicator that characterizes both of these aspects – return on equity (ROE) as a resulting variable. This indicator simultaneously characterizes *profit*, since it is a profitability indicator that represents the net profit received by the organization per unit of invested equity, and *company's value*, since it is the determining factor in calculating one of the value indicators – residual net profit [14]. In general, this indicator serves to assess investment attractiveness. Then, the authors determined factors directly affecting the return on equity. It is known that it represents the ratio of the net profit received by the organization during the considered period to the average amount of the organization's own capital for the same time [10]:

$$ROE = \frac{NP}{E}, \quad (1)$$

where NP is the net profit for a period of time; E - average shareholders' equity for the same period.

To study the dependence of the return on equity on various aspects of the organization's activities, the DuPont model was proposed, which by algebraic transformations describes return on equity on three factors: profitability (the rate of net profit), asset turnover and financial leverage [10]:

$$ROE = \frac{NP}{R} * \frac{R}{A} * \frac{A}{AE} = R * K_{turn} * FL \quad (2)$$

where R – net profit rate; K_{turn} – total asset turnover ratio; FL – financial leverage; NP – the net profit for a period; R – revenue for the period; A – average total assets for the period; AE – average amount of equity for the period.

The DuPont model already allows to determine how various indicators of an enterprise's performance affect the return on equity, but in the interests of this research, it was proposed to consider more of them. To do this, the authors turn to the twelve-factor decomposition of return on equity, which was derived by Vashakmadze from the DuPont model [11, 12]. The essence of this decomposition is that each of the factors of the DuPont model (the rate of net profit, asset turnover and financial leverage) in turn, also includes indicators. So, the decomposition formula has the following form:

$$OE = (GM - EMBE) * EFA * TE * \left(\frac{365}{CM + RM + IM + MCA + MFA + MNCA} \right) * (DB + LIFL + 1), \quad (3)$$

where GM – gross margin; $EMBE$ – effect of management and business expenses; EFA – effect of financial activities; TE – tax effect; CM – cash management; RM – receivables management; IM – inventory management; MCA – management of other current assets; MFA – management of fixed assets; $MNCA$ – management of other non-current assets; DB – debt burden; $LIFL$ – leverage of interest-free liabilities.

Thus, the above formula describes the dependence of return on equity on twelve indicators that together have a functional impact on profitability. Based on the functional type of this relation, we can say that all these factors affect the return on equity, but to different degrees, and the research task was to determine which of these factors affect the resulting indicator more than others. It is assumed that the structure of relations between indicators differs at different stages of the organization's life cycle.

Table 1 shows all twelve considered indicators and their calculation formulas. It is worth noting that all indicators are presented in the relative form. Besides, all indicators can be calculated based on the financial statements of organizations, taking into account the comparability of the time periods for which the indicator values are taken. Thus, the indicators calculated based on the report on the company's financial results are determined with using values of these indicators in the annual report. The situation is a little more complicated with indicators calculated on the base of a balance sheet: here it is needed to comply with the principle of comparability over time, and to calculate the average values of indicators for a year. To get the average annual value of the indicator, we calculate the arithmetic average of this indicator at the end of the year and at the beginning of the year.

Special attention should be paid to the methodological aspects of calculating management indicators for other current assets and other non-current assets. Based on the fact that the formula for the twelve-factor decomposition of return on equity was derived from the DuPont model, it is necessary that the six indicators of asset group management fully describe the turnover ratio of total assets, which means that all balance sheet items should be involved. Therefore, when calculating the indicator for managing other current assets, not only other current assets should be taken into account directly), but also all other current assets that are not related to cash, receivables and inventory items: financial investments and value-added tax on acquired values. This is also the case with the indicator of management of other non-current assets. For its calculation, it is necessary to take into account all non-current assets that are not fixed assets: intangible assets, RandD results, profitable investments in tangible assets, etc. [1, 2, 4, 6]. Secondly, to conduct an empirical study, it is necessary to create a sample of organizations, on the basis of which the dependence of return on equity on the twelve listed indicators will be estimated. The results of the correlation analysis will be calculated from a sample formed for each stage of the life cycle in accordance with the model by Miller and Friesen [5] with methodological refinements by Shirokova [9]. It is the most optimal for empirical research, since it characterizes the main and quite

Table 1. Factors of twelve-factor decomposition of return on equity

Factor	Formula	Symbols
Gross margin	$GM = \frac{GP}{R}$	GP – gross profit; R – revenue
Effect of management and business expenses	$EMBE = \frac{MBE}{R}$	MBE – management and business expenses; R – revenue
Effect of financial activities	$EFA = \frac{PBT}{OP}$	PBT – profit before taxation; OP – operating profit
Tax effect	$TE = \frac{PBT}{NP}$	PBT – profit before taxation; NP – net profit
Cash management	$CM = \frac{VM * 365}{R}$	VM – volume of money; R – revenue
Receivables management	$RM = \frac{VR * 365}{R}$	VR – volume of receivables; R – revenue
Inventory management	$IM = \frac{IV * 365}{R}$	IV – inventory volume; R – revenue
Management of other current assets	$MCA = \frac{VCA * 365}{B}$	VCA – volume of other current assets; R – revenue
Management of fixed assets	$MFA = \frac{VFA * 365}{R}$	VFA – volume of fixed assets R – revenue
Management of other non-current assets	$MNCA = \frac{VNCA * 365}{R}$	VNCA– volume of other non-current assets R – revenue
Debt burden	$DB = \frac{BC}{VE}$	BC – amount of borrowed capital; VE – the amount of equity
Leverage of interest-free liabilities	$LIFL = \frac{VIFL}{VE}$	VIFL – amount of interest-free liabilities; VE – the amount of equity

Source: authors based on [11, 12].

distinct stages of the company's development, and the use of models with a large number of stages significantly increases the probability of errors by identification.

The sample was divided into five groups, in accordance with different stages of the organization's life cycle – formation, growth, maturity, diversification and decline. The identification of the life cycle stage was based on the following criteria: the age of the organization, its size (number of employees), the degree of formalization and the degree of diversification. Information about companies was taken from official websites of companies and specialized resources dedicated to data verification (verification system Rusprofile.ru) [13], as well as the unified state register of legal entities. While data on the age of the organization and the number of its staff are quite specific, additional indicators and information had to be used to assess criteria such as the degree of formalization and the degree of diversification. For example, to determine the degree of formalization, we used information on the organizational structure and internal

divisions, as well as the share of management expenses in revenue, to assess the degree of diversification – the number of additional activities and the history of their addition to the register, news from companies' websites and catalogs of their products and services. To make the research results comparable and representative, the calculation was based on indicators taken for a single date. Thus, the correlation analysis was performed five times for each sample group by stages of the organization's life cycle, and based on the analysis results, it was determined which of the factors of the ROE decomposition have the greatest impact on the resulting indicator at different stages of the life cycle. These factors for each stage can be considered as the most important for management in order to improve the organization's efficiency.

3 Results

The sample consisted of 91 enterprises from the Republic of Tatarstan representing various industries. It is assumed that the results of the study will be fairly universal and will be applicable to organizations in various industries, however, it was decided not to include in the sample enterprises that provide services of a specific kind, as well as microenterprises, branches of other organizations and companies based on existing ones or being a result of mergers. Figure 1 shows the structure of the sample by stages of the business life cycle. Thus, organizations that are at the stage of maturity (26%) have the largest share in the sample, followed by the stages of decline (22%), diversification (20%), growth (17%) and, finally, formation (15%). In general, based on the structure by life cycle stages, the sample can be considered as a quite balanced one.

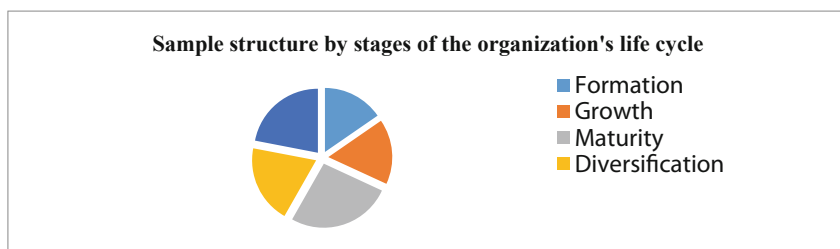


Fig. 1. Sample structure by stages of the organization's life cycle (Source: authors).

The first group, which represents the formation stage, includes 14 enterprises. The enterprises of this group are young (average age 4–5 years) and quite small, and their organizational structure is not yet sufficiently developed and formalized. As a rule, such organizations have a low degree of diversification, although there are exceptions – several enterprises from this group are quite highly diversified, but all types of activities were already declared initially when the organization was created, and diversification is not an evolutionary stage of their development. Table 2 shows results of the correlation analysis for the formation stage. As can be seen from the last row of the table, the most closely related indicators to return on equity are indicators of receivables management,

inventory management, effect of management and business expenses, and for all three indicators, the correlation coefficient has a negative value, i.e. the relation is reversed.

Table 2. Results of correlation analysis for the formation stage

	GM	EMBE	EFA	TE	CM	RM	IM	MCA	MFA	MNCA	DB	LIFL
GM	1,00											
EMBE	0,91	1,00										
EFA	-0,48	-0,54	1,00									
TE	0,48	0,37	0,06	1,00								
CM	-0,39	-0,47	0,05	-0,24	1,00							
RM	0,81	0,63	-0,43	0,33	-0,17	1,00						
IM	0,67	0,67	-0,50	0,29	-0,16	0,54	1,00					
MCA	0,92	0,76	-0,35	0,47	-0,24	0,80	0,57	1,00				
MFA	0,60	0,52	-0,27	0,26	-0,17	0,53	0,81	0,64	1,00			
MNCA	0,02	-0,09	0,08	-0,08	-0,19	-0,14	-0,13	-0,07	-0,06	1,00		
DB	0,15	0,27	-0,36	-0,05	-0,07	0,11	0,77	-0,06	0,50	-0,11	1,00	
LIFL	0,07	0,25	-0,39	-0,11	-0,12	0,02	0,70	-0,13	0,44	-0,15	0,97	1,00
ROE	-0,15	-0,21	0,18	0,19	-0,15	-0,30	-0,25	-0,16	-0,19	0,04	-0,12	-0,14

Source: authors.

The next group consists of 15 companies that are at the growth stage (Table 3). They are slightly older (the approximate age is 10–11 years) and larger than enterprises at the formation stage, and their organizational structure is more or less developed and complicated. These companies do not seek to diversify their products and services, unless this has been the goal of the company since its foundation. Organizations are largely focused on sales and profit and strive to increase their market share. Based on the results of the correlation analysis, the most closely related to the return on equity are

Table 3. Results of correlation analysis for the growth stage

	GM	EMBE	EFA	TE	CM	RM	IM	MCA	MFA	MNCA	DB	LIFL
GM	1,00											
EMBE	0,78	1,00										
EFA	0,03	-0,09	1,00									
TE	-0,11	-0,05	-0,37	1,00								
CM	0,01	0,08	0,11	0,10	1,00							
RM	0,02	0,01	-0,16	-0,02	-0,34	1,00						
IM	0,37	0,13	0,30	-0,21	-0,02	-0,15	1,00					
MCA	0,23	-0,11	0,17	0,00	-0,13	-0,23	0,85	1,00				
MFA	0,04	-0,15	-0,44	-0,12	-0,20	0,40	0,18	0,10	1,00			
MNCA	-0,12	-0,09	-0,56	0,92	0,05	0,15	-0,20	-0,06	0,26	1,00		
DB	-0,09	-0,10	-0,56	-0,12	-0,16	0,39	0,05	-0,06	0,94	0,27	1,00	
LIFL	-0,22	0,08	0,05	-0,16	-0,33	0,06	0,01	-0,13	0,10	-0,09	0,18	1,00
ROE	0,01	0,25	-0,24	0,02	0,10	-0,02	0,09	0,05	-0,03	0,01	0,00	0,41

Source: authors.

leverage of interest-free liabilities (LIFL), effect of management and business expenses (EMBE), and effect of financial activities (EFA). At the same time, LIFL and EMBE are directly related to the return on equity, while EFA is the opposite.

The third and largest group (24 enterprises) includes organizations at the maturity stage. These organizations have been functioning for a long time, and this group includes both enterprises founded in the 1990s and early 2000s (enterprises formed at the beginning of the formation of the market economy in Russia) and enterprises formed in the Soviet era and continuing to exist in the current conditions. The average age of enterprises in this group is 42 years. This group includes both large and medium-sized enterprises that have largely reached the peak of their development, but are still quite successful in their industry. On the one hand, they are characterized by a highly developed organizational structure, decentralisation of power, and a fairly stable financial position. On the other hand, excessive bureaucratization in such organizations negatively affects the innovative process, creativity of staff and their motivation. Slowing profit growth and lower demand for products lead to the condition when mature organizations have to look for new opportunities to avoid aging, for example, to diversify their activities.

For organizations that are at the maturity stage, according to the results of the correlation analysis (Table 4), the greatest correlation coefficient with the return on equity is effect of financial activities, cash management and inventory management. In this case, the positive value of the correlation coefficient is observed for the effect of financial activity, which means that its relation with the return on equity is direct. In contrast, for cash management and inventory management, the correlation coefficient is negative, so the relation is reversed.

Table 4. Results of correlation analysis for the maturity stage

	GM	EMBE	EFA	TE	CM	RM	IM	MCA	MFA	MNCA	DB	LIFL
GM	1,00											
EMBE	0,50	1,00										
EFA	-0,40	-0,27	1,00									
TE	0,13	0,16	0,03	1,00								
CM	0,37	0,08	0,03	-0,10	1,00							
RM	-0,01	0,01	-0,17	0,19	-0,20	1,00						
IM	-0,10	0,12	-0,09	-0,18	-0,23	0,49	1,00					
MCA	0,27	0,06	-0,11	-0,22	-0,01	0,58	0,33	1,00				
MFA	-0,18	-0,11	0,02	-0,03	-0,17	0,07	0,46	0,02	1,00			
MNCA	-0,07	-0,02	-0,07	0,03	-0,11	0,11	0,06	-0,11	-0,09	1,00		
DB	-0,08	0,07	-0,12	-0,21	-0,31	0,71	0,64	0,61	0,09	0,06	1,00	
LIFL	-0,07	0,37	-0,06	-0,21	-0,08	-0,19	-0,14	-0,06	-0,23	-0,11	-0,01	1,00
ROE	0,12	-0,29	0,51	0,14	0,37	-0,27	-0,31	-0,10	-0,22	-0,12	-0,27	0,05

Source: authors.

The fourth group of the sample included 18 organizations that are at the stage of diversification. According to Miller and Friesen, this stage of the organization’s life cycle characterizes a kind of revival of the organization, the revival of its activities [5].

According to the criteria of age (average age-55 years), size and degree of formalization, organizations of this group do not differ much from the previous group of the sample, the key factor of identification was the degree of diversification. Moreover, it is important to take into account that only those organizations that began to expand the range of their activities in recent years were included in this group (diversification), and that was not typical for them from the very beginning of their operation.

Results of the correlation analysis for the diversification stage are presented in Table 5. For such organizations the highest correlation with return on equity have leverage interest-free liabilities, debt load and inventory management, and leverage the interest-free obligations and debt burden have a direct relation with return on equity, and inventory management – reverse.

Table 5. Results of correlation analysis for the diversification stage

	GM	EMBE	EFA	TE	CM	RM	IM	MCA	MFA	MNCA	DB	LIFL
GM	1,00											
EMBE	0,79	1,00										
EFA	-0,39	-0,35	1,00									
TE	-0,56	-0,51	0,29	1,00								
CM	-0,14	-0,20	0,00	0,20	1,00							
RM	0,28	0,03	-0,33	-0,22	0,56	1,00						
IM	-0,38	-0,25	0,35	0,39	-0,09	-0,18	1,00					
MCA	0,45	0,37	-0,29	-0,25	0,04	0,33	-0,14	1,00				
MFA	0,34	0,42	0,36	0,06	-0,28	-0,43	0,39	0,14	1,00			
MNCA	0,24	-0,06	0,01	-0,13	0,09	0,36	-0,27	0,25	-0,08	1,00		
DB	0,34	0,29	0,05	-0,62	-0,26	0,15	-0,16	0,40	0,27	0,07	1,00	
LIFL	0,06	0,00	0,04	-0,57	-0,18	0,11	-0,16	0,04	-0,01	-0,02	0,82	1,00
ROE	-0,01	-0,27	0,18	-0,12	-0,11	0,19	-0,33	-0,21	-0,24	-0,01	0,42	0,60

Source: authors.

The group of organizations in decline is represented by twenty enterprises. According to the criteria of age, size, degree of formalization and degree of diversification, it is rather difficult to distinguish between organizations of this group and enterprises that are at the stages of maturity and diversification. To identify the decline stage, we analyzed graphs of the dynamics of revenue, net profit and value of the company. If an organization was founded a long time ago and has already passed the peak of its development, and over the past few periods there is a clear trend towards its loss, then these organizations were diagnosed with a stage of decline. For this group, the results of correlation analysis (Table 6) showed that the most influential factors on the return on equity are the debt load, the leverage of interest-free liabilities and gross margin. In contrast to the previous stage, the correlation coefficients for the leverage of interest-free liabilities and debt load are negative, i.e. the relation is reversed. The correlation coefficient for gross margin is positive, so the relation is direct.

Table 6. Correlation analysis results for the decline stage

	GM	EMBE	EFA	TE	CM	RM	IM	MCA	MFA	MNCA	DB	LIFL
GM	1,00											
EMBE	0,58	1,00										
EFA	0,10	0,11	1,00									
TE	-0,25	-0,09	0,01	1,00								
CM	-0,01	-0,10	0,00	-0,09	1,00							
RM	0,41	0,97	0,08	0,05	-0,12	1,00						
IM	0,09	-0,13	0,14	-0,36	0,04	-0,16	1,00					
MCA	0,39	0,96	0,10	0,03	-0,11	0,98	-0,21	1,00				
MFA	0,48	0,96	0,09	0,05	-0,09	0,98	-0,05	0,96	1,00			
MNCA	0,44	0,98	0,08	0,06	-0,11	0,99	-0,19	0,98	0,98	1,00		
DB	-0,01	0,01	-0,10	0,02	0,12	0,04	0,07	-0,04	0,06	0,01	1,00	
LIFL	0,34	-0,02	-0,03	-0,26	-0,09	-0,12	0,32	-0,13	-0,05	-0,08	0,14	1,00
ROE	0,24	0,10	-0,17	-0,04	0,08	0,09	0,21	0,07	0,15	0,08	-0,52	-0,35

Source: authors.

Thus, for each stage of the life cycle, using the results of correlation analysis, several key factors that have the greatest impact on the effectiveness of the organization were identified, and the nature of these relations was determined.

4 Discussion

The authors analyzed and interpreted results obtained for each stage of the organization's life cycle, as well as considered ways to apply the research results in practice in order to improve the organization's performance management system. Depending on the stage of the organization's life cycle, it is proposed to build a factor map with 12 considered indicators which are ranked in descending order of their impact on return on equity. The factor map is divided into three sectors: for factors of high significance (3 indicators with the highest correlation coefficient), medium significance (5 indicators that follow the most important by the value of the correlation coefficient) and low significance (4 indicators with the lowest correlation coefficient). It also reflects the nature of the relation between indicators with profitability – direct or reverse. It is assumed that the management of a minimum number of the most important factors can significantly increase the efficiency of the organization's performance (so, according to Drucker, 10–15% of phenomena generate 80–90% of the final results, and the remaining 85%–90% do not generate anything but costs [3]). Table 7 shows a map of factors for the formation stage, according to which the factors of greatest significance are indicators of RM, IM, EMBE. For all three indicators, the relation with return on equity is reversed. These results indicate that in order to improve the efficiency of the

organization, it is necessary first of all to reduce the duration of the turnover periods of accounts receivable and inventory, as well as the share of management and commercial expenses in revenue. Thus, at the formation stage it is critical for organizations to strive for more rapid receipt of funds from counterparties, to avoid long term contracts and contracts with a high risk of delay to lower the rate of receivables management, as well as to minimize the inventory cycle, to use them more effectively and prevent them from excess in order to reduce the rate of inventory management, as these organizations are very young and always lack money, while they are required to quickly identify their positions in the market and present their products. Getting into the list of key factors of EMBE and the inverse value of its correlation coefficient confirm that such organizations are not recommended to formalize and grow a serious organizational structure.

Table 7. Map of factors for determining the formation stage

Significance	Rank	Indicator	Relation
Factors of high significance	1	Receivables management	direct
	2	Inventory management	reverse
	3	Effect of management and business expenses	reverse
Factors of medium significance	4	Management of fixed assets	reverse
	5	Tax effect	direct
	6	Effect of financial activities	direct
	7	Management of other current assets	reverse
	8	Cash management	reverse
Factors of low significance	9	Gross margin	reverse
	10	Leverage of interest-free liabilities	reverse
	11	Debt burden	reverse
	12	Management of other non-current assets	reverse

Source: authors.

A map of factors for the growth stage is presented in Table 8. Here the most significant factors are LIFL, EMBE, and EFA. The relation between LIFL and return on equity is direct, which indicates that organizations at this stage of the life cycle increase the volume of their interest-free obligations, primarily receivables, by expanding production, attracting new contractors, increasing the organization’s staff. All this at this stage is natural and contribute to the normal development of the enterprise. In contrast to the formation stage, the value of the correlation coefficient for EMBE has a positive value, which means that the expansion of the organizational structure and the formation of professional management have a positive impact on the

effectiveness of the organization's performance at this stage. Finally, the reverse nature of the relation between return on equity and effect of financial activities means that an increase in the share of non-production income in profit is a negative factor for the effectiveness of the organization at the growth stage.

Table 8. Map of factors for the growth stage

Significance	Rank	Indicator	Relation
Factors of high significance	1	Leverage of interest-free liabilities	direct
	2	Effect of management and business expenses	direct
	3	Effect of financial activities	reverse
Factors of medium significance	4	Cash management	direct
	5	Inventory management	direct
	6	Management of other current assets	direct
	7	Management of fixed assets	reverse
	8	Tax effect	direct
Factors of low significance	9	Receivables management	reverse
	10	Gross margin	direct
	11	Management of other non-current assets	direct
	12	Debt burden	reverse

Source: authors.

Table 9 shows a map of factors for the maturity stage. Among the factors of high significance were effect of financial activities, cash management and inventory management. As an organization matures, reaches its development peak, it has a highly developed organizational structure, and the role of income that is not directly related to the main production significantly increases, so the indicator of effect of financial activities at this stage largely reflects the effectiveness of management, financial operations and investments. Mature organizations are usually well provided with cash, and the effectiveness of such organizations largely depends on how quickly they can reinvest funds in production, so it is logical to assume an inverse relation between the period of cash turnover and return on equity, which is confirmed by the conducted correlation analysis. Finally, the relation between inventory management and organizational performance is also understandable – for example, mature organizations usually have a large amount of inventory in warehouses, they bear quite large storage costs and risks for losses and shortages, so the problem of inventory management is always relevant for such organizations.

Table 9. Map of factors for the maturity stage

Significance	Rank	Indicator	Relation
Factors of high significance	1	Effect of financial activities	direct
	2	Cash management	direct
	3	Inventory management	reverse
Factors of medium significance	4	Effect of management and business expenses	reverse
	5	Receivables management	reverse
	6	Dept burden	reverse
	7	Management of fixed assets	reverse
	8	Tex effect	direct
Factors of low significance	9	Management of other non-current assets	reverse
	10	Gross margin	direct
	11	Management of other current assets	reverse
	12	Leverage of interest-free liabilities	direct

Source: authors.

A map of factors for the diversification stage is presented in Table 10. For organizations at this stage of the life cycle, the most important are leverage of interest-free liabilities (LIFL), debt burden (DB) and inventory management (IM). The above reasons related to the importance of this factor for the maturity stage are largely applicable to the relatively high value of IM factor. LIFL and DB, as indicators of borrowings, have positive values of correlation coefficient with return on equity since the attraction of additional borrowed funds at this stage is largely characterized by an increased economic activity, expansion of activity spheres, new projects.

Table 10. Map of factors for the diversification stage

Significance	Rank	Indicator	Relation
Factors of high significance	1	Leverage of interest-free liabilities	direct
	2	Dept burden	direct
	3	Inventory management	reverse
Factors of medium significance	4	Effect of management and business expenses	reverse
	5	Management of fixed assets	reverse
	6	Management of other current assets	reverse
	7	Receivables management	direct
	8	Effect of financial activities	direct
Factors of low significance	9	Tax effect	reverse
	10	Cash management	reverse
	11	Gross margin	reverse
	12	Management of other non-current assets	reverse

Source: authors.

Finally, a map of factors for organizations in decline is presented in Table 11. According to the results of the correlation analysis, the most important factors are debt burden, leverage of interest-free liabilities and gross margin. However, the value of the debt burden and leverage of interest-free liabilities for an organization at the stage of decline is very different from their value for the stage of diversification, since their correlation coefficients have negative values, that is, their impact on the effectiveness of the organizations performance has an inverse relation. This means that if the company is in a state of decline, then a large debt burden is an aggravating factor, and it is not recommended to attract additional borrowed funds, which is quite logical. The value of the gross margin indicator becomes significant, the higher it is, the more efficient the company operates. This means that one of the most important tasks for organizations that are in decline is to reduce the share of cost in revenue, i.e. to increase the efficiency of the production process itself, which is crucial for saving the firm.

Table 11. Map of factors for the decline stage

Significance	Rank	Indicator	Relation
Factors of high significance	1	Dept burden	reverse
	2	Leverage of interest-free liabilities	reverse
	3	Gross margin	direct
Factors of medium significance	4	Inventory management	direct
	5	Effect of financial activities	reverse
	6	Management of fixed assets	direct
	7	Effect of management and business expenses	direct
	8	Receivables management	direct
Factors of low significance	9	Cash management	direct
	10	Management of other non-current assets	direct
	11	Management of other current assets	direct
	12	Tax effect	reverse

Source: authors.

In addition, the authors offer a graphical performance management tool based on the received research results. For each stage of the life cycle, a petal diagram is constructed, along the axes of which the modular values of the correlation coefficient between a certain indicator of the system and the return on equity are placed. The factors diagram for the formation stage is shown in Fig. 2, and for the growth stage - in Fig. 3.

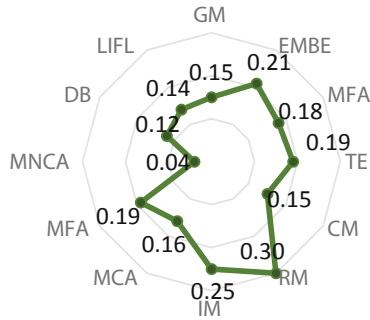


Fig. 2. Diagram of factors for the formation stage (Source: authors).

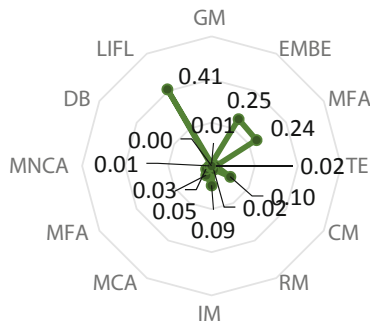


Fig. 3. Diagram of factors for the growth stage (Source: authors).

Diagrams for the maturity stage (Fig. 4), diversification stage (Fig. 5), and finally for the decline stage (Fig. 6) clearly demonstrate the extent to which each of the twelve indicators affects the effectiveness of the organization’s performance, and can serve for setting priorities by making certain management decisions.

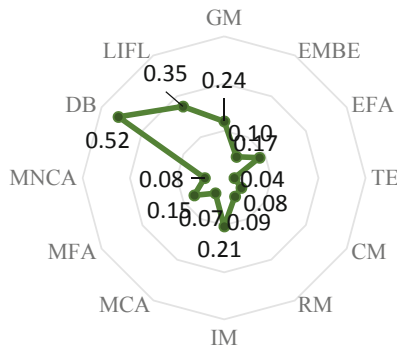


Fig. 4. Diagram of factors for the maturity stage (Source: authors).

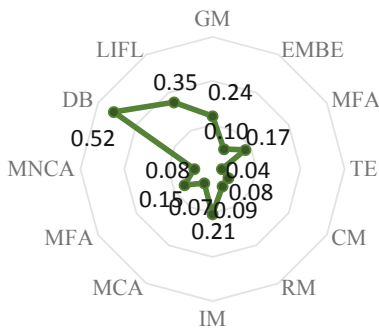


Fig. 5. Diagram of factors for the diversification stage (Source: authors).

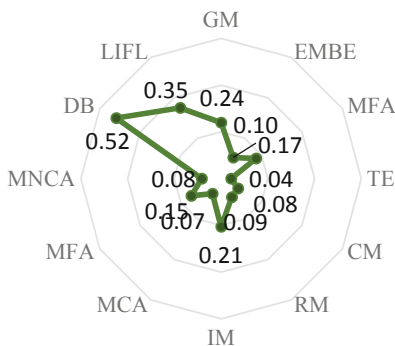


Fig. 6. Diagram of factors for the decline stage (Source: authors).

5 Conclusion

The research hypothesis was confirmed: the most important factors and the nature of relations are different for the sample groups that characterize stages of the organization’s life cycle. At the first stage of this study, a methodology was defined that is based on the correlation analysis. Return on equity was chosen as the resulting variable that determines the effectiveness of the organization’s performance, since it characterizes both the company’s profit and its cost. The factor variables for the correlation analysis were indicators of the twelve-factor decomposition of return on equity. Further, the authors presented a sample consisting of 91 industrial organizations operating in the Republic of Tatarstan, as well as the division of the sample into groups according to stages of the life cycle based on the model of Miller and Friesen [5]. Correlation analysis was conducted separately for each of the sample groups, and, as a result, it was revealed that at the formation stage, the most important factors influencing the effectiveness of the organization are receivables management, inventory management and effect management and business expenses, at the growth stage – leverage of interest-free liabilities, effect of management and business expenses and effect of financial

activities, at the maturity stage – effect from financial activities, cash management and inventory management, at the stage of diversification – leverage of interest-free liabilities, debt burden and inventory management and finally, for decline stage – debt burden, leverage of interest-free liabilities and gross margin. Based on the research results, tools for improving the performance management system were proposed: a factor map, in which twelve indicators are ranked by their significance at different stages of the organization’s life cycle, and a factor diagram that clearly demonstrates the degree of influence of each factor. Thus, since the effectiveness of the organization’s performance depends mostly on the management of a minimum number of indicators, the results of this study and their application in practice can contribute to improving the effectiveness of organization’s activities, based on the management of the most significant factors at the appropriate stage of the life cycle.

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The Choice of Logistics Services Provider in the Regional Market

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Abstract. The market for logistics services in the Russian Federation is not sufficiently developed. Its share of revenue for logistics providers was only 1.2% of GDP in 2017. The growth of the services market is ensured by the development of outsourcing of business processes of incoming logistics. In this regard, the scientific and methodological support of strategic decisions on the choice of service providers is relevant. The aim of the study is to develop a methodological approach to determining the criteria for the selection of logistics service providers, justifying a more affordable method of their choice from a practical point of view. The study used the theory of use value and customer satisfaction, expert ranking methods of logistics service providers, economic and mathematical methods of rank correlation. The main results of the study are to justify that the price/cost of the logistics service is a special criterion for the choice of providers that opposes all other criteria; using the concept of customer satisfaction from interaction with the supplier in the choice of provider; selection of logistics service providers based on the rank correlation method.

Keywords: Criteria · Methods · Models · Providers · Satisfaction · Utility

1 Introduction

The development of the logistics services market in the global economy is characterized by high growth rates, uneven dynamics in individual countries and market segments, as well as various logistics efficiency. The main trend in the development of global logistics, the volume of which is 8752 billion US dollars [10], is an increase in the share of services logistics (in developed countries it reaches 83%) and a decrease in the share of logistics of production companies (in developed countries – 17%) the market of logistics service providers exceeds \$ 800 billion [3]. Some of the most significant factors of the high dynamics of the development of the logistics services market can be noted [8]:

- the concentration of large and medium-sized companies in core activities,
- increased demand for logistics services in order to reduce logistics costs,
- further development of e-commerce,
- automation of business processes of logistics service providers (LSP – Logistics Service Providers),
- increased investment to meet the demand for software for logistics services,

- improvement of technological solutions and information technologies in such business processes of logistics as transportation, warehousing, cargo tracking, procurement and distribution.

The growth of the logistics services market is thus ensured through outsourcing of the logistics business processes of companies. Outsourcing efficiency factors include: reduction in the number of economic relations for the supply of material resources, the number of transactions and the level of transaction costs; a significant reduction in the level of inventories of manufacturing companies, storage costs, fixed and working capital; reduction of sales costs for manufacturers of products; an increase in the level of customer service and their satisfaction from cooperation with suppliers; risk insurance of product manufacturers and its consumers (redistribution of total risk); more complete satisfaction of consumer demand.

According to the level of development of logistics and its efficiency, the Russian Federation occupies 75th place among other countries (12). The main share of national logistics in terms of value is concentrated in enterprises (92.2%) and only 7.8% in logistics service providers. Logistics costs amounted to \$ 245.9 billion, and their share in GDP was 16.1% in 2017. In the overall structure of logistics expenses, the largest share was accounted for by transportation expenses (45.6%), the smallest – to administrative expenses (3.5%). The market of logistics services of the Russian Federation for the income of providers amounted to only 19.2 billion US dollars or 1.2% of GDP. The insufficiently high level of development of the Russian market of logistics services is explained by their low quality (low share of logistics services providers of the 3PL level - Third Party Logistics).

One of the reasons hindering the development of outsourcing of logistics business processes and management functions of Russian manufacturing companies, therefore, the growth of the 3PL market, is the insufficiently deep scientific and methodological support for strategic decisions on the choice of logistics service providers [1]. The models of the choice of logistics service providers developed in recent decades are quite diverse. Trends in building models and applying sophisticated selection methods are based on the use of numerous criteria, an increasingly complex mathematical apparatus, and software products. From a practical point of view, such complications, the need for highly qualified personnel and the complexity of the calculations limit their use in medium-sized enterprises and in the regions. Therefore, the development of simpler and no less accurate methods for the selection of logistics service providers, which can be used by medium-sized enterprises in regional markets, is required.

An analysis of the existing literature on evaluating the effectiveness of logistics service providers and their selection according to certain criteria shows that the main methods for making strategic decisions in this area are a combination of expert and economic-mathematical methods. The economic and mathematical methods used to select logistics service providers include hierarchy analysis method [5, 9], hierarchy analysis method, supplemented by such methods as ISM (Interpretive Structural Modeling) [11], DEA and linear programming [7]. Other methods for making multi-criteria 3PL selection decisions are ELECTRE I with sensitivity analysis from changes in the main parameters [2], a developed version of the hierarchy analysis method (FAHP) [6]. The approach to the selection of a logistics service provider based on the benefits, costs, opportunities and risks was formulated [4].

2 Methodology

The methodological approach to the selection of LSP is based on the concept of customer satisfaction from interaction with service providers. Satisfaction is based on customer emotions arising before, during and after the acquisition of a service. Satisfaction is a holistic characteristic of the emotional response of the consumer, in contrast to the quality of the service as a combination of its individual and balanced properties. The principle of integrity can be formulated in relation to the subject of research in the form of the following position: the whole (integrity) can be divided into parts (elements), but cannot be composed of these parts (elements).

Customer satisfaction from interaction with a logistics service provider can be determined based on expert evaluations of its effectiveness. If the number of experts is more than one, then there is a need to determine the consistency of their opinions on the basis of the Kendall Concordance Index. A modified concordance index was used in the work, which allows one to determine not only the consistency of provider ratings, but also to give a more accurate quantitative assessment of the priority of suppliers. Consequently, there is no need to calculate and use dozens of criteria for choosing service providers, using a complex mathematical apparatus for weighing and summarizing them. Dozens and even hundreds of selection criteria are not able to cover all the nuances of the interaction of the supplier and consumer of logistics services. The described approach to the selection of a logistics service provider based on a single indicator (criterion) of customer satisfaction corresponds to the Occam principle (if the evaluation results are equal, a simpler method of obtaining it is chosen).

3 Results

The world’s leading 3PLs provide consumers with a wide range of logistics services in supply chains (Table 1).

Table 1. World 3PL services

Functions	Functions
Supply Chain Reengineering	<ol style="list-style-type: none"> 1. Supply Chain Optimization 2. Supply chain analysis 3. Warehouse design 4. Transport and distribution design
Supply Chain Services	<ol style="list-style-type: none"> 1. Order Management 2. Cargo management 3. Customs services and compliance with international trade rules 4. Warehouse and distribution management 5. International hub management

(continued)

Table 1. (continued)

Functions	Functions
Technological services	<ol style="list-style-type: none"> 1. Supply Chain Collaboration 2. Warehouse management systems 3. Optimization of warehouse operations 4. Visual intelligence 5. Transport management systems
Customer service	<ol style="list-style-type: none"> 1. Implementation of global solutions 2. Global security 3. Account Management 4. Development centers 5. Quality of service and customer satisfaction

Source: author.

In all used LSP selection methods, the main criterion is the price of the service as a factor attribute in economic and mathematical models. This approach is contrary to economic theory and the common sense of any economic choice, where the client chooses a product/service in terms of price/quality. In economic theory, it is known that a product is characterized on two sides: value (price) and use value (utility). Value is created by abstract labor, the costs of which are determined by working time. Use value is created by concrete labor, which forms the usefulness of a product as a set of consumer properties. Although the price of the logistics service provider is the most important criterion for choosing an LSP, it is a criterion of a different kind that opposes all other criteria. Any summation, aggregation and weighting of prices and other criteria distorts the decision on the choice of LSP. What matters is only the ratio of price and other criteria in the methods and models used.

In choosing LSP, many multicriteria logistic decision making methods are used. The use of these methods in assessing LSP is based on an analysis of numerous indicators (evaluation criteria) of the financial situation of service providers, the level of logistics service, reputation, geographical location, environmental conditions, information technology, experience and, of course, the price/cost of services. This is just a short list of the main criteria for evaluating the effectiveness of LSP, which are complemented by subcriteria.

The choice of providers of logistics services in the regional market can be made on the basis of the Kendall rank correlation method. However, a modification of traditional calculations is required in order to obtain quantitative and comparable estimates of the utility (value) of each of the providers. The managerial decision on the selection of LSP was implemented in the company for the construction of trunk pipelines of “NOVA” Ltd, located in the Samara region of the Russian Federation, according to the nomenclature of rolled ferrous metals. As regional providers of logistics services were considered 12 local operators specializing in the provision of services for the supply of rolled ferrous metals.

Regional LSPs provide a minimum range of services of 3PL, including storage of metal products in an open area, closed warehouse, loading and unloading, delivery, insurance and forwarding, paperwork, calculation of the cost of services, as well as

production services (cutting and logging, packaging, drilling and edge processing, galvanizing, powder coating and turning).

Choosing an LSP involves several steps. At the first step, 5 experts, experts in the field of logistics and supply chain management conduct a ranking of these 12 service providers according to their degree of satisfaction, based on experience of working with suppliers, expectations of such interaction, customer feedback from the media and the Internet, communication and the opinion of the professional community. The results of expert evaluations are presented in Table 2.

Table 2. LSP ranking

The experts	Logistic service providers											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	2	2	1	4	1	5	6	5	7	12
2	4	3	2	2	2	5	1	5	6	7	6	12
3	4	3	3	4	2	6	2	6	6	7	8	10
4	5	5	4	3	3	5	2	6	7	8	9	8
5	5	3	4	3	1	6	1	7	7	8	9	10

Source: author.

In the second step, based on the data in Table 2, the Kendall concordance coefficient is calculated, and the quantitative values of the utility of each provider’s services in Mathcad are determined:

1. A matrix xc is formed, where m is the number of experts [6], n is the number of providers [12]. The total ranks for each LSP in the matrix (L_i) and the concordance coefficient (W) are calculated.

$$ORIGIN := 1$$

$$m := 5 \quad n := 12 \quad j := 1 \dots 5 \quad i := 1 \dots 12,$$

$$xc := \begin{pmatrix} 3 & 3 & 2 & 2 & 1 & 4 & 1 & 5 & 6 & 5 & 7 & 9 \\ 4 & 3 & 2 & 2 & 2 & 5 & 1 & 5 & 6 & 7 & 6 & 9 \\ 4 & 3 & 3 & 4 & 2 & 6 & 2 & 6 & 6 & 7 & 8 & 10 \\ 5 & 5 & 4 & 3 & 3 & 5 & 2 & 6 & 7 & 8 & 9 & 8 \\ 5 & 3 & 4 & 3 & 1 & 6 & 1 & 7 & 7 & 8 & 9 & 10 \end{pmatrix},$$

$$x := m \cdot \frac{n+1}{2}, \quad x = 32.5$$

$$L_i := \sum_{j=1}^5 x c_{j,i}, \quad L_i = \begin{pmatrix} 21 \\ 17 \\ 15 \\ 14 \\ 9 \\ 26 \\ 7 \\ 29 \\ 32 \\ 35 \\ 39 \\ 46 \end{pmatrix}, \quad W := 12 \cdot \sum_{i=1}^{12} (L_i - x)^2 / m^2 \cdot (n^3 - n),$$

$W = 0.702$.

The value of the concordance coefficient equal to 0.702 indicates a high degree of consistency in the estimates of LSP by experts.

The significance of the concordance coefficient was determined by the Pearson criterion (χ^2):

$$\chi^2 = m \cdot (n - 1) \cdot w = 5 \cdot 11 \cdot 0,702 = 38,61.$$

The table value of the Pearson criterion is 19.675:

$$\chi_{tabl.}^2(0,05; 11) = 19,675.$$

Since the calculated value χ^2 is greater than its tabular value, we can conclude that the coefficient of concordance is significant.

2. The calculation of quantitative values of the utility of services of each provider. The results are presented in the matrix S_i :

$$S_i := 1 - L_i / \sum_{i=1}^{12} L_i, \quad S_i = \begin{pmatrix} 0.928 \\ 0.941 \\ 0.948 \\ 0.952 \\ 0.969 \\ 0.910 \\ 0.976 \\ 0.900 \\ 0.890 \\ 0.879 \\ 0.866 \\ 0.841 \end{pmatrix}$$

The values of the LSP utility coefficients indicate that the highest utility of the services is provided by 7, 5 and 4 LSPs, which are the subjects of preliminary selection.

In the third step, for pre-selected LSPs, the consolidated price for logistics services for a complex of their types is determined, including storage in a closed warehouse (unloading, weighing, packing at storage locations, maintenance), forming sets, loading, unloading at destination points, delivery, insurance and forwarding, production services (cutting of sheet steel, cutting and metal cutting). The cost of services such as paperwork and tariff calculation are included in the price.

The fifth step in choosing LSP according to the criterion of the minimum ratio of the price of services to their utility is associated with the calculation of the unit price of the service. The provider is selected from the pre-selected, which has a minimum unit price. Calculation of unit prices is presented in Table 3.

Table 3. LSP unit price calculation

Name of provider (number)	Price, thousand rubles/t	Utility	Unit price thousand rubles/t
JSC “Steel Industrial Company” (7)	4.90	0.976	5.02
“Metal” Ltd (5)	4.85	0.969	5.01
“MetallSamara” Ltd (4)	4.69	0.952	4.93

Source: author.

According to the calculations, the regional provider “MetallSamara” Ltd is selected as the supplier of logistics services, which has the best price/utility ratio or the lowest unit price (4.93 thousand rubles/t).

4 Discussion

The results of the study can significantly simplify the choice of LSP based on a single criterion – customer satisfaction, which nevertheless allows you to take into account all the nuances of their interaction with logistics service providers. In this regard, experts participating in the LSP ranking must be subject to high knowledge of the regional logistics services market. In the subsequent evaluation of the utility of LSP services based on the concordance method, any computer program can be used.

Of particular difficulty in choosing an LSP is the determination of the consolidated price for a set of logistics services, which are calculated based on the summation of prices for their individual types. It is possible to use an approach based on the cost of services for the consumer. This cost is expressed by its transportation and procurement costs. The consumer’s transition from a traditional level of service to a higher one under LSP conditions leads to a significant increase in transportation and procurement costs. But this is opposed by a sharp increase in the utility of logistics services and a higher quality of business processes of incoming logistics. The proposed methodology and methods for choosing LSP in regional markets can be used by medium-sized enterprises in the regions of the Russian Federation. The direction of future research is to evaluate the economic efficiency of outsourcing logistics services in accordance with the requirements of international financial reporting standards.

5 Conclusion

The market for logistics services in the Russian Federation is not sufficiently developed in comparison with the markets of the USA and Western Europe. There are numerous reasons for this lag, among which there is a weak development of outsourcing of business processes of incoming logistics and the lack of a simple scientific and methodological justification for choosing a logistics provider of level 3PL for medium-sized enterprises in regional markets.

An analysis of the existing literature on the subject of research showed that the methods used and decision-making models are difficult from the practical point of view of their application. Therefore, the development of simpler and no less accurate methods for assessing LSP is required. In addition, there are methodological disadvantages of using multi-criteria models, where one of the criteria is the price/cost of logistics services. Based on the theory of consumer choice, it was concluded that the price of a service is a criterion of a different kind, and the choice should be based on the ratio of the price and utility of the service, that is, the unit price. The adoption of a logistics decision on the selection of LSP was tested at the “NOVA” Ltd trunk pipeline construction company according to the nomenclature of rolled ferrous metals. The solution is implemented in a computer program based on the method of rank correlation, supplemented by the calculation of the utility of the services of 12 providers. The main steps of the calculations were the ranking of providers according to the degree of satisfaction with the services of 5 experts, the calculation of quantitative values of the utility of each provider’s services, the selection of LSP according to the criterion of the minimum ratio of the price of services to their utility.

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Relationship Between Social Business Entrepreneurship and Business Freedom: An Evidence from Russia

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Abstract. The study sheds a light on contribution to the existing literature of entrepreneurial activities related to the social business entrepreneurship by considering the business freedom of the entrepreneurs of the Russian Federation, where how Gross National Income per capita and Industry value added per worker influence the business freedom of the social business entrepreneurship in the short-run and long-run. In the paper is applied model called The Vector Error Correction Model (VECM) and while considering log of business freedom index as the dependent variable in VECM, the results show that in the short run log of Gross National Income per capita and the log of industry value added per worker do not influence business freedom indexes. Also, the paper results show that in the long run, the log of Gross National Income per capita negatively observes the business freedom index. The investigation will additionally support and become an encouragement issue for improving business conditions for the established and new social business entrepreneurs in the Russian Federation and other countries as well.

Keywords: Business freedom · Entrepreneurship · Russian federation · Social business

1 Introduction

Nowadays, business changes the living standard of the citizens of a country by developing their economic condition from the situation, where they experience a lot of suffering because of the lack of financial and other available resources, even every day a country is introducing Social Business Entrepreneurship. The core aspiration of this study is to demonstrate the prescribed association between Social Business Entrepreneurship and Business Freedom: An Evidence from the Russian Federation. This paper examines the roles of social entrepreneurship in developing investment sectors, especially introducing social business enterprises in the Russian Federation. In recent years the social entrepreneurship has become modern way of conducting business [16]. This article evaluates the contribution of social entrepreneurship in the business scenario considering

business freedom, Gross National Income per capita, and industry value added per workers of the Russian Federation. This study focuses on the intellectual capability of social entrepreneurs. This article determines how social entrepreneurs behave towards changing the economy of the Russian Federation, the welfare of social entrepreneurship creates a strong relationship with the society and the human capital of a social entrepreneur impact on business freedom of the country [14].

We examine the short-run and long-run relationship between the social business entrepreneurship and business freedom considering industry value-added per workers and Gross National Income (GNI) per capita of the Russian Federation taking data from World Bank Development Indicators, Human Development Reports, and Economic Data and Statistics on World Economy and Economic Research (Heritage Organization) during the years 1995–2018 [6]. Exploring the entrepreneurial activities in favor of business freedom becomes the concentrated area of this paper.

For investigating the short-run and long-run relation between social business entrepreneurship and business freedom regarding the industry value-added per workers and GNI per capita, we employ the Vector Error Correction Model (VECM) under the supervision of the multivariate time series regression models. In this paper, all variables are endogenous. The target variable of this paper is business freedom, while the other two regressors are GNI per capita and industry value added per workers [15]. This study will be the additional support for both entrepreneurship and policymakers to decide the several initiatives fostering the economic growth of the Russian Federation and other countries as well. The rest of the section of this paper is structured as follows. First, we determine the effectiveness of the social business entrepreneurship in influencing the business sectors of the Russian Federation.

Examining the core projects related to the development of the entrepreneurial activities become another essential issue for us to execute a solid explanation describing the real social entrepreneurial business market of the Russian Federation. Second, we focus on the econometric estimation of paper in shaping the short-run and long-term effect of GNI per capita and industry value-added per workers towards the business freedom of the Russian Federation considering our collected datasets [7]. Third, we employ a Vector Error Correction Model determining the short-run and long-run relationship among target variables, business freedom, and other regressors, GNI per capita, and industry value-added per workers with time-series datasets from 1995 to 2018. Finally, we discuss the final output from STATA 14 and EVIEWS Lite Student Version statistical analysis software, recommend some strategic issues for the young researchers and policymakers of the Russian Federation and other countries as well.

2 Methodology

The prime concern of this paper is to determine the relationship between the social business entrepreneurship and business freedom of the Russian Federation. However, we have used time-series data from 1995 to 2018 for conducting the econometric analysis of this paper. We have considered the Business Freedom Index from Heritage Foundation/World Bank, Gross National Income (GNI) per capita constant 2011 US dollars from Human Development Reports of United Nations Development Programme,

and Industry (including construction) Value Added Per Workers from the World Bank Development Indicators for the analysis because of the availability of the data [17]. Our collected data becomes stationary after the first difference, meaning the series is $I(1)$, based on Augmented Dickey-Fuller and Phillips-Perron Unit Root Test [2]. At the same time, we employ the Gregory-Hansen Test for Cointegration [4] to identify the structural break of the model and Johansen tests for determining the rank of the cointegration among variables [3]. After performing the Johansen Cointegration, we notice that in our model, we have one cointegrating equation. Therefore, we implement the Vector Error Correction Model (VECM) for econometric analysis determining the short-run and long-run relationship between the social business entrepreneurs and financial freedom in favor of the Russian Federation [10].

Sims (1990) has introduced a prevalent method, which is VAR, for analyzing time-series modeling [13]. In the VAR system, the model contains a set of endogenous variables, where all variables are the dependent variable. Each endogenous variable has expressed as a linear function of p lags of itself, and one reduced-lag of other variables and an error term in the model. Sims (1980) has introduced two variables equation.

$$Y_t = \beta_{y0} + \beta_{yy1} Y_{t-1} + \dots + \beta_{yyp} Y_{t-p} + \beta_{yx1} X_{t-1} + \dots + \beta_{xyp} X_{t-p} + V_t^y \quad (1)$$

$$X_t = \beta_{x0} + \beta_{xy1} Y_{t-1} + \dots + \beta_{xyp} Y_{t-p} + \beta_{xx1} X_{t-1} + \dots + \beta_{xxp} X_{t-p} + V_t^x \quad (2)$$

Where, β_{xyp} is the coefficient of y in the equation of x at lag p . Adding one more variable in the system, the third equation will come up with variable Z_t and p lagged value of z , say β_{xzp} . The right-hand side of each equation will add β_{xzp} .

Researchers employ an Error Correction Model for an appropriate econometric specification if at least one cointegrating equation exists among variables. In the Error Correction Model, researchers have differenced the equation and include an error-correction term measuring the deviation of the previous period from long-run equilibrium. The Error-correction model requires a new test for cointegration. If there is no cointegration, there is no cointegrated relationship among the series [5]. In such cases, researchers perform only VAR for an appropriate econometric specification. Sims (1980) has introduced Vector Error Correction Model (VECM). The VECM for two variables is in the following way, where the error correction term comes up with only one lagged difference.

$$\Delta Y_t = \beta_{y0} + \beta_{yy1} \Delta Y_{t-1} + \beta_{yx1} \Delta X_{t-1} + \lambda_y (y_{t-1} - \alpha_0 - \alpha_1 x_{t-1}) + V_t^y \quad (3)$$

$$\Delta X_t = \beta_{x0} + \beta_{xy1} \Delta Y_{t-1} + \beta_{xx1} \Delta X_{t-1} + \lambda_x (y_{t-1} - \alpha_0 - \alpha_1 x_{t-1}) + V_t^x \quad (4)$$

Where, the coefficient λ shows the cointegration relating to $(t-1)$ period (meaning disequilibrium) that has taken place in period t . Researchers expect the value of the coefficient of λ will come up with a negative sign (meaning negative).

Researchers notice there is a covariance relationship that exists between the variables in Y_t and X_t while estimating VAR model parameters. The covariance takes place among variables when their first two moments are finite and time-invariant. If the

variables in Y_t are non-stationary at level, but they are stationary at first difference, then, researchers may use VECM. For the simplicity of this paper, first we execute VAR model with our targeted variables due to estimating the VECM for econometric analysis.

3 Results

3.1 Descriptive Statistics

From analysis of the data presented in Table 1, the authors make inferences. The Mean average of the Business Freedom Index is 61.95417. The deviation from the sample Mean is 9.821626. The minimum value is 50.7, and the highest is 85 in this series. The dispersion among the observations in this series, which is variance, is 96.46433.

Table 1. Descriptive Statistics BFDIX, GNIPC, and INDVAPW

Variables	BFDIX = [Business Freedom Index]	GNIPC = [Gross National Income (GNI) per capita (2011 PPP\$)]	INDVAPW = [Industry (including construction), value added per worker (constant 2010 US\$)]
Mean	61.95417	20738.92	19386.42
Standard Deviation	9.821626	4608.918	4969.839
Min	50.7	12769.15	11592
Max	85	26885.38	25036
Variance	96.46433	2.12e + 07	2.47e+07
Skewness	0.7870549	-0.4113201	-0.3485852
Kurtosis	2.340154	1.724445	1.471448
Observations	24	24	24

Source: authors.

The Skewness value is 0.7870549, where it measures the degree of asymmetry for this series. Zero is the standard skewness value. So, we can easily conclude that the business freedom index mirrors a normal distribution because skewness values are 0.7870549. The Kurtosis value is 2.340154. The data has a normal distribution, where the kurtosis value must be 3. The kurtosis is 2.340154, which is less than 3. We can conclude that the business freedom index is platykurtic. So, the shape is going to have a flat surface. The Mean of Gross National Income (GNI) per capita is 20738.92, and the standard deviation is 4608.918. The minimum is 12769.15, and the highest value is 26885.38. The diversity is negative. The Skewness value is -0.4113201, which mirrors a normal distribution but negatively skewed while the kurtosis is 1.724445. Skewness

reflects a platykurtic kurtosis, which is less than 3. The Mean value of industry value added per worker is 19386.42, and the standard deviation is 4969.839. The minimum is 11592, and the highest is 25036. The variance has a negative value. The Skewness value is negative, which is -0.3485852 . Skewness mirrors a normal distribution, but negatively skewed. The kurtosis is 1.471448, which reflects a platykurtic kurtosis.

3.2 Correlation Matrix

From analysis of the data presented in Table 2, the authors make inferences. The correlation matrix illustrates there is a strong positive correlation exists between the log of Gross National Income per capita and industry value added per workers at 5% significant level. The log of the business freedom index has a weak correlation with Gross National Income per capita, where value is 0.2552. The business freedom index has an ordinary association with industry value-added per worker in the log form, where value is 0.4849.

Table 2. Correlation Matrix

VARIABLES	LOGBFDIX	LOGGNIPC	LOGINDVAPW
LOGBFDIX	1.0000		
LOGGNIPC	0.2417 0.2552	1.0000	
LOGINDVAPW	0.1498 0.4849	0.9777* 0.0000	1.0000

Source: authors.

Researchers often consider AIC (Akaike Information Criterion) and (SIBC) Schwartz-Bayesian Information Criterion to choose the optimal lag length of the series. The analysis shows the non-stationarity and stationarity of the series at the level and first difference. The series becomes stationary after taking the first difference.

3.3 Determination of Structural Break of the Model

If the value of ADF, Z_t , and Z_a are higher than the 5% critical value, we reject the null hypothesis of there is no breakpoint. If the value of ADF, Z_t , and Z_a are less than the 5% critical value, we fail to reject the null hypothesis of there is no breakpoint [9]. Hence, in model 1, 2, and 3, the ADF, Z_t , and Z_a are less than the 5% critical value (Table 3). We are happy that there is no structural break in our targeted model, which is desirable.

Table 3. Gregory-Hansen Test for Structural Break of the Model

		Test Statistic	Break point	Date	Asymptotical Critical Values			Decision at 5% level
					1%	5%	10%	
Break (Level)	ADF	-4.64	18	2012	-5.44	-4.92	-4.69	Fail to reject null H_0 , there is no break point
	Zt	-4.75	18	2012	-5.44	-4.92	-4.69	
	Za	-22.96	18	2012	-57.01	-46.98	-42.49	
Break (Trend)	ADF	-4.38	18	2012	-5.80	-5.29	-5.03	Fail to reject null H_0 , there is no break point
	Zt	-4.86	18	2012	-5.80	-5.29	-5.03	
	Za	-21.95	18	2012	-64.77	-53.92	-48.94	
Break (Regime)	ADF	-4.96	18	2012	-5.97	-5.50	-5.23	Fail to reject null H_0 , there is no break point
	Zt	-5.08	18	2012	-5.97	-5.50	-5.23	
	Za	-23.89	18	2012	-68.21	-58.33	-52.85	

Source: authors.

3.4 Johansen Trace and Max-Eigen Test for Cointegration Test

In Johansen’s cointegrating equations, once the value of trace and max statistics is higher than the corresponding critical values at a 5% significance level, we reject the null hypothesis of there is no cointegrating equation [8]. In this regard, we reject the first null hypothesis of no cointegration. It means that we reject the null hypothesis of no cointegration (Table 4). We conclude there is at least one cointegrating equation among variables in this model.

Table 4. Johansen Trace and Max-Eigen Test for Cointegration Test with Lags (1)

Rank	Parms	LL	Eigen Value	Trace Statistic	5% Critical Value	Max Statistic	5% Critical Value	Decision at 5% Critical Value
0	3	166.49082	–	35.3511	29.68	29.0253	20.97	Reject Null H_0
1	8	181.00349	0.71690	6.3258*	15.41	5.2492	14.07	Fail to reject, H_0
2	11	183.62809	0.20406	1.0766	3.76	1.0766	3.76	Fail to reject, H_0
3	12	184.16639	0.04573					

Note: Number of Observations = 23, Lags = 1

Source: authors.

3.5 Vector Error Correction Model (VECM)

In STATA 14 output, the results represent the short-run coefficients of endogenous variables. The output places the target variable first, while other regressors are listed just below after the target variable. The row of CE1 shows the adjustments coefficients (the speed of adjustments). The row of Ce1 shows the cointegrating equation from the Johansen Normalized Restriction Imposed. Johansen’s Normalized Restriction shows

the long-run equation from where the value of the Error Correction Model has obtained. Johansen’s Normalized Restriction indicates the long-run relation. The Johansen normalized restriction value for the target variable, which is the log of business freedom index, is 1. The error correction term has generated from this long-run equation. For interpretation of the report of Johansen’s normalized restriction imposed, the researchers must reverse the sign of the coefficients.

The logbfdix has positioned as the dependent variable. In this case, we are going to say, in the short run, loggnipc and logindvapw do not cause logbfdix. However, the corresponding P-value, which is 0.001, of the cointegrating equation is statistically significant in the short run at the 1% significant level. In the long-run, the loggnipc has a negative (sign is positive) effect on the target variable, logbfdix. The logindvapw has a positive (sign is negative) effect on the target variable, logbfdix. The coefficient is statistically significant at the 1% level.

The cointegrating equation shows the corresponding P-value of loggnipc, which is 0.000, and the logindvapw, which is 0.000. In the long-run, Logpw and loggnipc have asymmetric effects on logbfdix on average ceteris paribus. Even in two lags, there is no autocorrelation, where the P-value of the first lag is 0.06697, and the second lag is 0.73794. In the normality test, the Jarque-Bera test shows the errors are normally distributed in three equations, where the P-value of logbfdix is 0.06251, loggnipc is 0.80004, and logindvapw is 0.84644. Overall, the entire system of VECM is normally distributed because P-value is 0.38785, which is higher than a 5% significant level. We fail to reject the null hypothesis of normality.

The cointegrating equation and long-run model is $ECT_{t-1} = [Y_{t-1} - \eta_1 X_{t-1} - \xi_1 R_{t-1}]$.

$$ECT_{t-1} = [1.000 \text{ logbfdix}_{t-1} + 5.879959 \text{ loggnipc}_{t-1} - 7.545918 \text{ logindvapw}_{t-1} + 5.574524]$$

$$\Delta Y_t = \sigma + \sum_{i=1}^{k-1} \gamma_i \Delta Y_{t-i} + \sum_{j=1}^{k-1} \eta_j \Delta X_{t-j} + \sum_{m=1}^{k-1} \xi_m \Delta R_{t-m} + \lambda ECT_{t-1} + u_t$$

Logbfdix as the target variable:

$$\Delta \text{logbfdix}_t = -0.0006819 - 0.025315 \Delta \text{logbfdix}_{t-1} + 0.089265 \Delta \text{loggnipc}_{t-1} - .3454636 \Delta \text{logindvapw}_{t-1} - 0.1881318 ECT_{t-1}$$

The adjustment term (-0.1881) is statistically significant at the 1% level, suggesting that the previous year’s errors or deviation from long-run equilibrium are corrected for within the current year at a convergence speed of 18.81%. As a result the VECM specification imposes 2-unit moduli, which is better for the model [12]. At the same time, all values are placing inside the circle. We conclude that we can rely on this model to determine the short-run and long-run relationship between social business entrepreneurship and business freedom considering industry value-added per worker and Gross National Income per capita of the Russian Federation.

4 Discussion

However, Social Business Entrepreneurship (SBE), a non-loss and non-dividend business, helps the citizens by addressing the created problems of the people in the country, like the Russian Federation. An individual determines the profit of the Social Business reinvesting the initial investment and its earnings in the business. They invest money many times as far as possible to generate more and more financial benefits or values. The person who is known as Social Business Entrepreneur deals with Social Business Entrepreneurial activities meeting social objectives. However, there is no short-run relationship between Social Business Entrepreneurship and Business Freedom. GNI per capita and industry value-added per workers do not have any short-run association with business freedom of the social business entrepreneurship. In short run, there is no impact due to economic stability and private and public sector funding opportunity to social business entrepreneurship. However, in the long-run, GNI per capita and industry value-added per workers impact business freedom of social entrepreneurship of the Russian Federation [11].

5 Conclusion

At present, a growing number of studies indicate the Russian Federation has experienced a stable stage because of the hostile business nature. Researchers have discovered the impact of entrepreneurial behavior is surprisingly little because of the knowledge gap. As a result, economic structures' transformation and explaining growth in emerging economies become representative issues [1]. Social business or enterprise introduces the capital accumulation of entrepreneurship. Social Business Entrepreneurship (SBE) brings a better transformation of the economic position through restructuring socio-economic infrastructure. SBE invests capital bringing innovations through business operations with social objectives. Social Business Entrepreneurial capital impacts the knowledge that needs to create the capabilities for entrepreneurial activities associating with institutional, legal, environmental, and social factors. However, it explains the regional economy of the country through operating business with social objectives. Social Business Entrepreneurship generates profits and solves social problems as well at the same time. SBE increases the value for the people by creating innovative ideas, exploring new opportunities, doing something for raising the social benefits, dealing with the accountability, ensuring the use of available resources wisely, and acting as a volunteer at a not-for-profit sector. SBE engages in business activities by considering a positive return to the community, transforming systems, practicing and analyzing the primary causes of poverty, marginalization, the deterioration of the environment, and dealing with the loss of the dignity of humans.

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Northern Latitudinal Railway Project: Priorities and Drivers

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Abstract. The subject of this research is the Northern Latitudinal Railway project, including consideration of its priorities and drivers. The relevance of this topic is associated with the implementation of the Transport Strategy of the Russian Federation until 2030 for the transport and logistics development of the Far North and access to the coast of the Arctic Ocean. The main purpose is to study the problems and prospects of the Northern Latitudinal Railway project. Materials and methods: analytical, marketing, design methods. Authors used materials of open access, official sites, own research results. Authors have considered project implementation priorities, drivers, bottlenecks, options for further development. The implementation of the project will not only double the existing capacity of the transport infrastructure of the macroregion, but also involve a wide range of minerals in the economy, ensure a stable presence of Russia in the western and central sectors of the Arctic.

Keywords: Northern latitudinal railway · Russian Railways · Transport corridor · Transport and logistics infrastructure

1 Introduction

The idea of constructing a railway in the Arctic zone, which would provide an opportunity to accelerate the development of the Far North and access to the coast of the Arctic Ocean, appeared more than 50 years ago. The Transport Strategy of the Russian Federation until 2030, approved by Decree of the Government of the Russian Federation on November 22, 2008 No. 1734-r, sets specific tasks for the development of transport in the polar regions of Russia. The creation of the Northern latitudinal railway will reduce the time for the delivery of goods from the Yamal Peninsula towards the ports of the North-Western Basin of the Russian Federation. It will provide unloading most congested section of Transsib and help to lower logistics costs for regional companies [14].

The Northern Latitudinal Railway project involves such powerful national-level stakeholders as Russian Railways, Gazprom, NOVATEK, the Yamalo-Nenets and Ural Autonomous Districts, the Republic of Komi. The project is directly controlled by the Government of the Russian Federation. The implementation of the project will create additional opportunities for large Russian industrial enterprises to enter global markets. In addition, the development of transport infrastructure will increase the interconnectedness of individual regions of the country.

2 Methodology

The methodological basis of the study consists of general scientific methodological approaches, such as system-structural, causal, situational, comparative, economic and statistical, factor analysis, graphical methods. The information base for the study was analytical reviews, reports and statistical data of Russian Railways. Authors used materials of open access, official sites, own research results. Authors have considered project implementation priorities, drivers, bottlenecks, options for further development. Results of research are presented using graphical methods.

3 Results

To organize transportation along the Northern Latitudinal Railway, it is necessary to develop an appropriate integrated technology. This technology should provide a rational balance of the volume of investments made in the development of infrastructure and the income from planned transportation. It is also very important to take into account the interests of shipping companies and the interests of shippers, for whom the availability and high quality of rail transportation in such a complex region is very important. The cargo base of the Northern Latitudinal Railway was determined in the framework of the concession agreement of September 15, 2018 in the amount of 23.9 million tons. It is based on existing enterprises in the region. The resource base for existing and planned enterprises in the area of gravity of the Northern Latitudinal Railway will be large oil and gas fields in the north of the Urals Federal District, which are located in the corridor of the route (Fig. 1).

The largest volumes of transportation will be provided by oil cargo (65%). In addition, there are prospects for increasing the cargo base of the region due to the development of new deposits of the Yamal Peninsula. In this case, the volume of traffic will be significantly increased. The construction of the Northern Latitudinal Railway at the Obskaya station will make it possible to attract an additional 23 million tons of cargo to the Northern Railway. The average weight of the loaded train is 6000 tons. This will increase the train flow of the Chum - Kotlas - Konosha section by 17 pairs of freight trains in the direction of the Oktyabrskaya Railway. To implement the project, it is necessary to carry out calculations of a prospective cargo base and prepare a forecast of long-term technical and economic indicators. The authors offer a reasonable list of measures to strengthen infrastructure throughout the highway. Currently, the ports of the North-West of Russia are among the leading of the total cargo turnover. They are

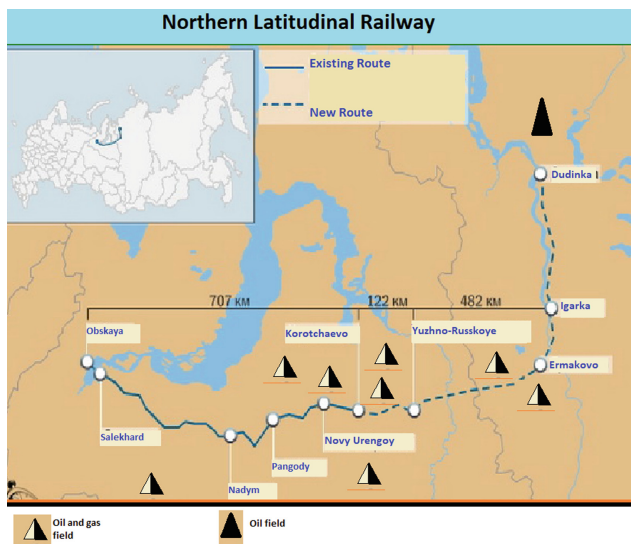


Fig. 1. Northern latitudinal railway. (Source: authors in Microsoft PowerPoint)

only slightly inferior to the ports of the Azov-Black Sea basin. Arkhangelsk and St. Petersburg personify the birth of the merchant fleet of Russia, and the Ust-Luga Commercial Sea Port is truly the most modern Russian port built in the 21st century. The ports of the North-West mainly receive cargo from the Ural, Central, Volga and North-West federal districts. By 2025 the projected arrival of the ports of Arkhangelsk, Vyborg, Vysotsk, Kandalaksha, Murmansk, Primorsk, St. Petersburg and Ust-Luga is about 220 million tons. This means that the loaded train flow following in the indicated direction, will increase by more than 50% compared to 2018 volumes [5].

More than 100 million tons of cargo are expected to arrive at the Ust-Luga port by rail, and at least 50 million tons are expected at the seaport of St. Petersburg. Experts predict an increase in train flow by 80 pairs of trains per day by 2025. Currently, most sections of the railway infrastructure lack a capacity reserve. The increase in traffic volumes inevitably require strengthening the relevant railway infrastructure. The future modernization of railways is regulated by: the sectoral master scheme for the development of the railway network, the state program of the Russian Federation "Development of the transport system", the state program of the Russian Federation "Socio-economic development of the Arctic zone", the "Transport strategy for the period until 2030". An analysis of these documents allows us to conclude that the Northern Latitudinal Railway project is of great strategic importance. The new railway will become the connecting center for the interaction of the Russian Railways railway network with PJSC Gazprom, which operates the Obskaya - Bovanenkovo railway line. In the future, this cooperation will be expanded to the line Polunochnoye - Obskaya - Salekhard.

The authors identify the main factor that determines the nature and extent of measures to develop the transport section Konosha - Chum - Obskaya and designate location of necessary technical equipment objects. This is a technological scheme for

the interaction of adjacent highways, regulating the technology of locomotives and locomotive crews [1]. The authors have also developed measures for the development of infrastructure in accordance with the current standards for warranty haul distance for freight cars (loaded - 2,200 km, empty - 3,300 km). When developing a project of the technological process for organizing train traffic on the Konosha - Obskaya section, it was decided to establish the following locomotive brigade circulation scheme on the approaches to the Obskaya - Purpe section:

- for locomotive freight brigades, the haul tracks of circulation from Solvychegodsk to Inta station remain unchanged,
- Inta - Yeletsкая haul track (253 km) is serviced with rest at the Yeletsкая turnaround point,
- on the section Yeletsкая - Obskaya (130 km) it is proposed to apply the principle of «driving from traffic»,
- the next Obskaya – Tatarintseva haul track (205 km) should provide rest time for locomotive crews.

On the Konosha - Solvychegodsk section, the haul tracks of the locomotive crews are changing, since it is proposed to build a locomotive maintenance center at Konosha station and, accordingly: 1) there is no need to disconnect locomotives at Kuloy station to perform their maintenance and equipment; 2) there is the possibility of increasing the length of the locomotive brigade circulation section without changing by 379 km. In order to exclude train stops due to the need to regulate their weight and length and to increase the efficiency of the use of traction resources in the Konosha - Obskaya section, it is advisable to carry trains with a weight of 6000 tons and a length of 71 conventional wagons.

The authors believe that the option of transporting two-section diesel locomotives is economically feasible, despite the need to use a pushing locomotive on the Ukhta - Yarega and Revazh - Udimа. The proposed technology for the operation of traction rolling stock at the Northern Latitudinal Railway will require the construction of a locomotive maintenance center at Obskaya and Konosha stations. It is necessary to build additional workshops for the operation and reconstruction of rolling stock at Sosnogorsk station for maintenance.

The railway of the Northern Latitudinal Railway adjoins the existing lines of the Northern and Sverdlovsk railways. The authors developed a unified polygon model for organizing the transportation process by the Northern Road Technology Service. A technological audit was conducted with the involvement of specialists from the Northern and Sverdlovsk Railways. As a result, the authors performed traction calculations and constructed train schedules at the Korotchaev - Novy Urengoy - Pangody and Obskaya - Chum - Konosha sections. The calculations take into account the unified weight norm of 6000 tons and the length of freight trains in 71 conventional wagons. The authors suggest the docking of 21 pairs of freight trains at Obskaya station. At the first stage of the operation of the project, if necessary, the need for freight trains will be no more than 14 pairs

The calculations assume a single weight norm of 6000 tons and the length of freight trains in 71 conventional wagons. The authors suggest the docking of 21 pairs of freight trains at Obskaya station. At the first stage of the project, the required need for freight

trains will be no more than 14 pairs. In all these sections authors have provided reserves for infrastructure maintenance, skipping service and snow clearing trains. Dispatch control at the Obskaya - Korotchaevo section will be carried out from the Sverdlovsk Railway traffic control center. The authors propose to create two dispatcher circles: Obskaya - Nadym and Nadym - Korotchaevo. Based on the foregoing, let us single out several priorities for optimizing the development model and technology for further work of the Northern Latitudinal Railway:

1. Creation of conditions for the most complete development of potential volumes of freight and train flows in the direction of the Northern Latitudinal Railway. The main condition will be integrated logistics services for shippers [9].
2. Reducing delivery times and freight charges, optimizing capital costs, increasing liability to carriers [7].
3. Ensuring high efficiency of maintenance and operation of the rolling stock of railways, optimizing the loading and use of infrastructure, increasing the efficiency of decisions on the regulation of the exchange parks of traction and non-traction rolling stock [10].
4. Maintaining process stability in case of train irregularity caused by weather conditions in winter [8].
5. The use of a partially batch train schedule with the mandatory availability of reserve schedule lines.
6. A detailed study of transport corridor technology in the summer period. Organization of technological windows for the maintenance and repair of infrastructure [11].

Priorities of the project are:

1. It is necessary to complete work on the approach to the Ust-Luga Sea Port and the development of the hub parks. The authors consider reconstruction of approaches to the Luzhskaya station to be especially important for the Northern Latitudinal Railway project. This station serves the cargo terminals of the Ust-Luga Sea Port. Currently, the next stage of work on the electrification of this direction has been completed, which allowed to increase the capacity of the section by 37 pairs of trains per day.
2. It is necessary to develop the Sonkovsky Track, which will take on part of the train flow, currently following from the direction of the Northern Railway along the section Koshta - Babaevo - Volkhovstroy. This will make it possible to predominantly specialize in a perspective train flow and direct cargo to the Baltic ports along the Sonkovsky Track.
3. It is necessary to modernize the Murmansk track. The Volkhovstroy - Murmansk section is a technically complex area. There are serious problems of the topography, geology, and hydrology at this section. It is exceedingly difficult to create a full double-track line and provide the required carrying capacity. Therefore, the authors propose to lay the second main rail track along the entire Volkhovstroy - Murmansk section.

The authors note a high potential for increasing freight traffic in the direction of the Murmansk transport hub. It is necessary to develop logistics infrastructure, including

the construction of 105.9 km of the second main tracks, the reconstruction of 21 stations, as well as the construction of locomotive facilities at the Vykhodnaya station. So, already in 2018, design and survey work began on priority objects: the construction of 32.8 km of the second track and the reconstruction of seven stations on the Volkhovstroy - Murmansk direction. In 2019, design and survey work was carried out on the construction of 73.1 km of the second track and the reconstruction of 12 stations. The development of the Northern Latitudinal Railway is one of significant infrastructure projects of the Russian Federation, combining the interests of large manufacturing companies. Creating conditions to reduce the cost of transportation of regional products will allow the regions to effectively integrate into the system of world economic relations.

4 Discussion

The construction of the Northern Latitudinal Railway as a large transport corridor is of key transport and logistical importance for the development of the regional infrastructure of the Far North. This will become a driver of growth in cargo flows towards sea ports of the North-West of the Russian Federation. Railway work in the Far North requires additional research. This problem involved mainly Russian scientists [2]. The above, of course, will require Russian Railways to change the technology for promoting and processing new train flows along the new transport corridor.

The possibilities of using the Northern Sea Route as a competitor to transportation through the Suez Canal were investigated in the works of scientists from Russia [4, 6] China [15] and EU [3, 10, 13]. The implementation of the Northern Latitudinal Railway project, in addition to the development of the planned delivery of cargo and the organization of traffic along the redistributed train flow, will reduce the time of cargo delivery and improve the operational performance of the rail track. The local speed will increase by 1.7 km/h, the average train weight - by 68 tons, and the productivity of the locomotive of the working fleet - by 137 thousand t-km gross. Project development is possible using the techniques described in earlier works of the authors [12]. This project, together with an increase in the movement of vessels along the Northern Sea Route, will create a stable transport channel in the Russian Arctic zone with the possibility of logistic maneuvering. This will give a new impetus to the development of the Far North and the development of the coast of the Arctic Ocean.

5 Conclusion

Thus, the Northern Latitudinal Railway project is an important component of the formation of a multi-modal transport infrastructure in the Russian Arctic zone in the direction of the Northern sea route – Northern Latitudinal Railway – Transsib. In addition, the project will not only double the existing capacity of the transport infrastructure of the macroregion, but also involve a wide range of minerals in economic turnover and ensure a stable presence of Russia in the Western and Central sectors of the Arctic. Authors conclude that the development of the listed priorities of

Russian Railways under the project Northern Latitudinal Railway will ensure the most efficient operation of the polar railway.

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Tourism After the Pandemic COVID-19: Potential Government Support Effectiveness

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Abstract. Today the tourism and hospitality industry study is relevant, since it is this economy sector that has suffered the most from the pandemic of the coronavirus infection COVID-19. The purpose of the study is to diagnose the consequences of crisis events in social and economic life in the world and in the Russian Federation on the state of the Samara region tourism sector, which ended up in the crisis zone, and to develop recommendations and measures of state support. The authors identified the following tasks: analysis of the tourism sector current situation in the Samara region, the tourism market participants perception by of state policy in this area, analysis of the development prospects of respondents-tour operators in the region. The basis of the article is a large-scale sociological study. The authors of the article revealed the key problems of the Samara region tourism industry. Respondents' expectations and the real possibilities of the public sector to overcome the consequences of the coronavirus infection COVID-19 pandemic were studied. The measures to improve the interaction of the business environment and the public sector to accelerate the restoration of the tourism industry in the Samara region were proposed.

Keywords: COVID-19 pandemic · Efficiency · Region · Restrictions · State support · Tourism

1 Introduction

Tourism is the most attractive economy sector, contributes to the creation of new jobs for the population around the world, is an investment-attractive industry, is a source of state budget replenishment. Inbound or outbound, domestic, children's, environmental, business tourism and others - all areas are in tremendous demand, both in the global service market and in our country. All types of tourism are scientific and cognitive in nature, contribute to the improvement of the population culture general level, which motivates states to develop this service sector, are the "driver of economic growth" [6, 7]. In this regard, there is no doubt about the relevance of the study topic. In addition, the tourist routes organization directly depends on the territory's infrastructure development level (roads, communications, electric networks, etc.), the recreational zone presence, favorable natural and climatic conditions [1]. On the other hand, the tourism industry contributes to the development of industries related to the production

of a tourist product: transport, housing and communal services, healthcare, culture and sports, trade, and catering. However, in connection with a world-wide event (COVID-19 pandemic), which affected almost all economy sectors, the tourism industry was the most vulnerable and affected industry [11].

The purpose of the study is to diagnose the consequences of crisis events in social and economic life in the world and in the Russian Federation on the state of the Samara region tourism sector, which ended up in the crisis zone, and to develop recommendations and state support measures. The tasks of the study included:

- analysis of the tourism current situation in the Samara region,
- perceptions of state policy in this area by the participants of the tourism market,
- analysis of respondents-tour operators development prospects of the region.

2 Methodology

The study is based on a large-scale sociological survey, in which representatives of all spheres of the Samara region economy affected by a new coronavirus infection took part. The total number of respondents was 11,954 organizations. The study's key object was the Samara region organizations in the field of travel industry, as the most affected industry in the pandemic COVID-19. Both qualitative and quantitative methods were used to analyze the tasks solution. Primary information posted on open Internet sites and catalogues of relevant ministries was collected, processed and analyzed. The article analyzed the main areas of state support both in Russia and abroad [2]. The analysis made it possible to identify key development problems in almost all sectors of the Samara region economy. The study is of a complementary nature in the recommendations development, does not call for any action, is not a consequence of legislative initiatives. Includes an independent analysis of the pandemic COVID-19 real effects. The results obtained during the sociological survey will help overcome the current situation and choose the most state support relevant measures.

3 Results

The tourism sector in the Samara region occupies a special place. In 2019, the share of employees in this sector amounted to 13.4% of the total number of employees in the region's economy. However, the unfavorable sanitary and epidemiological situation around the world has made unforeseen adjustments to the activities of each enterprise. This study, as indicated earlier, is based on the results of a major sociological survey of Samara region organizations.

The participants structure in the sociological survey is as follows:

- 65% - non-governmental organizations,
- 20% - individual entrepreneurs,
- 15% - state institutions.

The enterprises structure examination by activity area showed that non-public sector organizations, respectively, were most affected, without a “financial airbag” and legal protection in a new emergency to maintain obligations and retain staff. Such areas include: retail trade in non-food products, catering enterprises, consumer services, education, tourism and hospitality, organizations of physical culture and sports, cultural and entertainment, transport enterprises (Fig. 1).

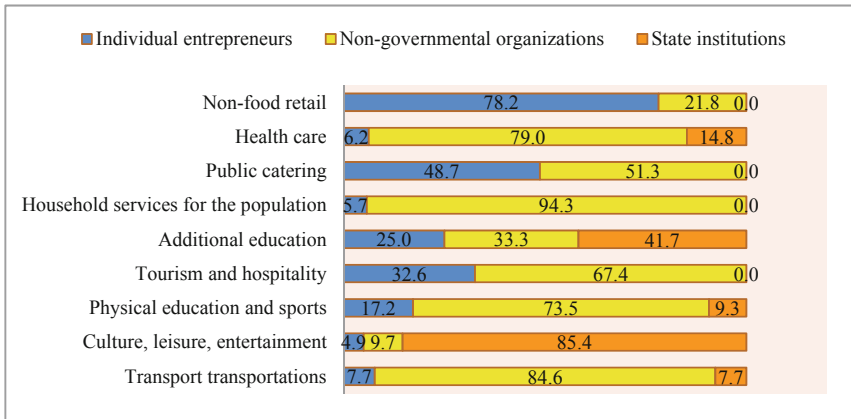


Fig. 1. The Samara region respondent organizations’ structure affected by the pandemic COVID-19 by industries, % (Source: authors).

The analysis showed that the pandemic of a new coronavirus infection COVID-19 negatively affected the tourism and hospitality industry of the Samara region. Let us dwell in more detail on the study of this sphere of the region’s economy. According to the results of the tourist organizations-respondents survey operating in the region, in April-May 2020 year there was a 100% decline in activity. We are talking about the organization of all tourism types: children’s, cultural and cognitive, both external and domestic tourism suffered. The study results showed:

- 76.7% of respondent organizations noted a decrease in income for April 2020 by more than 80% compared to the same period in 2019,
- 73% of income on average lost each respondent organization,
- 96% loss relative to the actual industry profitability,
- 40.8% of organizations participating in the sociological study noted difficulties in paying payment obligations (Fig. 2) in the context of income reduction.

The organizations mandatory expenses analysis showed the following results. 86.1% of the respondent organizations call utility expenses priority in April-June 2020, 73.3% of the respondent organizations noted the wage fund, 69.8% of the surveyed organizations pay rent and 60.5% of the participants in the sociological survey noted tax obligations.

The key problem, which was noted by 79.1% of respondents to the tourism sector, is associated with a drop in demand for services due to restrictions on social activity,

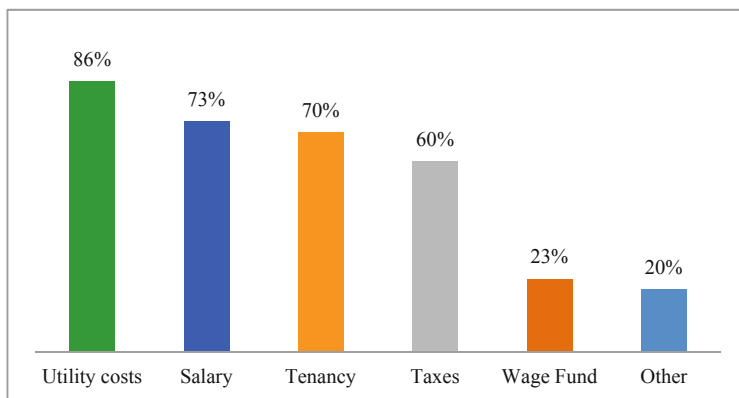


Fig. 2. Priority expenses of the Samara region respondent organizations in April–June 2020 (Source: authors).

the introduction of a self-isolation regime. In order to preserve their business, enterprises are reducing costs (81.4% of respondents), 53.3% of organizations are searching for new work formats. If we consider the real situation of “desire - opportunity” the following expectations of the travel industry from the state should be highlighted:

- 83.6% of respondent organizations consider easing restrictions on economic activity a state support priority measure,
- 70.3% extension of state support measures to additional All-Russian classifier of types of economic activity,
- 53.2% compensation for expenses on the salary,
- 29.1% of respondents for the write-off of tax and insurance payments spoke out,
- 18.3% is compensation for rental and utility charges,
- 14.7% decrease in interest on the loan.

Currently, the following state support measures for the tourism sector in the Samara region are being implemented:

- amendments to the Federal Law “On the Tourism Activity in the Russian Federation” [3] on postponement of obligations fulfillment on the sold tours to tour operators regardless of the activity main area and providing them with equal rights and opportunities to ensure the provision of travel services with a delayed period of time (at least 1 year),
- property tax exemption,
- land tax exemption,
- compensation for the cost of technical equipment and the development of IT programs that allow the introduction of online technologies,
- subsidizing at least 50% of the advertising and information services costs and the Russian tourist product promotion on the international and domestic market; to participate in international and regional exhibitions. The most attractive type of state

assistance for companies in the tourism field is tax and other financial benefits. The analysis of the demand level for state support measures showed the following results presented in Fig. 3.

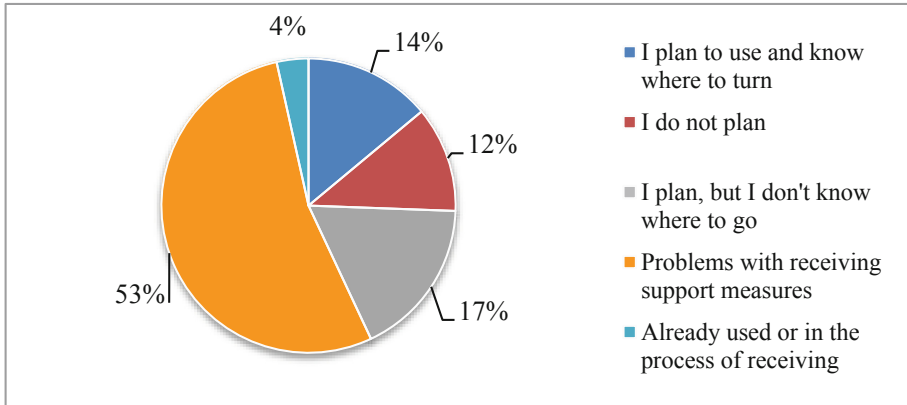


Fig. 3. The respondent enterprises distribution by decision to use state support measures (Source: authors).

The respondents opinions regarding the state support effectiveness were divided. 45.4% of organizations believe that the current support measures only postponed the problem severity. 24.4% of respondents indicated that the proposed measures are effective for only certain enterprises categories. And only 5.8% of participants in a sociological study in the field of tourism noted the high effectiveness of the proposed measures. These numbers are not random. The responding enterprises distribution by decision to use state support measures showed that 54% of organizations faced problems in obtaining support measures. The main problem is the inconsistency of OKVED, the activities of travel industry organizations. Only 3.5% of the Samara region tourism organizations took advantage of external state support measures from among respondents, 31% of organizations only plan to receive state support.

4 Discussion

The main deterrent to the tourism industry development, both in Russia and abroad, in connection with the pandemic COVID-19 was the imposed restrictions on the population movement. Bans on air travel, movement by rail, water and other means of transport negatively affected the tourist industry. Organizations of the tourism sector were in a deep crisis. The analysis of the best world practices in adapting the tourism industry in the context of the situation of the spread of new coronavirus infection (COVID-19), and the experience of their application can be practical in our country. The main measures of state support include:

- tax deferrals: Austria, Czech Republic, France, Germany, Greece, Italy, Japan, Italy, Canada, China and others),

- postponement or cancellation of health and/or social security contributions: Greece, Italy, Poland, France, Czech Republic, Spain, Italy, China, Portugal, USA and others,
- abolition or reduction of taxes, payments and fees related to tourism (air navigation, airport fees, fuel tax, residence tax, etc.),
- renewal of national registers of organizations: Australia, France, United Kingdom, Vietnam, Brazil, Hong Kong, Iceland, China, Colombia, Turkey, Croatia,
- exemption from prosecution of enterprises in serious difficulties; Review of non-appellable lawsuits: Australia, Brazil,
- postponement of losses incurred in 2020 for the following years: China, USA.

All measures are aimed at supporting the tourism sector, improving the industry competitiveness, as well as its further development. The adopted support measures in our country cannot fully cover the losses of the travel industry. The Samara region travel industry analysis showed the following results. The efficiency of these areas decreased by 96%, and the amount of lost income amounted to more than 1 billion rubles. At the same time, 17.4% of respondents announced the reducing employees, 30.2% of organizations did not take radical measures, but sent their employees on unpaid leave. Noted that it is now especially important to support small and medium-sized businesses, as well as to use foreign experience in financing the population directly, as happened in Germany and the USA. The problems caused by the spread of coronavirus infection COVID-19, on the contrary, showed a real picture of the industry, as well as promising directions for its modernization in accordance with the set strategic tasks [4].

5 Conclusion

A comprehensive sociological study of the Samara region tourism industry made it possible to identify key problems that respondents faced. Firstly, the low rate of tourist organizations adaptation to rapidly changing external conditions [5]. Secondly, insufficient interaction with government agencies. Thirdly, travel agencies do not have additional service, hotels are little known, transport companies note low territorial accessibility. The key problem is the introduced restrictions on social activity associated with the risk of the COVID-19 spread, which completely blocked the tourism and hospitality organizations activities. The results of the tourism industry temporary suspension severely dictated by the sanitary and epidemiological situation around the world, are disappointing:

- 73% of income on average lost each respondent organization,
- 96% - loss of industry actual income,
- 27.9% - the share of credited organizations.

Of course, not all enterprises will be able to quickly adapt to the new conditions that require compliance with social distancing standards. To do this, it is necessary to modernize infrastructure [10], equip recreation places with the necessary personal protective equipment, as well as divide tourist flows in order to minimize the

interaction of people. In the case of a temporary ban on visiting tourist places, it is possible to provide online services by organizing virtual tours [9, 12]. Domestic tourism is of particular relevance, the development of which also requires financial costs. The sociological study showed that for most respondents the proposed support measures are incomprehensible, inaccessible and ineffective. 43% of organizations indicated the need for personalized online information about support measures and a step-by-step mechanism for obtaining it. In this regard, it is recommended that the business community and the public be involved in the process of discussing and implementing the development strategy of the region [8]; establish feedback from target groups of sectoral specialists and the population on the degree of satisfaction with the achieved results of the socio-economic development of the region; ensure high-quality information support of management decisions by executive authorities; Provide up-to-date support measures that meet business requirements. Implementation of the proposed measures will allow to increase the efficiency of the tourism industry in the Samara region.

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Impact of International Standards on the Internal Environment of the Enterprise

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Abstract. In an increasingly competitive environment, companies are interested in corporate governance in attracting a variety of tools that allow them to realize their competitive advantage. Effective use of standardization methods in the form of international standards as tools increases efficiency and contributes to the sustainable development of companies. The paper considers the features of applying international standardization and identifying its impact on the state of the internal environment of enterprises by creating conditions conducive to increasing the value (capitalization) of companies in the framework of corporate governance. The features and forms of influence of various types and categories of standards used in the framework of corporate governance on changes in added value, added value and added utility on the company's capitalization are revealed. The role of various intangible assets associated with standardization in improving the business reputation and value of the company is shown.

Keywords: Effect · Intangible assets · International standards · Tangible assets · Types of standards · Value added

1 Introduction

The current stage of development of market relations in Russia is taking place in the context of an ever-deepening crisis in the world economy, which has affected the Russian Federation as an integral part of it, against the background of increasing competition between individual regions and countries, as well as between companies within the country. In these conditions, the management of enterprises faces an acute problem of attracting the maximum possible number of methods and tools that can be used to increase competitiveness, including those that have a relatively insignificant impact on improving the efficiency and effectiveness of corporate governance. However, given the instability of both the external and internal environment, even a small impact can be crucial for obtaining competitive advantages. In a market economy, effective and efficient implementation of corporate governance means the implementation of a set of measures, including the use of various measures and tools aimed, *inter alia*, at increasing profits, attracting investment, effective risk management, etc. On this basis, the company's value (capitalization) is increased, as well as mutual understanding with shareholders, suppliers, consumers, customers, partners, authorities and other stakeholders is strengthened.

In this case, the complex nature of the applied, homogeneous in nature, influences that contribute to the achievement of various goals facing the company is of fundamental importance. Complexity in this case does not always imply simultaneous, but necessarily comprehensive impact on various aspects of the company's activities: innovative, economic, financial, social, environmental, risk assessment, etc. This activity is aimed at achieving the relevant goals of the company, and can have a decisive impact on the overall results of the company and the assessment of its management.

The method that meets the above requirements is standardization. Standardization is an activity that allows you to ensure, based on common methodological approaches and a variety of tools, the achievement of the necessary results in various areas of the company's activities and contribute to increasing its capitalization. However, the contribution from the use of certain types of standards to capitalization growth varies in both form and size. Differences are due to the degree of monetization of results, due to the application of a particular type of standard in each case. Based on the provisions of the legislation in force in the Russian Federation in the field of standardization, as well as on the basis of domestic and foreign experience in implementing standardization mainly at enterprises of the real sector, the problem of differentiating the impact of different types of standards on the performance of enterprises of the real sector is considered.

2 Methodology

In this paper, the main method used is informational and descriptive, which allows us to identify the features of the use of standardization tools in solving certain tasks in the framework of corporate governance. First of all, it is necessary to determine which aspects of corporate governance may be affected by the company's use of certain types of standards. A standard is defined as the content of the requirements set in it, depending on the object or aspect of standardization. There are the following types of standards:

- product standards,
- standards for services,
- standards for processes (operations) of production, storage, transportation, sale and disposal,
- basic standards (organizational, methodological and general technical),
- standards for terms and definitions,
- standards for control methods (tests, measurements, analysis).

According to the international and domestic classification, the main types of standards include standards for products, services, processes (work), and organizational and methodological standards. The common source of effect for various types of standards is that the standards act as the core of the modernization strategy, through which companies strive to be included in those chains of the external environment that can generate added value in the relevant segments of the economy. According to estimates of foreign and Russian researchers, the overall benefit from using the

standards is from 0.5% to 4% of the annual revenue of companies. As a result of applying different types of standards, three main areas of effect formation can be distinguished, depending on the degree of direct monetization of results.

The first direction is characterized by a direct increase in the company's added value due to ongoing standardization activities. The growth of added value is associated with a reduction in costs within the organization, optimization of processes within it, and rationalization of the composition and content of the processes of work performed. The second direction is characterized by the expansion of sales markets and the development of new markets through the use of intangible assets (the company's image, business reputation, brand, the use of signs of compliance with standards of various types and categories, signs of circulation in the market and other intellectual property) contributes to the formation of added value. The concept of "value" in this case means that this phenomenon should be considered in many ways, in all the senses that it has for all stakeholders associated with a particular organization. In this case, an increase in the capitalization of the enterprise is associated with an increase in the competitiveness of both the organization itself and the products or services supplied to the market. The third direction is related to added utility. The source of the effect in this case is the interested parties for whom the application of the standard by the company creates a positive effect. In this case, the most important circumstance is the possible absence of a directly significant economic effect for the user of the standard. The resulting effect is formed by increasing the company's corporate social responsibility in the areas of safety and ecology, and manifests itself in the long term in the form of improving relations with such stakeholders as business partners, government authorities, etc., which affects the improvement of the company's image and the growth of its capitalization.

In other words, the third direction is associated with the successful implementation of social policies that promote overall economic growth through the implementation of the principles of social responsibility, and thus increases the overall utility of the company from the perspective of society as a whole. Thus, depending on the specifics of the effect, according to the degree of its direct monetization from the application of various types of standards, there are three directions of influence on the internal environment, the distinctive feature of which is the prevailing form of effect for this direction: added value; added value; added utility. This differentiation is due to the ratio of tangible and intangible assets of the enterprise represented in a particular object or aspect of standardization.

3 Results

One of the most important components of corporate governance is the implementation of a set of measures aimed at increasing the company's value. A possible way to achieve this goal is to increase the utility of all the company's assets, including both tangible and intangible. Depending on the type of standard used, its focus can be quite diverse. Then, depending on the specifics of obtaining the effect of standardization, we will distribute the types of standards in the above three directions. To determine the magnitude of the standardization effect, the International organization for

standardization (ISO) has developed a methodological approach for obtaining a quantitative assessment of the economic effect of applying standards to assess their contribution to the performance of individual enterprises [2, 3]. This method is used primarily for standards that directly contribute to a direct increase in value added. That is, in relation to the proposed classification within the first direction.

The first direction includes the following types of standards: for products, services, processes (work). Moreover, the service sector requires a certain adaptation that takes into account the characteristics of the organization that provides the service.

The application of these types of standards contributes to the spread of innovative solutions to products and technologies, reducing costs associated with the development and commissioning of new products, improving methods of control and management of technological processes, etc.

The source of value added in this case is the following:

- reducing the cost of materials, energy, deadlines, labor resources, protection of obligations,
- reduced costs due to interchangeability of parts due to product modifications,
- increased efficiency as a result of organizational changes and adjustments to relationships,
- increase productivity by optimizing material flows and operational processes,
- reduced transaction costs due to improved communication, reduced search times, fast access to information, simplified and internationally accepted measurement methods, tests and certification procedures.

An example is given of obtaining a significant economic effect as a result of applying the standardization method aimed at reducing the number of assembly units in [5]. The measures taken made it possible to get rid of various types of losses, which led to an increase in gross profit from 15% to 37%. As a result, the company was sold to another owner for 7.2 times its book value.

In part, the first direction also includes the basic standards presented by some sets of organizational and methodological standards. We are talking, first of all, about the sets of standards for various management systems included in this group. The impact of these standards on value creation is either directly – through production processes, or indirectly – through processes related to the management of the organization that create added value. An example of organizational and methodological standards for management systems that directly contribute to the creation of added value is the ISO 55000 series of standards in the field of asset management. In Russia, a set of national standards of the Russian Federation adopted on the basis of authentic texts of international standards of this series is in force.

In part, the first direction includes sets of standards for various quality management systems. First of all, these are the well-known standards of the 9000 series “quality management Systems”, as well as the standards of the series “food quality Management based on HACCP principles” [9]. The HACCP system (Hazard analysis and critical control points) is based on the requirements for organizations that participate in the food chain and, consequently, value added. The first direction can also include GMP (Good Manufacturing Practice) standards - GOST R 52249 “Rules of production and quality control of medicines” [9].

Thus, the first direction is related to the impact of standardization activities on the processes that take place in the internal environment of the organization and increase their effectiveness directly in value terms. Standards for products (services), works (processes), and control methods help to spread and implement innovative solutions for products and applied technologies, reduce costs associated with the design and development of production of new products for this enterprise, and improve methods of control and regulation of technological processes. In other words, these are processes related to the direct creation of product value in this organization - added value [12].

The second direction is related to increasing the competitiveness of both the organization itself and the products supplied to the market. Increasing competitiveness is seen as adding value. It is the market that determines the value added through the growth of the volume of satisfied effective demand for the products of this company.

The added value is expressed in increasing the reputation, authority of the trademark, its brand, that is, it is created mainly at the expense of intangible assets. This allows you to create a stable contingent of consumers who are focused on a particular supplier, which, ultimately, is reflected in the increase in the level of capitalization of the company.

Standardization contributes to the creation of added value through the formation of new intangible assets due to external motivation. The introduction of international standards of the 9000 series "quality management Systems", standards "food quality Management based on the principles of HASSR" and others helps to increase the confidence of business partners in the company's ability to meet their requirements for the stability and quality of products supplied. This contributes to the growth of the company's business reputation, which is one of the most important intangible assets. It should be noted once again that the 9000 series and HASSR standards are involved in creating both added value and added value.

The economic component of added value is realized through intangible assets, which include intellectual property and business reputation of the company. Intangible assets, in particular, are marks of compliance with voluntary standards. The economic effect of the application of the conformity mark is expressed in an increase in the volume of sales of goods marked with the mark of compliance with national standards. According to available information, the fact that goods are marked with this sign increases sales by up to 10% [10]. To explain these empirical data, it is necessary to identify those aspects of corporate governance that are affected by the use of conformity marks by enterprises (in this case, the "conformity mark" refers to the actual mark of compliance and the mark of market circulation, as defined in the Federal law "On technical regulation") [4]. Active involvement of intangible assets in value formation significantly increases competitive differentiation and makes them a strategic factor [13].

As noted above one of the main aspects of corporate governance is the formation and package of measures that contribute to increasing the company's capitalization. This goal is aimed at increasing the value and usefulness of all types of assets of the company, including tangible and intangible. Identification of certain types of intangible assets is associated with the risk of attributing to the latter, for example, such factors as market potential, monopoly position in the market resulting from the ownership of control functions, the possibility of conducting a dumping policy, etc. [1] shows how

these factors can create added value, although they cannot be attributed to intangible assets. In this paper, the classification of intangible assets proposed in [7] is adopted. In the specified classification, the following are highlighted: market asset; human-oriented assets; infrastructure asset; intellectual property assets. Intangible assets in the form of “intellectual property” also include the business reputation of the enterprise. This paper analyzes the legality of attributing the use of marks of compliance with national standards to an intangible asset, as well as to an object of intellectual property, the use of which can be regulated by the current legislation on copyright in the Russian Federation. For an intangible asset “intellectual property”, the economic effect can be manifested in the form of: 1) customers’ willingness to pay a higher price for products marked with a voluntary compliance mark, 2) increasing the market share of sales of products marked with the conformity mark, 3) formation of significant focus groups of regular customers of the company’s products. Thus, it can be stated that the form of economic effect when using the mark of compliance with voluntary standards is an increase in sales volumes and an increase in the profitability of the enterprise [11].

4 Discussion

According to the expert community, in the context of global economic instability, to ensure a stable state of the internal environment of any organization, including enterprises in the real sector, it is necessary to use all existing methods and tools, even if the contribution of each individual to achieving the goal is relatively small. It is characteristic that many studies show that despite the relatively small contribution to the increase in gross income of enterprises, the use of standardization methods, due to the complexity of the impact, which currently covers almost all aspects of its activities, allows us to positively assess the practice of using these tools in the context of crisis phenomena in the global economy. International standards are an effective tool that enables the management of the companies compliance with their obligations and to ensure the achievement of goals. Therefore, it is of great importance to study the impact of intangible assets on the internal environment of the enterprise when using the tools of international standardization [6]. To determine the impact of existing types and sets of standards on the company’s operations, the authors use classification – one of the methods underlying standardization. Using this method, the forms of standardization contribution to the company’s performance were identified. These forms are value added, value added, and added utility. Depending on the types of standards used, the degree of monetization of the resulting effect varies. This allows managers of enterprises to make an informed choice of the most effective standardization tools at the moment, depending on the current situation in the internal and external environment, to assess the effectiveness and efficiency of tangible and intangible assets. The inclusion of intangible assets as an important determinant of enterprise productivity reflects the current trend [8]. Purposeful use of standardization tools in corporate governance practice allows managers to consciously choose means that, on the one hand, allow increasing the company’s value (capitalization), and on the other hand, increase the confidence in the company from all interested parties, including government authorities. Differentiation of the resulting effect from the application of different types of

standards by the degree of monetization makes it possible to obtain an economic assessment of the organization's performance in various aspects - from purely economic, which are reflected in the financial statements, to social and environmental, which also receive economic interpretation.

5 Conclusion

Differentiation of the contribution of standardization by the degree of monetization of the resulting effect, depending on the types and complexes of international standards chosen for application, contributes to the conscious choice of the necessary tools for managers to solve both current and distant tasks facing the organization using standardization methods. Accounting differentiation of the contribution of standardization to the company's performance is a management tool that allows you to fine-tune the entire management mechanism when choosing development paths, taking into account the characteristics of the internal and external environment that you have to face in different markets – financial, goods and services, labor resources, as well as take into account the diverse interests of stakeholders.

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Competencies of Future Retailing Space

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Abstract. The processes of global digitalization of society have significantly affected the key sector of the economy – retail trade. In the digital economy, the key factor in the production of services, including trade, is a specific form of highly skilled labor. And the result of applying special knowledge and skills is information. The pandemic period confirmed the need to switch to new formats of work and customer service, especially in non-food stores. The research aims to analyze the conditions and prerequisites for the development of the Russian digital economy, the nature of the transformation of the retail sector and the spread of new formats of commerce, the search for new solutions and strategies for development in the new retail space and determination of the necessary competencies. We used general scientific, systematic, structural-analytical and statistical methods that allow us to study the main directions of changes in the quality of organization and management of trade space in the digital economy. This research is based on concepts that more or less reflect the vision of the future of the retail space and the new competencies associated with this process.

Keywords: Competencies · Digital economy · IT-solutions · Retail · Trading space

1 Introduction

The idea of retail creating and existing is traditionally reduced to bringing goods to end consumers and providing the necessary conditions for comfortable purchases. In other words, the product of the retail includes two main components: physical and intangible goods. Digitalization of the economy has largely contributed to the transformation of the integral part of the product - a complex of trade services, both by expanding their range and changing their quality standards, the form of submission, the level of requirements for the competencies of administrative and managerial and trade and operational personnel. In addition, network retail, which operates on the principles of category management, sets the tasks of joint responsibility for the professional development of both stores and suppliers. Digital technologies accompany the trading professions of both the present and the future, increasing their importance over time.

Retail readiness for quality growth is confirmed by research data from “PricewaterhouseCoopers” (PWC), which showed not only benefits, but also barriers to improving various sectors of the global economy, including the retail sector. Thus, 61% of trading companies identified the lack of teams with the necessary skills as a barrier to their development [9]. The relevance of this research topic is due to significant changes in the retail space, which we understand as multi-level, various types and forms of interaction

between sellers and buyers. Of particular interest in terms of the speed and depth of transformations is the retail services market and the associated labor market, professionals in the field of trade, whose new level of quality ensures the effective functioning of both individual subjects of the digital society and the country's economy as a whole.

2 Methodology

The problems of mastering and developing new competencies of professionals in retail should be considered from the perspective of the levels of development of the future retail space (Fig. 1).

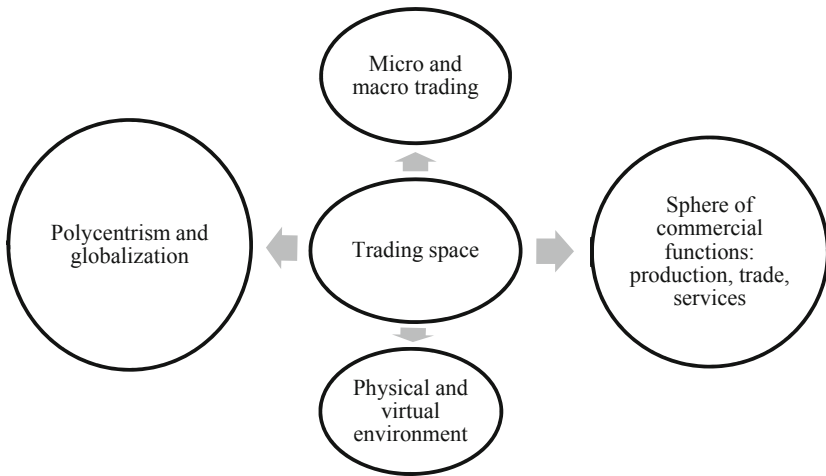


Fig. 1. 4D model of the future retail space formation (Source: author).

The competence of future specialists should be improved regardless of where the trading business is developing: in a particular company or in the region as a whole, in a particular country or around the world, in an offline format or as e-commerce, directly in distribution or retail, or it is a question of purchasing and sales management in the field of industrial production or in the service market.

The Government's concept is set out in the Passport of the national program "Digital economy of the Russian Federation". At the same time, one of the tasks set in this document is to create a mechanism for managing changes and competencies (knowledge) in the field of digital economy regulation [12].

The issues of developing the competencies of the future retail space should be considered from the point of view of the self-growth law of management personnel incompetence. Understanding the operation of the Peter Principle in our research explains the importance of continuous training of company employees, improving their overall level of development and in-depth study of the most relevant disciplines from the point of view of the future. The acquisition of skills must begin in the present time,

in order to be not only in demand in the future, but also to correspond to a new position, a new stage of career growth. The new competencies of the retail space of the future can also be considered from the point of view of the concept of social (emotional) intelligence of the administrative and operational retail personnel.

3 Results

In general, the mechanics of forming the necessary competencies of a specialist in the field of trade is the coordination of three blocks of knowledge and skills (Fig. 2).

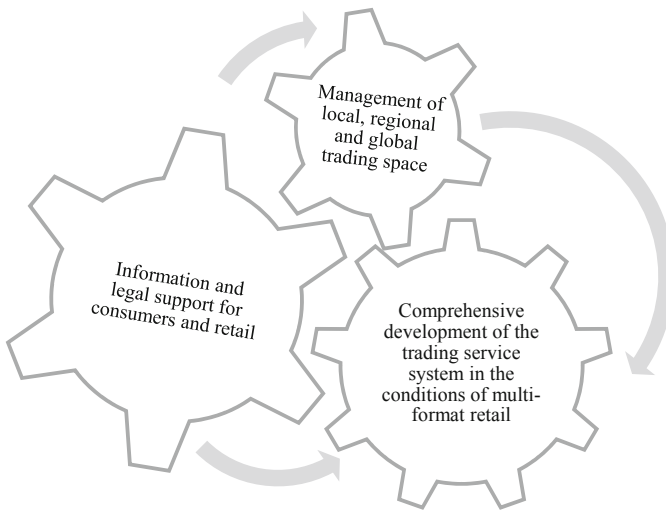


Fig. 2. Areas of formation of new competencies of the future retail space (Source: author).

The organization of trade at the micro and macro levels involves not only the study of the trade management and technological operations of the store, but also the development of strategic thinking, understanding of trends in the development of the modern economy and the features of regional markets of goods and services. The demand for a trade specialist in any economic sphere means his unsurpassed universality, knowledge of the specifics of any processes of goods production and service technology.

The state, as the initiator of digital transformation, creates an information technology platform for effective interaction with the population and the business community, thereby ensuring a high level of development of the country's digital society as a whole and its competitiveness as an international partner. The globalization of the trade space creates a need for future professionals to have an increased level of knowledge of the world's legal practice, leading business foreign languages, understanding of the features of cross-cultural communications, and general tolerance.

Multiformatization of retail today is manifested to a greater extent in the omnichannel sales. And one of the mandatory channels, which is also differentiated by

forms - the online sales. The modern buyer is increasingly making the final decision on purchasing in the digital image of the store – on the official website, on the company’s pages in social networks, in mobile apps. The competencies associated with the organization of online merchandising imply not only technical education, but also knowledge of the buyer psychology, as well as a creative approach to the development of virtual retail space.

Therefore, understanding the psychology of the buyer, his emotional state, which requires the seller to develop such a personal resource as social (emotional intelligence). It should be noted that recognizing customer emotions in a virtual retail space is quite difficult [5]. However, the solution to the problems of correctly passing the stages of sellers using classical sales technology does not lose its relevance, regardless of what environment the seller has to work in, for example, with objections, in physical or digital environment. Team work skills in trading are much easier to develop if you have key competencies of social (emotional) intelligence, which is especially effective in multi-stage sales of specific products by different teams of sellers [7].

Using the results of scientific achievements and technological progress in the organization of retail space implies the continuity of this process and the understanding that at a certain stage of development, the company’s staff will discover their own incompetence. This situation is partly explained by the transition to the next level of the company’s management hierarchy (according to the theory of incompetence or the Peter Principle), as well as asynchronous development of the internal and external environment. In this regard, the development of new competencies should be ahead of changes in the market and in the economy as a whole [3].

The authors of the “Competence 2030” foresight developed an almanac of promising industries and professions for the next 15–20 years. The Atlas of New Professions allows us to understand, first of all, what new specialists employers will need [11]. The atlas of new professions allows us to understand, first of all, what new specialists employers will need. For example, the above-mentioned knowledge of a business foreign language should be combined with knowledge of the parterres culture in the global economic space, if you choose the profession of a cross-cultural communications manager. Having a highly developed emotional intelligence will allow you to realize yourself as an emotion designer, as well as a coordinator of community development programs. The high-quality work of the designer’ virtual worlds ensures the effectiveness of interaction between the parterres of the future retail space.

4 Discussion

According to the scientists of the scientific public organization “Professional science”, the skills needed to expand the areas of digitalization can be grouped as follows:

- general skills in application development and networks management,
- additional skills related to the functioning of information systems (information processing, self-direction, problem solving and communication),
- digital literacy skills required in social and economic communications of a digital society [1].

The World Bank Group's global development report "Digital dividends" identifies three groups of skills that are mostly in demand in the modern economy:

- cognitive (possession of mathematical tools, logical thinking skills, verbal literacy, independent solution of professional problems),
- social and behavioral (personal qualities, readiness to change and gain new experience, ability to self-development, communication),
- technical (ability to work with technical devices, mechanisms used in a particular professional field) [13].

The competencies of the future retail space are reflected in the research of Bollweg, Lackes, Siepermann, Sutaj, and Weber. The trading company is focused not only on fulfilling its direct purpose – bringing goods to the ultimate customer. It already acts as a social-material assemblages, thus ensuring high customer loyalty [2].

Claes, Quartier, and Vanrie highlight the problems of transforming digital retail competencies. A special condition for training retail design specialists is a full understanding of the changes importance taking place in the global retail space [4]. Fernandez, Lara, Ugalde, and Sisodia also talk about the importance of developing special skills for small business professionals in order to gain a competitive advantage [6]. Oliveira, Indulska, Steen, Verreynne, [8] notify that there is a lack of research on the management of retail employees by the dynamic capabilities of social networks. Threats to the development of traditional trading business in the conditions of total digitalization and the need to develop the ability to form new sources of value creation are described by Reinartz, Wiegand, Imschloss. Scientists focus on recognizing changes and actively managing trade in developing ecosystems [10].

5 Conclusion

The changes taking place in the digital economy involve not only technical modernization and information and technological progress. The country's economic growth and increasing its competitiveness in the global trade space depend on many factors, one of which is the intellectual potential and the quality of human resources. Along with the perception of the scientific and technical process, the ability to self-development, the ability to understand and comply with the new rules of the internal and external environment of a trade organization is relevant.

The need to acquire and improve the competencies associated with participation in the process of digitalization is due to the importance of forming a competitive advantage in the modern market. The need to acquire and improve the competencies associated with participation in the process of digitalization is due to the importance of forming a competitive advantage in the modern market. Traditional intermediate sellers are gradually being replaced by automated network services, including mobile ones, which reduces transaction costs, ensuring greater availability of services in terms of financial costs for their purchase. The relevance of meeting the criteria of quality and attractiveness of physical environment of trading services as a tangible component necessary for their preliminary evaluation before purchasing, on the one hand, is somewhat difficult in the virtual space. At the same time, we can note some visually

evaluated parameters of electronic resources that affect the development of interest in accessing them (design and navigation characteristics of sites, the choice of ways to organize feedback, etc.). Accordingly, the competencies of the retail space of the future should also assume effective organization of retail in the electronic environment, including the management of societies in social networks. These skills are associated with the development of emotional intelligence of a future sales specialist. Emotion management both determines the comfort of the trading company's team and contributes to the formation of customer loyalty. Irreversible processes of globalization confirm the need to master not only foreign languages, which are most frequently used in the world practice, but also to understand and accept the features of cross-cultural communications.

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Key Factors of R and D Process Modernization at Industrial Enterprises of Russia

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Abstract. In the modern Russian economy, the level of development of the industrial sector continues to be quite low. A wide range of reasons can be identified for this, one of which is the historical background of the formation of industry in 70–80s. But it is important not only to understand that this area requires certain innovations, but also to evaluate the further creation of its development in order to improve the economic growth of the country as a whole. At the same time, the degree of influence of RandD in industry should not be underestimated. As concerns directly the prospects of the RandD sector of the national industry, it is determined by the following trends: insufficient implementation of RandD potential; - reduction of intellectual potential; increased labor intensity; institutional transformation, changing of the forms and specialization of the subjects performing the work. In this context, there is an objective need for modernizing management mechanisms to streamline complex interactions between production and research structures. This study evaluates the development of the RandD sector of industry in Russia.

Keywords: Government funding · Industrial development budget · Industrial sector · RandD

1 Introduction

The industrial sector has long played a decisive role in the economy of any country, allowing it to increase indicators and economic potential. Since Soviet times, the growth of industry has been a key factor in replenishing the state budget. This was due to regular modernization and development of the technological structure as a whole. But since the 90s, the Russian industrial sector has demonstrated a negative increase in indicators. The growth rate of industrial enterprises has decreased every year, while foreign countries, especially China, Japan and the United States, have showed positive dynamics in industrial production, resulting in stable economic growth.

The potential of the Russian industrial complex has not been fully used. Technologies are insufficiently improved, or lag behind foreign analogues, resulting in import substitution. In our country, when there is a huge scientific and technological potential, the quality and properties of products are not improved, due to which these indicators directly affect the growth of Russia's GDP. The technological capacity of industrial enterprises in Russia continues to develop at too slow a pace in the innovation sphere: long-established work patterns are used, which is unacceptable in the

conditions of regular development of innovative technologies. The market economy dictates its own rules of competition, in which the domestic industrial sector occupies, unfortunately, not the leading position. An objective assessment makes it possible to conclude that equipment is not upgraded at the enterprises with sufficient speed, some technologies have long been outdated and replaced by innovative analogues; production efficiency is not used at full capacity, despite the fact that improving productivity and product quality can be performed without attracting large additional resources.

The authors have worked out a new innovative evaluation strategy that addresses the issues of the duration of production of an innovative model and the RandD cost (planned and actual) of domestic industrial enterprises. The proposed method shows its effectiveness at all stages of development, which will improve the work and, of course, increase productivity in the industrial sector. The impact of contracting work at the RandD planning stages has also been analyzed in the research, since, according to the authors, this approach has not been fully studied or given sufficient importance.

As mentioned above, in recent decades the country's industrial development has declined, namely the RandD sector, a key sector, according to the authors. It was then that the issue of the development of innovative activity in this area became the most important and attracted the attention of researchers and practitioners. It becomes clear that if global changes in the equipment of modern industrial plants are not made, this could lead to a negative increase and further decline of the main economy-forming segment [4]. But it is important to understand that not only new equipment will help bring industry to a positive increase, but also competent modernization in the mechanism of RandD management and development, not only in particular cases, but also on the whole.

The study of this problem has been conducted, and the reasons that hinder the process have also been identified for a long time. However, all measures to eliminate them have not brought expected results, which makes it possible to assume the need for a deeper reformation, starting with the process of RandD creating. Not only obsolete equipment and the lack of cardinal innovations slows down the development of industry, but the approach and management scheme itself is ineffective.

2 Methodology

The authors studied the possibilities of improving research and development of the national industrial sector. The economic characteristics of RandD developments were worked out and an innovative approach to improving the work of low-tech industrial enterprises was proposed. The processes of RandD, experimental and technological development at low-tech industrial enterprises were analyzed. The key points of the analysis are: stages of RandD implementation and development in Russia's industry, Russia's industrial sector modernization assessment, importance of RandD process diversification, planning stage for the implementation of RandD at a low-tech industrial enterprises.

3 Results

In the process of the research, the authors formed an effective technological model that affects the process of developing new approaches in the field of RandD at industrial enterprises, including the dynamics of the duration and cost of stages for low-tech enterprises under the conditions of using the new planning stages proposed by the authors. This area of planning, divided into 13 stages, allows low-tech enterprises to make more accurate RandD forecasts, calculate not only labor costs, but also consider the financial aspect, which undoubtedly plays a key role. As for the duration of the stages, the development often becomes “outdated” at the time of release of the prototype, due to the long time intervals at each level. As a result, the development ceases to be innovative, and its demand drops to zero. The proposed analytics of the duration of the stages from “pilot project” to “operation” gives a clear idea of the possible results obtained with a minimum error.

As mentioned above, the industrial sector is one of the main sources of country’s budget replenishment and a source of economic growth in general. Stable economic growth and the level of Russia’s GDP directly depend on the level of the industrial turnover coefficient. In the industrial sector, the key factor is undoubtedly the level of innovative equipping of production, and directly the research and development work itself. It is this indicator that can be equated to the fundamental one when calculating the development coefficient of the national industrial sector. That, in turn, affects leadership in the competition between the world’s largest industrial powers. Evidence of the above can be provided by statistical data on the development of innovations in the industrial sector, namely in 2016, a negative increase of 1.5 points in terms of investment in research activities in the industrial sector [7]. This was the impetus for innovations and increasing the efficiency of enterprises, starting with the discovery of great potential in scientific field.

The result of this outcome of events could be a number of aspects related to the “boiler” approach in the study and implementation of RandD in industrial production. Most Russian industrial plants, as mentioned above, prefer to operate according to the methodology that has been worked out for years. Often there is a certain consistency in the interaction of intermediate structures, namely, contracts with long-established firms, institutions, research institutes. This is rather a historical trend that is difficult to overcome in the innovation process, since the mechanism for introducing new development is more or less well-established. One way or another, according to the authors, in the event of “leaving the zone of comfortable” cooperation with “old” contracting enterprises, the industry of the Russian Federation can certainly claim higher performance indicators of innovative developments. The effectiveness of the new subcontracting is undeniable. In order for industrial enterprises to reach a new level of RandD development, fundamental changes are needed precisely in the structure, it is also necessary to use absolutely all the existing potential of domestic developments [8]. It is the so-called “pattern” in the implementation of RandD at domestic enterprises that creates a barrier to improving the economic situation. Though this way of implementation is already familiar to our industry, it is not paid due attention by researchers.

4 Discussion

It is necessary to analyze several essential factors that affect the dynamics of industrial enterprises' production efficiency. The main point is benchmarking. This implementation approach is based on competitive parity. This approach is relatively new for domestic industry, and has been active for the last 40 years, which is relatively short for the industrial sector. Competition has become an important moment in the progress of RandD with the transformation of our economy to a market one [3]. An open database of statistics from competing enterprises is certainly an encouraging element in the process of developing a new product. Sometimes the appearance of a modernized product from a competing company is an impetus for new developments and improvements in production. This is an undeniable advantage of the market system where industrial enterprises operate. But a logical question arises as to how important it is to take into consideration the factor of the economies of scale in planning the development of each stage for small enterprises, since its significance in considering the largest industrial plants is undeniable. Once again, the question arises of how important it is to diversify enterprises by scale in the RandD process to conduct the most accurate forecast of the cost and duration of the stages [2].

The "benchmarking" method, built on planning RandD budgets on the basis of competitive parity, is considered to be most effective for markets with a pronounced innovative competitiveness factor. Largest global industrial holdings operate on this basis today. Apologists of the presented method of dividing the stages of RandD planning can point to its effective applicability for both large and small - medium industrial enterprises. Of course, one should take into account the error associated with individual industries, but on total assessment, and the collection of analytical data, the method demonstrates high correctness. It is important to understand that the coefficient principle of budgeting has a weak side - it does not take into account the "economies of scale". However, an error of 5–9% will not significantly affect the proposed methodology [5]. 1% of RandD expenses at a large enterprise can bring 7% of gross profit rise, while the same 1% at a small enterprise can bring only 1.2%. The indicators can be affected by both external and internal factors, such as the political situation in the country, indicators of wear resistance and modernization of equipment, purchasing power and demand for manufactured products or raw materials. All these and many other factors can easily affect the increase or decrease in indicators [6]. The situation is rather unstable.

After analyzing, the authors have proposed a method that will help to identify the cost and duration of implementation of an innovative product at the earliest stages of calculations with a minimum error. So, it was proposed to form 13 independent stages from the "task statement" to the "accompanying documentation", which will help more accurately determine the prospects of an innovative project. If the monitoring base of large enterprises determines the levels of RandD investment of the industry leaders (or the industry average), then for small innovative enterprises it is the budget of competing projects. This model demonstrates the logical way of innovations implementation at industrial enterprises and helps to prioritize the budget distribution at all stages of RandD planning and implementation. Table 1 shows a chart that allows you to

evaluate the duration of putting into the production of an innovative project at low-tech industrial enterprises. The most capacious process, as expected, is the production start-up and creation of a prototype. Of course, this stage is the main one, since it will give clear answer on how effective the innovative project is. The methodology also allows making cost assessment of the above stages. The authors' calculations revealed that the most expensive stages are "prototyping" - 14.5%, "production start-up" - 22.1% and "operation" - 46.3%.

Table 1. Empirical base of planning of average values of the RandD stages duration at a low-tech enterprise, %

Empirical base of planning of average values of the RandD stages	%
Pilot project	8,56
Intellectual property objects	2,4
Research	4,6
Specification	1,6
Prototyping	3,1
Pilot sample	15,7
Design documentation	7,6
Process innovation	14,2
Feasibility study	1,2
Patenting	6,4
Production start-up	22,9
Operation	7,24
Accompanying documentation	4,5

Source: authors.

In the industrial sector of the economy, large organizations tend to use the network model of RandD planning. On the basis of this method, calculations of co-financing of each of the proposed stages of innovative development are carried out separately [9]. The scope of RandD application in industry is one of the widest, so along with internal funding, the receipt of financial flow from external sources is essential. External investments are attracted on the assumption of the initial advance project of the innovation model, so calculations correctness of the stages cost and duration is the key point in assessing the effectiveness of an innovation project. This may lead to some inconsistency, because RandD planning budget includes co-financing from some external entities, but the recipients are the external enterprises themselves, whose domestic economic activity is not reflected in the budget. This kind of phenomenon causes many scientists to doubt the quality of the effectiveness of the already finishing model.

5 Conclusion

When using the network distribution model proposed by the authors, a number of contradictions may arise, namely, the possibility of underestimating the cost of RandD development stages in the interests of the customer. When it comes to the contractor, in this case, on the contrary, the cost can be artificially inflated [10]. As for the performers, as a rule, the selection goes through tenders, and the approval of the price is based on the assessment of the lowest and highest cost of the specified work. This sampling policy complicates the contours of network interaction, the task of attracting external investors to RandD, though the largest financial injection often comes from them. In addition, the process of coordinating the work of performers at each of these 13 stages is becoming more complicated. In this planning method, a number of controversial areas of interaction are observed, namely design bureaus, universities, the administration, the RandD departments of industrial enterprises themselves, the Innovation Support Fund, etc., which displaces the network control center [2]. The RandD departments of industrial enterprises and Universities take the first place. With this consideration of the situation, it is the only case when the above entities interact in the process of the development of this separation technique in RandD developing and implementing at an industrial enterprise. The chosen interaction scheme may differ because of various factors. Among them: type of company's activity, initial assigned budget, subcontracting, the innovative impact of RandD and implementation functionality on production, urgency of the implementation of innovative development, namely the period from "pilot project" to "operation". Surely, it is important to consider a number of external factors beyond control of the industrial enterprise and even the state [1]. Thus, summarizing the results of the study, we can confidently confirm that the proposed methodology for the development of RandD at industrial enterprises is of high efficiency. It may also contribute to our country's industry in competition with developed countries.

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Business Stabilization During the Crisis

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Abstract. The article touches upon the consideration of corporate management strategies aimed at maintaining the company in the conditions of the economic crisis. The authors highlight the signs and causes of the recession of 2020 as well as the actions taken to stabilize the economy in Russia. The necessity of finding an adequate response to the high risks of bankruptcy of the enterprise, the destruction of supply chains and sales of products, failure to fulfill payment obligations is noted. To solve the problem, theoretical research methods were used: systematization and generalization, the study of documents and activity results when identifying problems and finding ways to solve them, generalization of experience. The article suggests using scientifically based approaches as a means of making managerial decisions. In order for anti-crisis measures to be balanced and effective, it is proposed to use a variety of possibilities of quantitative analysis, mathematical modeling, strategic choice, econometric forecasting, and solving optimization problems.

Keywords: Anti-crisis strategies · Economic crisis · Management decisions

1 Introduction

Systemic economic crises are a periodic phenomenon that occurs due to various reasons at the national and world levels [7]. The economic crisis of 2020 arose against the backdrop of a confrontation between leading oil exporters and was exacerbated by the negative economic consequences of the coronavirus pandemic. The resonant effect of these causes led to grave consequences. The collapse in oil prices in March of this year led to a significant weakening of the ruble and a decrease in the financial transactions profitability. The spread of viral infection caused the collapse of a number of industries, airlines, travel companies, goods importers from China. The Russian economy showed signs of a recession: a long-term decline in business activity, a decrease in production volumes, an increase in unemployment, etc.

According to the Federal State Statistics Service, from January to March 2020 [12] real incomes of citizens decreased by 0.2% compared to the same period of the previous year. According to the results of the first quarter of 2020, relatively low inflation rates remained: consumer price growth amounted to 2.4% in annual terms, including 2% for food products. The average per capita cash income for the first quarter is estimated by the Federal State Statistics Service at 31.2 thousand rubles per month. However, this is only the beginning of the process. The introduction of a self-isolation regime at the end of the first quarter of 2020 reduced consumer spending on a number

of goods to almost zero, which led to an almost complete loss of income by entrepreneurs. Small and medium-sized businesses began to incur significant losses. The list of the Russian economy sectors most affected by the spread of a new coronavirus infection according to data for April 18, 2020 includes 38 types of economic activities [9], including air transportation, leisure and entertainment organization, sports activities, hotel business, catering, retail trade in non-food products, etc. As a result, unemployment has been recorded. Enterprises transfer part-time employees and send them on unpaid leave.

Further decrease in the income level of the population, expected in the second quarter of 2020, can be considered as an extremely negative factor for the country's economy. Against the background of this alarming dynamics, the government is developing an anti-crisis measures system of state support in the economic and social spheres: granting delays in paying taxes and contributions, increasing minimum wages and unemployment benefits, developing supplementary employment programs, subsidies for the payment of salaries and rents, extending reporting deadlines, a decrease in the supervisory burden, a reduction in the premium rate, a moratorium on bankruptcy, relief in licensing and other licensing procedures, direct payments from the budget, etc. Government support measures are likely to have a stabilizing effect. However, each enterprise in these conditions is forced to independently and efficiently look for ways to survive, retain staff, established business contacts. This article will discuss some methods of making managerial decisions to preserve production in crisis conditions.

2 Methodology

The following general scientific methods are used in this study: observation, systematization, and generalization (when analyzing general trends in socio-economic dynamics). Methods of theoretical research were also used: the study of literature, documents and results of activities in identifying problems and finding ways to solve them. Legal documents and statistical data on the research topic, published in the media, were studied. To formulate the results, methods of studying and generalizing the experience were used. In particular, measures to overcome crisis conditions at small and medium-sized enterprises are analyzed. As the most effective measures, quantitative methods of analysis and forecasting based on economic and mathematical models are proposed.

3 Results

When the economy enters into a state of turbulence, it is important for company managers to use all available measures for the survival of enterprises and the stabilization of their activities. Crisis economic conditions are a stimulating factor for the creation and implementation of new ways to preserve business, especially for small and medium enterprises that are most vulnerable in such situation. When choosing forms of response to the challenges of the external economic environment, it is important to be guided by scientifically sound methods, make managerial decisions based on reliable

forecasts and calculations. Significant help in this case can be provided by economic and mathematical methods of assessment, optimization and forecasting. Their implementation using software, digital technologies, platforms, services and applications with a competent approach will help reduce risks and avoid the negative effects of the crisis.

4 Discussion

The specifics of the situation during the crisis period stimulate enterprise managers to search for new forms of organizing production activities in order to preserve business. It is necessary to find opportunities for an adequate response to the high risks of bankruptcy of the enterprise, the destruction of supply chains and sales of products, and failure to fulfill payment obligations. To a large extent, these measures are classic solutions to crisis management, however, the search for new interaction strategies to stabilize the situation is also important.

Factors of the Enterprise Stabilization During the Global Crisis

Lower production costs. The main factor in increasing profitability is the reduction of fixed and variable costs by optimizing production processes and organizing production, reducing the tax base, flexible pricing, reducing non-manufacturing costs, etc. Customer-oriented approach as the main business strategy. Priority is given to solutions aimed at maximizing customer satisfaction. The actions to create long-term mutually beneficial relations with the client [8] include correct determination of the consumer's expectations, analysis of the proposal (situation) from the consumer's point of view, finding positions that can be improved, forming a mutually beneficial proposal or managerial action, using the personal qualities of employees as rationally as possible. In the context of this strategy, during the crisis period non-standard solutions are born: individual offers, non-standard order picking, targeted delivery, service and maintenance, spare parts sale, semi-finished products and consumables, customer consulting support, comfortable space organization.

Workforce optimization to reduce costs. External adverse conditions force companies to severely reduce staff, saving payroll and corresponding deductions, expenses for maintaining staff and jobs, etc. In April 2020, according to various estimates, about half of Russian companies reduced their headcount, and about a third did not exclude this possibility in the next half year [10]. It is clear that this forced and extreme measure has negative prospects both for laid-off employees and for the enterprise itself in the future. The social responsibility of the business encourages management to search for and use measures to retain staff, such as: changing the schedule of staff, reallocating employees, making paid holidays, sick leave, switching to part-time work, retraining staff, and expanding staff qualifications. If there is no alternative to staff reductions, staff optimization should be carried out as sparingly as possible: by transferring to subsidiaries, using early preferential pension programs and compensatory payments. First of all, employees of inefficient units with low professional potential are forced to fall under the reduction.

New forms of interaction with partners and consumers: the use of digital platforms, services, remote access technologies for the most beneficial cooperation. Digital

technologies provide new business development opportunities [4]. During the period of stable operation of the enterprise, software changes, the introduction of business promotion information tools are associated with certain inconveniences of users and may not be considered as necessary measures. In a state of instability, the transition to digital means of business communication is a powerful driver of development [11]. Modern mobile applications, services and platforms allow us to find new ways to promote goods, the interaction of the seller and the buyer, partners, regulatory authorities and accountable persons. Through their use, you can pre-order, browse product catalogs, keep records, create a chain of production operations - from production support to delivery of goods to the final consumer and much more.

Use of government support measures for small and medium-sized businesses. In a situation of economic crisis, authorities at the state and regional levels seek to provide maximum support to entrepreneurship by implementing targeted programs. At the end of the first quarter of 2020 two packages of documents on state support at the federal level and a number of decisions at the regional level were adopted. The government of the Russian Federation allocated 2 trillion rubles. to support small and medium enterprises. Thus, the state is taking unprecedented measures to stabilize the economic situation [5]. The proposed measures include: grants and interest-free loans for wages, soft loans, installments and deferrals for loans and for utility bills to entities of the most affected sectors of the economy, tax rates, tax breaks on the use of municipal property and land, financial support for employee remuneration, a moratorium on bankruptcy, tax audits, debt collection and fines, federal subsidies for banks to reduce debt, help to goods exporters. We also note the recommended possibility of concluding exclusive agreements with private owners of leased real estate: in an effort to preserve the contingent of solvent customers, the owners are invited to consider the treatment individually and provide in some cases special conditions for tenants.

Reorientation and diversification of production, partial reprofiling of production. The transformation purpose is to turn towards the production of goods (services) of increased demand. Promising areas can be considered production with an extended shelf life, the development of related areas, the production of related products, and optimization of the assortment [2]. So, in the spring of 2020 the sewing manufactures of the Italian company Prada arranged in a few days the release of medical protective equipment - overalls and masks. Faberlic took the initiative to re-profile part of its capacity for the production of antiseptic agents and received approval and support from the capital's authorities [1].

Implementation of digital corporate management services. The transition of the enterprise to new forms of functioning in any aspect is associated with a change in the usual forms of internal interaction. To avoid lack of control, it is necessary to establish a management structure, a communication system, build business chains, competently organize document management, information flows, internal audit, identify control points and require each employee to clearly perform duties. Moreover, each employee should be able to take the initiative, be heard and receive feedback [3]. These tasks are perfectly handled by corporate governance software. Among the abundance of corporate software, we can distinguish groups of analytical systems, security systems, systems for business development, accounting systems, logistics and storage systems, business process management systems (including document management, efficiency,

etc.). A significant market share (at least 40%) of electronic document management tools in Russia is held by 1C, but there are also other equally effective software products. The choice of funds is made taking into account the qualifications of employees, the cost of the product, the scale of the tasks to be solved, technical capabilities, development prospects.

Formation of a positive image of the enterprise through participation in charitable assistance projects, social events. Responsible attitude to objective social problems and the provision of feasible assistance to those in need creates a positive perception among the consumer, and subsequently can become a factor of preferred choice. This is a job for the future, but crisis conditions are ending, and the company's reputation is an enduring value. Thus, the global holding company LVMX, a manufacturer of luxury goods, in the conditions of the crisis of 2020 announced the start of antiseptic gels production at three French enterprises instead of top brands of perfumes. The first batch of disinfectant gels began to come for free to hospitals, pharmacies, nursing homes within a week. Later, other manufacturers of elite perfumes, alcohol in Europe and Russia joined the action. As part of social assistance, the automaker Hyundai Motor Company decided to provide training centers as a room for treating patients, and allocated 100 cars to volunteers for transporting food and medicine to those in need in several cities of Russia. This list goes on and on. Thus, leading manufacturers, providing charity assistance, help to cope with global challenges, demonstrate caring for people in difficult moments for society, while receiving a positive PR effect.

The use of science-based approaches in business, organization of production and logistics, in planning and forecasting. Despite the instability of the economic situation, during the crisis it is especially important to have significant arguments for making informed management decisions. Currency volatility, high risks of financial assets, the destruction of supply chains, falling demand and other negative factors are actually an incentive to resort to special forecasting and planning methods based on economic and mathematical modeling, statistical forecasting methods, risk assessment and operational efficiency.

Problems of Production Optimization, Planning and Forecasting and Mathematical Methods for Their Solution

As noted above, during a period of unstable economic situation, scientifically substantiated quantitative methods of analysis and forecasting based on economic and mathematical models are of particular importance. A wide variety of mathematical methods and models of linear, integer and dynamic programming, game theory, graph theory and network modeling, queuing theory, probability theory and mathematical statistics, correlation and regression analysis can contribute to the successful solution of business problems. The list of problems solved by these methods is wide and it continues to grow due to the latest theoretical and practical developments. Here are some of them.

The quantitative substantiation of decisions on production optimization is the main task of such branches of applied mathematics as the study of operations and optimal decision methods. Based on mathematical modeling of production processes, the following problems can be solved:

- tasks of resource allocation (arise when it is required to find the optimal production plan with a limited supply of resources),
- inventory management tasks, which consist of finding the optimal values of inventory levels and order size,
- tasks of repair and replacement of equipment, which are reduced to determining the optimal timing, the number of preventive repairs and inspections, as well as the timing of replacing obsolete equipment,
- tasks of network planning and management, which consider the relationship between the deadlines for the completion of a large complex of works and the moments of the beginning of all operations of the complex and consist in finding the minimum durations of the complex of operations, the optimal ratio of cost and timing of their implementation,
- tasks of scheduling, which determine the optimal sequence of operations on various types of equipment,
- queuing tasks, which are devoted to the analysis of service systems with queues of applications and consist in determining performance indicators of systems,
- tasks of planning and placement of new objects, taking into account their interaction between themselves and with existing objects,
- route selection tasks or network tasks, which consist in determining the most economical routes.

To solve the problems associated with data analysis in the presence of random influences, an arsenal of tools and methods of applied statistics and econometrics is intended. Based on the correlation and regression analysis, a mathematical model is built, its parameters are evaluated, and forecasts are made. Econometric forecasting methods have taken a worthy place in economic practice, which was facilitated by the use of affordable and high-quality software packages and applications.

In order to navigate in the difficult financial situation of the crisis period and determine prospects, it is necessary to adequately assess the financial stability of potential partners, competitors, shareholders, creditors on a probabilistic basis. To determine the parameters of financial transactions, property and risk assessment, statistical methods of financial and economic calculations are used. Financial calculations are a tool not only for fixing, but also for assessing market expectations of various financial outcomes (discount and interest rates, exchange rates, payback ratios and performance standards, tax rates, insurance premiums, margins, annuities, etc.), performed, as a rule, in conditions of uncertainty and risk, taking into account future gains or losses. Simple types of financial calculations cover calculations of bank interest, deposit, borrowing and tax rates, rental, collateral, leasing, lend-lease, social payment rates and benefits, usually determined by directly assigning their sizes. More sophisticated methods are used to analyze contractual insurance, investment, exchange, currency, trust, and other transactions in the face of uncertainty and risk. This also includes the calculation of the outcomes of special financial transactions, their unfixed benefits or losses, transactions with securities, forward, futures and options transactions, factoring and forfaiting, exchange and all over-the-counter transactions carried out in conditions of extreme uncertainty and, therefore, complete risk [6]. A special place among the methods of mathematical support for management is occupied by

decision-making methods in situations of uncertainty or risk, studied by game theory. This is a mathematical theory that develops recommendations on the most rational course of action for each of the participants in a situation where their interests are opposite (in a conflict situation) with repeated occurrence. Participants in conflict situations may agree on joint actions or act independently from each other, communicate their decisions to other participants or not inform about them. At the same time, none of the parties can fully control the situation. So, from the position of game theory, setting the price of a product in a competitive environment is a conflict. It is beneficial for the conflict participant to set the maximum price, but at the same time, a competitor's price reduction can lead to an outflow of customers and a decrease in revenue. In conflict situations, each player seeks to find the best action strategy for himself, having only a general idea of the set of response actions acceptable for the partner. Another type of conflict occurs in a situation of uncertainty, when one of the partners acts randomly (the so-called games with nature). Methods for choosing the optimal strategy in games with nature of is one the most effective decision-making tools in a crisis economic situation.

5 Conclusion

Any economic crisis, on the one hand, deals a significant blow to the welfare of citizens and the state, but on the other, it is a powerful incentive for development in various fields. The need to take decisive anti-crisis measures puts into action previously unused opportunities, solutions and communications in the field of management, science, technology, finance, education, etc. When choosing methods for stabilizing a business, much attention is paid to production optimization methods, a significant part of which is based on the use of qualitative methods, advanced management experience, and the other part is based on quantitative approaches. In a difficult socio-economic situation, an entrepreneur, businessman or leader has a reliable means of assistance, which are economic and mathematical methods. In their arsenal there is a variety of opportunities for quantitative analysis, mathematical modeling, strategic choice, econometric forecasting, solving optimization problems. The application of a scientific approach to stabilize a business using modern software and digital technologies can serve as a tool to overcome the economic crisis.

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Tools for Estimation of “Deterministic Chaos” of Economic Sectoral Mesodynamic

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Abstract. The purpose of the study is to substantiate the methodology and develop tools for evaluating the indicators’ dynamics of Russian regions’ industries. Sectoral mesodynamic is considered as open, nonlinear and weakly structured. The synergetic principle of “deterministic chaos” and the econo-physics models are implemented for modeling. Approbation by the authors on the exploration mesodynamic data of 12 main sectors over 78 Russian regions during the period from 2005 to 2017. Tre results demonstrate a great adequacy of the applied tools, outlined a set of directions for its development and areas of possible application, including socio-dynamics. The prospects of applying nonlinear trends, mainly logistic ones, are shown. E.Slutsky’s theorem on modeling medium-term business cycles by the sum of three harmonics with non-multiple frequencies is confirmed. The adequacy of trajectories’ modeling is provided by supplementing the known structures of mesodynamic trajectories with additive-multiplicative interactions, and considering the stochastic component as a mixture of distributions with heavy tails. Exploratory results showed heterogeneity of institutional and economic development of regions, which creates imbalances in economic cycles, allowing to make forecasts for the development of regional economies, to form knowledge bases to characterize the cause-and-effect relationships of economic theory.

Keywords: Cycles · Mesodynamics · Nonlinear · Structures · Synergy · Trends

1 Introduction

The term “mesolevel” was first introduced in 1986 [11]. As an open economic system, the region is also affected by external macro- and microeconomic factors. Cyclical fluctuations are projected on the region horizontally (from the neighboring regions) and vertically (from other hierarchical levels), forming aggregative nonlinear mesodynamics [7, 10]. The mesolevel is often associated only with the regional economy and industries, but it should also include economic clusters, corporations, and other microlevel economic institutions that determine the possibility of sustainable development and macroeconomic systems [8, 18]. The subject of research for these objects is the study of their structures and the mechanisms that determine economic phenomena and measure the effects of their impact [22]. The rapid scientific and technical development of the world, especially in technologies, and significant political turbulence

caused the transition from the policy of market fundamentalism, from scientific scholasticism to a new synergetic theory of the economy evolutionary development, considering it as a developing, complex and improving organism.

Now there is a need to change the methodology of economic science: from the theory of searching and maintaining a state of equilibrium to the theory of studying the laws of its development and retention within the increasing complexity of economic activity, an immanent regime of constant variability. Economic practice already shows that we should not only allow deterministic development trajectories, but also be prepared for “chaos”: the possibility of bifurcation points appearing within a short time that change the trajectory of dynamics of one or more attractors. They may not be fully implemented in practice due to the possibility of new attractors and the next search for mechanisms for retaining increasing complexity. The “deterministic chaos” differs from the regular dynamics in its probabilistic behavior, which originates from the object of analysis itself, and doesn’t require the influence of external factors. However, and it is very important, it can respond to scenarios of its regulation (determination).

2 Methodology

The most common characteristic of an analysis object’s modeling and forecasting is trajectory trends. Synergetic widely uses solutions of nonlinear dynamics differential equations for trends that reflect the essential properties of the analysis object, as well as “soft” (phenomenological) dynamic models, which are not always associated with theoretical assumptions, but are often adequate [6, 9]. Researchers analyze not only the specific values of trends, but also the topology of the phase space. They identify several main indicators in the dynamics (order parameters), adjusting all the others parameters to them. Thus, hundreds of economic indicators in such models can be replaced by a small number (from three to eight) of order parameters that characterize the evolution of the analysis object, determine the trajectory of its development, bifurcation points, and stable states trajectories.

The common industrial economy was guided by the production scale effect and negative feedbacks, while synergetic also considers (and creates) positive feedbacks of self-development. New relationships can be determined by the economic theory laws, solutions of the corresponding differential equations, and soft data processing models. It is necessary to compare the adequacy of the order parameters in the realized (and assumed) ranges of their values, as well as to evaluate the dependence on the ratio of the useful signal dispersion of the trajectories’ regular components and the stochastic component in the observations.

A special feature of synergetic is that the distribution law of the stochastic component is considered as a mixture of distributions, which becomes an informative sign of the evolution presence, when there are distributions with heavy tails, for instance, Pareto, Levi etc. [4]. It is a common misconception that the normal distribution is generally applicable to stochastic component and that the least squares method can be used to test any statistical hypotheses. Next, however, we will also consider the possibility of transforming the distribution to normal when selecting a seasonal component, without giving up the task of monitoring evolution.

Distributions with heavy tails are not exotic because the sum of independently and equally distributed random variables converges to them. These distributions have a deep cognitive significance, since they are determined by the nonlinear dynamics of processes in mesoeconomics by its laws and the economic mechanism of self-organization and interaction. They may also contain a normal distribution formed by a large number of independent factors inside the nonlinear dynamics of the mesoeconomics object such as errors in measuring indicators, the influence of the shadow economy, failures and rounding in data transmission, computational errors in models' identification, etc.

There are known and confirmed by practice universal but also hard for application methods of synergetic (the apparatus of game theory and production functions), specialized mathematical methods (agent-oriented modeling and simulation calculations), simulation modeling that takes into account some individual properties of objects of analysis, market models of imperfect competition, and others, an overview of which is presented in [13]. However, only mathematical methods of synergetic are usually not enough to assess the socio-economic development of an economic system. For real economic systems we need a fundamentally new tool with the almost common informative dynamics characteristics: regular and stochastic components and their mutual relations. Human-computer methods of developing various scenarios of economic systems' behavior are also mandatory, depending on the control actions taken under these scenarios.

The results of the experiment gave a representative assessment of the adequacy of the adopted methodology and the proposed tools. The authors tested the principle of synergetic deterministic chaos [1–3] and several models of econophysics based on mesodynamic data from 12 main economical sectors over 78 regions of Russia during the period from 2005 to 2017 [13]. Time series of the following industries are considered: construction and building, retail trade, natural resources extraction and mining, crude oil and gas extraction, metal ores extraction, industry and manufacturing, chemical industry, production of rubber and plastics, pharmacy, metallurgy, production of electronics and optical devices. Up to 12800 panel data observations were processed for each industry indicator. The results of this study can be considered as the first exploratory step. They outlined a number of ways to expand the scope of models' application and the extent to which they correspond to known theoretical assumptions, including the possibility of additional accounting and social processes in the region and in the country. The next step is the correction or formulation of new theoretical assumptions, their verification on empirical data, including forecasting and analyzing regional socio-dynamics [4, 13, 22].

For the purpose of evolution monitoring in the mesodynamic models smoothing and identification should be performed on relatively short samples of monthly observations. Classical statistics cannot be applied on such samples, so the researches should refer to bootstrap procedures that generate additional pseudo-samples from the original ones. With a large enough number of pseudo-samples, it is possible to apply the common traditional statistical hypotheses as well as point and interval accuracy estimates. Whatever the type of empirical distribution it is not difficult to determine which lower and upper bound of values should be selected to ensure the desired probability of getting sample statistics in a given confidence interval. Thus, the bootstrap technique

allows calculating various functions and functions from an experimental sample, without relying on a priori information.

During the modeling process the authors widely used the methods components' decomposition and composition. We started the decomposition of economic sectors dynamical indicators with a periodic seasonal component, for which the period (one year) and the reporting periods (months and quarters) are fixed. A researcher with heterogeneous mesodynamics of regional economic sectors does not have sufficient grounds for choosing a particular distribution law of the stochastic component in seasonality. However, it is possible to estimate their abnormality. Its presence is not informative to solve the problem of evolution monitoring of the analyzed economic system. There is a desire to exclude the influence of abnormal values so that they do not affect the final goal of research related to the Pareto distribution, and at the same time, allow the usage of various statistical procedures that are prior to the final goal of the research. There are several ways to achieve this purpose.

For example, to eliminate seasonal fluctuations, we used the LOESS method with the STL function (Seasonal Decomposition of Time Series by Loess). The trend is smoothed using LOESS with parabolic polynemes. Then the trend is subtracted from the original series and the seasonal coefficients are smoothed for the same months. Unlike Census II method, it doesn't just calculate the average over all the years, but also performs smoothing on a sample window. Thus, seasonal coefficients evolve from year to year, the faster the smaller is the sample window (7 years as minimum).

We perform two attempts of the model identification: with additive and multiplicative structures. The implementation of the STL in R, which was used by the authors, assumes only an additive model structure, so for the multiplicative structure a normalizing transformation is required (taking the logarithm). After calculating seasonal coefficients, they are converted back from logarithms to the original values. For each attempt, deseasonalization is performed (seasonal coefficients are subtracted from the original series or divided by them) and partial autocorrelation is calculated for the adjusted series. The choice between the additive and multiplicative structure is made by the autocorrelation of order 12 (for months) – the closer it is to zero, the better the time series are adjusted of seasonality. A more complex and promising alternative is the Yeo-Johnson transformation [21], which, in comparison with other known transformations, takes into account zero and negative values of observations in calculations. The Yeo-Johnson transformation converts anomalous distributions into normal law, thus allowing the usage of the least squares method when performing statistical procedures that characterize the seasonal component.

Trend growth curves could be grouped into three types. The first type includes curves for describing the monotonous development of an economic system without inflection and extremum points. The second type includes S-shaped logistic curves which are also monotonous but have an inflection point and two asymptotic levels (upper and lower, the level of non-expanding demand). And if the curve has the extremum point and two inflation point so it is growing to the maximum and then returns back to the asymptotic level (bell-shaped curves) it is considered as a third type. More complex trends (for instance, multimodal) can be constructed as a combination of these three basic types. In other approach logistics trends are grouped together and can be considered either cumulative (S-shaped) or impulse (bell-shaped) depending on the

available data length and stages of the object’s life cycle. Models with arbitrary (configurable) asymmetry and separate phases of the life cycle should be considered promising for expanding the scope of logistics models [14]. The latter model is of particular interest, since this is a common case for several known logisticians with certain parameter values.

The Fig. 1 shows both increasing (solid line) and decreasing (dash line) cumulative logistic curves with their asymptotic levels (dash-dot horizontal lines). Impulse logistic curves can be obtained as a result of their differentiation. In Russian synergetic studies only two models are usually considered: symmetrical Verhulst model (also known as a sigmoid) [20] and Gompertz model [5] with fixed right asymmetry while the authors of the article proposed the complex of over twenty different logistic curves including both known models and models proposed by the authors. This complex seems to be more adequate for real economic practice. As a result of computation on our exploratory data and comparison of all the considered model types we found out that in over 90% of the cases logistic curves of both types are more accurate than growth curves [13]. Although exponential curve was applicable for short time periods.

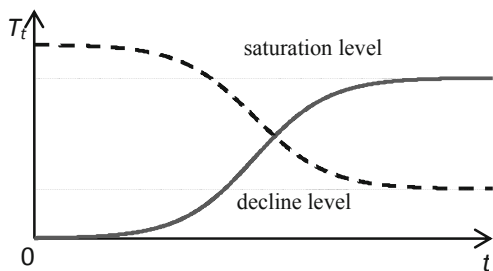


Fig. 1. Cumulative logistic model. (Source: authors).

As we expected the wide usage of liner trend on mesodynamic is improper since it assumes constant value of the model derivative (growth/decline speed) which seems unrealistic in real economy especially on longer time periods. The amount of time series in our experiment which can be adequately described by linear trend is only 3,4% and they are mostly time series with almost no trend (only constant level) that describes stagnation. Using polynomial parabolic trend is also questionable because it assumes the second derivative (acceleration) to be constant while the first is linear. It seems to be even more unachievable condition. As the practice shows parabolic trend has high forecasting errors. Although this model is non-linear towards time variable it still cannot be considered as an evolutionary one since it is reversible. The object model is significantly non-linear and irreversible if at least one of the model components is non-linear towards its parameter. This property can be achieved if any type of trend would be complemented by at least one harmonic function (which is implied in seasonal and cyclical components). This circumstance explains the popular “illusion” of modeling adequate nonlinearity of mesodynamics by the sum of linear trend and harmonic functions.

We should also mention that all the considered trend models are generalized by adding a constant (intercept) which allows more flexibility and free moving along the ordinate axis but restricts possibility of the models' linearization using logarithm, inverse, etc. Thus, we have to use computational methods to evaluate the models' parameters. In traditional additive structures of the time series the stochastic component is considered as additive against the regular, determinate components. The possibility of the multiplicative structure was already considered above on elimination of the seasonal component.

The authors considered additive and mixed additive-multiplicative structures [13]:

$$Y_t = T_t + C_t + S_t + \varepsilon_t,$$

$$Y_t = (T_t + C_t)(1 + S_t) + \varepsilon_t,$$

where Y_t is the original time series, t – time (ordering indices), T_t – trend values, C_t – cyclical component values, S_t – seasonal component levels, ε_t – stochastic component. It is also reasonable to consider other mixed structure types as alternatives for decomposition purposes. To expand nonlinearity presence the following additive-multiplicative models can be considered:

$$Y_t = (T_t + C_t)S_t + \varepsilon_t,$$

$$Y_t = T_t(1 + S_t) + C_t + \varepsilon_t,$$

$$Y_t = T_t(1 + C_t) + S_t + \varepsilon_t,$$

$$Y_t = T_t(1 + C_t S_t) + \varepsilon_t,$$

$$Y_t = T_t(1 + C_t + S_t) + C_t + \varepsilon_t,$$

$$Y_t = (T_t + S_t)C_t + \varepsilon_t.$$

As an addition to the considered additive-multiplicative structures even more sophisticated interactions of trend and other, fluctuational components can be considered. Thus, fluctuational component can be both additive and multiplicative or be weighted by the amplitude [12, 16]. The fluctuations can also change their frequency decreasing on the higher values of the trend and increasing on the significant logistic decline. Other methods of logistic curves transformation and adaptation for time series evolution were also introduced in [13, 15]. This widely expands their application field.

In some studies the urgency of evaluating the interaction of growth models with the beginning of the increasing phases of cycles is noted. However, their proposals are characterized by the specificity of the choice of exogenous factors, and the identification of cyclical development of regions is based either on descriptive approaches, or is associated with the scientific and logical justification of the theoretical hypotheses and assumptions put forward. Our research allows us to implement instrumental support for this assessment on real data.

For the first time, according to our knowledge, the authors of the article confirmed the hypothesis of Slutsky about modeling aperiodic cycles of mesoeconomics by the sum of three harmonics (sines) with non-proportional frequencies [19]. The regional industry cycle defines the dynamic process of fluctuations in economic activity within the life cycle of the industry, characterized by the repeatability of successive stages of decline and recovery in the region’s industry.

3 Results

Figure 2 illustrates the obtained results on the economic sector “production of rubber and plastic products”. On the left models (trend, cycles, seasonal) for Altai Region is shown as an instance of one of the 78 observed regions of Russia. On the right there is shown generalization of the cycles over all the 78 regions as well as average (dark line), median (light line) and quantiles (light dotted lines) [13]. Each point on the right plot represents scaled cyclicity of a single region at the given timestamp. The darker the point the farther it is from the average. These results showed heterogeneity of the institutional and economic development of Russian regions for different sectors of the economy, which creates imbalances of economic systems and regional cycles.

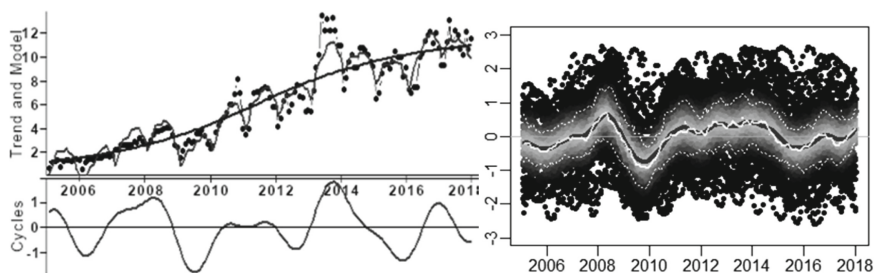


Fig. 2. Production of plastic and rubber (left – model for Altai Region, right – generalization over all the Russian regions) (Source: authors, compiled with the authors’ program in R language)

It is also possible to solve new problems [13]:

- to clarify the spectrum of potential impact of the sectoral regional cycle on the stability and balance of spatial development of regions and macroregions,
- to assess the level of imbalance and stability of regional development in the medium term,
- to develop directions for improving the level of stability and balance of the Russian economy;
- to identify homogeneous regions along the length of the cycle and identify groups of regions that are most promising for investment,
- to make proposals on strategic directions of high-tech regional development and improving the balance and sustainability of regional development.

The language R and numerical methods of non-linear least squares, ARMA (autoregression – moving average) models, genetic algorithm, simulated annealing method and RPROP (resilient backpropagation algorithm) were used for modeling mesodynamics of economic indicators [13, 17]. The research allowed us to start forming a knowledge base for describing the cause-and-effect relationships of the economic theory of mesodynamics.

4 Discussion

Such components of scientific knowledge as precision measurement and identification, reasoning of factors involved in the generation of cyclical industries mesodynamic model of “deterministic chaos” is still not used by economists. This largely predetermined the subjectivity of the received assessments and conclusions. With appropriate results and recommendations for scenario planning to set benchmarks in a situation of uncertainty, regional authorities can potentially be effective participants in the sustainable smoothing of the regional business cycle. Attempts to use scenario planning are known in Russia and abroad, but it is necessary to expand the scope of its application. The data we relied on in this article was focused on the innovative development of Russian regions in the context of economic sanctions. At the moment, the coronavirus epidemic makes the task of obtaining them even more urgent. The analysis of a certain duration of degradation of mesodynamic will be required, it may be the continuation of the development of appropriate tools on it, and then its subsequent application.

5 Conclusion

The results of the study have shown the heterogeneity of the regional institutional and economic development, which creates imbalance that drives out equilibrium in economic systems and underlying business cycles. This also includes obtaining development forecasts as well as forming a knowledge base to characterize the causal links in economic theory. The application of the project consists in providing an array of data for making managerial decisions by the authorities of the country, macro-regions, and regions. The conclusions and recommendations can be used by the enterprises’ administrations, scientists in research organizations, graduate and post-graduate students.

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Corruption Prevention on Electronic Trading Platforms

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Abstract. This article is devoted to the corruption risks arising from the active use of electronic trading platforms, including fraudulent and corruption schemes, as well as modern technologies for their neutralization. In particular, to minimize these risks, it is proposed to use a smart contract, a computer algorithm designed to conclude and maintain commercial contracts using blockchain technology. Using modern methods of scientific analysis, the authors identify the main problems associated with trying digital technologies on trading platforms and consider the problems of legislation in the field of combating corruption.

Keywords: Corruption · Economy · Electronic trading platforms · Measures · Reforming · Risks

1 Introduction

Corruption is a universal and adaptive phenomenon that requires comprehensive and multidisciplinary approaches to effective resistance. The dualism of the digital economy is in the fact that the advantages obtained in connection with its development are closely related to the risks generated by the digital essence of fundamentally new objects and processes that are not characteristic of the “analog world”, based on the integration of technologies and business models into a single digital space. The digital transformation of the state apparatus meets the expectations of greater transparency and accountability in the provision of state services. Digital transformation also affects improving the interface between the state and citizens, and Internet portals provide unified access to public services. Digital innovations help in solving the most current social problems at the local level by combining design thinking [1], crowdsourcing methods, and big data analysis tools. Automation of management processes reduces the vulnerability caused by unfair human intervention.

Without any doubt, digital technologies have become an ally of transparency [2], which has a positive impact not only on the convenience of citizens and organizations and the corruption prevention. However, practice shows that at a certain stage of digital technology implementation, legal norms may compete with regulations and algorithms

that mediate digital technologies. Unfortunately, both are subject to the threat of corruption, which constantly evolves and, like any complex phenomenon, has no borders [9]. Another problem is that in the Russian legal doctrine, regulations, in particular administrative regulations, are usually considered as an act of legal regulation of the procedural aspects of a government body activities, containing a description of the actions (administrative procedures) of this body, aimed mainly at regulating its internal work.

2 Methodology

Modern legal science has developed various technologies for influencing legal norms aimed at eliminating the risks of corruption associated with their application. The solution to this problem is provided, in particular, through the introduction of the Institute of anti-corruption expertise, aimed at ensuring the high quality of legal norms, which does not leave opportunities for corruption offenses in their implementation. At the legislative level, the provisions on conducting anti-corruption expertise of normative legal acts and their projects were enshrined in article 6 of Federal law No. 273-FL dated December 25, 2008 “On combating corruption” [7]. Subsequently, this anti-corruption technology was further consolidated in Federal law No. 172-FL of 17.07.2009 “On anti-corruption expertise of regulatory legal acts and draft regulatory legal acts” [6].

Along with anti-corruption expertise, Russia uses such anti-corruption technologies as anti-corruption monitoring, control over the compliance of expenditures of individuals holding public positions and other persons with their incomes [5], prevention and settlement of conflicts of interest, etc.

Ensuring the “targeting” of anti-corruption measures increases the effectiveness of anti-corruption measures and avoids imposing excessive prohibitions, restrictions and duties on employees whose powers do not give them real opportunities for abuse. The technology for assessing corruption risks allows us to solve this problem by focusing existing controls on “critical points” where it is really necessary. Many studies have been devoted to the content and analysis of the practice of using these anti-corruption technologies. Approaches aimed at reducing corruption risks in the digital sphere have received less attention so far.

Effective development of markets and industries (activity spheres) in the digital economy is possible only if there are developed platforms, technologies, institutional and infrastructure environments. In this area, legal regulators are significantly lagging behind the development of public relations involved in the use of digital technologies. It is often not taken into account that along with the opportunities for growth, the digital economy also carries risks generated by the digital entity (“Digital colonization”, “Uberization”, “Cyber attacks on the digital structures of competitors’ business systems”, “identity theft”, etc.).

3 Results

The use of electronic trading platforms (ETP) allows to consolidate suppliers and consumers of various goods and services in one information and trading space and provides ETP participants with a number of services that increase the efficiency of their business. Nowadays ETP is any Internet resource through which purchase and sale transactions are concluded between enterprises (buyers and sellers). Through ETP, customers can conduct electronic tenders — auctions, contests, requests for quotations and offers for optimizing costs, and suppliers can participate in ongoing purchases, post information on the products and offered services. New technologies help reducing the discretion of officials, for example, when issuing permits and licenses, as well as during procurement procedures.

Sometimes the placement of trading procedures is handled by specialized companies that, in addition to placing information on the trading platform, process the result and determine the procedure winner. At the same time, IT employees (for example, system administrators) acquire some public functions, in particular, the functions of establishing and maintaining generally binding rules of behavior [11]. The regulation of socially significant public relations is always characterized by serious corruption risks [8, 12–15].

With the appearance of new technologies, the subject composition of corruption offenses is changing. Now they are administrators of electronic purchasing platforms who help “pass on price” or create problems for competitors when they submit applications. Despite periodic legislative reforms, the procurement system is still not transparent, and there are serious corruption risks.

It has always been believed that the use of modern digital technologies in the procurement system helps to reduce corruption risks. Unfortunately, this is not always the case. The fact is that human nature does not change, there is always a temptation to build a particular process in such a way as to create opportunities for illegal profit.

Subpoint “b” of item 16 of the national anti-corruption plan for 2018–2020, approved by presidential decree No. 378 of June 29, 2018 [3], provides for the continued development of topics for assessing corruption risks. In particular, the Ministry of Labour of Russia, with the participation of interested federal state bodies, is instructed to develop guidelines for identifying and minimizing corruption risks when purchasing goods, works, and services to meet state or municipal needs.

Various fraudulent schemes are associated with the operation of electronic trading platforms. Their participants can be: online fraudsters; ordinary bidders; unscrupulous tenders organizers; trading platforms themselves.

A common scheme is when ETP participants received emails sent on behalf of the site administration notifying them of making adjustments to the terms of cooperation. It also usually contains a requirement to transfer significant amounts to the specified banking requisites for verification. Also, on behalf of the trading platforms, participants and customers of the tenders received letters that a mandatory audit is being performed, which requires chargebacks. Otherwise, fraudsters threaten to cancel the results of the auction. Corruption risks can be discussed in cases where the lot is pre-sharpened for a single customer. At the same time, the most difficult conditions are created for other

bidders. Thus, applications for participation may not be accepted under any pretext, and if they are accepted, the price requests of undesirable participants are not accepted in different ways. For example, undesirable participants may not have the appropriate technical capability.

The situation is compounded by the fact that many potential performers are waiting for the end of the application process in order to throw the most interesting offers in the digital and other plans under the closure. But not everyone succeeds. One of the important documents may not be attached for hours, and the system simply “hangs”. It happens that the “submit application” button itself is not pressed. In addition, you can always blame the supplier’s representative for problems with their equipment. If previously the biggest problem was considered to be corruption collusion between bidders and the customer, with the introduction of e-procurement, new entities with information about how many participants on virtual tenders and what their chances of winning (the administrators of the corresponding electronic platforms). Thus, the sphere of ETP functioning becomes the object of economic espionage [10].

Thus, there is a question on establishing specific status requirements, prohibitions, restrictions, and responsibilities for individuals who administrate the ETP.

In accordance with part 1 of article 13.3 of the Federal law “On anti-corruption” [7], any organizations, regardless of their organizational and legal form, are required to take measures aimed at preventing corruption. Along with such traditional measures to avoid corruption risks, modern technologies and, first of all, smart contracts can be used in procurement procedures. “Smart contract”. A smart contract is a computer algorithm designed to conclude and maintain commercial contracts in blockchain technology [11]. For example, when signing a smart contract, you can use methods similar to signing sending funds in existing cryptocurrency networks. Once signed by the parties, the smart contract takes effect.

In practice, the parties can conclude a deal, prescribe its terms and fix a certain amount of money. When all the pre-written conditions are met, the performer automatically receives the transaction amount to their account. If at least one of the conditions is violated, the payment will not be made. If any pre-agreed conditions are not met, the smart contract may include a fine or penalty. These approaches are implemented on blockchain technology, where it is impossible to cancel transactions or somehow fake or change the already entered data.

Blockchain technology aimed at ensuring the security and integrity of information at a time when concerns about data privacy and trust declining in government are growing. The scientific literature notifies that a blockchain is a type of database in which records are grouped into blocks, with each block linked to the next using a cryptographic signature [4].

Blockchain has two distinctive features that make it a powerful tool against corruption. It provides an unprecedented level of information security and integrity of the records it manages, ensuring their authenticity. In the framework of public tenders, land transactions signed by authorized officials of public contracts and payments, indicators of corruption or information may be hidden from the authorities, which, being linked to information from the register, may indicate illegal benefits received by a public official. In Brazil, for example, the transparency portal provides detailed information on five main categories of transactions:

- direct expenditures of federal government agencies based on contracts and tenders,
- all financial transactions of the state, municipalities and federal district,
- financial transfers allocated to charitable programs,
- administrative expenses, including staff salaries, staff, travel expenses, and clerical expenses.

Blockchain also helps to implement personal identification in the digital space. Many states create national identification systems where personal information is stored in distributed books. For example, Guinean civil employees are registered in the state register using biometric identification. India launched the Aadhaar project in 2009 with the goal of giving every Indian a single digital identity in the form of a biometric authenticated 12-digit number.

It is also worth noticing the technology for registering assets on the blockchain, which consists of registering assets and the storage chain, in particular the register of ownership and land ownership rights. The governments of Sweden, Georgia and Ukraine are planning to transfer their agricultural land registers, state property registers and land plots to a blockchain system. Blockchain is suitable for preventing corruption in the asset register and tracking transactions, such as purchasing processes. Nowadays unique solutions are offered in practice to improve the provision of services within the organization of purchases and sales:

- using the blockchain network: Ukraine has officially launched the world’s first electronic auction based on blockchain technology, used for the sale of confiscated property,
- introduction of the legal digital interface function: mobile operator: MegaFon launched a service for checking public procurement documentation “Purchase analysis per hour”, which will allow you to participate in tenders without a lawyer, check the documentation and, if necessary, form a complaint,
- using neural networks and artificial intelligence algorithms: Gazprom used the Antirutina Corporation system (a set of advanced technologies and algorithms based on neural networks, genetic stabilization and mathematical modeling) to catalog its purchases, which allowed avoiding the formation of the so-called “administrative catalog”, minimizing the risks of erroneous forecasts, and increasing transparency and manageability in the field of material costs,
- application of automatic control with the function of tracking violations, including through the use of algorithms and systems for intelligent analysis of purchases: the accounting chamber has developed and implemented an information and analytical system for remote external state audit.”

Open data platform opentender. The EU allows you to search and analyze tender data from 33 jurisdictions (28 EU member states, Norway, EU institutions, Iceland, Switzerland, Georgia). The state program “Digital economy” serves to legally consolidation of the above technologies and creation of the basis for their implementation in the Russian Federation, including the sphere of state and corporate procurement [10].

4 Discussion

The distinctive characteristics and features of using smart-contracts under the procurement procedures are: the lack of middlemen, the cost reduction to the contract procedure; safety, reducing the risk of fraud; invariance conditions; automated transactions; automated procedures for the collection and return of collateral and cash transfer; high speed of execution of decisions; saving time and resources; the accuracy of the performance conditions; transparency (all interested participants are free to observe developments with privacy); the inability to change contractual terms after conclusion of the contract; increase control of execution of contracts. At the same time, despite the obvious advantages of using blockchain technology in procurement procedures and minimizing corruption risks, there is still a danger of transforming corrupt practices and localizing them at the stages of procurement planning and drawing up Smart contracts, as well as their control and implementation.

5 Conclusion

It is recommended to consider this group of risks when implementing blockchain technology in the procurement system for state, municipal and corporate needs. In addition, it is proposed to consider the issue of establishing specific status requirements, prohibitions, restrictions and responsibilities for individuals that administrate ETP. At the same time, basic anti-corruption bans and restrictions may include:

- restriction on business activity,
- restrictions on other paid activities in organizations that are potential participants in electronic procurement procedures administered by an ETP employee,
- prohibition to receive remuneration from individuals and legal entities in connection with the performance of official duties,
- prohibition to disclose or use for purposes not related to official activities information constituting a commercial secret, and other information classified as confidential, which became known to him in connection with the performance of official duties,
- the obligation to take measures to prevent the occurrence of a conflict of interest (article 10.11 of the Federal law of 25.12.2008 No. 273-FL “On combating corruption”) [7],
- the obligation to report to the head of the organization on inducement to commit corruption and other offenses.

It seems that in the conditions of modern technological development, new digital technologies such as artificial intelligence, blockchain and others, if used correctly, will reduce the human factor to a minimum, ensure strict compliance with anti-corruption standards and full implementation of anti-corruption legislation.

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Assessment of Environmental Components in Municipal Development Strategies

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Abstract. The solution of environmental problems in territorial development deserves special attention both at the federal and regional levels. The national strategies for socio-economic development of the Russian Federation address the solution of regional and local environmental problems. In the article, the authors analyze the environmental components in the Municipal Development Strategies of Samara Region for 2025–2030. The authors note that out of 13 elements of the environmental component, priority is given to maintaining health and solving environmental engineering problems. The solution of such environmental problems as preservation and increase of biological diversity, improvement of the state and expansion of protected areas is minimized. When developing Strategies, the authors suggest turning more attention to the requirements of environmental regulatory documents, legislative acts and decrees on ensuring environmental safety, as well as take into account foreign experience.

Keywords: Development strategy · Environmental component · Environmental safety · Municipal districts

1 Introduction

The world community pays special attention to solving environmental problems in territorial development [11]. The strategic environmental assessment (SEA) of the territories is conceptualized [4]. SEA claims to be a promising solution, changing mentalities and enhancing social values [2]. The national strategies for socio-economic development of the Russian Federation are expected to address regional and local environmental problems. However, the environmental factor in 73% of them does not find targets or is reduced to a secondary status (26% of strategies), or even completely absent (12% of documents) [1]. The research aim is to assess environmental sections of strategic documents for the development of the territories in Samara region, a large federal subject of Russia. The objectives of the research include determining the status of existing and planned municipal regional environmental programs, projects and activities during their compilation in 2014–2018.

2 Methodology

In the process of planning and programming environmental goals, a variety of principles, methods and models are considered [3, 5, 6]. The general regulatory process of this scientific research is built from the hypotheses to analysis and interpretation of facts. The authors propose a multidisciplinary approach for this research.

The main methodological principles of the research are the following:

- the principle of the diversity of research forms and integrated assessments,
- the principle of taking into account regional specifics,
- the principle of information security of the study and the completeness of the data used,
- the principle of practical feasibility.

When conducting analysis and making recommendations, the authors use the following scientific methods:

- description and comparison methods,
- mathematical and economic analysis,
- and logical construction.

The authors propose a scientifically based formation of the concept of managerial decisions of the socio-economic development of the regional municipalities of Samara region and the tools for regulating the environmental component in the municipal development strategies. The discussion materials are the official socio-economic development strategies of 27 regional municipal formations of Samara Region for 2025–2030, as well as regulatory and legal documents of the Russian Federation, statistical data, and literature sources.

3 Results

The territory of Samara region is characterized by great variability and instability of the manifestation of natural conditions, in which diverse environmental problems are recorded in land use, forest management, environmental pollution, water use, water disposal, waste management, etc. An analysis of the regional strategic document, calculated for implementation until 2030, shows that environmental issues are reflected in the SWOT analysis and in strategic directions [9]. We can identify 10 trends in improving the environmental situation in almost all environmental components. However, in reality, it is possible to evaluate only 10 specific targets in 3 planned directions, while the rest are declarative in nature and have no real basis.

The municipal regional strategy, environmental programs, projects and activities should be based on federal and regional normative documents, be involved in the system of socio-economic development of the region, synchronized with each other and pursue a common strategic goal. Ensuring the constitutional right of citizens to a favorable environment is, without a doubt, the fundamental goal of the regional environmental policy. The environmental component in the current strategic materials from the maximum accepted 13 elements (ingredients) is qualified by a variety of local preferences, where the advantage (100% of the territories) is given to maintaining health and solving environmental engineering problems (Table 1).

Table 1. Environmental component in the strategies of municipal development in Samara region

Municipal districts	Environmental component in municipal development strategies *										Total elements				
	Health safety	Water supply	Water disposal	Waste management	Park development	Rehabilitation	Env. education	conservation	Water objects	Forests		Lands	Emission reduction	Biodiversity	Protected areas
Alekseevsky	+	+	+	+	+	+	+	+	+	-	-	+	-	-	9
Bezenchuksky	+	+	+	+	+	+	+	+	+	-	-	+	-	-	9
Bogatovsky	+	+	+	+	+	-	+	+	+	-	-	+	-	-	8
Bolsheglushinsky	+	+	+	+	+	+	+	+	+	+	+	-	-	-	10
Bolshechernigovskiy	+	+	+	+	-	+	+	+	+	+	+	-	-	-	8
Borsky	+	+	+	+	+	+	+	+	+	-	-	-	+	-	9
Volzhsky	+	+	+	+	+	+	+	+	+	-	-	-	-	-	8
Yelkhovskiy	+	+	+	+	+	-	+	+	+	-	-	-	-	-	6
Isklinsky	+	+	+	+	+	-	+	+	+	-	-	-	-	-	6
Kamyshlinsky	+	+	+	+	-	+	+	+	+	+	+	-	+	+	10
Kinelsky	+	+	+	+	-	+	+	+	+	+	+	-	-	-	9
Kinel-Cherkassky	+	+	+	+	+	+	+	+	+	-	-	-	-	-	5
Kiyavlin'sky	+	+	+	+	+	+	+	+	+	-	-	+	+	-	8
Koskinsky	+	+	+	+	+	+	+	+	+	-	-	-	-	-	7
Krasnoarmeysky	+	+	+	+	+	+	+	+	+	+	+	+	-	-	10
Krasnoyarsky	+	+	+	+	+	+	+	+	+	+	+	-	-	-	9
Neftegorsky	+	+	+	+	+	+	+	+	+	-	-	-	-	-	8
Pesarsky	+	+	+	+	+	+	+	+	+	-	-	+	-	-	8
Pokhvisnevsy	+	+	+	+	+	+	+	+	+	-	-	+	-	-	7
Priolzh'sky	+	+	+	+	+	+	+	+	+	-	-	-	-	-	6
Sergiyevsky	+	+	+	+	+	+	+	+	+	-	-	+	-	-	6
Staropolsky	+	+	+	+	+	-	+	+	+	-	-	-	-	-	6
Syzransky	+	+	+	+	+	-	+	+	+	+	+	-	-	-	7
Khvorostyansky	+	+	+	+	+	+	+	+	+	-	-	-	-	-	6
Chelno-Vershinsky	+	+	+	+	+	+	+	+	+	-	-	-	-	-	5
Shestainsky	+	+	+	+	+	+	+	+	+	-	-	-	-	-	7
Shigonsky	+	+	+	+	+	+	+	+	+	-	-	-	-	-	6
Total elements	27	27	27	27	21	19	17	12	8	8	6	3	1		

Source: authors based on [9].

* This does not take into account the construction and reconstruction of cattle cemeteries, which can be recognized as a transitional measure from plans for territorial development of about 10–15 years ago

The illustrated preferences are quite explainable by the national priorities for increasing the life expectancy of Russians and the reforms in the housing and communal services. On average, in municipal strategies, the environmental component consists of 57.8% of the possible ingredients. The ratio of the number of 203 elements planned for implementation to all regions for their total probable number is 351 (27 regions \times 13 elements). This may indicate, among other things, the absence of a unified methodology for environmental strategic planning. Actually, the environmental tasks: preservation and increase of biological diversity, which may be under the negative pressure of widely planned recreation (development of local tourism), improvement of the state and expansion of protected areas, is allocated a minimum of 1–3 municipalities. At the same time, for example, in Khvorostyansky district, where no one plans to develop protected areas, they occupy only 0.1% of the entire territory, which is almost 18 times less than the regional average, or 300 times less than in Stavropol region, leader in the given factor.

4 Discussion

Environmental planning in reality does not fulfill the important role of ensuring balanced socio-ecological-economic development, but acts as a minor addition to the two main areas of sociology and economics. However, it is no secret that the state of the environment, which is the basis of the environmental component, is the most important condition for saving health. The vast majority of strategic documents lack target indicators of environmental development or they are contradictory. So, in the text of the document of the municipal district of Stavropol, among the measures to ensure the implementation of the program for creating a favorable environment and reducing emissions, target indicators are listed. However, in the planned period they not only do not decrease (in terms of harmful substances emitted into the air by stationary sources of pollution in 2015 and ten years later in 2025 - 10.0 thousand tons each), but also increase (by the volume of discharge of polluted wastewater into surface water bodies: in 2015 it is 541.0, but in 2025 - 542.0 thousand cubic meters).

The disadvantages and shortcomings of compiling the environmental section of the strategies are relatively general. Let us consider this as an example of the strategic plan of Neftegorsky district with an average number of elements of the environmental component. Here, environmental programs and projects are mainly reflected in the strategic direction “Municipal District - Habitat”, in which the execution of 5 programs is announced. These programs are more dedicated to socio-environmental issues [8]. They announce the updating of water supply and sanitation schemes; construction of a landfill for municipal solid waste; rehabilitation of channels of small rivers, lakes and ponds; land reclamation under unauthorized landfills, etc. Specific goals, 18 tasks, structure, terms and stages of the implementation of programs and subprograms are identified, a brief description of the subprograms and projects is given, 20 indicators are set, 24 expected results are listed. At the same time, many provisions are declarative in nature, not supported by substantive projects, planned indicators. One may get the impression of the residual principle of financing social and environmental programs and the uncertain form of their implementation. So, in the subroutine for updating water supply and sanitation

schemes, tasks are distinguished, for example, from reconstruction of existing water intake nodes, reconstruction of main pipeline networks. However, this is not reflected in the target indicators, a vague wording is given: “number of accidents”.

There are no target indicators at all toward the stated goal of improving the quality of drinking water and guaranteed wastewater treatment in accordance with both environmental safety standards and minimizing the harmful effects on the environment. In the subprogram of construction of a landfill for solid household waste, it is necessary to mention the inadmissibility of unauthorized landfills, which is absent in the document. The restoration of water bodies, their environmental rehabilitation and the implementation of water conservation measures should be aimed at preserving and increasing the sustainability of ecosystems. When developing the document, the diversity of the intended use of water bodies (rivers, lakes, ponds, natural and artificial, recreational and commercial) is not taken into account, there are no specific subprograms and projects.

There are cases when the name of the program and its purpose are complemented by unusual tasks. Thus, the program for the restoration of land under unauthorized landfills provides for the solution of the problem of studying the “morphological composition of waste and making decisions on their use, disposal, storage, disposal, recycling.” However, this is a sphere of certification of waste, but not land reclamation, which in the objectives of the program quite rightly expands to the technical and biological stages of reclamation. In this section, the corresponding subprograms and projects have not been formed, and the deadlines for the implementation of the planned ones have been unjustifiably shifted to the distant 2024–2030. A range of indicators available for use can be indicators of environmental performance in municipal management [7].

Municipal environmental programs do not fully take into account the requirements of Presidential Decree No. 176 of April 19, 2017 regarding environmental safety in the country, the preamble of which emphasizes that it is an integral part of national security [10]. This document has become a new stage in state environmental politics, and therefore adopted in 1994 in Russia, the state strategy for protecting the environment and ensuring sustainable development is recognized as invalid. It can be assumed that the level of significance and responsibility of environmental programs is increasing, as they are transferred from the status of environmental protection and the uncertainty of sustainable development to the status of guaranteeing safety. The current municipal regional environmental policy is not sufficiently correlated with the goals, main tasks, priority areas and mechanisms for implementing state policy in the field of environmental safety. Key indicators of its implementation are not reflected. First of all, this is noticeable when identifying a territory that does not comply with environmental standards; and the population residing in territories with violations of quality standards. There are no requirements for accounting for volumes of municipal solid waste by hazard classes, the status of protected areas, etc.

5 Conclusion

The authors concluded that the development and adjustment of municipal development strategies requires a unified methodological support and improvement of environmental strategic planning. The authors propose a triune socio-ecological-economic systems

approach in the preparation of program documents, taking into account foreign experience in developing guidelines for SEA. It is a kind of symbiosis of the use of tools to integrate environmental goals into politics and practice, models of sustainable environmental development strategies and the best domestic practices of environmental strategic planning. The authors propose, when drawing up strategic municipal regional environmental initiatives, to correlate them with national and regional environmental legislative and program documents, environmental safety planning, the national ecology project and the regional component of the national ecology project.

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Integration of the Process Approach and Lean Manufacturing to Formalize Risk-Based Thinking

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Abstract. This article explores the problem of the formation of risk-based thinking as an indispensable element of the quality management system using the tools of the lean manufacturing methodology. Such symbiosis allows not only to comply with the formal requirements of ISO 9001: 2015 to ensure standardization of products, but also provides managers with detailed risk information to identify losses and optimize costs at each stage of the production process. The article proposes to evaluate risks based on their division by the cause of risk and the risk event, as well as the ranking of risks by the nature of their belonging to each of the stages: supply, production, and marketing. The interconnection of risks among themselves is established and it is proposed to use the scales of the significance of each risk to establish the potential risk and its consequences for the economic entity in the form of losses, reducing the planned financial result.

Keywords: Lean manufacturing · Production · Risk · Supply · Quality management system

1 Introduction

New social and economic realities dictate the need to change management concepts used in production in the direction of reducing costs and increasing the mobility of the enterprise to restructuring both the production cycle and the entire scope of its activities. The guideline is to reduce the time of production and delivery of products and maximize customer satisfaction. It is possible to provide such results of the enterprise using the currently known management concept of lean-production.

At the same time, losses and excessive costs of enterprises are a consequence of the impact of risks. Risks that were not prevented in time or to which measures to reduce them were not applied entail the outflow of funds of the enterprise. Currently, there are regulations providing for mandatory risk assessment. These include international quality standards. ISO 9001: 2015 indicates the association of risk with a lack of information about the event, its consequences or likelihood [4]. At the same time, it should be noted that during the audit, risk management is not subjected to separate verification as an independent activity, but is part of the QMS audit object.

Although there are no specific requirements in ISO 9001: 2015 on how to document the results of identifying risks and opportunities, the organization must determine the amount of information necessary to provide the audit with objective evidence of risk-based thinking [4]. Due to the lack of clear regulation, the amount and type of such information may vary due to the individual characteristics of each organization. Nevertheless, risk-based thinking is part of the information support system for managing the organization as a whole and the knowledge management of the organization, as well as part of the quality management system (QMS).

Since risk management refers to one of the components of a quality management system, which is a combination of the organizational structure, methods, processes and resources necessary for general quality management and is an integral part of the organization's overall management system, the problem of organizing a risk management system on based on a risk-based approach within the concept of lean manufacturing. Before creating a risk management concept in a lean manufacturing system, it is necessary to establish what exactly ISO 9001 provides under the term "risk-based thinking" [4]. The standard establishes that the principle of its construction is based on the process approach, which includes the cycle "Plan - Do - Check - Act" (PDCA), and risk-based thinking [6].

The implementation of the PDCA cycle is the basis of the QMS and allows you to provide the enterprise with the necessary resources, to manage them, to develop and implement approaches to their improvement. Together with the PDCA cycle, risk-based thinking allows you to identify factors that may lead to deviations in actual indicators or processes, as well as apply preventive measures to manage risks to minimize negative consequences and maximize the opportunities that arise. ISO 9001 defines risk response options [4]. These include risk avoidance, risk assumption in order to track opportunities, eliminate the source of risk, change the likelihood or consequences, share risk or contain risk by making a decision based on information.

However, the standard does not provide detailed information on the stages of identifying risks in conjunction with the PDCA cycle or formalizing actions to respond to risks. On the contrary, the standard states that it does not require formalized risk management methods or a documented risk management process. Thus, each enterprise decides independently how to regulate risk management, how to link planning and risk assessment with the Shewhart-Deming cycle [13]. Despite this, during the audit of the quality management system, including the mandatory assessment of the QMS compliance with the requirements of the standard for certification, the facts of the use of risk-based thinking tools should be documented, understandable and provable. This is confirmed by the requirements of ISO 9001: 2015 [4]. It states that the organization is responsible for the use of risk-based thinking and for actions taken in relation to risk, including for making decisions about the storage of documented information that contains information about the level of risk. On this basis, the urgent problem is the formalization of risk-based thinking as an indispensable element of the quality management system using the tools of the lean manufacturing methodology.

2 Methodology

This study is based on key aspects of methodologies dedicated to the organization and control of quality management systems, in particular, the formation of risk-based thinking, as well as the implementation of the concept of lean manufacturing. Scientists emphasize the possibility of using not one, but many concepts of enterprise management (lean manufacturing, Kaizen, 6 Sigma and others), using their elements to achieve the most effective result, taking into account the individual characteristics of the economic entity [3, 9]. The use of such tools does not contradict the methodology of forming a quality management system, which is regulated by international standards, but it is supplemented and expanded by scientific works and research results concerning an innovative approach to organizing such a system [13].

The main provisions of the concept of lean manufacturing are disclosed with the scientific works of Woomek and Jones [11]. The Delphi method in this study was used to quantify the potential risk in terms of the concept of lean manufacturing, as well as to determine the weights of the causes of risk and risk events [12]. The weight of the risk events and the causes of the risk was used to calculate the adjusted value of the risk potential [10]. To determine the degree of correlation between risk events, the modeling method was used [1, 2]. The result of its application is a formed model of organizing risk-based thinking using the Shewhart-Deming cycle in the concept of lean manufacturing and a formed risk model. The purpose of this study is to develop an integrated risk management model using the tools of the lean manufacturing methodology [13].

3 Results

It should be noted that ISO 9001 also refers to ISO 31000: 2018 “Risk Management Guideline” in this context: the organization, on its own initiative, can choose a more detailed and formalized approach to risk management in the organization and use ISO 31000 for this [4, 5]. However, the use of ISO 31000 «Risk Management» is a labor-intensive and complex process for many enterprises [5]. The approach of using the developed model of formalizing risk-based thinking within the framework of the QMS, the structural elements of which can be reconfigured and changed depending on the individual characteristics of the activity of a particular enterprise, seems easier. However, such a risk management model, taking into account modern concepts of managing not only product quality, but also the enterprise as a whole, should be interlinked with the concept of lean production. In this case, at the enterprises when organizing the QMS on the basis of the requirements of ISO 9001-2015, the principles of lean production will be applied [4]. This will ensure that the QMS complies with ISO standards, as well as integrate risk-based thinking tools in this system aimed at identifying losses and managing them to improve product quality and reduce production costs. This approach is reflected in the risk management model presented in Fig. 1.

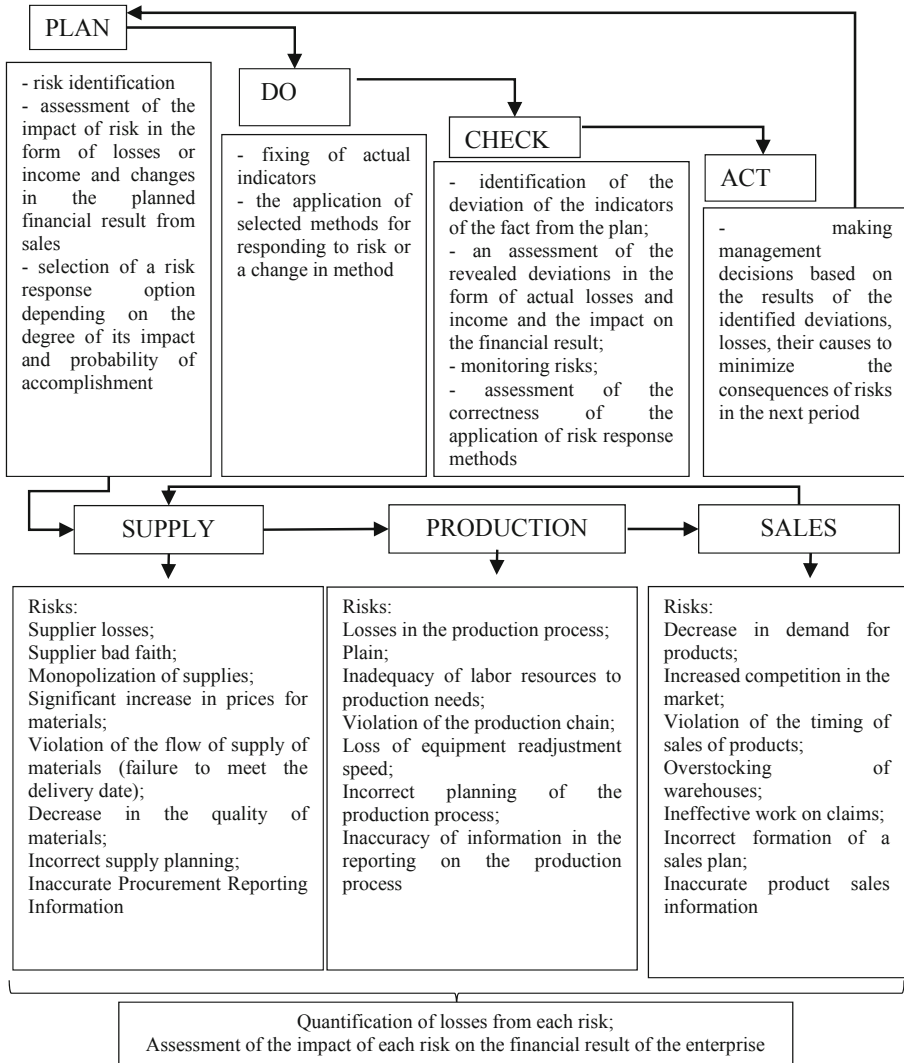


Fig. 1. A risk management model using the Shewhart-Deming cycle in a lean manufacturing concept (Source: authors)

In the framework of this study, a mechanism for assessing the risks of supply, production and marketing at the planning stage is proposed [7, 8]. Risk management is divided into several stages: risk identification, risk analysis, risk assessment and risk reduction. Scientists offer various options for risk management: hedging, diversification, risk transfer, compensation, and others. However, these methods are not related to the ISO 31000: 2018 standard, which uses the PDCA quality management concept

(plan, do, check, act) [5]. For the purposes of optimizing risk management using lean manufacturing tools, it is proposed to assess risks as follows. The first step in risk assessment is to identify potential risks. Risk identification can be carried out using methods such as: brainstorming, questionnaires, professional judgment based on experience; observation, etc. However, when determining risks, it is necessary to take into account expert opinion. The Delphi method is used to collect information about potential risk from an expert. The application of the Delphi method in identifying risks is the use of an iterative questionnaire with controlled feedback from experts.

After determining the identification of risks (they are individual for each economic entity), it is necessary to distinguish between the cause of the risk and the risk event. At the first stage, the ranking of the causes of risk based on the determination of their total risk potential is carried out according to the formula:

$$CPRc = Pc \sum Io \cdot Roc, \tag{1}$$

Where: *CPRc* - the cumulative potential risk; *Pc* - the probability of the occurrence of the cause of the risk; *Io* is the degree of exposure if the risk event occurred; *Roc* - the correlation between the cause of the risk (c) and the risk event (o) (or the probability that the cause of the risk will cause the event risk).

To determine the relationship between the cause and the risk event, the Pearson correlation coefficient is used. The correlation between the risk event and its cause can be in the range of values from 0 to 1. These values show a zero relationship, a low degree of relationship, an average relationship and a high correlation, respectively.

At the second stage, it is necessary to determine the priorities of preventive actions aimed at improving the efficiency of work with identified causes of risk at the first stage. Table 1 presents the possible causes of risk and risk events that occur at the stage of supply, production and marketing.

Table 1. Causes of risk and risk events, including lean manufacturing

Cipher	Risk Events	Cipher	Causes of Risk
Common Risk Block			
E1	Impossible to meet goals on time	C1	Lack of senior management involvement
		C2	Lack of funding
E2	Lack of employee motivation	C3	Lack of staff motivation tools
E3	Inaccuracy of information in the reporting on procurement, production process, sales of products	C4	Lack of transparency of information on the processes of supply, production, marketing
E4	Incorrect planning of supply, production process, formation of a sales plan	C5	Low qualification of employees
		C6	Low degree of business process automation

(continued)

Table 1. (continued)

Cipher	Risk Events	Cipher	Causes of Risk
Supply risks			
E5	Supplier loss	C7	Lack of feedback on the quality of work with contractors
		C8	Change in financial conditions for working with counterparties
		C9	Decrease in solvency of the organization
E6	Substantial increase in material prices	C10	Supply monopolization
E7	Violation of the flow of supply of materials (failure to meet the delivery date)	C11	Lack of clear monitoring of delivery times and liability for its violation
		C12	Information about the planned delivery dates do not coincide with the terms established and the contract
		C13	The occurrence of force majeure and force majeure circumstances
Production risks			
E8	Production losses, downtime	C14	Long equipment readjustments
		C15	Violation of the production process chain, loss of equipment conversion readiness
		C16	Staff disinterest in minimizing production losses
Supply risks			
E9	Decrease in demand for products	C17	Increased competition in the market
E10	Violation of the timing of sales	C18	Ineffective claims handling
E11	Overstocking	C19	Production in large batches

Source: authors.

After the risks arise, it is necessary to establish a relationship between the risks, and not just determine the risk and the cause. Consider the relationship between risks, you can clarify the significance of the risk or its reduction. The result is a risk model. The next stage of risk management in the framework of the concept of lean manufacturing is risk analysis, taking into account the importance of priority risk. This stage is aimed at identifying risk factors for the management system as a whole. Risk analysis is also used to calculate the number of priorities. The risk can be caused by two reasons. Table 2 presents the early probabilities and consequences of risk.

Table 2. The matrix of probability and consequences of risk

Risk Probability (P)		Consequences (C) of risk	
Rank	Description	Rank	Description
1	Minimum, less than 5%	1	Minor consequence, the effect is very weak, the risk can be accepted
2	Low, 5–10%	2	Minor impact, weak impact, consequences can be eliminated without significant costs and reduce productivity
3	Medium, 10 to 25%	3	A moderate consequence does not affect the achievement of the strategic goal of an economic entity
4	More than average, 25–40%	4	Significant impact, the goal of the economic entity may not be achieved in a certain part
5	Large, 40–65%	5	The consequences are significant, possibly a decrease in performance
6	Very large, 65–100%	6	The consequences are very strong, can significantly reduce profits

Source: authors.

Each of the risks has its own likelihood and consequences, this complicates the risk management process, since all the parameters for risk assessment must be taken into account. However, the difficulty lies not only in this. Based on the data in Table 1, it can be determined that some risks can be caused with other risks. For example, a risk event may be triggered by one or more risk events, or a risk event may be triggered by one or more risk factors. This means that to measure risk, it is necessary not only to take into account all individual risk parameters, but also these relationships and the influence of risks on each other, applying certain weighting factors to any risk that is related to another. An example of the relationship of risks is presented in Fig. 2.

Figure 2 shows the relationship between risks. For example, a risk event C7 is triggered by a risk event C4, C5, as well as risk reasons P11, P12, P13. Given the relationship between risk events or between a risk event and a risk agent, the weight of the risk event and the risk agent must be calculated. Determination of risk weight is carried out by expert judgment (Delphi method). The risk will be the greater, the more losses for the enterprise it may entail. Having determined what risks may arise and affect an economic entity, it is necessary to determine the weight of the probability of a relationship between risks. For this, a formula for calculating the probability of the relationship of risks taking into account the probability of a risk event is used.

$$P_{corr} = P_b + (P_{corr1} \cdot W_{corr1}) + \dots + (P_{corn} \cdot W_{corn}), \tag{2}$$

where: P_{corr} – probability of risk relationship taking into account the probability of a risk event; P_b – probability of a risk event; $P_{corr 1, n}$ – the probability of a risk event affecting another risk; $W_{corr 1, n}$ – weighted average probability of the impact of a risk event on another risk.

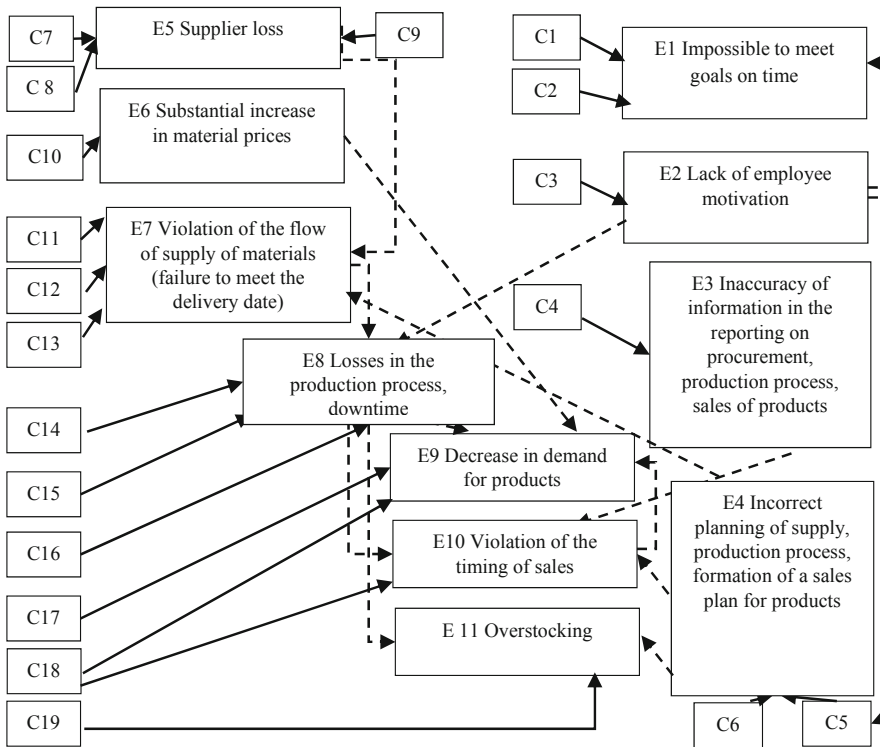


Fig. 2. Model of interaction of events and causes of risks (Source: authors).

After performing a risk analysis and determining the necessary parameters, it is necessary to carry out a risk assessment. This study proposes to use the adjusted value of potential risk taking into account the relationship of risks for risk assessment.

$$PR = P_{corr} \cdot C, \tag{3}$$

where: *PR* – adjusted value of potential risk; *C* – consequences of risk.

Determining the adjusted value of potential risk allows you to establish the degree of influence of risks on the production system of the organization, as well as to associate a quantitative assessment of risk with losses in production and the impact of the consequences of risk on the financial result of the economic entity.

4 Discussion

The results obtained allow us to continue the study of the application of the risk-based thinking system in the concept of lean manufacturing in relation to: documentation of the identification process, risk assessment and application of response measures to them; comparing planned risk values with actual data; calculation and assessment of

losses that are a consequence of risks and assessment of their impact on the financial result of the economic entity. Currently, there are scientific papers on the relationship of risk management with the implementation of the lean manufacturing system. However, it is precisely the problem of the organization of labor and work space that is considered when introducing such a concept that is considered, then this study is aimed at business processes as a whole and allows you to expand the tasks of building risk-based thinking and consider it not only through the prism of formal requirements, but also from the point of view of revealing real losses.

5 Conclusion

Based on the results of the study, a risk management model was developed using the integrated method of applying the Lean Manufacturing concept toolkit. The integrated model is designed to identify, analyze and assess risks, taking into account the application of the process approach in the implementation of the concept of lean manufacturing. In the framework of using such a model, it is proposed to identify the causes and events of risk, to determine the relationship of risks with each other and their priority. Given the priority of risks, it becomes possible to develop recommendations to mitigate these risks or their consequences for the economic entity, using risk-based thinking as an element of the quality management system.

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Factors of Investment Attractiveness of Industrial Enterprise Development Projects

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Abstract. There is a long period of decline in investment activity in the Russian economy, despite the modern paradigms of intensive updating of processing and technically complex types of economic activity. Underfinancing of industrial projects occurs along with large volumes of capital exported by their owners abroad, including equipment depreciation funds, and the funds from the accumulation fund at enterprises are not formed in the proper amount. The relevance of the problems under consideration is caused by the need to ensure sustainable competitive positions of industrial enterprises and manufacturing entrepreneurship by attracting investment in technical development, industrial research and development, and implementing a catching up economic development scenario. The purpose of the study is to reveal the modern characteristics of the investment process in the Russian industry, to determine the impact of its unfinished restructuring, to systematize the factors that inhibit investment attractiveness of manufacturing industries. We used the methods of international comparisons, analysis of cause and effect relationships, meaningful economic interpretation of the investment process in the Russian and world economies. The research results are systemized factors determining investment activity in the Russian industry and directions for improving the investment process.

Keywords: Advanced technologies · Entrepreneurship · Industry · Investment · Restructuring · Technical development

1 Introduction

Many experts note the inconsistency of the current model of the Russian investment environment with the requirements for the normal reproductive process of the domestic economy, ensuring the innovative development of industry and its industries as the basis for competitiveness in the context of the rapid development of Industry 4.0 technologies, the ubiquitous digital transformation. The practice of post-reform socio-economic development has developed negatively for investment activity in Russia, and imbalances in relations between consumption and accumulation, as well as between regions and sectors have become apparent [15].

At present, none of the main mechanisms for attracting investment resources to real production fully fulfills its functions: neither the stock market, nor the credit mechanism. Moreover, in the absence of the necessary volume of investments, the export of domestic capital abroad is observed on a significant scale (hundreds of billions of

dollars). The export of capital is also facilitated by characteristics of the legal structure of the investment environment that exist in the economy. The openness of the domestic economy, the absence of significant restrictions on the capital export, the stable functioning of competitors - firms of industrialized countries, the possibility of using offshore schemes and dual citizenship lead to the fact that available free funds of owners of domestic enterprises, potentially regarded as investment resources of the Russian industry, are withdrawn in jurisdictions of foreign economies, sometimes showing an unfriendly character to our country, strengthening them, and at the same time depriving them of stability, destabilizing the normal course of the reproduction process in the domestic economy. Only a part of this capital is returned to the Russian industry, but in the form of foreign investment. However, the magnitude of these flows is not comparable - the volume of the capital export exceeds the amount repatriated by an order of the magnitude.

The factors that oppress investment activity are largely determined by external factors, and first, by the imperfection of the existing economic mechanism and imbalances in the market. For example, the level of profitability in domestic engineering is quite comparable with that of similar firms in many industrialized countries. But if you compare its value with other sectors and sectors of the economy in our country, especially with the level of lending rates, it turns out that it is extremely small, and these ratios do not stimulate the development of engineering. In a normally functioning economic mechanism, the ratios in profitability of activities should contribute to the balanced development of industry and all areas of the economy.

2 Methodology

The theoretical and methodological basis of the study was the principles of a comprehensive and systematic analysis of the state of the Russian and world economies, the investment process in industry, which allowed studying the existing development phenomena in manufacturing activities. The analysis involved measures to intensify innovation and investment activities, taken to solve the problem of the technical development of enterprises at different levels of economic management. A comparative analysis was used to draw conclusions on solving the problem of investment attractiveness in the Russian economy and comparing with foreign counterparts. When studying the modern characteristics of the investment process in the Russian industry, it is important to note that its unfinished restructuring significantly affects investment activity of individual industries. In methodological terms, it was emphasized that the most important characteristics of the modern investment process in the Russian industry are a low level of trust to external financial investors on the part of the owners of enterprises, as well as the underdevelopment of effective forms of interaction with strategic partners - co-investors. It was considered that it continues to remain a tough struggle for economic assets, the establishment of control over property and insufficient protection of the rights of the owners. As a strategic partner, the investor, as a rule, is large companies, most often TNCs, pursuing the main goal - access to know-how, new markets, key counterparties, as well as resources or technologies. In any case, both forms of investment involve changes in the ownership structure of the capital of the

resident enterprise. However, under insufficient protection of property rights, this may lead to loss of control over the enterprise. The authors examine the relationship between the subjects of investment activity in the chain “state - investment market - industrial enterprise” in addressing production of promising products and technical re-equipment of enterprises. The experimental base of the research is Russian industrial enterprises and business entities engaged in the manufacturing sector.

3 Results

For a comprehensive study of the existing negative characteristics of the domestic investment process, it is necessary to build their integrated systematization in accordance with the main reasons that cause them (Table 1).

Table 1. Description of the current depressed state of the investment process in the Russian industry

№	Reasons	Characteristics
1	High uncertainty and risk compared to economies of industrialized countries	<ul style="list-style-type: none"> – Orientation in production and investment only for the short term – Making investments only in support of existing production potential – Export abroad of all income received, including depreciation
2	Legal framework for the investment environment	<ul style="list-style-type: none"> – Export of large volumes of capital – Return of a part of capital under the guise of foreign investment and with another jurisdiction
3	Incomplete industrial restructuring, insufficiently careful control over investment activities of state corporations	<ul style="list-style-type: none"> – Large integrated structures capable of competing with transnational corporations and accumulating investment resources, cover far from all important sub-sectors of industry, leaving them without technical development – Investment activities of large state corporations in many cases are focused on foreign machinery and equipment, engineering services and methods of organizing production
4	Low profitability of many industrial enterprises, especially engineering ones	<ul style="list-style-type: none"> – Unavailable credit resources due to a high rate of loan interest – Profitability level of other areas of activity is higher, especially financial investments, risk and capital turnover period are less, which determines the withdrawal of funds from real assets to financial ones

(continued)

Table 1. (continued)

№	Reasons	Characteristics
5	Shortage of working capital and unstable financial situation of many industrial enterprises	<ul style="list-style-type: none"> – Difficult to attract long-term loans – Investment unattractiveness of securities issued by enterprises (stocks, bonds) – Misuse of depreciation
6	Fierce competition for control over the property of enterprises and insufficient level of protection of the rights of owners	<ul style="list-style-type: none"> – Distrust to external financial investors on the part of the owners of enterprises – Underdeveloped forms of work with strategic partners – investors
7	Low level of solvent demand of a significant proportion of both intermediate and final consumers	<ul style="list-style-type: none"> – Output of obsolete products; lack of investment in the development of new ones – Need for investment to launch new products and to modernize the production potential of enterprises underinvested over the years
8	Great amount of imported goods in the market and in several industries – engineering services	<ul style="list-style-type: none"> – Need for increased investment to develop equipment and technologies and to promote products in the competitive environment with transnational corporations – Dependence on available foreign developments, component base, consumables when choosing the investment object

Source: authors.

Even though this or that characteristics of the investment process is influenced by a set of reasons, however, it seems correct that the factors highlighted in the table are the most significant for the studied characteristics. So, for example, high uncertainty and great risk inherent in the domestic economy, especially industry, determine the possibility of adapting the activities of manufacturing enterprises mainly in the short term. This in turn make the owners of enterprises refuse to implement long-term investment projects and use investments only to maintain the existing level of the production potential. Of course, there are exceptions - these are state corporations engaged in the mining industry. However, their long-term investment projects are primarily associated with technological features of field development, which determine the need for promising investment justifications. At the same time, even in these corporations, large-scale investment projects of modernization were not carried out in their processing units until state economic authorities forced them to do this, tightening environmental standards for products, for example, for petroleum products, to Euro4 and Euro5. This exceptional short-term orientation also determines the desire of the owners of enterprises to export their income to countries with a more stable and predictable economic system. Moreover, those funds, for example, depreciation of fixed assets, which are necessary to maintain the normal reproduction process, are often included in these revenues.

Speaking about the existing structure of industry, it is possible to single out some large integrated companies, especially in raw materials industries, as well as many medium and small, micro-enterprises. Large Russian integrated structures have developed today in the fuel and energy, metallurgical and other industries. At the same time, in several manufacturing industries, such structures either did not work out, or they are not Russian in terms of capital ownership or are aimed at solving narrowly defined tasks. So, for example, if there is United Shipbuilding Company, a United Aircraft Building Company, and Russian Technologies Corporation in engineering, most civil engineering products are produced not by these structures, but by a large mass of medium and small enterprises. At the same time, if a large integrated structure can accumulate investment resources on priority projects, then medium and small enterprises, as a rule, cannot do this. Such a difficult situation is observed in the conditions of fierce competition with leading multinationals in target segments of the world market. Especially important are special measures on the part of the state in the crisis to support high-tech medium-sized businesses (the so-called national champions, gazelles), from among private, high-tech, fast-growing, and medium-sized ones [12]. At present, state support measures do not apply to most representatives of this scale of business. Most of them are initially export-oriented, their products and services are internationally competitive, therefore measures to support their exports are significant. They need support tools for industrial research to seriously reduce their tax base and free up funds for further development.

The public-private partnership in the scientific and technical sphere has a significant effect when co-financing part of the costs of private companies on an order to conduct RandD at universities and research institutions. This allows innovative high-tech companies to seriously save money when introducing new technologies and new products, while helping Russian research organizations commercialize new technologies and launch innovative products. So, the most part fast-growing companies are not able to develop at their own expense, exploiting modern high-cost technologies with small amounts of start-up capital. Support measures are in demand, such as project loans for investment projects, resource capabilities of the Industrial Development Fund with soft loans for introducing new technologies and products for production. However, both private companies of all sizes and state-owned, prefer to buy finished equipment abroad, rather than trying to do something new. Finished equipment of the previous generation, which has already proved itself, reduces risks. There is not enough incentive for such companies to create new technologies, new products, which is considered the biggest drawback, if we talk about the overall innovative nature of the business development within the framework of industrial policy.

As part of this block of reasons, one more feature should be noted. In the conditions of insufficient control over investment activities of state corporations, they are in many cases oriented towards the acquisition of foreign machinery and equipment, technologies and engineering services. Of course, it is necessary to consider the technical, competitive level of the investment object, but in fact it turns out that with the money accumulated by the state for the development of corporations, they invest not in income to support for domestic enterprises, but they invest in foreign, sometimes hostile to our country. Among the important reasons determining the state of the investment process in industry there is the chronic lack of working capital and the unstable financial

situation of many industrial enterprises. This determines the misuse of depreciation, the lack of the adequate accumulation fund at enterprises, the difficulty of attracting long-term loans, and the investment unattractiveness of securities issued by enterprises. This group of reasons can be combined with low profitability of many industrial enterprises into a larger group – low efficiency of their activities. In recent years, another reason has emerged from some negative characteristics of the investment process. This is a great amount of imported goods in the market, crowding out domestic products, as well as engineering services ordered by several industries.

The first reason is determined by higher capabilities of TNCs in production and sale of new products in comparison with domestic enterprises, which are also inferior to marketing opportunities. TNCs can offer not only the best industrial products, but also provide their high quality, backed by reputable global brands, which is significant in relation to investment equipment or the automotive industry. In addition, TNCs do not offer individual units of engineering products, they offer complexes of related equipment provided with pre-sale and after-sales services, guarantees and uninterrupted supplies of consumables. To compete with these transnational corporations on equal terms, domestic enterprises need to attract an increased volume of investments in the development of equipment and technologies and in creating a market, promoting products, and providing them with comprehensive equipment and services. In practice, domestic enterprises are not able to independently attract such a large volume of investments, which once again emphasizes the fact of the unfinished restructuring of many sectors of the industrial complex, and the need to form large integrated structures.

The second reason is participation of foreign companies, developers of promising products, in large investment projects in some leading industries and they provide a range of engineering services. This causes the dependence of domestic manufacturers on foreign corporations when choosing the investment object. The acquisition of new technologies from foreign companies is always stipulated by several burdensome conditions, such as the need to participate in a project of a foreign company-designer, the use of equipment only from a certain manufacturer, the purchase of raw materials and consumables or components only from suppliers indicated by the designer, repair and maintenance of foreign equipment by a partner company. There are restrictions on sales, its scale and geography. As a rule, domestic enterprises do not have a place in this list of works, services, but in fact the funds they invest strengthen the competitive position of a foreign competitor.

4 Discussion

The issues of increasing investment attractiveness of the real sector of the economy are considered by a significant number of Russian and foreign scientists. The intensification of the structural adjustment of production, the creation of the necessary raw material base for the efficient functioning of enterprises, the enhancement of competitiveness and quality of products, and the solution of social problems are linked with these aspects. So, Shkodinsky and Nazarov note low investment activity of the industrial complex, which leads to the lag of Russian industrialists when developing competitive and advanced technologies [10]. The analysis conducted by Bobryshev,

Rodionov and Whatev coincides with these findings of other authors, which showed that one of the key points for understanding the issues under study is relatively high return on investment in industry, and long-term stability of the external environment of the business. They also note low investment attractiveness of projects of most manufacturing enterprises [2].

Avdeev, Mokretsov, and Tesalovsky, using the example of the forest industry, showed that even with a positive tendency to increase the revenue of enterprises, their investment attractiveness remains not high enough, due to many unresolved problems of industrial, marketing, infrastructure, personnel nature, as well as the deterioration of the competitive environment in industry and the increased threshold of entry into business [1]. Research by Grimm, Hartwig, Lay showed that small firms in selected poor countries achieve high marginal returns on capital but show low rates of reinvestment. There is a high level of risks and the forced redistribution of income through a rigid fiscal system, which impedes the development of private enterprise [8]. Dvoretzskaya proposes a solution to these problems by attracting funds from private investors, who can be offered to use not only tax incentives, but also the results of the latest dual-use research and development (RandD) in the civil-military integration mode [5]. Sokolova and Lozhkina connect investment activity of Russian enterprises, which is unfavorable in scale, with the unrelenting influence of various kinds of risk factors that prevail over the rate of return on investments. Therefore, they propose a single method for assessing investment attractiveness of the enterprise based on many factors that determine the efficiency of future investments [13]. Gnych, Lawry, McLain, Monteroso, Adhikay describe the formation of “investment readiness” to develop national economies, when the development of the potential of regional economies allows us to diversify and invest in new production sectors, linking them with value chains that correspond to the world market and environmental standards. An important condition is that innovations of economic authorities and markets will support the effective management and development of resources and competencies at the level of regions and industries [7]. In turn, Dey, Gupta, Singh showed that access to resources and the ability to transform these resources are technologically dependent on matrices of institutional guarantees and attitudes towards risk to turn existing threats to business into entrepreneurial investment opportunities [4]. Budinis, Sachs, Giarda, Hawkes based on materials from the PRC economy, showed that facilitated access to capital makes investments in environmentally sustainable technologies more attractive for small and medium enterprises. The result depends on the developed infrastructure, the availability of the supply chain and land use restrictions [3]. Snieska, Zykiene were able to identify the conceptual characteristics of the regional economy that is attractive for investment from the point of view of the interests of entrepreneurs. Among the factors that shape investment attractiveness, in many cases there are the availability of skilled labor and its cost, resource prices and competition [11]. As elements of instrumental support of investment processes in manufacturing industries, Mayadunne and Park proposed an economic model for assessing information security conditions of risky investments of small and medium enterprises using the expected utility approach [9]. Gebrezgabher, Taron and Amewu proposed to use a combined model of the analytical hierarchy process and targeted programming in decision-making to identify and prioritize key indicators of the investment climate, based on materials from

processing enterprises [6]. Wu, Jang, Cheng, Nishi and Cheng [14] proposed a concept ensuring sustainable investment in the safe environment for a pool of chemical enterprises.

5 Conclusion

The development of the Russian industry is not accompanied by investment processes, and none of the main mechanisms for attracting investment resources into real production fully fulfills its functions: neither the stock market, nor the credit mechanism. Several missed innovation and investment cycles, rejection to implement them for many years, require attracting large amounts of funds to launch new products, and modernizing the uninvested, worn out production unit of the enterprise over the years. In the context of the ongoing “investment hunger” this task becomes difficult. The most important reason for low investment activity of many industrial enterprises, especially engineering one, is lower profitability of their activities in comparison with other spheres and sectors of the economy. This leads to unavailable credit resources for technical development due to the increased interest rate compared with the profitability level of enterprises’ financial intermediation and commercial sphere, as well as to the overflow of free financial resources to other, more profitable business areas. If the level of return on financial investments is higher than real ones, while the risk and the period of capital turnover are less, then the investment attractiveness level of such projects is higher than real ones. Modern characteristics of the investment process in the Russian industry enable to single out the factor of low solvent demand from a significant share of both intermediate and final domestic consumers. This helps to maintain the production of cheap products with low quality and obsolete. There is a lack of motivation for investment to upgrade production and produce competitive goods. The identified and systematized factors oppressing investment attractiveness, if they are eliminated by the methods of industrial policy, can intensify the technical development of enterprises and lead to production of competitive products.

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GOELRO Plan - An Innovative Program for the Development of the National Economy

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Abstract. The article defines the conditions and prerequisites for the development and adoption of an innovative GOELRO plan for the Soviet state. Based on the methodological concept of the “big waves”, the results of the planned technical and economic strategy that initiated a technological breakthrough in the national economy are analyzed. The complex nature of the strategy under study, which was based on the electrification of the country, is characterized. The long-term consequences of the implementation of planned measures, both a negative and a positive plan, for the further development of the national economy have been identified.

Keywords: Electrification · GOELRO plan · Innovation · National economy · Soviet Russia · Technological revolution

1 Introduction

In the early 1920s the economies of many countries participating in the First World War (1914–1918) were in a crisis state: productive assets were seriously damaged or lost, industrial output was significantly reduced, and territorial and irretrievable human resources were lost. There was no exception for Soviet Russia, which bore the brunt of military trials on its shoulders, survived the revolutionary upheavals and fierce confrontation of its own population in the civil war. Being the only state that chose the path of socialist orientation and Marxist-Leninist ideology as the state, Soviet Russia found itself in political and economic isolation, which became an important factor determining the uniqueness of the forms and methods of restoring the national economy with the decisive role of the state. In the current situation of a geopolitical ideological vacuum and economic crisis, the state chose the path of strategic planning of technical and economic development, the first historical example of which was the GOELRO plan. The decision to develop an electrification plan for the Soviet state was made by the All-Russian Central Executive Committee in February 1920, on the basis of which the State Electrification Commission of Russia was formed, headed by Krzhizhanovsky (1872–1959). The GOELRO plan, which determined the development of the economy for many years, whose implementation was designed for 10–15 years, was developed over 10 months and approved by the VIII All-Russian Congress of Soviets. The

strategic planning was based on the principle of harmony, synergy in the development of all sectors of the Soviet economy, provided with affordable electricity [5].

The GOELRO plan as a technical and economic strategy took into account the resource potential of the national economy and was developed on the basis of a rigorous analysis of domestic pre-revolutionary and world experience, rationally substantiated the regional and sectoral distribution, set performance indicators of national economic activity. The content of the plan included aspects of industrial, transport, agricultural and social development of districts. The driving force behind the strategy was the enthusiasm of the working people, the use of the labor of prisoners of the Gulag. Electrification was considered as a crucial element of technological progress, having a socio-ideological orientation, emphasizing the advantages of the Soviet political system, and its readiness to use the achievements of scientific and technological progress in economic transformations.

2 Methodology

The study is based on the concept of “big waves”, developed by C. Pérez for the analysis of technological revolutions [10]. Many authors wrote about this phenomenon, along with the features of its course and the complexity of the processes [2, 14, 15]. Pérez focused her attention on the analysis of the basic elements of the technological revolution. The “Big Wave”, as presented by Pérez, covers all spheres of the economic, social, political and cultural life of society. The authors of her concept highlight the line associated with the scientific understanding and implementation of new ideas and technologies in the real economy. Pérez emphasizes that the processes of the formation of a new scientific paradigm, its implementation, are in themselves complex and multifaceted, are associated with personal and ideological conflicts, with the resistance of the old paradigm [10]. These processes take place against the background of other transformations, and at the time of the breaking of the wave, political revolutions or other deep socio-political transformations very often happen. The history of the adoption of the world’s first electrification plan for the whole country - the GOELRO plan, we see as a phenomenon that fully reflects simultaneously all the technical, technological, managerial and political changes in Russia. The GOELRO plan, on the one hand, was the result of many years of work by leading Russian scientists and engineers in the field of electrical engineering. On the other hand, it was a propaganda decision of the young Soviet government, promoting at the height of the civil war the idea of socialism as an “era of electricity” [3, p. 104].

3 Results

The GOELRO plan was an integrated system of economic, political and social events. Completeness, harmony and vitality were introduced into the plan by communist ideology, which made strategic planning consistent with the ideological principles of the majority of workers. Willingness to start building a society of universal justice at an accelerated pace, support and personal labor participation of the population in the

implementation of planned activities gave the plan a social orientation. The plan was carried out in the specific conditions of the formation of a centralized economy, in the extreme situation of the post-war period and social transformation, which allows us to consider it as the largest project to restore the national economy. The implementation of the strategic indicators laid down by the GOELRO plan became possible only with a combination of organizational, economic, scientific, ideological factors.

The basic role of the state laid the foundation for the creation of an electric power complex that would satisfy the demands of the national economy under the conditions of Soviet modernization. For all the main indicators of the power and productivity of the plan, a significant overfulfillment was noted, contributing to the development of the economy of the Soviet country. The total length of power lines by the end of the 1930s exceeded 3 thousand km. By the year 1935, Soviet electric power industry reached the third place in the world after the USA and Germany [12]. Electrification was the basis of industrial development, providing an impetus to the functioning of the cable industry, power engineering and metallurgy, closely related to a key industry. In general, the GOELRO plan became the basis for the implementation of Soviet industrialization. Electrification of the national economy in conjunction with mechanization in specific conditions for the implementation of the studied strategy allowed to increase labor productivity in all sectors of the economy by 4 times [6]. The basis for the development of the Soviet national economy was the rapid growth of the electric power industry, which contributed to raising the living standards of the population. Electrification to some extent contributed to the improvement of social relations in the labor sphere. The quality side of increasing labor productivity was a certain reduction in the share of manual labor; the foundation was laid for the liberation of man from low-skilled work. There was a transformation in the content of labor, which was supplemented by an intellectual component, overcoming the differences between mental and physical activity [13]. Thus, on the basis of the GOELRO plan, a synergy effect was achieved in the scale of the national economy. The strategic planning of the country's technical and economic development in the framework of the GOELRO plan set, on the one hand, the right benchmark for the development of the national planned economy for many years to come, and on the other hand, it did not exclude distortions and shortcomings in its implementation. The rejection of market mechanisms, the super-centralization of the national economy, subjectivity and voluntarism in strategic decision-making seriously distorted the emerging economic system and did not leave it any chance to sufficiently implement its plans. The fulfillment of the targets clearly indicated the priority of the development of heavy industry over agriculture. The extent of electrification of agriculture was negligible. Thus, the number of peasant households using electricity in 1936 amounted to 530 thousand, i.e. only 2.1% of the total. Only 3% of collective farms (7600) were electrified [12].

4 Discussion

The discussion about the GOELRO plan and the possibilities for implementing its tasks arose from the first days of the Commission's existence. The subject of the dispute was the issue of priority industries, the development of which the party and the government

should have given high priority to. Members of the Commission, headed by Krzhizhanovsky, supported by the head of government Lenin (1870–1924), believed that the restoration of the country is possible on the basis of the widespread development of energy. “GOELRO is the second program of the communist party,” Lenin announced at the VIII All-Russian Congress of Soviets [7]. The main opponents were the second persons of the state - Chairman of the Supreme Economic Council Rykov (1881–1938) and Chairman of the Revolutionary Military Soviet of the RSFSR Trotsky (1879–1940), who were convinced of the need to develop heavy industry as the basis of the country’s industrialization. This dispute, as a result, after the death of Lenin, led to the internal party struggle and the coming to power of Stalin (1879–1953) [11]. In the following decades, criticism of the GOELRO plan no longer sounded, but its scientific discussion came to naught. By the anniversary dates of the GOELRO plan, small articles were published telling about the successes of energy in the USSR, and that was all. Since the early 1990s. In connection with the ideological and socio-economic changes in the country, interest in the GOELRO topic reappeared, and interest was comprehensive. Not only historians did discuss the events of the early 1920s, but also economists, engineers, politicians. The opinions expressed regarding the GOELRO plan vary widely. Some authors consider it an actual experience of Soviet industrialization [6], others insist on the demythologization of the GOELRO plan, proposing to exclude all elements of silence, one-sidedness, tendentiousness, and sometimes direct falsification [3]. The background of the GOELRO, the pre-revolutionary development of the electric power industry in the Russian Empire was studied in detail, the questions of the significance and results of the economic development of the USSR on the basis of the plan of 1921 are highlighted [9, 12].

In Western historical literature, critical points of view prevail in assessing the processes that took place in the Soviet Union in the 1920s and 1930s, including the activities of the GOELRO Commission. The majority of authors argue that the economic transformation in the USSR is a tremendous failure of the Stalinist government, which resulted in the wasting of “the material well-being of the nation” [4, 8]. Some Western scholars, such as Gregory, believe that the 1917 Bolshevik coup violated the logic of the slow, steady growth of Russia’s economic growth rates. “A statistical portrait of the economy [of that time - approx. auth.] is a portrait of a market economy taking the first steps in the direction of modern economic growth” [2, p. 53]. Allen disagreed with them, and noted the positive outcome of the communist revolution and the Soviet five-year plans, without which “Russia to this day would remain a backward state.” “The economic institutions created by Stalin worked for the good of the country. They represented a better way to use the levers of government to stimulate economic growth, which otherwise would invariably be in a stagnation stage” [1, p. 31].

5 Conclusion

Based on the methodological concept of the “big waves” by Pérez, the consequences of the implementation of the innovative planning strategy of the GOELRO have been analyzed, and those consequences entailed a technological breakthrough in the national economy [10]. The studied innovative program turned out to be socially and

ideologically in demand in the context of the political and economic crisis that the country experienced after the military revolutionary events. The GOELRO plan drawn up by the Commission contained a comprehensive strategy for the technical and economic development of the national economy, which was based on the principle of electrification of the country. Electrification has become the economic and ideological foundation of social transformation, introducing new opportunities into the life of the country, improving the quality of life and transforming the content line of labor. Despite a number of shortcomings in the implementation of the plan, its historical significance lies in the fact that it determined the strategic development vector of Soviet society for many years to come. The effectiveness of the implementation of the strategy on a national scale is explained by a combination of political, ideological, technical, economic, social, scientific, resource factors for an optimally effective technological breakthrough based on the achievements of scientific and technological progress.

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Investment Attractiveness of Companies: Formation and Assessment

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Abstract. Based on the research of economic interests between the subjects of investment relations and analysis of dynamically transforming business environment, the authors of the article considered the process of formation and assessment of investment attractiveness of companies. The key indicators affecting the investment attractiveness were analyzed. The authors suppose that investment attractiveness is an integral characteristic reflecting its competitive advantages and acts as the key indicator for raising investments. The emphasis is made on formation of requirements to the complex approach of assessment of investment attractiveness. It is justified that a system of indicators including enterprise value, value of intangible assets and value of intellectual property rights enables to get a trustworthy reasonable evaluation of investment attractiveness of a company.

Keywords: Enterprise value · Intangible assets · Intellectual property · Investment attractiveness

1 Introduction

The definition of “investment attractiveness” is continuously refined in the Russian and foreign practice along with the development of production processes, changes in business environment and changes in goals of economic agents. The concept of investment attractiveness is commonly linked to quantitative and qualitative investment characteristics of the investment object, including the score ranking. Investment attractiveness is a general indicator reflecting the advantages and risks associated with investments into investment objects including companies from a certain investor’s perspective (be it government, regional or municipal authority, financial institutions, corporations, and individuals).

The analysis of different versions of investment attractiveness definition enables to state that the modern nonfiction definitions revealing its different sides for a potential investor take into consideration, on the one hand, too broad list of factors diluting the basic definition and keeping out the specific features of investment attractiveness; on the other hand, a limited set of indicators and factors does not take value-based features into consideration.

Some authors consider investment attractiveness as a set of different metrics measuring the property complex usage efficiency in the organization, its solvency, financial stability, equity and dividend growth prospects [4]. Impact of project parameters onto its value is analyzed using the definition of NPV coherence, linking the sensitivity analysis, project profitability and main project investment attractiveness indicators [7, 8]. Timing options which presume the availability of a choice of the best possible time momentum to invest [2] and real options [1] are used.

Application of non-stochastic models are recommended for situations with high uncertainty of the investment environment when there is no ground to assume the investment environment complies with stochastic rules [5]. Notwithstanding the fact that general methodological approaches to scenario modelling were created long before, the exact frontiers and methods are still not outlined, and the researchers applying the approaches to scenario modelling primarily focus on the specifics of tasks under consideration [3, 9].

Agreeing with the fact that multiple indicators rather than one shall be utilized, the interrelation of suggested metrics, the value-based indicators and the economic interest satisfaction degree of different investor cohorts shall be taken into consideration which enables to avoid unreasonably narrowed interpretation of “investment attractiveness” definition; at the same time it prevents the diluted version to be. As a result, the authors defined investment attractiveness in this paper as the ability of a company and investment objects to satisfy the economic interests of the investment relations subjects.

2 Methodology

The approach to assessing investment attractiveness should take into account the system of economic interests of the subjects of investment relations, therefore, in modern economic conditions, along with the desire to obtain high profits, increase profitability, investors are increasingly paying attention to the prospects for the development of investment objects, their future competitiveness. The interest of investors in the successful development of the investment object, along with value interests, allows to highlight the interests associated with the intellectual-related development.

The prevalence of a particular group of interests depends on the “status” of the investor. Corporate investors are primarily attracted by the growth of cash economic and shareholder value added (CEVA, SVA), which determines the competitive advantages of the investment object, market share and prospects for its preservation and expansion. However, it is not that simple, in the new reality an effective mechanism for solving social and environmental problems is required to form a potential image of a company. Thus, value indicators, reflecting the main economic interests of all categories of investors, their investment goals, are included in the system of indicators of investment attractiveness of companies for all potential investors. The market value of the business is becoming the main indicator of the investment attractiveness of a company.

Diversification of investment interests and goals leads to the modification of metrics of investment attractiveness of companies due to the inclusion in their system

of value, economic, social indicators, indicators that reflect the level of development of technology, intellectual capital, rational value structure of assets, including intangible assets. Moreover, these metrics may vary depending on investor rank (*or investor status*).

3 Results

The process of forming the criteria for assessing the investment attractiveness of a company is based on the assumption that the company is attractive to investors, must satisfy their economic interests, which are expressed through a system of investment goals, which ultimately allows to create a set of indicators of investment attractiveness. Investment goals, in turn, change under the influence of the business environment, the changing macroeconomic situation, and even, as the events of 2020 have shown, the environmental and epidemiological situation.

The diversity and variability of investment goals require a periodic reassessment of the implemented approaches to evaluating investment attractiveness, necessitate the formation of such an approach and assessment tools, which, on the one hand, characterize permanent investment interests, and on the other, allow expansion by including relevant indicators reflecting the current change in conditions and re-emerging values. The best approach may be to assess investment attractiveness, combining three main components: growth in business value, and, consequently, an integrated indicator of value; intangible assets (and their value); objects of intellectual property and the results of intellectual activity (corresponding to the modern scientific and technological stage of development of society), as well as the possibility of their monetization (commercialization), and the social significance of the business and its effectiveness.

Assessment of the investment attractiveness of a company should include an analysis of the efficiency of using the property complex, financial stability, the ability to improve the technology of production processes and increase the competitiveness of products, as well as taking into account the risk of investments, that is, the whole range of metrics taken into account in the concept of “value” and its derivatives indicators. The analysis of approaches to determining the essence of the concept of “investment attractiveness” showed that the assessment of factors of the external and internal business environment is taken into account in each of the approaches under consideration. Within the framework of these approaches, the main groups of factors affecting the investment attractiveness of a company include: the financial position of the company, its production potential, the level and quality of company management, as well as its market stability.

The factors that determine the investment attractiveness of a company should also include the “flexibility” of the business, its creativity and ability to adapt to the environment. The latter is linked to:

- the presence in the company’s assets of objects of intellectual property and the results of intellectual activity subject to commercialization,
- the positive profitability dynamics,

- the preservation of financial independence and the availability of reserves for increasing borrowings without affecting the level of solvency,
- the effective risk management system,
- the progressive profit distribution policy,
- information transparency of the business,
- compliance with modern technological development stage and potential opportunities to ensure competitive advantages.

A comprehensive assessment of the investment attractiveness of a company is based on determining the market or investment value of the business, which allows evaluating the productivity and prospects of its current and future activities, on a comparative assessment of the value of the business before and after investment investments. The value of the business reflects the value of its current and future cash flows, the composition and structure of the entire set of assets, both creating and destroying the value of the company. Cash flows are discounted at a rate that reflects the risks of the investment and is an indicator of the effectiveness of the investment. Therefore, value shall be an indicator that most reasonably reflects the investment attractiveness of a company.

Factors affecting the investment attractiveness of a company are divided into external and internal. These groups of factors form the company's income, expenses and cash flow. Internal factors include the company's strategy in marketing, manufacturing and finance, while external factors include macroeconomic and industry factors, as well as customer relations. Internal factors are determined by the activities of the company, the chosen management system, the range of products, the degree of use of innovative solutions and technologies, external factors are associated with the industry specifics, the potential of the region and market in which the company operates, the level of compliance of the legislation with the needs of economic development.

The choice of investor is influenced by the openness of the company, the completeness and reliability of the information provided on activities in external sources. High investment attractiveness is usually attributed to the company which can provide the investor with any information about property, financial results, cash flows at any moment of time. The analysis of methods for assessing the investment attractiveness of companies showed that various valuation methods are currently being applied, which can be divided into two groups. The first group of methods includes methods that allow to integrally assess the financial position of the company, and the second group includes methods that take into account external and internal factors. The main methods for assessing investment attractiveness are shown in Table 1.

There are interrelations between these methods, expressed in general quantitative and qualitative indicators, although each method has its own specifics. And their combination shall be used in order to get the see the full picture. Let us consider in more detail the main stages of assessing the investment attractiveness of a company. Assessment of the investment attractiveness of a company in modern practice is preceded by an analysis of the financial position by the current liquidity ratios, equity and debt ratios, debt/equity ratio, asset coverage ratio, return on sales and return on equity.

Table 1. Main methods for assessing the investment attractiveness of a company

Method	Description
Discounted cash flow method	Assessment of investment attractiveness is based on an analysis of the correlation of future cash flows and the price at which the object can be purchased
Seven factor return model	Allows to assess the factors that affect the return on assets
Financial and economic assessment of investment attractiveness	The internal performance indicators of the company, which can be divided into five blocks, are applied
Assessment of investment attractiveness based on external and internal factors. Factor assessment	External and internal factors are distinguished based on the Delphi method. A model of the influence of these factors on investment attractiveness is developed

Source: authors.

At the next stage, an assessment is made of the company's market position. The investment climate of the region, the investment attractiveness of the industry are analyzed, the attractiveness of the geographical market for the sale of products is determined, the stages of the product life cycle and its competitiveness are taken into account. Afterwards, the absolute results of operations are determined, which include indicators such as: revenue, net profit, dividend payout. The resulting indicator of investment attractiveness is an indicator that takes into account weighting, analysis of financial position, market position and absolute results of operations.

Deeper study of the investment attractiveness of the company implies application of factor models, the use of which allows to maximize the value of net cash flow using various methods. The peculiarity of such models is that when conducting factor analysis, it is necessary to have information about the specifics of production, the payback and riskiness of each investment option. Factor analysis allows to understand how large-scale investments in fixed assets affect the cash flow. Thus, as a result of the analysis of the above methods for assessing the investment attractiveness of companies, the following conclusions can be drawn:

- investment attractiveness is a characteristic that reflects the prospects for the further development of a company, the possibility of increasing revenues and increasing enterprise value,
- investment attractiveness is a comprehensive indicator that depends on many factors affecting the optimal investment conditions for financial and other resources to obtain an effect,
- formation of investment attractiveness, development of an investment strategy with the identification of priority areas, a comprehensive justification of the investment sources mobilization, taking all the factors into consideration are all an important condition for the development of the company and attracting potential investors to the region,

- to assess investment attractiveness, discounted cash flow methods, a seven factor return model, a financial and economic model for assessing investment attractiveness, and assessing investment attractiveness based on external and internal factors are used.

4 Discussion

The complication of the system of indicators of investment attractiveness of companies necessitates the improvement of approaches and methods for assessing investment attractiveness, allowing to take into account the ramified value system of modern investors. A comprehensive approach that integrates all investment interests can become a conceptual basis for a modern assessment of investment attractiveness of companies, which is methodologically and logically connected with the concept of integrated valuation of investment projects [10].

The investment attractiveness of a company is assessed through a quantitative measurement of indicators reflecting the degree of satisfaction of the economic interests of the subjects of investment relations, and the assessment of economic interests should be comprehensive, taking into account the entire set of priorities of modern investors.

Market value is a leading indicator of investment attractiveness, since its main factors are a mirror reflection of the results and prospects of the company. Market value of a company (V_m) is determined as follows:

$$V_m = a \left[\sum_{n=1}^k \text{PVCF}_n + \text{PVTV} \right] + b[M \times \text{base indicator}] + c[A^* - L^*],$$

where:

PVCF_n – present value of the forecast n-period cash flow;

PVTV – present value of terminal value;

M – market multiple;

A* – assets of the company, recalculated at the market value as of the valuation date;

L* – liabilities of the company, recalculated at the market value as of the valuation date; a, b, c – weighting coefficients, the sum of which is equal to 1 (or 100%).

It is the basic formula. For practical implementation, its modification is possible. But to justify an integrated approach to assessment, it is sufficiently illustrated, clearly reflecting the main relationships. In order to determine the market value of a business, the indicators comprehensively characterizing the company's activities, are used (Table 2).

Thus, value and metrics derived from it are synthetic (complex) indicators that take into account most of the factors characterizing investment attractiveness, including the value of intangible assets and intellectual property (as seen in clause 9 of Table 2). Determination of value (or indicators based on it) in combination with indicators characterizing the level of social responsibility of the business, the degree of its impact on the social and environmental climate of public education are the essence of an

Table 2. The relationship of value indicators and investment characteristics of a company

#	Indicator	Investment characteristic
1	CF – cash flow EBIT – earnings before interest, tax CE – capital expenditures Δ WC – changes in working capital AT – actual tax I – interest on loans DP – debt paid DI – new debt raised NT – hypothetical taxes	The result of operating, investment activities of the company; another level of tax optimization
2	Rf – risk-free rate of return	The level of risk of investing in government debt
3	Rm – market rate of return	The risk level of investing in a particular financial market
4	B – coefficient of volatility of a certain company's stock (beta coefficient)	Risk level of investing in a specific company in comparison with the average market risk
5	R – discount rate	Synthetic risk indicator of investing in a particular company
6	g – constant growth rate	Reflects in a first approximation business prospects in the post-forecast period, which goes to infinity
7	TV – terminal value	The expected value of the value that the business will generate in the future, in the post-forecast period
8	M – market multiple	Reflects how the market evaluates a certain indicator of the company
9	A*; L* – assets, liabilities	Assets and liabilities revalued at market
10	S1–S5 – company-specific risk as of a certain date	Risk associated with the quality of company management, with the diversification of its activities, with the size of the business, with the level of capitalization, the ability to forecast, etc.
11	κ – forecast period (number of years, quarters, months) n – serial number of a certain forecast period (year, quarter, month)	The duration of the expected successful operation of the business in the foreseeable future

Source: authors.

integrated approach to assessing the investment attractiveness of a company. The second most important group of indicators of investment attractiveness of the company, not so long ago included in the system of investment goals, is the group of intangible assets, intellectual property, and the results of intellectual activities. The influence of this group of indicators on the system of investment attractiveness metrics continues to grow. At the present stage of economic development, intangible assets are becoming

increasingly important and are currently one of the factors of competitiveness of an economic subject. Intangible assets are also one of the factors of the company's added value. An analysis of Russian companies, whose stocks are listed on the stock exchange, revealed that enterprises are underestimated due to the fact that company managers face certain difficulties in managing intangible assets [6].

5 Conclusion

Diversification of investment interests and goals leads to a change in the generally accepted system of indicators of investment attractiveness, and therefore, a change in the investment characteristics of investment objects that are of interest to investors. This leads to a modification of the metrics of investment attractiveness of companies due to the inclusion in their system (system of indicators of investment attractiveness) of value-based, environmental, social indicators, indicators reflecting the level of technology development, intellectual capital of the rational value structure of assets, including intangible assets. Moreover, these metrics may vary depending on the investor rank (or investor status) and the specifics of the business environment. Whereas, a number of indicators remain unchanged, for example, market value. The complication of the system of indicators of investment attractiveness of companies necessitates the improvement of approaches and methods for assessing investment attractiveness, allowing to take into account the ramified value system of modern investors.

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Big Data as an Instrument of Socio-economic Development in the Modern World

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Abstract. The article considers Big Data as an effective instrument for socio-economic development. The role of this technology in the modern world is rapidly increasing. The phenomenon of Social Data is specially noted. It has noncommercial character, but it can be used for commercial purposes. Studying of Social Data allows creating complex models of relations, recognizing the target groups for advertising companies. Big Data is qualified as an engine of progress in marketing and sales. Basic methods for predicting consumer behavior with a help of Big Data technology are pointed. There are forecasting, segmentation, association and neural networks among them. It's concluded that the volume of data processing is constantly growing today, as well as the speed of this process. Development of Big Data technology is relevant to the modern world, rapid and innovative.

Keywords: Big data · Consumer behavior · Marketing · Sales · Social data · Targeting

1 Introduction

The recent years in the modern world's development were full of fundamental scientific and technical innovations. They have provided humanity with a set of new opportunities for collecting, storing and analyzing digital data. The amount of data and its sources is increasing exponentially in the modern world. Every action on the Internet can be documented, processed and connected to a great number of other actions and data. As a result, new information is accumulating rapidly; its volume is growing increasingly. This makes possible using of information resources in various areas and for different purposes. So, the question of data processing technology is very actual today. This applies primarily to such an innovative technology as Big Data preferred by many modern users.

Big Data is an effective instrument for processing large amounts of information and making individual decisions based on it. It's very useful for modern people. Large amounts of data are processed in such a way that everyone can get specific and desired results for their further effective using. The concept of «Big Data» implies the sets of data that are voluminous, complex, poorly structured and fast-changing [5]. So, they can't be processed in a traditional way. They are usually more than 100 TB of data per

day [1]. «Big Data» illustrates complex of technologies functioning on the basis of data processing and digital communications. Perhaps these technologies will cause the main changes of the global world and the society in future.

2 Methodology

The main methods for analyzing large amounts of information are the same:

- crowdsourcing. This technology is based on the ability to receive and process the streams of billions of bytes from various sources. The finite number of its creators and providers is unlimited. The only thing limiting it is the power of the system,
- data classification and deep analysis. These two methods have been borrowed from the field of small amounts of data and ordinary structured information processing. But their using in new conditions have changed them significantly. Now they include a number of improved mathematical algorithms based on advances in the digital sphere development,
- forecasting. This method permits to set certain parameters for the system. Then it'll be possible to check the object's behavior basing on the large amounts of information coming in,
- split-testing. The use of this method involves the selection of several elements from a certain array. Then they are compared with each other alternately – «before» and «after» changes. So, the testing procedure helps to identify the factors having the defining influence on the elements. For example, using of split-testing makes possible a huge number of iterations and helps to get closer to a reliable result,
- analysis of network activity. Big data technologies can be used to study social networks, relations between account owners, groups, and communities. This procedure is used to create target audiences based on interests, geolocation, age, and other metrics,
- machine learning. In the nearest future artificial intelligence will be able to receive and process large volumes of unsystematic data. Then they'll be used for autonomous machine learning.

3 Results

3.1 Place and Role of Big Data in the Modern World

Big Data is «one of leading emerging technologies that will have a major contribution and impact on the various fields of science and varies aspect of the human society over the coming decades» [11]. Today the large amounts of data are already being generated in all spheres of human activity. We operate them everywhere. Spam filters in our e-mails adapt automatically to various virus threats and unwanted letters. Car traffic is successfully forecasted for hours ahead by a special satellite tracking. Analysis of facts and data that have no connections at the first sight, demonstrate us surprising correlations in various spheres of life and activity.

Systems constructed on the basis of machine learning can work effectively with large amounts of data, help to make correct forecasts. Moreover, they are able to self-improvement and self-learning while the new data becomes available and the new useful signals and patterns are receiving. Using the constantly updated information, we can get the most complete results. This allows finding out the nuances invisible in the case of a small amount of data. Big Data provides a clear vision of the details, segments and subcategories, that can't be evaluated with a help of sampling method.

Today it's impossible to imagine the modern world without Big Data technologies. They are useful in all areas of human activity – from medicine and public order to marketing and sales. The data is constantly produced and collected by public organizations and private companies. Then it's processed with a help of digital technologies. Such information is daily updated and expanded. It includes various facts from the field of communication systems, measurement and control devices, economic sectors, insurance and banking, planning and diagnostics, statistical reports, medical care, scientific researches and education, publication activity in news feeds and social networks, etc.

3.2 Social Data as an Important Part of Big Data

One of the most important components of Big Data is Social Data. «Social Data is a part of Big data, created by people for non-commercial purposes, including are various social networks, photo banks, blogs, chats, etc.» [1]. Millions of users visit popular Web sites and platforms every day and leave different «traces» behind them [2]. They write comments, publish reviews, and share opinions. Such information and other private data are available for analysis and searching for correlations. It's a unique resource that can be compared with an «oil» of the XXI century. It's also called a real «Social Data revolution» [10], based on an increasing impact of the Internet on human lives and activities.

The «Social Data revolution» is a popular trend of nowadays changing the way of human being and interactions [3]. It's especially noticeable in the last decade. It's manifesting in the form of exchanging of personal information and its various consequences. The base of these tendencies is a mass spread of social networks and their increasing influence on various spheres of social life. An unprecedented accumulation of published private data is a phenomenon of nowadays. It's a unique source of information that is constantly updating. It can be effectively used in social sciences and digital humanities for studying human behavior – individual or collective, on the level of social groups or the society as a whole.

Social Data analysis and processing can help to predict public attitudes and political opinions, disease outbreaks and fashion trends, the rise and fall of unemployment, etc. The best examples of Social Data successful application are Twitter and Facebook – the most popular social networks. Facebook is focused not only on the users' posts, but on their interactions with real and potential friends. This makes possible to collect different kinds of data from the users: comments, tags, photos, etc. Such data is very useful. It can be used for commercial purposes, for example, to create complex models of relations. This allows recognizing and studying the target groups for advertising companies.

3.3 Big Data as an Engine of Progress in Marketing and Sales

In marketing Big Data instruments allow to identify the most effective ideas at a certain stage of the sales cycle. Data analysis is used to improve the relations between investments and customer management system, to choose an effective strategy of increasing the conversion rate and optimizing the customer's lifecycle. In business related to cloud technologies, Big Data algorithms are used to minimize the cost of customer's attracting and to increase his lifecycle.

The main reason of Big Data using in marketing is a need of pricing strategies differentiation. The last one depends on the client's individual habits and his internal system level. McKinsey Global Institute has found that about 75% of the average firm's revenue comes from basic products, but 30% of them are priced incorrectly. Price increase by 1% leads to 8.7% increase in operating profit [8]. The Forrester research group has found that data analysis allows marketers to make client relations more successful. Researches in the field of customers' development, help specialists to assess the level of their loyalty, as well as to extend their lifecycles in the context of a certain company [9].

Data analysis helps modern companies to get a complete image of key aspects of their business. Increasing revenues, reducing costs and working capital are the three main tasks modern business tries to solve with a help of analytical instruments.

3.4 Methods for Predicting Consumer Behavior Using Big Data

To study and predict customer behavior the following methods are usually used:

- forecasting (classification, regression analysis, etc.) – to predict a specific indicator, for example, the product that the customer will choose,
- segmentation (clustering) – to divide people into groups with similar behavior. In future, you should work with each group separately, basing on the similar needs and interests of its customers. For example, if you select a group with a high purchase price, you can offer them the most expensive products,
- association rules – to find typical patterns of customer behavior, that allow to make recommendations on products/product groups. For example, a customer chooses a remote control, and the system offers him the batteries automatically. This method is often used for online stores,
- neural networks – learning algorithms that allow to segment clients and predict their behavior.

Using these methods provides new data improving the models in all areas. From a marketing point of view, new information about products and their using will allow to make a new model of customer interactions. Particularly, the future offers will be totally personalized. Analysis of new data will give new knowledge useful for advertising companies and platforms. This will help to predict the client's behavior and to offer him what he really needs or what he hasn't even time to think about.

Of course, such an active interaction of devices is a matter of the nearest future. But the mechanism is already applied in its simplified form, for example, by sending push-notifications motivating a person to visit a certain location. This can be either a simple notification or a specific personal offer based on the customer's behavior and the goals of the partners.

4 Discussion

Using Big Data technologies causes a number of problems that have been already discussed in the research literature. For example, many authors note «the inevitability of a continuously growing role of data in our society» [6, p. 6], describe «a data-driven society where data has become one of the most valuable assets» [11, p. 5]. So, it's very difficult for modern users and even specialists to process the growing amount of information. Traditional approach to this problem connected with an attempt of structuring databases is ineffective in relation to the great information resources. The only technology that can really help us in such a problematic situation is Big Data. It can process the poorly structured data, the specific information stored in different formats and periodically updated.

The question of the unstructured data quality is also very actual today. It's related to the large amount of falsified content located on the Internet. For example, there are special agents and artificial intelligence programs for writing reviews of both positive and negative content. The fact is that Big Data technology processes the large volumes of information every day [4]. So, the requirements for its exactness must be reduced. When an ability of measurement is limited, we are taking into account the most important indicators only according to the logical desire to get an exact number. It's well-known that the careful verification of information is impossible without require of exactness. If we are talking about small amounts of information and the similar cases, this procedure looks quite important. But if we mean technology of Big Data, exactness seems impossible and even unnecessary, especially in its absolute form.

If you are operating with a constantly changing data, strict exactness takes a back seat. Big Data is totally disordered; it includes a great number of resources of different quality and nature; and the countless servers are located all over the world [3]. At the Big Data level, we usually form a general view on the subject; its thorough study including all nuances and details isn't required. If we lose part of information because of its inexactness at the micro level, it allows us to make discoveries at the macro level. We are losing exactness, but we can find sudden correlations between data of different nature. And this provides an increase in knowledge, opens up a number of new prospects and opportunities.

Many authors pay attention to the following circumstance: it isn't right to collect as much data as it's possible when you are working with Big Data [7]. Data collection for the sake of data itself, as well as several specialists' enthusiasm for new technologies for the sake of these technologies, isn't productive. We must take into account the specifics of actual practice.

5 Conclusion

Today, people are surrounded by a great number of different devices – mobile phones, tablets, household appliances, machines, etc. These devices become more powerful every year, and provide people with more opportunities. And this is a question of the nearest future, when the devices will probably get smarter. So, they'll start interacting with each other. This conception is called the «Internet of things» – a wide network connecting all possible objects. Taking into account a huge volume of devices producing information, the amount of data will generate enormously. This causes the question about principles and methods of their processing. The main technology that allows working with such an amount of data involves parallel processing of information from hundreds and thousands of devices.

One of the most famous and widely known applications of Big Data instruments is processing of users' requests and targeting. Big Data helps us to analyze customers' habits in order to understand their potential consumer requests in future. Modern companies use not only the traditional data sets and information resources. The last ones are expanded by information from social networks (Social Data). Studying browser search history is also very effective: it helps to form the most complete client base and to get full information about its members. If the leader of the company wants to move with the times and to develop successfully he should create his own predictive model with a help of Big Data technology. Unfortunately, only big companies are ready to do it nowadays. In general, the volume of data processed by Big Data technology is constantly growing, as well as the speed of processing. This direction development is quite consonant with the modern world, its rapidness and innovations.

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Research of Small Business' Problem Areas

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Abstract. This article provides statistics of small business' share in the Russian economy and its role in the development of the country's innovative potential. The author concluded the presence of barriers that prevent the normal functioning of small business in the country, as well as in the Samara region. The main factors that slow down the development and effective functioning of small business and all entrepreneurship in Russia are highlighted. Within the framework of this topic, an analysis of the small business structure in the Samara region and a survey of individuals associated with small business were conducted. Based on this analysis, the author identifies a list of problems that stop the optimal functioning of small business. In addition, a significant result of this scientific work is the systematization of the control crisis and entrepreneurship support.

Keywords: Administrative barriers · Business development · Capacity · Entrepreneurship · Financing · Small enterprises

1 Introduction

The purpose of this article is to identify problem areas of small business as the main factor of sustainable development of the Russian economy. Statistics shows that in 2018, the share of small business in Russian GDP (Gross Domestic Product) was 20% [8]. The number of enterprises in this period was 2659943. Enterprises engaged in wholesale and retail trade, construction and processing occupy the largest share in the classification of small business by activity fields. The smallest number of small business is engaged in mining, sports and culture, education, leisure and entertainment. The state's interest in the development of small business is due to the influence of such business segment on the level of innovative development, the social and economic climate in the country and regions.

But in the modern economy, the development of small business is associated with a number of problems that slow down its functioning. Despite the fact that the percentage of small business in GDP is 20%, the dynamics of this share is negative. In 2017, this indicator was 21.9%. In other words, the number of small enterprises is decreasing. According to the data of the Unified register of small and medium-sized business in

2017, the number of small enterprises was 267598, in 2018—265719 small enterprises, and in 2019—249097 enterprises [2]. Also of interest is information about opened and closed enterprises: in 2018, more than 290 thousand enterprises were opened in Russia, and more than 600 thousand companies had dissolved their activities.

These statistics confirm the existence of barriers that prevent the normal functioning of small business. The problems are caused by the reduction of the subjects of this business segment, the development of corruption and an increase in the number of enterprises in the shadow economy. Any of these consequences negatively affect the economic situation in Russia, so the state goal is to understand the problems of small business and take correct actions to solve them.

2 Methodology

In order to define which of the main problems of small business most acutely affect the activities of Samara enterprises, the authors of this article conducted an appropriate interview and questionnaire. Individuals directly or indirectly associated with a small business were asked to answer a question about whether or not a small business has problems and to place the problems in descending order of importance. The survey results with a list of many problems were analyzed, divided into 4 subgroups and shown in the diagram (Fig. 1).

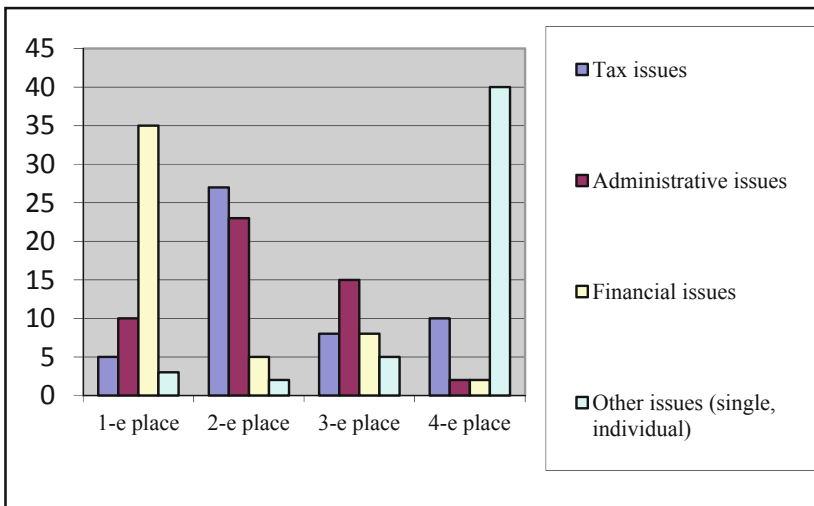


Fig. 1. Problems of small business in the Samara region (Source: authors).

100% of the surveyed entrepreneurs answered in the affirmative to the question on whether the entrepreneur has problems in business running. The most relevant group of problems, according to respondents, was the financial side of creating and running a business, which consists of difficulties in obtaining credit funds. The tax problem was

the second most important issue. And third place went to administrative barriers related to the abundance of regulatory authorities and the impact of frequent inspections on the company's activities.

3 Results

The biggest problems of small business development are administrative barriers, tax barriers, and problems related to business financing. The administrative problem for a small enterprise is primarily the presence of a large number of controlling bodies and the functions duplication. Currently, the company's inspections are carried out by dozens of organizations: tax authorities, the Federal Bailiff Service, the Pension Fund, the Social Insurance Fund, the state fire guard, the Prosecutor's office, and the State Labor Inspectorate. In addition, if the company conducts activities that are to be licensing, inspections can be carried out by Rosspotrebnadzor, Roszdravnadzor, Rostekhnadzor, etc.

The inspections are stressful for the firm. It is necessary to collect a large number of necessary documents and make reports. This process is also complicated by the fact that there are many controlling bodies and their functions are often duplicated. Each authority operates according to its own system, according to its own standardized documents, separately from other systems [6]. There are numerous inspections that require the same documents and data. All this creates a fuss around the enterprise and disorganizes its work, disrupts the efficiency of the company. The lack of coherence in the system of inspections often leads to the development of corruption activities.

In the current conditions, the system of administrative control requires improvement. The unity is necessary. We need to strengthen the mechanism of interaction between controlling organizations, make the report of each of them public and accessible to other bodies.

But it is worth noticing that in the case of inspections of small enterprises, the situation is a little simpler. Tax inspections are not conducted earlier than three years after the opening of the enterprise. Also, to ease the pressure on small enterprises, the state conducts so-called "Supervisory holidays". This means a moratorium on inspections by control and audit bodies of small business until a certain period (currently-until the end of 2020). The moratorium does not apply on companies engaged in activities in the field of education and medical services, energy supply and electricity, management companies that cater for the housing and communal sector, organizations of the hotel business, audit firms and organizations in the field of social services. In addition, if the activity of an enterprise raises suspicion of the possibility of offenses commission, the Supervisory authorities can conduct inspections of this enterprise.

The enterprise may also have difficulties paying taxes. In order to understand exactly what they are, you need to get an idea of the existing tax systems for small business. The information can be obtained in the Tax code of the Russian Federation. Very detailed, but not a simple material for a young entrepreneur. And tax legislation data should be more available. Every entrepreneur has to know his/her rights and to fully understand his/her responsibilities. Nuances in special tax environment should be

obvious facts, and not pitfalls. It is necessary to fix the tax authorities duty, systematically explain the norms of tax legislation to taxpayers, to inform them in a timely manner about changes in the tax system and to support organizations involved in consulting entrepreneurs in this area. Regulatory and legal acts related to taxation issues should be presented in an open and, most importantly, understandable form for everyone. If we talk about taxes, in 2020, several legislative acts that make the tax burden of business more difficult were adopted.

In addition to the difficulties associated with overcoming administrative and tax barriers, small business are characterized by the financing problem. And how small business suffers during difficult periods for the country: default, devaluation, and inflation. The enterprise constantly needs money to expand the enterprise, improve production, and sometimes just for the existence of the organization. In this regard, a small enterprise has certain barriers that prevent it from financial resources receiving.

There are several ways to finance an enterprise. There are the internal and external sources of financing. Internal expenses include depreciation and net profit. These include sales of shares, credit loans, loans from other firms, and financing from the budget. And here again, the difficulties associated with the specifics of organizing and running a small business. According to the small enterprise criteria, an enterprise cannot sell more than a certain percentage of shares.

Difficulties arise with credit funds obtaining. In order to get a loan, it is important to know which area the company belongs to. It will be easier for enterprises focused on agriculture, production of machinery and equipment, and projects of social significance to get a loan, since the loan repayment guarantee is already available—the company's activities are relevant, there will be demand, profit, and, accordingly, funds for loan repayment. If the enterprise belongs to an oversaturated area that does not require development, it will be more difficult to get a loan, since its activities are not so relevant and the probability of success is lower. This applies firstly to cafes, travel agencies, and small retail businesses.

The actual field of activity is not the only condition for granting a loan to a company. There are other requirements. First, the existence of financial assurance. This section is a guarantee of loan repayment. This is also beneficial to the borrower, since the loan term increases, and the interest rate decreases, and other requirements for the loan debtor are eased. There are two types of assurance—a guarantee and a pledge. Secondly, the borrower must have a clean credit reputation and no tax debts. After receiving the application, the bank carefully examines the borrower's credit history and its activities as a taxpayer. Third, having a business plan is the advantage. A professionally prepared business plan clearly defines the planned income and expenses, which means that the bank will be confident in the borrower's credit worthiness. Non-compliance with these requirements may lead to the bank's refusal to a loan granting. Speaking of the small business problems in general in the country, we need to analyze this issue in the regions. The Samara region is taken as an example. The development of small business is one of the main goals of the Samara region. The relevance of this issue is due to the impact of small business on the economic potential of the Samara region, the socio-economic situation, and the profitability of the region's budget.

In 2019, 136233 business entities have been registered in the Samara region, 5696 of which are small business entities. Small businesses in our region have certain

specifics. Most enterprises are engaged in trade. There are also a large number of companies that provide various services to the population. Production and construction sectors are well developed. Fewer enterprises are engaged in agricultural activities and hotel business. Small businesses currently employ 156,751 residents of the Samara region.

The Samara region has the program of «Small and medium-sized business development in the Samara region, 2019-2030» [7]. Its goal is to provide favorable conditions for the development of small and medium-sized business of the Samara region and increase its competitiveness. In accordance with this program, the Ministry of Economic Development of the Samara region provides various measures to support the small business segment. In accordance with certain conditions, the entrepreneur can expect to receive subsidies that offset the equipment costs. The region is holding a competition of grants on their own business creation. Priority is given to enterprises engaged in tourism, innovation, and social services. Business incubators also operate. There are such organizations on the territory of our region: in Samara, Tolyatti, Neftegorsk, Kinel-Cherkassk district. Some of them specialize in innovative entrepreneurship supporting.

The Ministry of Economic Development of the Samara region pays special attention to the innovation development. The Innovation Fund, the Fund for promoting venture investments in small enterprises in the scientific and technical spheres, the center for innovative development and cluster initiatives, and the Regional center for innovation operate in the region. In addition to innovative entrepreneurship, one of the priorities of the region economic policy is the development of youth entrepreneurship. In this regard, the federal program “You are an entrepreneur” is being implemented. The program provides young people with opportunities to acquire business knowledge, improve and implement their business ideas. Also, the government of the Samara region and the Russian export center, solve the task of bringing small enterprises to the foreign level.

To meet the needs of the economy of the Samara region in specialists with entrepreneurial competencies, the region is constantly updating and improving the system of additional education, and the most active role in this is played by the Samara State University of Economics. The University has been training specialists in the field of economics, management and law for more than 30 years, implementing such an up-to-date program as “Business”. Thus, the Samara region has an extensive infrastructure for small business supporting. Measures to improve the functioning of this business segment are diverse and include both financial and property support, as well as information and advisory support. However, here and in the country, there are problems that hinder the small business development.

From the analysis, the questionnaire method revealed that, despite the measures of state and regional small business support, the entrepreneur still faces certain difficulties that do not allow his company to work most effectively [5, 9]. In order to optimize the functioning of the small business segment, it is necessary to apply measures to solve tax and administrative problems, expand the program action for financial and property support of small business.

4 Discussion

Speaking of the problem analysis in the research of other authors, it should be noted that this analysis is made taking into account various points of view and many aspects that affect the activities of small businesses. For example, Korže analyzes issues of legal policy in order to develop special measures to support small businesses [4]. The study indicates the role of such measures in bringing small business into an equal position with other market participants, which will facilitate the competition of small enterprises with large ones in the context of globalization. Wong, Wong and Boon-itt consider resource allocation models on small enterprises [10]. They compare models of small enterprises with models of large enterprises, from which they draw conclusions about the possibility of upgrading these models in order to obtain additional benefits in the core activities implementation.

In their work, Chatterjee and Kumar Kar analyze the significance and possibility of implementing the social media marketing mechanisms in small businesses [1]. The authors note that the usefulness and simplicity of using such methods in small businesses subjects have a positive impact on them, but the additional costs of this system implementation are negatively perceived by enterprises heads [3]. All this shows the significance of the analysis of small business' problem areas in terms of various aspects of the activities implementation.

5 Conclusion

Thus, the study highlighted the importance of the small business role in Russia. It is considered in this article as a strategic factor that contributes to the balanced development of the country's economy in general and the regions in particular. The study has analyzed the structure of small business in the Samara region. A survey of individuals, associated with small business, was conducted. Based on expert assessments, a number of problems that hinder the optimal functioning of small businesses were identified. The most significant barriers are administrative, tax and financial difficulties. And specifically for the Samara region, the most acute problem is the receipt of funds for the creation and development of business. To solve these problems, it is necessary to improve the system of tax collection, establish the control crisis of the enterprise, and increase the awareness level of entrepreneurs on the key legislation provisions. Financial support is equally important. The infrastructure functioning of the small business segment support will reduce the impact of the financial burden on the enterprise's activities, and, consequently, optimize the situation with the development of small business in the country and regions.

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Theory and Practice of Management Decisions on Regional Cluster Policy Implementation

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Abstract. The authors focus on the problem of low level of technologization of management activities of public authorities in the implementation of cluster regional policy, which leads to the adoption of ineffective management decisions in supporting regional cluster initiatives. To solve the problem, the authors propose a developed algorithm for evaluating the economic and organizational factors of the formation of an industrial cluster in the region. As a result of factor analysis, authorities receive information on the objective possibility and subjective readiness of enterprises in a particular industry to cluster formation processes, as well as determine the type of cluster, its most optimal structure and organizational model. Practical testing of the developed algorithm is tested on the example of designing a territorial cluster of building materials in the Samara region, Russian Federation. The developed technology is of practical importance for making decisions on the allocation of state subsidies for the implementation of cluster initiatives in the region, as well as for the inclusion of cluster projects in the strategy of social and economic development of the territory.

Keywords: Development of management solutions · Regional cluster policy · Regional public authorities · Territorial industrial cluster

1 Introduction

In this article, a territorial industrial cluster is considered as a geographically concentrated group of interconnected companies, specialized suppliers, service providers, firms in the industry, as well as related entities that compete, but at the same time conduct joint activities [1]. In the market economy, the process of creating industrial and intersectoral clusters is primarily an initiative of economic entities of the local territory, the result of realizing the benefits of consolidating resources in order to increase the competitiveness of enterprises and the industry as a whole.

One of the most noticeable trends in the modern economic policy of Russia is the strengthening of the state role in the formation and development of industrial clusters. In this sense, we are talking about the choice and implementation in Russia of the so-called “conductor” model of cluster policy, which is focused on providing various direct and indirect measures of state support to industrial clusters [9].

Regional cluster policy involves the development of a cluster development strategy as part of the overall strategy of social and economic development of the region, the participation of authorities in supporting cluster initiatives in the functioning of the cluster as a member or organizing body [2]. The implementation of cluster policy involves the development and adoption of management decisions by the regional authorities on the need to support various industry clusters. This decision is based on the awareness of the regional need for the functioning of certain clusters on the territory of the region and the possibility of clustering of national economy branches.

2 Methodology

The regional government authorities decision to support cluster initiatives in the region should be based on the analysis of factors that determine the objective processes of clustering of economic sectors. It is proposed to include factors that determine the ability and readiness of enterprises in a particular industry to cluster formation processes in the first group of factors. Following are the characteristics of factors and their significance for clustering processes.

1. The presence of industries and complexes region specialization that produce competitive products.
2. Localization of economic entities in the industry.
3. The presence of a key resource (factor of production).

The definition of a key resource is based on the following characteristics:

- access to a key resource increases the level of competitiveness of each enterprise participating in the cluster,
- the key resource must be placed locally on the territory,
- access to a key resource must not be exclusive,
- a key resource should create conditions for self-producing business activities.

The type of key resource (production factor) sets the main parameter for building the cluster model.

4. The presence of relationships within the selected populations, grouped according to industry and territory.
5. The degree of innovation activity of industry entities.
6. There is a steady demand for the products of industry enterprises.

In general, based on the analysis of these conditions, the economic expediency and the possibility of combining enterprises in a cluster, as well as the structural model of the cluster, is determined. The second group of factors includes the availability of existing financial mechanisms of cluster initiatives supporting. This group of factors is of fundamental importance at the first stages of cluster formation and is determined by the nature of cluster interaction of economic entities in the region. The need of enterprises in the region to build cluster economic ties is due to the opportunity to get access to innovations. It is the innovative nature of clusters that determines the essence and order of interaction between its participants. At the same time, the introduction of

scientific developments in production processes is associated with a significant risk of uncertainty situations in business investment decisions for the region enterprises.

Financial instruments of cluster initiatives supporting by the state are the most common way to stimulate clusters. Currently, there are the following models for financing cluster initiatives in the Russian Federation. The first model was developed by the Ministry of Industry and Trade of the Russian Federation. It involves subsidies for reimbursement of costs to participants of industrial clusters in the process of implementation of joint projects.

The second model of state support is offered by the Ministry of Economic Development of the Russian Federation. Unlike the previous one, it does not involve direct subsidies for cluster projects, but rather the allocation of funds to the regional budgets for the implementation of regional cluster development programs. The main condition for obtaining such subsidies is the presence of innovative clusters in the region. Thus, models of federal financing of cluster policy in the regions of the Russian Federation are the main condition for supporting cluster initiatives—the high innovative potential of enterprises—future participants of clusters, as well as their ability to build horizontal bindings, implement joint projects, increasing the synergetic effect of spatial juxtaposition in a single value chain. However, the absence of these characteristics of economic entities in the region does not allow to receive federal funding and launch the processes of cluster interactions at the first stage of creating a cluster.

The third group of factors that determine the management decisions of the regional public authorities to support cluster initiatives includes characteristics of the organizational potential of economic entities in cluster interaction. The organizational potential of business entities is determined by their readiness to be the initiator of cluster relationships construction and their ability to self-organization when creating organizational structures of clusters managing. These characteristics determine the management decisions on the choice of the organizational model of the cluster

Currently, there are two forms of cluster construction depending on the organizational potential of its participants. The first organizational form is a strategic partnership. When creating such clusters, the initiative usually belongs to the state authorities of the region. This is due to the low activity of self-organization of economic entities in the construction of cluster interactions. Their interaction is situational and is activated only when cluster initiatives and projects appear. Cluster entities rely mainly on external sources of their projects financing. Managing a strategic partnership involves creating “soft” organizational forms, including the creation of coordination councils, project groups, and holding strategic sessions.

The second organizational form has a character of a club. The club organizational form of cluster interactions is relevant in regions and industries where economic entities have a high potential for self-organization, and take the initiative of building a cluster. Such clusters are focused on internal sources of cluster initiatives funding. They unite economic entities of the industry that are ready to invest in strengthening permanent cluster ties. Cluster management in this case is based on the creation of more “rigid” organizational structures: cluster management companies, supervisory boards, and the Institute of membership in the cluster organization of interaction subjects.

3 Results

The proposed algorithm for developing a management decision on creation of an industrial cluster was tested on the example of a construction materials cluster in the Samara region of the Russian Federation. The analysis of the group of economic factors of the cluster formation of building materials industry has revealed the following strengths and features of the development of the construction industry in the Samara region, creating favorable conditions for the processes of cluster formation.

1. In 2019, according to the rating agency of the construction complex, the Samara region took the 2nd place among the regions of the Volga federal district of the Russian Federation on the index of competitiveness of the industrial construction complex. Moreover, this rating has been increasing in the last few years.

Production of construction materials in Samara region takes the 3rd place in terms of specialization after power machinery construction and pharmaceuticals. Construction products produced on the territory of the Samara region have a wide distribution both within the country and on international markets. The highest level of competitiveness in the construction area at the moment is the production of building materials, construction products, and construction objects.

2. Features of geographical localization of subjects of the industrial and construction complex define the structure of the construction cluster of the Samara region as a nuclear cluster (satellite type). The core of the cluster is the developer enterprise (s). Production and consumption of building materials, as well as construction of industrial and civil facilities are concentrated around the major cities of the Samara region, forming the agglomeration core: Samara, Tolyatti, Syzran. Such geographical localization of industrial and construction complex enterprises defines the binding of cluster enterprises to the final manufacturer-the construction of residential and non-residential facilities.
3. The key resources (factors of production) for the industrial construction complex in the Samara region are: stone and construction raw materials and human resources. Reserves of stone and construction raw materials (carbonate rocks, crushed stone) are the largest in the Volga region. Samara region ranks 7th in the Russian Federation in terms of the availability of qualified workers, 2nd in terms of the availability of senior managers, and 6th in terms of the development of the labor market. In terms of education, the Samara region exceeds the average performance in the Russian Federation and the Volga Federal district. According to the indicator “the number of students of higher educational institutions per 10 thousand people”, Samara region is ranked 3rd in the Volga Federal district, and 8th in the Russian Federation.
4. The depth of relationships between the construction industry enterprises of the Samara region is determined by the presence of a complete chain of productions on the territory of the region, ensuring the creation of the final product, namely: enterprises of the extractive industry, enterprises that produce construction materials, enterprises that produce building structures and products, enterprises for the construction of buildings and structures.

5. The degree of innovative activity of the industrial and construction complex subjects. Currently, in the Samara region in the industrial and construction complex, there is a high activity of scientific research, expansion of the infrastructure of scientific research. At the same time, innovation processes related to the introduction of scientific developments into production remain medium, compared to other regions. Therefore, the innovative territorial cluster of the construction materials industry in the Samara region at the first stage should be built by the type of production integration. With the further development of the cluster, it is expected to increase the competitiveness of innovations in the industrial and construction complex, which will create conditions for the transformation of the cluster by the type of innovative integration.

In the future, it is necessary to increase the innovative potential of the industrial and construction complex by expanding measures of state support of innovative processes, such as the creation of an industrial (industrial) park of innovative building materials, within which it is necessary to deploy a complex of production of construction materials using nanotechnology. In particular, it is possible to reimburse the costs of design and survey work and prepare the territory for the placement of production facilities at the expense of the regional budget. It is planned as part of the creation of an industrial (industrial) park of innovative construction materials in the Samara region.

6. The economic feasibility of cluster production is determined by the overall competitive positions of the industrial and construction complex in the Samara region, which is reflected in the following indicators. Samara region takes the 3rd place in the total volume of housing commissioning in the Volga Federal district, the 3rd place in the total volume of the Volga Federal district works on external economic activity "Construction". According to the indicator "provision of the region with organizations per capita, the construction sector takes the 2nd place (4 organizations per 1000 people).

Based on the analysis of existing models of construction clusters functioning in the Russian Federation and the results of identifying conditions that affect the structuring of the cluster in the Samara region, a structural model of the innovative territorial cluster of the construction materials industry in the Samara region has been developed (Fig. 1).

The Samara territorial cluster of construction materials is formed as a nuclear discrete specialized cluster. The discretisation of the cluster is determined by the nature of the company that forms the core – the developer, i.e. the final manufacturer. (several real estate developers). The cluster's specialization will be determined by its innovative orientation. The developer company, acting as the author of the cluster initiative, forms satellite links with enterprises and companies that conduct scientific research in the field of creating and promoting new building materials and construction technologies. The role of the developer enterprise as the core of the innovation cluster is determined by several parameters. Among them, an important role is given to such a parameter as market share. A high market share in construction leads to a significant amount of demand for building materials and technologies, and affects the degree of cooperation between enterprises in the process of innovations implementing.

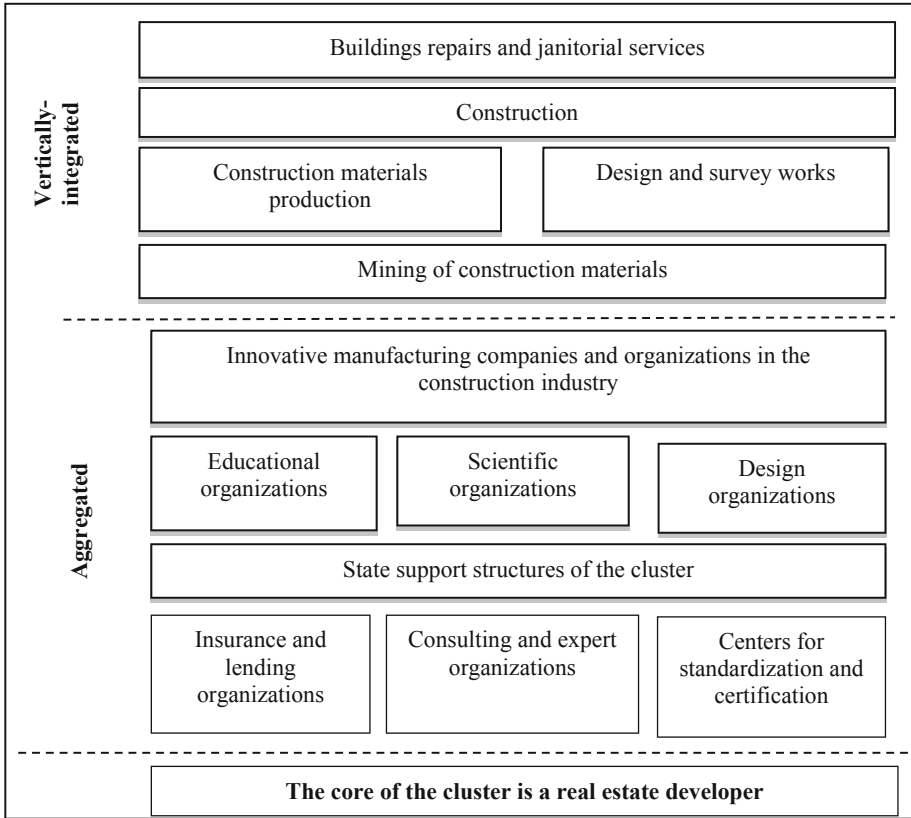


Fig. 1. Structural model of the innovative territorial cluster of the construction materials industry in the Samara region (Source: authors).

The second parameter that defines an enterprise as the core of an innovation cluster is the share of non-typical projects construction. A high proportion of non-standard projects leads to a more flexible approach of the construction company to the use of innovative technologies, which can potentially serve as a basis for forming the core of the innovation cluster on the basis of such enterprises.

The third parameter that determines the choice of the developer's enterprise as the core of the innovation cluster is the introduction of modern construction materials and technologies. Currently, such materials and technologies include, for example, the construction of monolithic walls or using large blocks. The fourth parameter that defines an enterprise as the core of an innovation cluster is the subjective readiness of the developer to innovations implementation, which is due to the presence of so-called cluster competencies. In-depth interviews with major developers revealed in most cases a low level of cluster competences, lack of direct interest in innovation processes and readiness to innovations implementation, which is a significant obstacle to the formation of an initiative construction cluster in the Samara region.

Thus, the analysis of factors of the first group showed that in the Samara region there are quite favorable objective conditions for the formation of a construction cluster, but the subjective readiness of manufacturers to implement cluster initiatives is poorly expressed. In this case, the authorities can initiate the cluster creation. The basis for the formation of a cluster is a major regional problem related to ensuring the competitiveness of the entire region, usually formulated within the framework of a state program or strategy. The policy decision on the formation of territorial clusters is primarily aimed at developing or providing those resources or resource conditions that are considered for the corresponding cluster as key resources of the cluster members integration. Only in this case, you can expect successful results of cluster formation.

The choice of an organizational model of building an innovative territorial cluster of the construction materials industry in the Samara region is based on taking into account all the positive and negative aspects of each of the organizational models described above, and also takes into account current trends in state policy in the field of development and support of industrial and innovative clusters on the territory of Russian Federation:

- the federal budget does not provide direct subsidies for the activities of specialized organizations of industrial clusters,
- financing of management companies from the federal budget has been reducing since 2016,
- the financial burden of supporting the activities of innovation clusters is increasingly shifting to the regional level or to non-budgetary sources,
- clusters with a mixed form of financing are the most effective.

Main characteristics of the proposed organizational model for the formation of an innovative territorial cluster of the construction materials industry in the Samara region are shown in Table 1.

Table 1. Main characteristics of the organizational model of forming an innovative territorial cluster of the construction materials industry in the Samara region

Parameters of the cluster organizational model	Characteristics of the organizational model of the Samara region construction cluster
Organizational and legal form	Nonprofit organization
The initiator of the cluster creation	Construction industry enterprises that represent the core of the cluster (developer companies)
General goal	Increasing the industry's competitiveness and investment attractiveness in interregional markets by ensuring access to innovative processes for all participants in the construction industry
Sources of financial and property support of cluster activities	Contributions of cluster participants, budget subsidies, borrowed funds, funds of the cluster core enterprise, income from the cluster's own activities, use of cluster property
Forms of interaction organization in a cluster	Option trading, joint projects, innovative projects, investment projects, technology platform
Mechanisms of interaction between regional authorities and cluster participants	Public-private partnership, implementation of the state program, implementation of cluster projects

Source: authors.

These characteristics reflect the mixed principle of the cluster organizational structure, which assumes the creation of a cluster based on the initiative of one or more cluster members which are the core of this principle. Entry of other enterprises will be implemented as cluster connections develop and their advantages for cluster participants are revealed. The main subject of cluster interaction in this model will be “club benefits”, which will only be available to cluster members.

4 Discussion

Cluster policy of the region is an independent area of modern research on clusters and their functioning patterns. The problems of cluster policy in scientific research are presented in the following areas [6, 7]. A significant number of studies around the world are devoted to the role of cluster interactions in supporting innovation processes, considering the qualitative characteristics of cluster construction in terms of innovation processes supporting [5]. Chinese researchers are actively engaged in building cluster models that promote the introduction of “green technologies” in high-tech industries, and developing policy solutions of clusters supporting [3, 8, 11].

In Russian studies, cluster policy is considered in the context of the formation of mechanisms for attracting investment in innovative projects, which is reflected in the works of Markov, Kurmashev and Nizkovsky [4]. At the same time, researchers are have to report that the construction industry is currently the least innovative. The organization of clusters is designed to solve the problems of implementing innovations in construction [10].

Another area of cluster research is the justification of practical tools of cluster policy implementation based on the generalization of the best Russian and foreign practices. In particular, Kosareva’s work explores the mechanisms of cluster policy implementation through a direct and indirect methods of cluster initiatives supporting. The author also considers organizational and institutional conditions of cluster policy implementation [2].

The third up-to-date area of research in economic clusters is the study of cluster policy role in improving the competitiveness of economic entities. Abashkin, Boyarov and Kutsenko, consider the role of cluster policy in improving the competitiveness of economic entities and the region as a whole [1]. A number of studies provide evidence of the positive impact of clusters on firm productivity, sales revenue, size, and export performance [9].

At the same time, modern researchers practically do not address the issues of making decision methodology and technology on the development of certain industrial clusters, taking into account both objective and subjective factors that affect the formation of a cluster. The practice of implementing cluster policy in many cases faces a conflict of interests between state authorities and economic entities.

5 Conclusion

The proposed organizational model of the innovative cluster of construction materials of the Samara region is the result of testing the methodology of developing and management decisions making by the regional authorities in practice. This decision is based on answers to the following questions.

1. How appropriate is the formation of a construction cluster in the Samara region?
2. On what sources of financing the activity of the cluster will be formed?
3. What is the most rational form of cluster integration?
4. What method of cluster structuring will be selected?
5. Which organizational and legal form of the cluster operator will be selected?

Taking into account the existing objective and subjective factors of clustering of the regional enterprises determines the rationality of decisions to support the cluster by the regional authorities and the most effective organizational model of interaction with the cluster subjects.

Analysis of clustering factors in the construction materials industry in the Samara region has shown that the region has a high economic and innovative potential for the formation of a construction cluster. At the same time, enterprises participating in the construction industry are not ready to take the initiative in building of cluster interactions, and do not have the competencies that allow them to see the benefits of participating in a cluster. Therefore, the proposed organizational model of the innovative cluster of construction materials in the Samara region is based on close interaction between the state and enterprises participating in the construction industry in the implementation of cluster projects.

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Assessment of the Intercompany Relationship Between Business Interests and Human Capital

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Abstract. The profitability of human capital at the microeconomic level depends on a harmonious combination of meeting the interests of wage labor and business. In other words, the level of wages must be equitably combined with the level of profit. In a formalized form, the profitability of a business appears to be a point on the vector of addition of many forces, including the potential and real effectiveness of human capital. Effective motivation of wage labor requires a comprehensive consideration of all its significant results, which include not only the volume of manufactured products, work performed and services. It is also important to consider the indirect results of labor affecting profits in the form of initial material resources saved.

Keywords: Business financial results · Human capital · Motivation

1 Introduction

One of the essential features of a “smart” business at the micro level of the economy is its based on common sense and focus on the harmonious interests of all external and internal stakeholders. This orientation creates the necessary conditions for the continuity of entrepreneurial activity for the long term, orients the business towards innovative development and predictability of expected results. The external and internal status of a harmonious business is ensured by the strategic implementation of the requirements of the universal laws of the universe. Among these laws, for example, the priority of activity (movement) over passivity, as well as the excess of the value of the effect over the value of the cause, stands out. The laws of the universe dictate the inevitability of effective innovation and investment activity for any business, as the conditions for its survival through the accumulation and retention of competitive advantages.

The experience of the formation of economic potential in human civilization proves the average justification of entrepreneurial initiatives, which manifested themselves in the form of innovative and investment activity. A generalization of this experience allows us to determine the lower boundary or the minimum level of innovation and investment activity. The methodological significance of the minimum level of activity is that its excess signals progressive economic development. An activity level below the minimum calculated value characterizes the state of stagnation in the economy.

The point of bifurcation or a change in the quality conditions of a holistic economic system corresponds to such a volume of investments, in which for the foreseeable time

the profit of profitable projects covers the losses of unprofitable projects. This determination of the bifurcation point is based on the assumption that when taking into account a large number of events over a long period of time, there are more profitable projects than unprofitable ones. This follows from the fact that entrepreneurial activity is part of anthropogenesis, where in most cases common sense prevails. It follows the conclusion that with the expansion of the scale of a particular business, the potential for its profitability increases.

In each specific situation, there is a certain bifurcation point for innovation activity, below which the risk of losses is increased, and above there is an increase in business profitability. Many factors specify the point of bifurcation, where there is a change in the quality state of a holistic economic system depending on changes in the intensity of innovation and investment activity. Among these factors, of particular importance, for example, is the ratio of own and borrowed funds of the firm, as well as the motivation of the employees of this firm to achieve design results.

Crisis phenomena in the economy reduce the availability of borrowed financial resources. Firms have to rely primarily on their own funds. It also affects the determination of the minimum required level of innovative strategic activity in the direction of its increase. The renewal of the physical capital of the company through the mobilization of internal financial resources leads to a general decrease in its profitability. Such a decrease in profitability, as a rule, is short-lived and is justified ultimately by obtaining the desired amount of profit for the foreseeable time.

Compensation of the negative consequences of reducing profitability can be by redistributing the financial resources of the company within the structure of production costs. For this, the part of these costs most sensitive to managerial influences is selected. Typically, this part of the cost is salary.

In calculating the size of wages, it is necessary to take into account all possible direct and indirect results of labor. The direct results of labor include volume indicators of the number of products released, work performed and services rendered. As a rule, these results are directly charged in the conditions of piecework or time-based pay systems. Here, the amount of wages is directly proportional to the amount of time of productive work or the number of units in which this work is measured.

Indirect labor results for business are also important, as they affect future financial results. In these indirect results of labor, firstly, that which has a positive effect on the consumer or buyer stands out. This includes courtesy and attentiveness in the provision of services, various manifestations of concern for the consumer of goods in the form of their physical cleanliness, neat design, and the like. Secondly, indirect labor results are manifested in the process of performing production functions, job responsibilities and the like. These results are associated with increased attention and increased labor efforts aimed at a careful attitude to production property. Such indirect labor results are expressed in savings (compared with the average values) of the consumption of raw materials and materials, as well as an extension of the service life and reduction of equipment repair costs.

Rational and balanced redistribution of financial resources of the company in the direction of strengthening the motivation of high indicators for indirect labor results requires the following conditions. The amount of financing of the first type of indirect labor results should be limited by the amount of profit growth due to the increase in

sales associated with additional labor efforts. The limitation of the amount of financing of the second type of indirect labor results is the amount of profit growth due to the saving of material resources. This savings is calculated as the difference between the actual and average costs of material resources in the process of their production consumption. The condition for low values of the actual values of the consumption of material resources should be additional labor efforts associated with rational thinking, experience and professional skills.

The criterion for the rationality of managerial decisions is the excess of the gain in profit provided by indirect results of labor over the value of the costs of motivating such labor. This excess or the positive difference between the additional profit and the cost of achieving it is intended to maintain the desired level of profitability. Methodological prerequisites for analytical calculations in this direction require appropriate justification and are as follows.

The effectiveness of the implementation of managerial decisions, as a rule, is evaluated according to the criteria of proportionality, rationality, efficiency and balance. Operational management at the micro level of the economy in most cases is guided by considerations of rational use of resources, between which technologically justified proportions are observed. However, the strategic plan focuses on efficiency and balance, which are more consistent with the goals of the business. These goals are expressed in the form of the accumulation of financial and physical capital, increasing the value of the company, making a profit and reducing unit costs of products.

2 Methodology

Research in the field of human capital, as a rule, focuses on finding ways to increase its financial efficiency. However, the great potential use of human capital lies in the concept of integrated reporting based on the Global Reporting Initiative (GRI). The orthodox development of this concept involves taking into account only direct financial, but also indirect labor results. The approaches of such scientists as Ageev, Galushkina, Kopkova, Smirnova are interesting in this direction [1]. The relevance of research in the effective use of human capital is confirmed by such scientists as Bibarsov, Khokholova, Okladnikova [4], Bruskin et al. [5], Dudin et al. [7], Glukhova, Syrotyuk, Sherstobitova, Pavlova [8], Rampersad, Hussain [10].

Great help in the formulation of the provisions on which the approaches proposed in the article to the separation of direct and indirect labor results are based on the scientific statements of such scientists as: Bazarov [2], Berdnikova, Mikhalenok, Frolova, Sukhacheva, Krivtsov [3], Catmell [6], Melikhov, Maluev [9], Rasskazov, Rasskazova, Deryugin [11]. During the writing of this article, such scientific methods as analysis and synthesis, deduction and induction, comparisons, groupings, and others were used. This allowed us to draw reasonable conclusions and formulate proposals for the further development of methods for analyzing the efficiency of use of human capital. The principles of an integrated and systematic approach were the basis for proving the feasibility and necessity of redistributing financial resources for balanced motivation to achieve high direct and indirect labor results. The dialectical approach

made it possible to identify ways to eliminate the contradictions between the interests of business and wage labor.

3 Results

The pattern observed in the surrounding world is a movement leading to growth, which is interpreted with respect to each business as an imperative condition for survival and prosperity following the law of large numbers, that is, in most cases, not excluding the risk of losses. A significant reduction in the possible negative consequences of this imperative is ensured by rational business segmentation, which allows to reduce the risks of its individual areas and find opportunities for their synergetic interaction.

Permanent business expansion has now become a prerequisite for its survival. Therefore, each business entity as a whole and in the aggregate of individual segments is doomed to generate newly created (added) value, which is the basis of future investments, that is, development. The greater the increase in value added, the more opportunities for expanded reproduction. The most important obvious condition for its increase, providing capital gains, is the relative saving of the resource mass, accompanied by a decrease in the unit cost of the produced use values.

However, this is a private interpretation of the general requirement of strategic balance, which consists in the need for faster growth of indicators of consequences over indicators of causes along the entire interconnected chain of iterations of the capital cycle. It is thought that in order to evaluate individual manifestations of balanced indicators, it is appropriate to take for axiom the regularity of a continuous increase in business value, which is clearly observed in the process of this circuit. Given initial position, with allowable simplifications that do not fundamentally distort the interconnection of the main components, in a formalized form it is represented:

$$\frac{C^1}{C^0} < \frac{v^1 + b^1 + a^1}{v^0 + b^0 + a^0} < \frac{v^1 + b^1 + a^1 + p^1}{v^0 + b^0 + a^0 + p^1} < \frac{a^1 + v^1 + p^1}{a^1 + v^0 + p^0} < \frac{p^1}{p^0} \quad (1)$$

where C^1, C^0 - capital advanced in the actual and base periods of time, respectively, capital gain for the period: $\Delta C = C^1 - C^0$. Conditionally taken in the amount of the balance sheet currency;

v^1, v^0 - part of the value of the newly created (added) value distributed in consumption in the produced consumption values (finished products, works and services) for the actual and base periods, respectively. Conditionally taken in the amount of wages with deductions in the cost of sales;

b^1, b^0 - the costs associated with the objects of labor for the actual and base periods, respectively. Conditionally taken in the amount of material costs in the cost of sales;

a^1, a^0 - the amount of depreciation in produced consumption values (finished products, works and services) for the actual and base periods, respectively. It is conditionally taken in the amount of accrued depreciation of depreciable property included in the cost of sales;

p^1, p^0 - the part of the value of the newly created (added) value related to the generated free financial resources (net, after all payments, profits) by means of the produced use values (finished goods, works and services) for the actual and base periods, respectively. Conditionally taken in the amount of profit from sales;
 $v + b + a$ - the cost of sales of products, works and services (S); $v + b + a + p$ - the volume of sales of products, works and services at selling prices (Qt); $a + v + p$ - the volume of sales of products, works and services, measured by the value added to the value of the consumed labor items, value (Qa); $v + p$ - the volume of sales of products, works and services, measured by the newly created (added) value or net sold products (Qn). The initial data for the analysis of compliance with effective ratios in the dynamics of indicators reflecting the causal relationship between costs and business results at the Vita pharmaceutical factory are given in Table 1.

Table 1. Summary data for two adjacent periods of activity of the Vita pharmaceutical factory (thousand monetary units)

Indicators	Designations	Time period*		Growth rate (%)
		t0	t1	
A	B	1	2	3
1. Advance capital	C	150000	150000	100,00
2. Salary in sales	v	38496	39466	102,52
3. Material costs in sales	b	98694	104214	105,59
4. Depreciation in cost of sales	a	8360	8360	100,00
5. Cost of sales	S	145550	152040	104,46
6. Sales in sales prices	Qt	146520	154860	105,69
7. Value-added sales	Qd	46410	49230	106,08
8. Sales at value added	Qn	38050	40870	107,41
9. Profit from sales	p	970	2820	290,72

Source: authors.

*t0, t1 are the previous and current time periods, respectively

During the analyzed period, the profit at the factory increased significantly - by 190.7%. This was facilitated by the observance of rational ratios in the rate of change of providing and effective indicators. The ever-increasing inequality established in formula (1), repeating from left to right, was fully fulfilled and looked like: $100\% < 104.5\% > 105.7\% > 105.9\% > 290.7\%$. The advanced capital showed effective use in the costs incurred (+4.5%), the return on which in the finished product increased (+1.2%). Similarly, the latter showed its added value (+0.2%), which showed almost three times the effectiveness in profit, mainly due to the price factor.

In formula (1), the cost of human capital is represented by salary with deductions, that is, by the amount of funds intended for its renewal and development. Human capital is goal-oriented, as ultimately the economy is created by people and determines their livelihoods. Therefore, the efficiency of use of labor resources within the company serves as an external measure of its economic potential in a competitive environment

and an internal indicator of the effectiveness of a unit of labor. This performance has various aspects. Therefore, it is necessary to single out direct and indirect results of labor in order to be able to adequately solve the multifaceted task of assessing their effectiveness. The logic of the formulation of such a problem determines the form of its solution in the form of a formalized generalization of many interrelated indicators that reflect the parameters that are currently important, including those related to these relationships. The evaluation criterion is in the balance of indicators according to the logic of their progressive change in the chain of cause and effect relationships.

4 Discussion

It seems that it is impossible to obtain an integral characteristic of the multifaceted results of the work of the personnel of the company on the basis of any one synthetic indicator. Such an assessment requires a system of direct and indirect indicators obtained on the basis of the corresponding calculation algorithm. This approach makes it possible to see in the results of labor not only the number of produced use values, but also the observance of an appropriate combination of the efficient use of all advanced (material and labor) resources at the same time. A good system of motivation for effective labor allows you to save material resources due to labor efforts for their careful use in the production process. This saving is considered as a virtually newly created product, which in natural-material form is expressed in the estimated value of the relative release (saving) of the corresponding materials from the production process, the production time of using specific equipment, energy, etc. In determining such a saving, the priority of a prospective assessment of results over the current or operational one is rightly justified. It follows from the laws of economic development, the requirements of balanced indicators, which mean the excess of the growth rates of investigative indicators over the growth rates of causal ones.

Scientific and technological progress, the accumulation of experience in the rational organization of labor and production, advanced training of workers and other similar factors provide the possibility of establishing new progressive bases (standards) of unit costs of production resources per unit of use value. The implementation of these opportunities for business as a whole is due to the desire for competitive advantages, and for hired labor - motivational systems. A balanced combination of the interests of all stakeholders, their inclusion in the crowd sourcing system, especially owners and employees, involves taking into account the results of labor and allocate savings or over-expenditure of material resources, depending on its specific application, along with traditional labor productivity, expressed as a specific amount of products, work or services. Such savings (cost overruns) arise as a result of increasing the level of implementation, rationalization, the introduction of effective organizational and organizational measures (violations of production discipline, careless attitude to production property) and the like.

5 Conclusion

An important point in the motivational management of production personnel is the use of non-financial indicators such as the level of its production culture, and immersion in professional activity. The orthodox continuation of this approach to determining the results of labor in terms of the number of produced consumption values (target products and estimated savings of initial material resources) in conjunction with the amount of wages does not imply its subsequent calculation, but preliminary, with a pre-established procedure for adjusting for the results actually achieved. It seems appropriate to dialectically consider wages as the cause of its results from the standpoint of the active role of labor resources among other production resources. In the capital cycle, as a rule, prepayment of labor is not practiced, since from the point of view of recognition of its results, payment is a consequence. If this were true, then it should be recognized that the growth rate of wages should outstrip the growth rate of labor results in accordance with general economic laws. However, this contradicts the logic of the entire chain of causal relationships in the capital cycle. This logic provides for the certainty of rational, balanced combinations of remuneration, its productivity and other results. Logically justified is the consideration of wages from the point of view of the funds advanced to it in the business plan, along with materials and fixed assets.

The main quantitative characteristics of the relationship between results and wages are focused on the ratio of labor productivity and average wages, which is a special case of the ratio of the shares of capitalization and consumption in the newly created (added) value. Formalization of the relationships of the considered indicators makes it possible to quantify these characteristics. Of particular note is the analysis of the transformation of the assessment of these relationships for the business as a whole and in the context of its individual segments.

Depending on the objectives of the business analysis, various volume indicators of products, works or services that characterize the return on assets are determined. The assessment of the possibilities for extensive or intensive business expansion is largely determined by the ratio of the dynamics of capital productivity over the entire newly created (added) value (J_x), as well as only in terms of distribution to consumption (J_y). The algorithms for calculating the indicators characterizing the phenomena under consideration are illustrated by the data from Table 1 for the Vita pharmaceutical factory. The growth rate of the first indicator of capital productivity (J_x) is calculated by the formula:

$$J_x = \frac{v^1 + p^1}{C^1} : \frac{v^0 + p^0}{C^0} = \frac{(v^1 + p^1)C^0}{(v^0 + p^0)C^1} = 42286/39466 = 107,15(\%) \quad (2)$$

where 1 and 0 at the top of the letter designation of indicators indicates the actual (subsequent) and basic (previous) value, respectively;

C^1 , C^0 - the actual and base value of the advanced capital, respectively.

The growth rate of the second indicator of capital productivity (J_y) is calculated:

$$J_y = \frac{v^1}{k^1} : \frac{v^0}{k^0} = \frac{v^1 k^0}{v^0 k^1} = 39466/38496 = 102,52(\%) \quad (3)$$

The outstripping growth of all added value over the growth of its consumed part as a whole for an economic entity is expressed by the inequalities:

$$J_x > J_y; \frac{(v^1 + p^1)k^0}{(v^0 + p^0)k^1} > \frac{v^1 k^0}{v^0 k^1}; \frac{p^1}{p^0} > \frac{v^1}{v^0}; J_p > J_v \quad (4)$$

In other words: $107,15 > 102,52$ and $290,7 > 102,5$.

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Features of the Development of Microinsurance in the Developing Countries' Insurance Markets

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Abstract. Nowadays microinsurance is gaining great popularity in Asia, Africa and Latin America. In emerging economies microinsurance products are more common than traditional insurance products. The purpose of this article is to identify the necessary factors for the successful development of microinsurance, including microtakaful, and the possibility of implementing the international experience in the Russian Federation. For this purpose, it is very important to involve state and non-state institutions in social protection, use modern technologies and identify main distribution channels of microinsurance products. A multi-factor economic model was developed to calculate the effectiveness of microinsurance implementation, and the prospects for the development of microinsurance in Russia were determined.

Keywords: Developing economies · Low-income sectors of the population · Microinsurance · Microtakaful · Social protection

1 Introduction

In the modern world one of the functions of the state is to provide social protection to the population. The concept of social protection includes the creation of a system aimed at providing assistance to citizens in meeting social needs, respecting the rights to receive medical care and education, as well as providing support to vulnerable groups of the population, including people living below the poverty line, large families, and disabled people and people of retirement age. These tasks are solved both directly by state organizations, and by supporting the activities of non-state structures aimed at providing social protection for citizens. The organization of social protection of the population contributes to the economic growth of the state, since it leads to stabilization of solvent demand, which leads to an increase in consumption. In addition, the socially protected population is able to work with increased productivity. Thus, providing social protection in the end as a result, it contributes to economic growth and the development of society [4]. One way to provide social protection to low-income citizens is microinsurance. Microinsurance is an important mechanism and contributes to poverty

reduction and economic growth in emerging economies [7]. According to a World Bank report, about 45% of the world's population lives on 5.5 or less dollars a day [12]. The problem of poverty remains relevant today despite the fact that the number of the poorest people in the world living on less than \$ 1.9 per day has dropped to 10% according to this report. Most economists point out that it is the poorest segments of the population that most require insurance coverage. The results of the introduction of microinsurance in developing countries show that insurance saves the poorest households from the risk of a sharp decline in income, increases the number of poor citizens who become available to receive education and services health care. Microinsurance is currently gaining popularity in Asia, Africa and Latin America. In the countries of the Middle East and North Africa, where the predominant number of citizens profess Islam, *microtakaful* is increasingly used.

2 Methodology

In this work both theoretical research methods and applied ones were applied. The analysis and synthesis of scientific literature on the issue of research on the introduction of microinsurance in the countries of Asia, Africa and Latin America was carried out. By studying the regulatory legal acts of countries with developing economies, the features of microinsurance activities in the countries of the region were identified. By studying and summarizing the practical experience of introducing and developing microinsurance in the countries of Asia, Africa and Latin America, the factors of successful development of microinsurance were identified. Promising microinsurance products were analyzed. The paper presents the popular distribution channels of microinsurance products. Innovative methods promoting the spread of microinsurance have been considered. The mathematical method of data processing in the Gretl environment was applied by constructing a multi-factor economic model based on statistical data collected from international sources. The resulting model was applied to the Russian Federation. The prospects for the possible development of microinsurance in Russia were identified.

3 Results

It should be noted the reasons for the active development of microinsurance in Asia, Africa and Latin America. The following factors, which are determined by the readiness of society, the state and the country's economic development, contribute to the growth of microinsurance in these regions:

1. The level of state regulation and government programs

This factor is primarily determined by the degree of state interest in the development of microinsurance. A manifestation of such an interest may be state subsidies and the development of appropriate programs, the reform of insurance legislation.

For the development of microinsurance in the countries of Asia, Africa and Latin America, the states provide preferential conditions to insurers for carrying out this type of activity. The legal framework for this type of insurance is emerging, which establishes regulatory rules and protects policyholders.

In South Africa the size of the authorized capital for insurance companies is much lower than for traditional insurers. 3 Mio. South African rand (about 12 Mio. Rubles) for micro-insurance companies, 5 Mio. South African rand for short-term insurance companies and 10 Mio. South African rand for long-term insurance organizations.

In Brazil microinsurance organizations are granted tax credits. The Microinsurance Act of 2008 established a special tax regime for microinsurance operations. Income tax for micro-insurance organizations was set as preferential at a rate of 1%, and social tax was also 1%. In traditional insurance in Brazil, income tax is 25%, and net income is taxed at 15% social tax.

2. Active participation of non-governmental institutions

The introduction of microinsurance as an element of social protection is carried out by both state bodies and public and commercial organizations. Commercial organizations are insurance companies. In cooperation with state bodies for its dissemination, private organizations are also involved, also taking on financial and organizational obligations. There is a list of countries where insurance organizations conclude microinsurance agreements with certain groups of citizens, which are financed by the insurance companies themselves at the expense of other incomes, charitable foundations from charitable contributions, or government organizations through government subsidies.

3. Society structure

In order to implement the project of introducing microinsurance in a particular country, it is necessary to take into account the social characteristics of the state. First of all, it is necessary to assess the level of poverty and social inequality in the state, since it is precisely the poor who are targeting the microinsurance product. It is also necessary to pay attention to the religious preferences of citizens. Currently, more than 20% of the world's population are Muslims, most of whom live in Asia and Africa. In this regard, it seems very important to develop insurance in accordance with the requirements of the Sharia. Such a system of insurance is takaful [3]. Therefore, one of the features of the development of microinsurance at present is the widespread use of microtakaful, a type of microinsurance based on Sharia.

In order to implement the project of introducing microinsurance in a particular country, it is necessary to take into account the social characteristics of the state. First of all, it is important to determine the social inequality and the level of poverty in the region because microinsurance policyholders are the poor. Also religious considerations must be considered. Currently, about 20% of the world population are Muslims, most of whom live in Asia and Africa. In this regard, it seems very important to develop insurance in accordance with the requirements of the Sharia. Such a system of insurance is takaful [3]. Therefore, one of the features of the development of microinsurance at present is the widespread use of microtakaful, a type of microinsurance based on Sharia.

4. Availability of an alternative social protection system

It is necessary to take into account the existence and effectiveness of the social protection system in each country [10]. An excellent example is India, a developing country in Asia with a predominantly poor population [9, 11]. Only in 2019, a free medical care project was developed in India [10]. Prior to this, the poor, who did not have a microinsurance policy, could not “afford” to get sick, since the cost of treatment and the purchase of medicines could exceed the amount of their annual earnings.

5. The introduction of new technologies

Innovations increase the availability of microinsurance services for low-income populations, especially in areas with poor infrastructure, which occupy large areas in Asia, Africa and Latin America. They help to reduce the cost of collecting numerous, but small in size insurance premiums and making payments, which is important for microinsurers. The innovative microinsurance fund ILO provides grants for the development of modern technologies for microinsurance. This has led to many new developments. For example, in Kenya, livestock can be insured using satellite imagery. It is also interesting to note that the use of blockchain technology in microinsurance for automatic payments will significantly reduce costs and eliminate the risk of fraud.

6. Effective marketing of microinsurance products

First of all, it should be noted that with the development of high technologies it has become easier to obtain statistical data using «big data», which are used to implement risk management in microinsurance and to identify the necessary microinsurance products in a specific area. For different social groups, certain sets of risks are relevant. The most popular microinsurance product is life insurance.

According to a report from the Microinsurance Network, on the African continent, 26% of microinsurance policies are borrower life insurance policies. 25% of policies fulfill the functions of health insurance. Standard life insurance accounts for 15% of all microinsurance policies [6]. It is important to highlight that life insurance and funeral insurance are very popular in South Africa. Such microinsurance policies are held by 55% of South African citizens. This is due to the tradition of holding a magnificent funeral.

In Asia the main microinsurance product is also life microinsurance, which accounts for 40% of microinsurance policies. The second most popular microinsurance product among these countries is accident insurance, about 78 Mio. People are holders of these policies (21% of all micro-insurance contracts). Usually the policyholder for this policy is not one person, but several. Often the insurer is a whole family [8]. In Latin America more than 70% of microinsured policies sold are life insurance (51% life insurance and 26% borrower life insurance) [1].

An important feature of the marketing of microinsurance products is that when determining distribution channels, it is necessary to observe the principle of maximum cost reduction, including reducing the remuneration of intermediaries. It leads to the fact that microinsurance offers «boxed» products and sells them via the Internet or in cooperation with other organizations, such as microfinance institutions, retail organizations, post offices, consumer services and others.

Recently, the use of mobile communications has become increasingly important. This distribution channel of microinsurance products is notable for its low cost and prevalence among the population. It should be noted that 70% of the world’s population use mobile communications, while 80% do not even have bank accounts. This makes it easier to pay for microinsurance products through mobile applications without opening a bank account [2]. The following is a summary table with examples of microinsurance products that are offered by the Alliance group and are popular in the emerging economies of Asia, Africa, and Latin America (Table 1).

Table 1. Examples of microinsurance products

Country	Product type	Number of policyholders	Insurance period	Insurance premium	Sum insured	Distribution channels
Indonesia	Life	Individual	One year	3,7\$	370\$, 1800 \$	Microfinance organizations, agents
India	Agriculture	Individual	One season	3,8–15\$; 5–12%; 4–7%	230–460\$, 310–1500\$	Banks
Malaysia	Motorbikes	Individual	One year	25\$ + 3,7\$	1200\$	Post office
Egypt	Borrower life insurance	Group	One year	0,60%	100%	Microfinance organizations
Colombia	Real estate	Group	One year	25\$	7000\$	Microfinance organizations

Source: authors.

The data in the table means that in Indonesia the maximum insurance benefit in the event of natural death is \$370, in the event of an accident - \$1,800. When you purchase a microinsurance policy for the life of the Alliance group, the conclusion of the contract occurs through its activation via SMS.

The Alliance Group agro-insurance product in India assumes an insurance period of 1 season, which is about 3.5 months. This product is a must for the poor who have taken out a loan to develop their agricultural land. The insurance premium is from 3.8 to 15 dollars per hectare or 5–12% of the loan in the rainy season or 4–8% in the winter season. It should be noted that 50% of insurance premiums are subsidized by state bodies, which indicates the interest of the state in providing social assistance to the population. The insured amount is 230–460 dollars and 310–1500 dollars in case of insurance against the death or partial loss of food crops and cash crops, respectively.

In Malaysia due to the high popularity of such a vehicle as a motorcycle, a mandatory microinsurance product is liability insurance for 3 persons resulting from driving a motorcycle. The insurance premium is an average of \$25 per year. However, it varies depending on the characteristics of the motorcycle. Also, the client at his discretion can purchase additional coverage for only \$3.7 per year. This coverage is similar to accident insurance. The insurance claim will be the market value of the damaged car part or the market value of the vehicle itself. In the case of additional

coverage, the insurance payment will be \$1,200 in the event of the death of the motorcycle driver or his disability and \$120 as payment to the beneficiary in the event of loss of the breadwinner.

The microinsurance product described in the table in Egypt is obligatory for customers who take a loan. This product can be used only by low-income people whose average debt is \$540. The insurance premium is 0.6% of the loan amount.

In Colombia real estate microinsurance is a popular microinsurance product. The amount of insurance contributions ranges from \$1.7 per month to \$2.3 per month, depending on insurance coverage. The product is designed for customers of microfinance organizations with low incomes, the total loan amount of which does not exceed \$800. The purchase of this policy is voluntary. In the event of death or damage to property as a result of an explosion, lightning, or falling of an object, the insured amount will be \$7,000, in case of flooding as a result of natural disasters will be \$5,000 and \$700 due to unlawful actions of third parties.

To analyze the effectiveness of microinsurance implementation in the Russian Federation, we will build a multifactor economic model. For this purpose, we consider the factors affecting the introduction of microinsurance and its successful development in the Gretl environment. In order to correctly answer the question about the coefficient of population coverage with microinsurance services, if implemented, it is necessary to take into account certain parameters that led to the active use of microinsurance in countries of Asia, Africa, and Latin America with developing economies. Using regression analysis in the Gretl environment, it is possible to build a model based on selected factors and data for countries where there is a high coefficient of microinsurance coverage.

It should be noted that without the presence of state support and the support of non-governmental organizations promoting the introduction and distribution of microinsurance products, it is impossible to imagine the development of microinsurance. Therefore, for the purpose of building a model, it will be assumed that these factors are successfully applied.

Consider the model of the reaction of the population to a new product in the insurance market. The dependent variable was selected coverage ratio. Data for building a model of microinsurance coverage for emerging economies (Y) was taken from the World Bank, The Microinsurance Network, IMF. The following criteria are selected:

- X1 - annual per capita income, dollars.
- X2 - inflation rate, %
- X3 - the share of the rural population, %
- X4 - the share of the poor by national threshold, %
- X5 - GDP, billions of dollars.
- X6 - the number of deaths per 1000 people.
- X7 - the number of mobile-cellular subscriptions per 100 people.

We formed the table in MS Excel using the collected statistics. We entered the data taking into account the given variables (Table 2).

Table 2. Country statistics

Country	X1	X2	X3	X4	X5	X6	X7	Y
India, 2012	4860	9,3	68	30	1828	7,3	69	9
Brazil, 2016	14880	8,7	14	25,7	1794	6,3	118	6,6
South Africa, 2014	12700	6,1	36	55,5	351	10	145	64
Philippines, 2012	7350	3	54	25,2	250	5,7	124	20,6
Ghana, 2014	3890	15	46,5	23	39	7,8	115,5	29
Thailand, 2012	1404	2	54,5	12,6	398	7,2	125	14
Pakistan, 2012	4680	9,6	64,5	36	224,4	7,3	64	3
Malaysia, 2012	22160	1,6	27,7	1	314,4	4,7	142	3,7
Colombia, 2016	14030	7,5	19,9	28	280	5,5	121,8	19,5

Source: authors.

Next, export this table to the Gretl environment to build a regression model. To solve the problem, the least squares method is used. Using observations 1–10. The resulting model is presented in Table 3.

Table 3. Calculated model

	Coefficient	std. Error	t-ratio	p-value	
const	-159.411	49.9233	-3.193	0.0857	*
X1	0.00144457	0.00136133	1.061	0.3998	
X2	2.73095	1.5996	1.710	0.2294	
X3	0.886703	0.490068	1.809	0.2121	
X4	1.18714	0.3847233	3.086	0.0909	*
X5	0.000603626	0.00293313	0.2058	0.8560	
X6	-2.48681	4.006858	-0.6112	0.6033	
X7	0.799816	0.188325	4.247	0.0512	*
Mean dependent var		19.14000	S.D. dependent var		17.96745
Sum squared resid		43.87976	S.E. of regression		4.684002
R-squared		0.984898	Adjusted R-squared		0.932039
F (7,2)		18.63263	P-value (F)		0.051868
Log-likelihood		-21.58373	Akaike criterion		59.16745
Schwarz criterion		61.58813	Hannan-Quinn		56.51197

Excluding the constant, p-value was highest for variable 5 (X5)
 Source: authors in the Gretl environment.

The next step is to determine the possible coefficient of microinsurance coverage in the case of the introduction of microinsurance in Russia. The formula for calculating the coefficient of microinsurance coverage is as follows:

$$Y = -159,411 + 0,00145X_1 + 2,73095X_2 + 0,8867X_3 + 1,18714X_4 + 0,000604X_5 - 2,4868X_6 + 0,7998X_7 + C \quad (1)$$

We substitute the statistical data on the Russian Federation collected by the World Bank and the Russian Federal State Statistics Service for 2019 into this model.

$$\text{Coverage ratio} = -159,411 + 0,00145 * 30284 + 2,73095 * 3 + 0,8867 * 25 + 1,18714 * 13 + 0,000604 * 1750 - 2,4868 * 12,9 + 0,7998 * 160 = 27,2 \quad (2)$$

Thus, the calculated coefficient of microinsurance coverage in the Russian Federation is 27.2% of the population of the Russian Federation. Based on the calculations, it can be concluded that the coverage ratio for microinsurance in the Russian Federation is 27.2% of the total population of the country. From the above calculation, we can conclude that 27.2% of the population of the Russian Federation can become potential consumers of microinsurance products subject to certain requirements, such as support for microinsurance by the state, financial and nonprofit organizations, as well as in the case of competent creation of microinsurance products and their distribution. This coefficient indicates that microinsurance will be in demand in Russia. This indicator also points to the fact that 27.2% of the population of Russia is able to become potential consumers of microinsurance products. However, government support for non-profit financial and microinsurance organizations must be respected, as well as the correct creation of microinsurance products and their increased use. This coefficient indicates that microinsurance will be in demand in Russia.

4 Discussion

As noted above, without state support the development of microinsurance in the Russian Federation is almost impossible. First of all, it is necessary to develop relevant legislation governing microinsurance activities and contributing to its implementation. The development of microinsurance would be facilitated by the editing of the Federal Law of the Russian Federation dated November 29, 2007 № 286-FZ (as amended on July 29, 2017) "On mutual insurance", since in many countries of Asia, Africa and Latin America microinsurance is widely spread through mutual insurance organizations (hereinafter MIO) [5]. The current version of the Law limits the number of participants (up to two thousand individuals) and the number of microinsurance products available within the MIO. So, personal insurance cannot be the object of MIO. To reduce costs, which is necessary for the successful implementation of microinsurance, it is inexpedient to limit the number of potential insurers, since the size of the costs and a more accurate forecast of the occurrence of insured events depend on the number of customers.

The unpopularity of MIO in Russia is also associated with the lack of sufficient funds for individuals to form the initial fund of the company. It should be noted that the introduction of microinsurance in Russia has its own specific features due to the vast

territory, most of which has a low population density, so you need to pay attention to the search for low-cost ways of distributing microinsurance products. These include the spread of microinsurance services via the Internet, Russian Post, as well as microfinance and other organizations that are within “walking distance”. The distribution of microinsurance policies through aggregator sites and financial supermarkets, where potential customers can choose their insurance coverage, study the size of insurance premiums, terms of contracts, and also improve their financial literacy by studying financial articles and news from insurance markets, can be especially interesting.

5 Conclusion

This work carried out a systematic analysis of domestic and foreign works and statistical data collected from international sources on microinsurance topics, as a result of which we can conclude that the importance of including microinsurance in the social protection system in the world is important. The basic principles of marketing microinsurance products in emerging economies and their development trends were highlighted. The study developed a regression model for calculating the effectiveness of the introduction of microinsurance in Asia, Africa and Latin America in the Gretl environment. The resulting model was applied to the Russian Federation, and the prospects for the possible development of microinsurance in the Russian Federation were determined. As a result of the analysis of information on microinsurance markets in Asia, Africa and Latin America, the main factors affecting the development of microinsurance were identified and the following conclusions were drawn:

1. The importance of microinsurance as a means of social protection of the population.
2. Of particular importance is the development of microinsurance in countries with developing economies.
3. The need for the participation of state bodies and non-governmental commercial and public organizations in the development of microinsurance.
4. The importance of attracting innovation in the development of microinsurance.
5. The need to search for products and distribution channels for the spread of microinsurance.
6. The ability to strengthen insurance organizations and profit from the use of microinsurance products in the insurance business.
7. The prospects for the development of microinsurance in the Russian Federation and the need to use the experience of countries in Asia, Africa and Latin America, in which microinsurance is common.

Based on the findings, it can be concluded that the spread of microinsurance in Asia, Africa and Latin America, including in the Russian Federation, is a promising area of economic and social activity.

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Forecast and Analytical Studies of Sustainable Development Directions of the Samara-Tolyatti Agglomeration

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Abstract. The article is devoted to predictive and analytical studies of possible directions of sustainable socio-economic development of the Samara-Tolyatti agglomeration on the horizon of 2019–2035. The research was carried out in order to design the future of the Samara-Tolyatti agglomeration, balanced in terms of goals and resources, based on a comprehensive analysis of statistical data from previous years and an expert vision of development alternatives, taking into account the unstable external environment. A digital agglomeration model has been created that allows calculating the values of national project targets and performance indicators for senior officials.

Keywords: Agglomeration · Analysis · Digital model · Forecasting · Scenario

1 Introduction

Samara-Tolyatti agglomeration is a set of compactly located urban and rural localities of the Samara region, united by stable and intensive economic and social ties, characterized by an increasing concentration of population, economic activity and the dominance of two core centers - the city districts of Samara and Tolyatti. Samara-Tolyatti agglomeration (STA) is the third most populous agglomeration in Russia. The STA consists of 17 municipalities - 8 cities and 9 municipal districts. To increase the effects of agglomeration development, a modern STA management system is needed, aimed at using additional mechanisms to turn agglomeration effects into concrete social and economic effects. As part of the development of such a management system, in 2019, forecast and analytical studies of the directions of socio-economic development of the Samara-Togliatti agglomeration were conducted in order to create a digital model of the STA as an object of management. All the work was carried out by the Samara State University of Economics. The article analyzes the results of modeling and long-term forecasting of the socio-economic development of municipalities that are part of the STA, and the agglomeration as a whole as a sub-region.

2 Methodology

Predictive and analytical studies were conducted by constructing forecasts for the development of the municipalities based on scenario materials of municipal strategies, the development strategy of the Samara region [9] and targets of national projects, after which the municipal forecasts were combined into the forecast of the STA. Digital models of socio-economic activity of municipalities and information technologies of long-term scenario forecasting were developed for conducting forecast experiments. Within the framework of the used methodology, *long-term forecasting* was considered as constructing of a future balanced by goals and resources, based on past statistics and expert vision of development alternatives. Long-term forecasting is a complex task because it uses a large number of variables that change dynamically and are closely related to external factors within a complex economic architecture. Therefore, a structured approach that combines scenario planning with technological forecasting is needed [1].

The most important component of scenario forecasting technology is the scenario. The values of scenario parameters quantitatively reflect the actions of management mechanisms that economic agents use in managing socio-economic processes (for example, tax rates, budget distribution proportions, etc.), as well as the influence of the external environment (the cost of a barrel of oil, the dollar-ruble exchange rate, etc.). From a mathematical point of view, the scenario is an integral part of the model of the object under study, which adds to the model expert knowledge about external events and behavior of individuals that are difficult to formalize, or they are outside of the model. The article by Wright provides an overview and evaluation of scenario forecasting methods used for complex problems [12]. The authors of the article divide scenarios into the following classes:

- forecasting that answer the question “what happens if...?”,
- trending (“business as usual”) with the addition of a low, medium and high projection into the future that deviates from historical values to the baseline,
- research, which is in contrast to predictive scenarios take into account multiple perspectives [5].

Despite some progress in methodology, many scientists consider scenario forecasting an art that lacks theoretical and methodological severity, because when creating scenarios, they consider the future created by people’s imagination. However, approaches have been developed to reduce the subjectivity of scenario forecasting, for example, to determine the “best” scenario option through a deductive exclusion process [2]. It is also proposed to focus on the main directions of development in order to avoid an unacceptable quantitative increase in scenario parameters [8]. The article by Trutnevte, Guivarch, Lempert and Strachan substantiates the value of using a socio-ecological approach to the strategy in conditions of turbulence [10]. The authors link scenario planning with social ecology concepts, showing how scenario methods complement a set of strategy tools suitable for a turbulent environment.

In this study, scenarios of socio-economic development of municipalities was formed on the basis of official socio-economic development of municipalities based on the parameters of the “target scenario” of the development strategy of the Samara region [9] and targets of national projects. Inter-municipal economic relations, migration processes and approved investment projects were also taken into account when creating scenarios. The main principle of forming a scenario for the development of the municipalities was to form such values of scenario parameters, in which the main indicators of socio-economic development of the municipalities are as close as possible to the established target values for the basic scenario of development described in the official strategy of the municipalities.

The forecast analysis of socio-economic development of municipalities were conducted on economic and mathematical models of socio-economic activities municipalities that combine into a whole model of the reproduction process, the distribution model value added final consumption model and gross accumulation and the model of the production factors (Fig. 1). The model of the reproduction process is developed in the class of Computable General Equilibrium (CGE) models that consider the development of the economy as the result of the activities of economic agents - the main subjects of the region [4]. The main prototypes of the developed model are CGE models [3], which are also widely used in domestic developments [6]. Calculations on the model are performed in 1-year increments. At each step, according to a given development scenario, the *gross output, shipment, and value-added elements are calculated sequentially on the model of the reproduction process*, taking into account resource constraints. Value-added elements in the *value added distribution model*, the revenues and expenditures of budgets of all levels and extra-budgetary funds, investment resources, monetary incomes and expenditures of population, quality of life indicators, and other indicators of socio-economic development are calculated. The *model of final consumption and gross accumulation* forms the final consumption of households, government agencies, and non-profit organizations. In *the model of production factors*, the production potential of the economy is calculated and restrictions on economic growth in terms of labor resources and fixed capital are formed. The potential of fixed capital is calculated on the fixed capital model, which is a set of models of fixed assets (FA) branches of the municipal economy. The dynamics of production potential is modeled on the basis of the processes of capital input and outflow associated with the investment activity of economic agents and the loading of fixed assets. The recommendations given in the review [7] were also used in the construction of the production potential model. The potential of labor resources is estimated on the basis of demographic calculations based on the classical model of age mobility (*Demography model*).

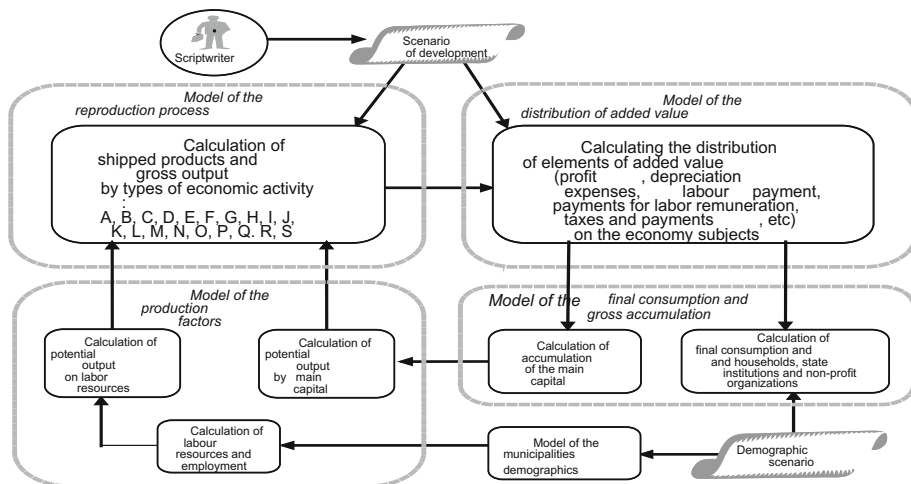


Fig. 1. Economic and mathematical model of socio-economic activity of the municipalities (Source: author).

3 Results

Multi-variant demographic and economic development scenarios have been developed for all 17 municipalities that are part of the STA for the period 2019–2035. The development scenario for each municipality included the following groups of scenario parameters: 1) parameters of the external environment (the cost of oil barrel; foreign investment; inflation in the industrial markets of goods and services; exports and imports by product groups); 2) parameters of the strategy of the federal government that conducts state policy in the region and the municipalities (federal tax rates and payments, the dollar exchange rate, the proportions of distribution of regulatory taxes between the levels of the budget system, pensions and budget salaries, parameters of federal investment and social policy); 3) parameters of the municipalities management strategy (rates of regional taxes and fees, investments from the regional budget in the fixed capital of the municipalities, gratuitous transfers to the municipalities budget from the regional budget); 4) parameters of the municipalities management strategy (rates of municipal taxes and fees, proportions of distribution of the municipal budget, investments in fixed capital from the municipal budget); 5) parameters of strategies of economic entities by sections and classes of the economy (production indexes, indexes-deflators of prices for finished products, the rate of remuneration, investment policy parameters); 6) parameters of a demographical strategy (migration balance, the individual factors of fertility and mortality); 7) parameters for the development of small and medium-sized businesses, foreign economic activity.

The following approaches and assumptions were used in forming the trajectories of scenario parameters:

1. When you specify scenario parameters relating to the federal authorities and the external environment, the information that the ministry of economic development of the Russian Federation (RF) send annually to the regional governments according to the rules of development of the socio-economic development of the Russian Federation, approved by Russian government decree. The information sent contains the following sections: 1) external conditions for the formation of economic development options for the forecast period, 2) the main indicators of the forecast of socio-economic development of the Russian Federation for the forecast period, 3) forecast of inflation indicators and price systems for the forecast period, deflators and producer price indexes by types of economic activity, 4) prices (tariffs) for products (services) of natural monopolies for the forecast period.
2. When forming the trajectories of scenario parameters related to regional authorities, the scenario material presented in the “Strategy of socio-economic development of the Samara region for the period up to 2030”, approved by the decree of the government of the Samara region from 12.07.2017 No. 441 [9], was used.
3. When forming the trajectories of scenario parameters related to municipal authorities, the scenario material presented in the strategies of socio-economic development of municipalities that are part of the STA of the Samara region was used.
4. The trajectories of scenario parameters of economic entities (indexes of production by type of activity, the rate of labour remuneration, investment policy parameters) were calculated on the basis of established targets and investment projects presented in the strategies of socio-economic development of municipalities that are part of the STA of the Samara region. At the same time, the indexes of production by types of activity and investment in fixed capital were coordinated and balanced in a special table of inter-municipal interaction.
5. Scenario parameters for the municipalities demographic scenario (individual birth and death rates, migration growth) were formed on the basis of targets for indicators “Life expectancy at birth” and “Natural population growth (decline)” taken from municipal strategies. However, migration processes were balanced in a special table of inter-municipal migration.
6. Scenario parameters of the development of small and medium business were formed based on targets for the increase in the share employed in the business in total number of employed population and the increasing share of small and medium business in added value of the economy.
7. If there is no information on the possible behavior of scenario parameters on the forecast horizon, information on the dynamics of these parameters in the segment of the reporting period preceding the forecast period was used. For some scenario parameters, it was appropriate to keep the base year values for the entire forecast horizon, for example, for federal and regional tax rates.

The search for the optimal development scenario for each municipality was carried out on a digital model of the municipalities (see Fig. 1). As it was said above, the principle of forming the optimal scenario was to select such values of scenario parameters for which the main indicators of socio-economic development of the studied municipalities are as close as possible to the established target values in model experiments. Since the values of scenario parameters quantitatively reflect the actions

of management entities, the scenario that leads to the achievement of targets can be considered as the basis of the roadmap strategy. The forecast of the STA as a whole as a sub-region for the 2019–2035 horizon was formed by combining the received municipal forecasts, taking into account inter-municipal interaction. The results obtained allow us to draw the following conclusions about the prospects for the development of STA:

1. Analysis of the prospects for demographic development of the Samara-Tolyatti agglomeration showed that the agglomeration will retain its demographic potential in the period 2019–2035. The population of the STA by 2035 will increase by 14 thousand people (by 0.5%) – from 2747 thousand people in 2018 to 2761 thousand people in 2035. This will be possible due to the following factors: 1) the expected increase in individual fertility rates (the total fertility rate per 1 woman will increase from 1.46 in 2018 to 1.8 in 2035), 2) reducing the population's mortality from all causes (by the end of the forecast horizon by 36% points to the level of 2018), 3) migration growth of the population (up to 2.0 per mille per year).
2. On the horizon of 2019–2035, the number of labor resources of the STA will increase by 75 thousand people (4.5%) – from 1668.5 thousand people to 1743.6 thousand people as a result of the reform of pension ages. Also it is expected to increase the labor productivity (by 57% compared to the level of 2018); to reduce the shadow sector of the economy (increasing the share of the average number of employees in the total number of employed from 48.4% in 2018 to 55.5% in 2035); to increase the number of employees in small businesses (almost 1.28 times the level of 2018).
3. On the forecast horizon, it is expected to increase the volume of industrial production of the STA by 1.52 times to the level of 2018 (average annual growth-2.5%). There will be an increase in the production potential of the STA due to the growth of labor productivity in industry (by 57% compared to the level of 2018); faster growth of small business turnover (more than 1.8 times compared to the level of 2018); faster growth of investment in fixed capital (1.95 times to the level of 2018).
4. Gross agricultural output produced in the STA will also grow and will amount to 137.4% of the level of 2018 (the average annual growth is 1.9%). The contribution of Samara and Tolyatti urban districts to total agricultural production is expected to grow significantly, from 15.4% in 2018 to 20% in 2035.
5. On the horizon of 2019–2035, a significant increase of its own revenues of the STA consolidated budget is expected (by 87%), which will occur due to the growth of taxable monetary income of the population by 60% to the level of 2018 as a result of economic growth; the increase in property taxes by more than 2 times due to an increase in tax rates by 1.6–1.8 times to the level of 2018 (tax policy of municipal authorities); and the growth of non-tax budget revenues by 1.8 times to the level of 2018.
6. Investments in fixed capital at comparable prices in 2035 are expected to reach 195% of the level of 2018 (average annual growth – 4.0%). The main volume of investments will be made at the expense of own funds of economic entities, the share of which in the total volume of investments in fixed capital will grow

continuously on the forecast horizon from 59.6% in 2018 to 73.2% in 2035. On the contrary, the share of investments at the expense of budget funds at all levels tends to decrease and will not exceed 9.3% in 2035. Investment activity of economic entities in the forecast period will increase from 27.4% in 2018 to 42% in 2035, which will indicate an improvement in the investment climate.

- Real disposable income per capita will grow by 55% by 2035 compared to the level of 2018. This is expected due to the growth of real wages by 1.55 times to the level of 2018; the growth of pensions, advancing the growth of consumer prices; the growth of business income (1.83 times the level of 2018). It is also expected to increase the level of budget security per capita (almost 1.6 times compared to the level of 2018). The growth of monetary incomes of the population will have a positive impact on housing construction, which will lead to an increase in the total area of residential premises per inhabitant from 26.6 m² in 2018 to 38.2 m² in 2035. The diagram shown on Fig. 2 illustrates the dynamics of the main indicators of socio-economic development of the STA on the forecast horizon.

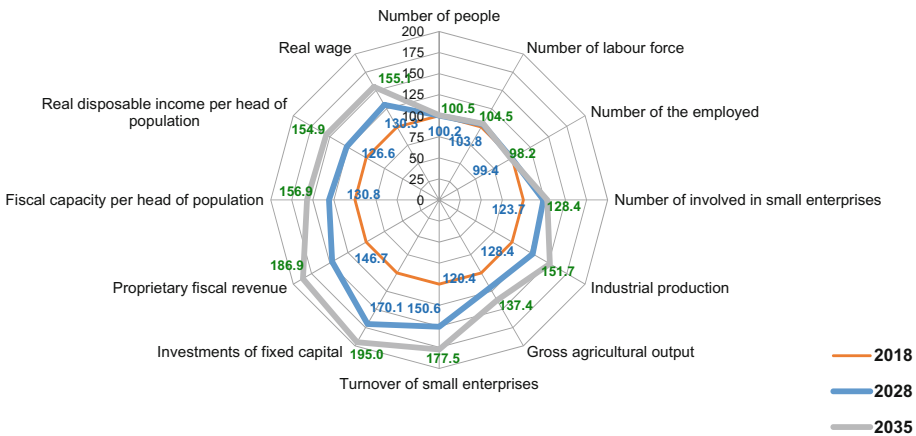


Fig. 2. Results of forecasting the socio-economic development of the STA until 2035 (Source: author).

The red line in the drawing shows the level of 2018, which is taken for 100%. The blue line shows the expected level of 2024. The green line corresponds to the level expected in 2035

4 Discussion

Research areas of socio-economic development of the STA was carried out by practicing on a digital economic-mathematical models of STA development strategies municipalities included in the STA, taking into account inter-municipal relations and

general resource constraints (population, labour, financial, production). An attempt is made to construct balanced strategies of the municipalities, which allow us to get as close as possible to the targets of national projects. The conducted research allowed:

- objectively take into account the strategic priorities of the municipalities development, their balance and achievability, considering the overall resource constraints,
- to see the threats of the municipalities development and suggest preventive measures to reduce or eliminate them,
- create a digital image of the STA by combining municipal forecasts with the balance of inter-municipal interactions,
- see the possibilities of obtaining agglomeration effects on the territory of the STA and calculate quantitative estimates of these effects,
- assess the prospects for achieving the target values of national project indicators for the period 2019–2024 with their extension to 2035.

During the research, a digital model of agglomeration was created, which will be useful in the future when building a system for supporting managerial decision-making in agglomeration management tasks. The digital agglomeration model allows calculating the values of national project targets and can be used to evaluate the performance of senior officials.

5 Conclusion

The research was carried out in order to construct a future STA, balanced in terms of goals and resources, based on a comprehensive analysis of statistical data from previous years and an expert vision of development alternatives. The conducted studies allowed to see the economic component of agglomeration as an object of management, to assess demographic and resources of agglomeration (including migration processes), manufacturing, tax, and investment potential, prospects of improving the standard of living of the population, and also to see vulnerabilities and resource constraints. Based on the conducted studies, a digital image of the agglomeration as an object of management was developed, and potential points of growth of the STA were identified that provide the greatest effect from agglomeration development. The generated digital image of the agglomeration can serve as a “comparison base” for evaluating development options with additional agglomeration effects. The obtained results of the analysis of the agglomeration potential and prospects for its development were used for strategic goal setting, forming a tree of goals and developing a new agglomeration management system aimed at solving agglomeration problems and enhancing agglomeration effects [11].

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Management of Innovative Ecosystems in a Digital Transformation of the Economy

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Abstract. The article discusses the formation and management of innovative ecosystems in a digital economy. The approaches to the definition and content of the term “innovative ecosystem” are analyzed, the specifics and conditions of managing innovative ecosystems are investigated. Digital technologies allow using information systems and data exchange to combine enterprises, scientific and research centers of various types of activity, into virtual groups or associations that carry out collective development and implementation of innovations. A specificity of an ecosystem is its strong link with innovation industrial activity. Scientists regard innovative ecosystems as effective mechanisms of cooperation aimed at combining individual offers of various firms into a single offer focused on the client and thereby creating new demand.

Keywords: Cluster · Digital economy · Ecosystem · Innovation ecosystem · Integration · Innovation ecosystem management

1 Introduction

One of the relevant and sought-after areas of enterprise development in the digital economy is the creation of innovative industries that use high technology, including digital, in their activities. Digital technologies allow using information systems and data exchange to combine enterprises, scientific and research centers of various types of activity, into virtual groups or associations that carry out collective development and implementation of innovations. Industrial integration, known since the period of industrial revolutions, by researchers in scientific works received such names as industry, industrial cluster, economic sector, financial and industrial group, network of enterprises, etc. [2].

In modern conditions of development of scientific and technological progress and digitalization, the term “ecosystem” has begun to be used to determine the integration of various economic agents, which originates in the course of biology. A specificity of an ecosystem is its strong link with innovation industrial activity. It is no accident that the leaders in ecosystem formation are the USA, Germany, Japan, Finland as countries

with highly developed innovative potential in production and management. The specifics of innovations in these countries is that in the production of goods and services they do not build on existing market demand, but with the help of innovative technologies they create new needs and new consumer demand [14].

2 Methodology

The study is based on an analysis of domestic and foreign experience in understanding and developing a digital research infrastructure, which is based on an understanding of the knowledge management system and processes (the paradigm of thinking and relationships), on economic concepts of information and knowledge management. The methods of analysis are comparative analysis, methods of cognition, content analysis, methods of deduction and modeling as a method of scientific knowledge of socio-economic processes.

One of the basic conditions for the effective functioning of the innovation ecosystem is the application of innovation management methods. The choice of a method or combination of methods for interaction for ecosystem management (or for creating your own ecosystem) depends on three things: ecosystem strategy, market environment and the general risk appetite of agents and business units [8].

Before starting the formation of an innovative ecosystem, it is necessary to take into account its future resource endowment. In most cases in Russia, innovative ecosystems are created from scratch and the threat is the lack of sufficient space required for all ecosystem agents to work, an incomplete list of agents included in the ecosystem, a shortage of personnel, and insufficient experience in creating and managing ecosystems [12]. Therefore, to ensure the effectiveness of the management of the innovation ecosystem at the initial stage of its formation, it is necessary:

- assess the geographical proximity of the agents that will be included in the ecosystem, and develop models for information interaction for remote agents,
- determine the commonality of principles and technologies, the commonality of the raw material base,
- to develop directions for the integration of enterprises, banks, funds, etc., acting as business units,
- assess infrastructure,
- to develop areas of interaction between ecosystem enterprises in the production and marketing spheres,
- evaluate the innovative component of the ecosystem (which innovations will be introduced, what consumer demand will form, how they will be implemented, etc.),
- analyze the personnel component of the ecosystem,
- ensure the inclusion in the ecosystem of educational, research, development organizations that will provide the necessary training and the generation of innovations [10].

3 Results

The Development Program for the Digital Economy of Russia defines the ecosystem as the center of the “synergy of the state, business and citizens”, represented by digital platforms that form the technological environment with API2 [13]. Similar consolidation of the state, business and citizens provides the provision of services and is a platform for signing cooperation agreements [4]. Domestic authors represent the innovation ecosystem as a complex of enterprises that create, disseminate and apply new knowledge, render assistance to all aspects of innovation activity and operate in a single space on the basis of constant interaction.

Innovative ecosystems at the core of the activity use cross-cutting digital technologies, which are the basis of the digital economy. Such technologies are: nanotechnology, quantum technology, big data, wireless technology, virtual reality technology, industrial Internet, robotics components, etc. Despite the relative novelty of this term in the research of domestic scientists, discussions regarding its content and in the practical activities of the ecosystem in Russian industry already occupy a strong place. Innovative ecosystems are one of the pillars in the development and construction of the innovative environment of the region [6].

Clusters are examples of innovative ecosystems in Russia. A cluster is a combination of industry entities connected in a single system as a result of territorial proximity and functional dependence and formed on the territory of one constituent entity of the Russian Federation, or on the territories of several constituent entities of the Russian Federation. Examples of successful innovative integration of enterprises into clusters on the territory of the Russian Federation include the Innovative Territorial Aerospace Cluster of the Samara Region, the Cluster “Fizteh XXI” (Dolgoprudny, Khimki), the Cluster of Pharmacy, Biotechnology and Biomedicine (Obninsk), Shipbuilding Innovative Territorial Cluster of the Arkhangelsk Region, Innovative Territorial Cluster of Rocket Engine Building Technopolis Novy Zvezdny (Perm Territory), etc.

The purpose of integrating enterprises within the ecosystem is to increase the competitiveness and sustainability of enterprises, reduce the costs of maintaining and developing units that perform common functions at these enterprises, and also search for cheaper and more reliable supplies of raw materials, materials, goods and services for the production of the final product.

Managing innovative ecosystems is associated with many conditions. The management body for an innovative ecosystem may have other names, for example, an innovation ecosystem management center, an innovation development agency and other. The management body needs to fix the basic functions from the implementation of which the functioning of the innovation ecosystem will depend:

- coordination of innovative development, coordination of the activities of all agents and business units included in the ecosystem,
- consultations, monitoring,
- adaptation of government programs to use in the activities of the innovation ecosystem,

- expansion of the ecosystem by attracting new business units and investments into its structure,
- assistance to cluster business units in bringing new products to the market,
- organization of training and retraining of ecosystem personnel, etc.

Given that the created innovative ecosystems are “linked” to the regions and their capabilities, it is necessary to take into account the regional potential when creating the ecosystem.

As elements of an ecosystem, it is necessary to highlight:

1. Regional state institutions, among which one can distinguish the regional government, interdepartmental groups, etc.
2. Science: higher education institutions, research and development laboratories, research institutes, as well as “points of idea generation”, which are represented by creative, intellectual, innovative spaces (coworking centers, loft spaces, business spaces) etc.
3. Business units: holdings, enterprises, financial and industrial groups, banks, investment funds, etc. Business units will directly produce innovative products. When forming the list of business units, it will be important to take into account the directions of the upcoming integration, to determine the areas of responsibility for specific business units in the ecosystem.
4. Social environment. The social environment provides the formation of innovative thinking in the region, the necessary loyalty of the population to the ecosystem, the demand for products and services, etc. The social environment includes: the community of the region, public masses, various groups of the population.

To ensure effective management of innovative ecosystems, government support and the use of an element of government are important. State management of innovative ecosystems should ensure the creation of business incubators, provide financial support through grants and competitions, and invest in the most interesting and sought-after ecosystem creation projects. Here, it must needs be said that the existence of such important conditions for managing an innovation ecosystem as the use of creative management from the top and middle top management of the ecosystem, the development of their own management programs and their application in practice, the creation of training centers based on ecosystems for the development of managerial skills of staff [11]. An important aspect of ecosystem management is the training of qualified personnel with a completely new type of thinking, based on a high level of digital competence [5]. Effective ecosystem management is inextricably linked with the internal level of management, which is provided precisely by specialists within the ecosystem. Any industry (sub-industry) of the digital economy is based on the knowledge economy. The knowledge carrier in the ecosystem of the digital economy is specialist [15]. The specialist’s knowledge is supplemented by artificial intelligence - a set of programs, software, digital technologies, with the help of which there is an accumulation, processing of information that can transform into new knowledge. According to the European Commission, 32% of the economically active population in the EU have a low level of digital competency [7]. This indicator has led to the development of digital educational platforms, online courses, webinars, and trainings

that allow for the process of continuing education and advanced training of specialists for ecosystems.

4 Discussion

Thanks to the development of innovative technologies and scientific research on the introduction of innovations in various sectors of the economy, the term “innovation ecosystem” appeared in the USA, which was later studied and used in other countries.

In the studies of American scientists, the innovation ecosystem is a set or combination of conditions that ensure the effective development of production [1]. Scientists regard innovative ecosystems as effective mechanisms of cooperation aimed at combining individual offers of various firms into a single offer focused on the client and thereby creating new demand [1]. In the framework of the sociological approach, the innovation system is considered as a circle of social networks, creating favorable conditions for the emergence and subsequent development of innovations. In the economic literature, the innovation ecosystem has the collective nature of innovation, which results from interactions between different firms, where organizations act as actors, and institutions “determine the rules of the game” [9].

In the framework of a systematic approach, an innovative ecosystem is defined as a living social organism that is in constant change under the influence of the behavior of agents and ecosystem business units, between which multidimensional internal relationships are established. According to research by American scientists, the ecosystem is based on the “three whales”: self-development, self-organization, self-regulation and is a complex structure. The difficulty lies in the fact that as soon as the ecosystem ceases to be regulated, it inevitably collapses. Therefore, for the functioning of the ecosystem, personal contacts between various economic agents, which are the constituent elements of the system, are also important. Among domestic authors there is no consensus on the definition of the term “ecosystem” and its content. The idea that the formation of an ecosystem is determined by the development of an innovative environment and is achieved through the integration of science in the real sector of the economy unites the authors’ positions. If foreign scientists in their works analyzed the concept of an ecosystem, the order of its creation, then domestic scientists took the path of studying economic clusters, which are analyzed in the works from the perspective of the ecosystem [3].

5 Conclusion

The formation of digital competencies of future specialists is one of the tasks of the modern educational environment. The manageability of the ecosystem largely depends on the ability of specialists to adapt to rapidly changing economic conditions and their ability to receive education and improve their professional level throughout their lives. Digital educational technologies are aimed at narrowing the gap between academic education and the real conditions for the implementation of professional activities, combining scientific and educational organizations and enterprises in order to train

specialists with knowledge not only in the field of professional knowledge, but also able to continue education online to solve various managerial functions and tasks. The managers of the innovation ecosystem should have such competencies as possession of mobile-cloud technologies, the ability to search and organize information in a global network of online resources, introduction of startups into ecosystem management, the generation and development of ideas for the formation of consumer demand, etc. In the framework of ecosystem personnel management, the development of a personnel forecasting system that will link ecosystem forecasts in specialists of various profiles with the education system, the resources of educational institutions that are used to train future specialists, as well as with institutions and organizations engaged in advanced training of specialists. Thus, the innovation ecosystem is a complex industrial and commercial structure, the functioning of which is associated with the unification of various kinds of business units, educational and scientific organizations to develop innovative products and services using advanced technologies, including digital. Economic systems provide a breakthrough in the economy, improve the quality of life in the regions, form a new type of economic thinking, create an innovative infrastructure.

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Dependence Between Investment and Economic Development of Russian Regions: Copula Approach

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Abstract. The structure of dependence between the level of economic development and investment provision of Russian regions in 2012–2016 is studied. Investment provision and the level of economic development in the regions are described by fixed capital investment (FCI) per capita and gross regional product (GRP) per capita, respectively. The copula method is used to model the dependency structure. It is established that the probabilistic structure of the relationship of the studied indicators can be described by a Gumbel copula in each year of the period 2012–2016, with the exception of 2014. The Gumbel copula in 2012–2013 transformed into Frank copula in 2014. There are no significant changes in the Gumbel copulas parameters in 2012–2013 and 2015–2016. It is concluded that the probabilistic structure describing by the Gumbel copula remains stable during the observed period. It is established that the Gumbel copula describes a sufficiently strong relationship between the studied parameters and has the asymptotic dependence in the upper tail of the distribution.

Keywords: Copulas · Investment · Gross regional product · Regions · Tail dependences

1 Introduction

It is known that investment is a driving force for economic growth. On the one hand, a high level of investment provision can create more possibilities to develop the region's economy, but on the other, a high investment provision is not yet a guarantee of economic growth in the region. The dependence between the investment provision and the economic growth of the region is inherently probabilistic. This is due to the incomplete knowledge about the real functioning of investors as well as the known uncertainty of the characteristics of the regional economic system. We will describe the investment provision of the Russian region (indicator X) by the amount of Fixed Capital Investment per capita in Russian region. The level of development of regional economy (indicator Y) will be characterized by Gross Regional Product (GRP) per capita. We will apply the copula approach in order to study the probabilistic structure of this dependence. Copulas are a powerful tool for modeling joint distributions of random variables. That's why we opted for this approach. Using copulas, we can analyze the risks of sharp changes in the level of development of the regional economy

in response to unexpected changes in the investment provision of the regional one. We believe that the analysis of the probabilistic structure describing the relationships between the studied indicators is relevant.

2 Methodology

We begin this section with a brief discussion of copula-functions. We describe a two-dimensional copula, following [4]. A copula is a function $C: [0, 1]^2 \rightarrow [0, 1]$ with the following properties:

- 1) $C(0, v) = C(u, 0) = 0$ for every u, v in $[0, 1]$;
- 2) $C(u, 1) = u$ and $C(1, v) = v$ for every u, v in $[0, 1]$;
- 3) $C(u_1, v_1) - C(u_1, v_2) - C(u_2, v_1) + C(u_2, v_2) \geq 0$ if $u_1 \leq u_2$ and $v_1 \leq v_2$.

The copulas applications in the economic processes modeling are based on the Sklar’s theorem [4]. Let $H(x, y) = P(X < x, Y < y)$ denotes a joint distribution function of random variables X and Y . Let $F(x) = P(X < x)$ and $G(y) = P(Y < y)$ be the marginal distribution functions of random variables X and Y , respectively. Then we say that according to the Sklar’s theorem, there exists a copula C , such that for all x, y in \mathbb{R} : $H(x, y) = C(F(x), G(y))$. If F and G are continuous, then C is unique [4].

There exist several constructive families of copulas. Those are Elliptical, Archimedean and Extreme Copulas [4]. They may differ in symmetry(asymmetry), the strength of interdependence on the average and the presence (absence) of asymptotic dependencies in the tails of the distribution. Therefore the copulas allow to characterize various probabilistic structures. One popular of elliptic copula is a normal (Gaussian) copula. The important Archimedean copulas are Clayton, Gumbel, Joe and Frank copulas.

A copula is a tool for describing the asymptotic dependences at tails. Asymptotic dependences at tails for two random variables X and Y reflect upper and lower tail dependence coefficients which can be expressed as [4]:

$$\lambda^U = \lim_{u \rightarrow 1-0} P(X \geq F^{-1}(u) | Y \geq G^{-1}(u)); \quad \lambda^L = \lim_{u \rightarrow +0} P(X < F^{-1}(u) | Y < G^{-1}(u)),$$

where $F^{-1}(\cdot)$ and $G^{-1}(\cdot)$ are the marginal quantile functions and $\lambda^U, \lambda^L \in [0, 1]$.

If $\lambda^U > 0(\lambda^L > 0)$ then asymptotic dependence at upper (lower) tail exists.

To estimate copulas with empirical data can be applied semi-parametric method [3]. This approach consists of the following steps. The first step provides the non-parametric estimate of the marginal distributions with the empirical distributions:

$$\hat{F}(t) = \frac{1}{n} \sum_{i=1}^n I(X_i \leq t); \quad \hat{G}(t) = \frac{1}{n} \sum_{i=1}^n I(Y_i \leq t),$$

where $I(\cdot)$ is the indicator function.

The non-parametric estimation of the marginal distributions is executed for each observation (X_i, Y_i) , $i = 1, 2, \dots, n$. The second step assumes the calculation of the log-likelihood function for the copula:

$$L(\alpha) = \sum_{i=1}^n \ln c(\hat{u}_i, \hat{v}_i; \alpha),$$

where $c(u, v; \alpha) = \frac{\partial^2 C(u,v;\alpha)}{\partial u \partial v}$ is the copula density; $\hat{u}_i = \frac{n}{n+1} \hat{F}(x_i)$, $\hat{v}_i = \frac{n}{n+1} \hat{G}(y_i)$; α are the copula parameters.

The copula parameters are the solution of the following task:

$$\hat{\alpha} = \arg \max_{\alpha} L(\alpha).$$

Thus, the estimation of copula parameters is obtained by maximizing the log-likelihood function L .

We will search for the best fitted copula among the copula models C_1, C_2, \dots, C_K , guided by the Akaike information criterion (AIC) [2]. The Akaike information criterion allows to select the copula which has the least value from the following:

$$AIC(C_k, \hat{\alpha}_k) = -2 \sum_{i=1}^n \log c_k(u_i, v_i; \hat{\alpha}_k) + 2q_k, \quad k = 1, 2, \dots, K,$$

where $\hat{\alpha}_k$ is the copula parameter estimation vector;

q_k is the number of parameters on which the copula C_k depends;

n is a sample volume. The best fitted copula is one which minimized the AIC value.

3 Results

We use the data on Russian regions for period from 2012 to 2016 obtained from official web sites. We analyze statistical arrays of the indicators “The amount of fixed capital investment per capita in the region of Russian Federation” (indicator X, millions of rubles per capita) and “The Gross Regional Product per capita” (indicator Y millions of rubles per capita) for 2012–2016. We describe the structure of the two-dimensional distribution of indicators X and Y in each year of the period 2012–2016 using the copula-models. We search for the best fitted copula among the copulas available in the R program. These copulas include a Gaussian copula, Student t-copula, Frank, Clayton, Gumbel, etc. It should be noted that before the assessment of the copula, an independence test must be applied. The null hypothesis that random variables are independent is rejected at the conventional significance levels for all years. Therefore, in 2012–2016 the joint distribution of the indicators X and Y can not be described by the independence copula. We use a semi-parametric method to evaluate the copula-model in each year of the period 2012–2016. To get a copula estimate we use the R program. We apply the CopulaSelect procedure from the CDVine package. As a result, we select the one from the copulas set for which the Akaike criterion has the minimum value.

The Table 1 shows the ML-estimates for the best fitted copulas of indicators X and Y in each year of the period 2012–2016. The parameter estimates are significant at conventional significance levels and the AIC value shows minimum value. It can be seen that the Gumbel copula is chosen as the best fitted copula in 2012–2016 excluding 2014. Frank copula is chosen as the best fitted copula in 2014. Table 1 demonstrates also that parameter estimates of Gumbel copula are almost identical to each other in 2012–2013 and 2015–2016. This means that the dependency structure did not change during these years.

Table 1. Parameter estimates for best fitted copulas in 2012–2016

Year	Copula	Parameter estimate	AIC	Tail coefficients estimates	p-value
2012	Gumbel	2,917	-146	$\lambda^U = 0,732; \lambda^L = 0$	0,21
2013	Gumbel	2,949	-148	$\lambda^U = 0,735; \lambda^L = 0$	0,66
2014	Frank	9,915	-97,8	$\lambda^L = \lambda^U = 0$	0,43
2015	Gumbel	2,917	-147	$\lambda^U = 0,732; \lambda^L = 0$	0,41
2016	Gumbel	3,022	-152	$\lambda^U = 0,742; \lambda^L = 0$	0,46

Source: author.

We check whether the best fitted copula is consistent with empirical data for each year of the period 2012–2016. We use a test based on the Cramer-von Mises statistics, see, for example [2]. The null hypothesis that the best fitted copula is consistent with empirical data. The BiCopGofKendall function from the R program implements a statistics-based fit test. The last column of the Table 1 shows the approximate p-values of the test obtained by calling the BiCopGofKendall function from the R program. It can be seen that the null hypothesis cannot be rejected at conventional significance levels.

Copulas of Frank and Gumbel are one-parameter. They belong to the Archimedean family and have the form [2]:

$$C_{FR}(u, v; \alpha) = -\frac{1}{\alpha} \ln \left(1 + \frac{(\exp(-\alpha u) - 1)(\exp(-\alpha v) - 1)}{\exp(-\alpha) - 1} \right), \quad \alpha \in (-\infty, \infty) \setminus 0$$

$$C_{GU}(u, v; \alpha) = \exp \left(-[(-\ln u)^\alpha + (-\ln v)^\alpha]^{\frac{1}{\alpha}} \right), \quad \alpha \in [1, \infty)$$

It can be seen in Table 1 that parameter estimates of Frank and Gumbel copulas are positive. This means that the copulas describe a positive relationship. The positive parameter of Frank copula interpolates the dependence structure intermediate between independence ($\alpha = 0$) and absolute positive dependence ($\alpha = \infty$) [2]. The positive parameter of Gumbel copula also interpolates the dependence structure intermediate between independence ($\alpha = 1$) and absolute positive dependence ($\alpha = \infty$) [2]. Thus, the values of the copulas parameters indicate the presence of quite strong dependencies between the studied indicators.

Though these copulas (Frank and Gumbel) have radial symmetry, their tail dependences are different from each other. For example, Frank copula has no tail dependence, i.e. $\lambda^U = \lambda^L = 0$. Therefore asymptotic dependences at tails for Frank copula are absent.

The Gumbel copula has upper tail dependence and no lower tail dependence, i.e. $\lambda^U > 0$ and $\lambda^L = 0$. The value of the parameter $\alpha \gg 1$ for the Gumbel copula (see Table 1), which ensures the presence of a strong dependence in the upper tail ($\lambda^U \approx 0,74$).

The positive upper tail coefficient λ^U indicate the ability of indicators X and Y to go up together. The lower tail coefficient $\lambda^L = 0$ for the Gumbel copula, reflecting, thus, a lack of ability of indicators X and Y to go down together. Thus, there is a strong asymptotic dependence on the upper tail of the distribution and an asymptotic independence on the lower tail of the distribution in each year of the period 2012–2016, with exception 2014. In contrast, there is asymptotic independence on both tails of the distribution in 2014.

4 Discussion

There are various approaches for analyzing the relationships between economic indicators. For this purpose, researchers use advanced methods of econometrics: multi-scale correlation analysis [1], panel co-integration analysis [8], macroeconomic production functions [7], the copula approach [4–6]. The advantage of copulas is that they fully describe the probabilistic structure of the studied dependencies. Knowledge of the probabilistic structure allows to characterize dependence between random variables at average and asymptotic dependences at tails.

In this research we selected Frank and Gumbel Archimedean copulas for describing the relationship of the investment provision and economic development of Russian regions. It is found that this relationship is stable throughout 2012–2016 and described by Gumbel copula. The exception is 2014, when Gumbel copula transforms into Frank copula. We found that the selected copulas are the best fitted copulas because they are consistent with empirical data for each year of the period 2012–2016.

These copulas reflect strong dependencies between the studied indicators and have radial symmetry. However, the Gumbel copula, in contrast to the Frank copula, shows an asymptotic dependence on the upper tail of the distribution. The asymptotic independence in the lower and upper tails of the Frank copula reflects the fact that an abnormal drop (rise) of the one indicator has not a significant impact on the decline (increase) of the other indicator.

Knowledge of the probabilistic structure of the studied dependence will allow us to analyze the risks of unexpected changes in the economic development in response to sudden changes in the investment provision of the Russian region. Therefore, the task of studying the probabilistic structure of the relationship between the levels of the investment provision and economic development of Russian regions seems relevant.

5 Conclusion

We investigate the relationship between the level of economic development and investment provision of Russian regions in 2012–2016. Investment provision and the level of economic development of regions are characterized, respectively, by fixed capital investment (FCI) per capita and gross regional product (GRP) per capita. In our opinion, the structure of the relationship between the studied indicators is inherently probabilistic in nature due to the known uncertainty of the characteristics of the regional economic system. This is why we use the copula approach to model the structure of dependency between indicators in 2012–2016. We find that the best fitted copula describing the relationship between the studied indicators is the Gumbel copula in each year of the period 2012–2016, with the exception of 2014. The best fitted copula in 2014 is the Frank copula. It is concluded that the dependence structure describing by the Gumbel copula remains stable through the observed period. Significant changes in the parameters Gumbel copulas in 2012–2013 and 2015–2016 is not observed. It is established that the Gumbel copula describes a sufficiently strong relationship between the studied parameters and has the asymptotic dependence in the upper tail of the distribution. The Frank copula reflects a quite strong dependency between the studied indicators also. However it has asymptotic independence in both tails of the distribution. In summary, the copula approach allowed us to distinguish periods of stability of the dependence structure and periods of structure transformation.

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Legal Regime of Realtors' Activity as a Segment of Engineering Economy

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Abstract. The relevance of the issues under consideration is due to the lack of certainty in the legal regime for realtor activity in Russia. The aim of the study is to identify current problems of legal regulation of realtors' activities in the context of the use of digital technologies in the engineering economy and develop recommendations for their solution. Methods of research are analysis and synthesis, elements of comparative law. The article examines the trends in the development of the real estate market under the influence of digital technologies, organizational and legal problems of realtors in their activities, their legal status. This article may be useful for specialists in the field of law, economics, as well as for those who carry out law-making activities.

Keywords: Digital technologies · Legal regime · Organizational and legal means · Realtor activity · Real estate market

1 Introduction

The acceleration of the changes taking place in society has increased significantly due to the use of numerous and diverse information technologies in all spheres of life of Russians. This fate has not passed the real estate market. The COVID-19 pandemic has accelerated the mass transition of countries from globalization to protectionism, which determines their use of various means of ensuring economic security, including financial security [7], and protection of their national markets.

Digital technologies, the pandemic, the economic crisis and other circumstances in a variety of interactions can cause or at least accelerate changes in the range of real estate objects, the volume of its turnover, significantly changing (most often reducing) the liquidity of conventional objects (large apartments in the secondary and even more primary housing market, office space, and others), and causing the emergence and greater liquidity of new ones. Thus, in the last decade, trends of reasonable savings and co-consumption of real estate have intensified, which have led, for example, to properties with a function, such as coworking (collective offices) and coliving (cohabitation houses), which was indicated before the pandemic and not in connection with the economic crisis [6]. The above-mentioned patterns and events have a noticeable impact on the services sector in the real estate market, and the most significant one - on realtor activity. Thus, in the conditions of increasing competition in the real estate market, realtor organizations that consistently adopt new technologies that improve cooperation and strategic management of real estate objects get significant advantages. For

example, these ones that use geoinformation services through the Geomanagement app [1], which supports the implementation of the business strategy of a real estate brokerage agency based on the mobility and joint work of its employees. At the same time, the legal regime of real estate activity does not have sufficient certainty and special legal regulation, which determines the relevance of the issues chosen by the author as the subject of the study.

2 Methodology

The results were obtained by using such methods as analysis, synthesis, comparison, generalization. The methodology of the study included the study of scientific literature on the selected topic, analysis of regulations governing the activities of realtors, taking into account the results of legal practice; conclusions were formulated and the publication was prepared. The study of changes in the provision of services in the real estate market has revealed a direct dependence of the very existence of the realtor services segment on the pace and completeness of their implementation of IT capabilities in the conditions of the digital revolution [8] and increasing competition on this market.

3 Results

The achievements of the Russian state in the legal regulation of certain segments of the real estate market are not only obvious, but also recognized by the international community. Thus, from May 2018 to May 2019, the Russian Federation moved from 35th to 28th place in the global ranking of countries in terms of favorable business conditions (and especially the legal environment). And it ranks the 12th in terms of 'property registration', which combines such criteria as: registering property procedures, time and cost to transfer a property and the quality of the land administration system [11]. At the same time, it should be recognized that on the microeconomics scale, legal requirements are an important set of factors that determine the profitability and even the overall efficiency of the engineering economy entities, adjusted for risk [4]. Certain segments of the engineering economy have a developed and relatively complete, and in some cases even redundant legal base in the real estate market, such as development activities, appraisal activities, and the legal status of entities engaged in such types of business. Against this background, the assessment of the level and completeness of the regulatory consolidation of the of realtor activity legal regime, including, first of all, the extreme uncertainty of the legal status of realtors themselves in the Russian Federation, appears to be negative. Currently, the activity of realtors is a necessary segment of services in the real estate market, largely serving it, speeding up the turnover of real estate, ensuring the best combination of interests of its participants, representing the interests of customers, significantly reducing the legal, organizational, economic and other risks of participants [10].

At the same time, it is difficult to explain the contradiction between the social and economic significance of a certain type of business for the national economy and the country as a whole and the degree of legal order of this type of business. What is the

justification for the lack of attention of the Russian legislator to the problems of this type of business activity? Do law-making bodies consider them not significant enough for the purposes of legal regulation? In fact, the problem under consideration is more complex, which was revealed during the discussion of the draft of the relevant Federal Law [3] (hereinafter – the Draft Law) in 2016, which proposed the introduction of such legal means of regulating realtor activity as its licensing and establishing a regime of mandatory membership of realtors in a self-regulatory organization. The discussion of the Draft Law [2] showed that the legislator faced a difficult choice, which should be preferred over the two socially significant values. On the one hand, the establishment of the legal regime of economic activity proposed by the Draft Law would entail the following negative consequences for the national economy (with a non-obvious positive effect):

- significant limitation of the already excessively regulated entrepreneurial activity, which has now made it necessary for the Russian government to apply such a radical and undisputed measure of ‘liberating’ the entrepreneur as a regulatory guillotine,
- significant increase in the costs of real estate entities, and ultimately - additional costs to customers,
- increasing complexity and difficulty for new business participants to enter this market, which would contribute to the growth of stagnation in this segment of the economy,
- expansion of the already critically widespread practice of so-called ‘shadow realtorship’ - i.e. the implementation of realtor activities not only without membership in a self-regulatory organization, but even without registration as an entrepreneur (as a realtor agency for commercial organization or as a realtor for an individual entrepreneur).

On the other hand, the establishment of requirements for realtor activity (that will become certain barriers for realtors) in the form of certification and mandatory membership in a self-regulatory organization is possible only if the following conditions are fulfilled:

- there is an objective need to change the current model of entrepreneurial activity regulation,
- there is a reason for the industry to adopt such a model of self-regulation,
- the main thing is that realtor activity has a high potential risk of damaging the rights, legitimate interests, life or health of contractors and third parties.

According to the participants of the legislative process, the activities of realtors do not meet these requirements. However, it is difficult to agree with this conclusion. Since the Russian state has refused the previously used licensing of real estate activities, it is possible to consider such experience as a failure, however, it has not received the necessary comprehensive analysis in the studies of historians of modern domestic law. However, after the achievement of a steady turnover of real estate and its accompanying services, and due to the presence of a large number of unskilled and/or unscrupulous participants among the subjects of realtor activity, the need to legislate the legal regime of their activities increases. Currently, the Russian Federation is not

the only country that does not use either separately or jointly any of the two main methods of public legal influence on realtor activity:

- its licensing,
- obligatory participation of realtor organizations and (or) realtors-individual entrepreneurs in self-regulatory organizations.

Thus, at present, state licensing of realtor activities is absent in Austria and Spain, therefore, on their territory, as in Russia, any commercial organization can carry out realtor activities if this type of its entrepreneurial activity is indicated in its Charter and, accordingly, in the country's commercial register. A completely different legal regime for realtors has been established in a number of other countries that actively use institutional and legal means of state influence on participants of such activities. In the Federal Republic of Germany, for example, the participants of realtor activities are usually lawyers who have completed additional training in the relevant courses, successfully passed the exam and received a state license. Various organizational and legal means of preliminary, current and subsequent state, public and collective (corporate) control over the activities of real estate professionals and brokers are used in the United States of America. It is interesting which is for independent research.

4 Discussion

Due to the high cost of real estate objects and their special significance for the economic situation and social conditions of life and activity of the majority of participants in civil turnover, it seems reasonable to conclude that realtor activity has a high potential risk of damaging the rights and legally protected interests of contractors of realtors and third parties. It is necessary to point out the contradictory use of terms to refer to participants in entrepreneurial activity in the real estate market in domestic literature (and not only popular, but also scientific) in the field of jurisprudence, economics, and management. This can apparently be explained not only and not so much by the peculiarities of national speech, but by the use of terms by the legislative and other law-making bodies of a particular country, the historically established set of doctrinal terms adopted in national jurisprudence. Services in the real estate market, including realtor services, are being studied both in Russia and in other countries. The legal aspects of realtor activities are chosen by Russian scientists most often as a subject of independent research. In the latest works of foreign authors, real estate turnover issues, including realtor services, are usually considered comprehensively, without special attention to legal aspect. This is especially true when highlighting the possibilities of using the latest digital technologies in real estate turnover. Examples of such analysis can be the identification of: the potential of virtual and augmented reality technologies in making decisions about the purchase of real estate with high involvement [9]; opportunities for supporting cooperation and strategic management of a real estate broker based on the location of the service [1]; the key role of estate agency industry in the growth of the real estate market (in historical aspect) [5], and others. This methodological approach seems to be productive.

5 Conclusion

When determining the legal regime of realtor activity, it is advisable for the legislator to take into account the practice of using organizational and legal methods which is widespread in economically developed countries and has a positive reputation:

- admission of new participants to the realtor services market,
- ensuring the necessary qualifications and integrity of existing market participants.

The practice of using public legal means of preliminary, current and subsequent control is characterized by features that are individual for each national legal system (in the USA, Europe, UAE and other countries). The modern practice of law-making activities of the Russian state allows us to conclude that it currently has no purpose to regulate realtor activity by special rules of public law.

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The Research on Peculiarities of the Blockchain Implementation in Global Regulatory Legislations

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Abstract. The presented research provides the ethical examination of the blockchain-driven systems (e.g., Social Credit System) for social engineering with the additional analysis of its impact on the Society (efficiency) and the modifications, which the System brings to it (effectiveness). SCS from the Western perspective is digital dystopia (de Freytas-Tamura 2017). For foreign parties can use SCS as the instrument of the trust gaining and vice versa- China increases its face of the open economy by the SCS. However, behind the scope of the observation of the current research focus is the ethics of the blockchain-enabled platforms for the control of the credibility of the behavior of the parties as the System, which really makes discrimination without any appeal opportunity. Moreover, the System immediately harms the reputation of the evaluated party via blacklisting regardless the potential mistakes in these conclusions. The results appeal via the manipulations, making the errors, is possible only in judiciary procedure with rare reevaluation of the rank- SCS destroys the trust in the Society- these projects were preliminary elaborated for the control of minorities (e.g., the Sinczian and Uighur autonomous regions- largest minorities centers in PRC). Is the Blockchain in these realities blessing or a curse?

Keywords: DLT · Blockchain · Effectiveness · Efficiency · Ethics

1 Introduction

On the current agenda of the global business operations (particularly in the niche of the fintech business the tendency of the clash of two positions is remarked as the actual tendency of the contemporary context. The companies are demonstrating their propensity for cutting of the costs for initial authentication and verification of the statements and of the reports on the operations and on the financial “health” and for the enterprise sustainability in the multiple spheres of its external environment. Therefore, the need of the solutions for the simultaneous verification of the validity of the financial reports and for retrieving of the footnotes from the different sources is remarkably demonstrated by the business enterprises and their stakeholders. The balancing in-between the “code opening” for management of the costs from the managerial perspective and the “secure of the

provided information” from the illegal use by the competitors and by other players in the fraudulent way is highly requested agenda of today.

The peculiarity of the global blockchain agenda of today is that they are overused and overdeveloped on the market of the transactions with the cryptocurrencies and they are not employed in the full sense and appear not to be efficient enough in the scoring procedures and in the verification of financial of the multiple documents with the different structure on the initial stage of the call scoring, which is usually applied during the evaluation of the applicant for credit, for the scoring of the party, calling for the loan, for the evaluation of the credibility and of the payment capacity during the evaluation of the mortgage loans affordability, and, finally, during the evaluation of the statements, provided by the different sides of the leasing deals [2].

The globalization transforms the whole structure and the conjuncture of the market of the blockchain solutions: the complex transactions provide the need to employ the algorithms, permitting to process, to digest and to analyze the big amount of the differently structured data, provided by the whole variety of the analytical interfaces. Therefore the elaboration of the workflow of the financial statements analysis becomes very topical issue and the niche for the new market [4].

From the very trivial analysis we can receive that the so-called “Distributed Ledger Technologies” (DLT) are usually employed for the validation for the verification and for the certification of the peer-to-peer transactions, and employed mainly in the electronic commerce deals. The footnotes of the data on all of the peers of the transaction and the group of the similarly structured transaction footnotes formulate the block of the data [6].

The implementation of the blockchain and of its application facets is now arranged in the “umbrella brand” way: the blockchain facets are now employed during the asset introduction in the production flow, its registration and reflection in the different financial statements, in the authentication of the footnotes on the value of the brand and of other intellectual assets, patents and the right of the use of the multiple intangible assets in the production and upgrade process of the music production and pieces of art composition up to the imitation of the contemporary behavioral transactions [8]. The attempts of the employment of the blockchain technologies on the level of the global governance are today arranged in the very cautious way. The need of the undertaking of the measures for the securitization of the different secret assets. The status quo is that there is the consensus in understanding in- between miners of the data, administrators of the blockchain transactions, and the users of the digested reports is the “hype” of the DLT and the shady grey character of the transparency of their operations. The complex character and the intensification of the speed of the growth of the transactions provokes the necessity of the elaboration of the measures for its authentication, verification, and control of the results [3].

2 Methodology

The presented research paper is done with the application of the pool of the methods of the analytical sources analysis and synthetical modeling of the results. Under the scope of the observation were put the sources, dedicated to the analysis of the Social Credit

System from the perspective of the pool of the parametres, dedicating to its characterization as the socio-engineering IT-enabled project, owned and initiated by the Government, but mainly administered by the private enterprises. From this perspective the Social Credit System is to be analysed from the offensive realism perspective and the key characteristics, which were the main categories of the analytical overview of this System were: its effectiveness, its efficiency, and its ethics.

Under the “effectiveness” dimension was understood the grade of completion of the Social Credit System of all of the “expectations” of the Government, which were imbedded in the Special Government report, dedicated to the strategy of the development of the Social Credit project. Under the “efficiency” of the System as of the mechanism, transforming the behavior of the population is understood the grade of the growth of the “behavioral consciousness”: how significantly the proportion of the misleading acts has decreased in comparison with the situation before the introduction of the System.

Under the certain precious attention and thorough observation are put the articles and papers, dedicated to the critical overview of the Social Credit System as the project, which is potentially interfering in the Human Rights, is potentially violating the personal privacy, the secrecy of the personal private life of the citizen or resident on the territory of PRC, and in the result on the macro-scale threatening to the PRC sovereignty, because of the significant amount of data, analysed within the assistance of the foreign enterprises. The next layer of the deepening of the analysis is the research of the Social Credit System as of the most illustrative case of the prototyping. The originally American scoring framework, that appeared to underperform in the application for the scoring of the parties of the economics on the financial sustainability) the framework of the scoring (FICO and Ultra-FICO) appeared to be intensively absorbed and successfully implemented in the Chinese Society with the entire philosophy of the Confucianism, with the cult of trust and ambience of total distrust in the Society (particularly in-between Society and Government) and in the realities of the increasing representation of the minorities (from the very first stages of the integration the Social Credit System was to provide the symmetry of knowledge in case of the natural asymmetry of information of the mental particularities of the concrete minor people, living on the territory on People’s Republic of China.

3 Literature Review

3.1 The Implication of the Blockchain in the Global Business Operations

Today the blockchain is the most frequently employed in the niche of the emissions of the cryptocurrencies. The course rates, the monetary rates, the rates of the prices of the financial instruments are monitored, controlled and maintained by the supra-national and global financial regulatory institutions, having their impacts on the private regulation of the relationships on the principles of the private law and the regulation of the public responsibility of the parties on the basis of the public law [2].

The implication of the blockchain algorithms and of the DLT protocols in the public law appears to be the emerging and promising solution: the global transborder

trade in-between different states and the operations of the companies, operating in the multiple jurisdictions. The Belt and Road Project, launched by China, within the administration via the blockchain is focused on the monitoring and control of the circulation of the goods as well as the control of the legal nature and of the transparency of the financial flows [4]. The leadership position on the blockchain market is taken today by PRC and by the USA. PRC is well known expert in the prototyping and of the scaling of the models, while the USA are keen on the elaboration of the brands, of the intangible assets, and on the creation of the whole bunch of the instruments and of the facilities for their protection against the fraudulent actions, against the industrial espionage. Both PRC and the USA are today struggling with the decrease of the leading role on the arena and with the emergency of Australia, Denmark, Hong-Kong, and India as the new blockchain producers [6]. The emergency of the blockchain is today remarked in the contract management, in the procedure of the due diligence, where the conventional scoring systems of traditional behavioral scoring appear to be underperforming, expensive, conflicting with each other and generally incapable to perform o the extensive growth of the scope of the observation [1].

3.2 The Place of Blockchain in International Finance

Due to the fact that the organization of blockchain network with the entire currency offerors validation as well as organization of transactions ecosystems as peer-to-peer information exchange the currency exchange and smart-contracts on the smaller scale and the blockchain as the whole system requires several levels of document regulation, counter-agents validation and different levels of document observations [8].

The entrepreneurial application of the blockchain appears to the most empirically applied solutions when it is applicable to several groups of stakeholders with the different level of influence and within this framework the blockchain is requiring the set of institutions, security and cross- control instruments and mechanisms, which are to sustain the in fact peer- to-peer market on the large platform of different counteragents. Entering as the offeror of the cryptocurrency the company has to determine its strategy, limits, and schema of the operations with cryptocurrency and leverage which the crypto currency issuer should undertake to sustain, support, and make volatile on the global market the perspective cryptocurrency [3]. In the application of blockchain projects on the global business scale there is the challenge of extrapolation affordability the weak point is left untouched and undeveloped aspects in readiness and legislation of disclosure of the data protocol and disclosing the code in the way of the open technology innovation as well as its concrete application on the market. The next critical milestone of this type of interaction is monitoring and control of non- fraud coding, which is crucial field, needed for the interactions and transactions ground viable, sustainable, and resistible to the external attacks [5]. During the fundraising the new born-global enterprises launch and employ the multiple blockchain infrastructures, which are multi-branched, served in different states and therefore require the intergovernmental monitoring and control.

4 Results

Distributed ledger technology (DLT) from their nature are to be a crossjurisdictional, complex, global and unified deployment. Lawmakers and initiators of other type of asset regulation and control are to collaborate across national borders to make the regulation soft, harmonious and flexible, in the diligence of deus and of potential risks of new projects, including the risks for manipulation of market on the smaller scale, which could result at the monopolization in future on the larger scale. In order to make the sustainable answer for this issue from the organizations would be required the elaboration of significant organizational and legal modifications for elaboration and adoption of the mechanism for synergetic collaboration to alignment insurance [3].

Particular issue, which is matter for the claims is the storage of the data, cloud and platform technologies and different protocols, used for the data transmission. In one countries the special regime is installed as the framework for the offshoring of the crypto-bargaining, crypto-investment and fundraising with the help of the crypto currencies on the currency exchange and stock exchange platforms. In Algeria and Bolivia on the American and African continents as well as in the Asian Countries with the colonial background and with absorbed customs of doing business (e.g., Nepal, Pakistan, and Vietnam) blockchain as well as each and every DLT technology are banned at all because of their riskiness and lack of transparency [7]. In the Middle East countries, the crypto-trading is crucially forbidden from the point of the norms of the Shariah compliance. Certain states like Bangladesh, China, Colombia, Iran, Lesotho, Lithuania and Thailand) introduce the restriction tools on such shady transactions. The expertise in the issuing, emission of the crypto-currency, fundraising, and crowdfunding is very rare phenomenon of the key competence of the few countries- China (both PRC and ROC), Macau and Pakistan. It is really curious peculiarity that some of the cryptocurrencies and blockchain providers are located on the offshore jurisdictions territories (Marshall Islands, Bermuda Islands) and are represented in several specifications such as Tokenized Securities, Cryptocurrencies and Coin Offerings, and Tokenized Securities.

5 Conclusion

On the current stage of the development the Social Credit System is not officially proclaimed to be the fully operating framework, performing on the anticipated level of effectiveness (as it was proclaimed in the Government publications) and therefore its efficiency is also providing the field of the additional discussions. From the more detailed perspective it would be relevant to conclude the presence of the following constraints and counter- effects (i.e., externalities), which are already remarked within the results of its implementation:

1. The ethical aspect of any reform is that it should nor harm the good people-people, who are compliant with the institutional rules of the Social Credit System. Social Credit System harms the good people and sometimes due to the errors blacklists the people, who did not committed any acts of the misleading and, what is more, it harms sometimes for those, who performs in high ethical standards, but does not emphasizes his/her positive face.

2. On the current stage of the elaboration the Social Credit System even on the level of the official prototype performs correctly (without the errors) only on the level of the provinces. However, the Social Credit Scores are not comparable- therefore the results of the Social Credit Rating are not valid in the full sense.

3. Each of the provinces and cities, where the Social Credit System is launched, uses its own protocol of the codification of what is ethical and what behavior is considered as untrustworthy, but even on the level of one province the connotation of the one term (e.g., honesty and accuracy in payment of the bills) is understood differently- therefore, the opportunity of the creation of the one homogeneous Social Credit System on the level of the State does not appear today to be successfully completed.

4. In fact, there are 3 Social Credit lists instead of one: the Social Credit System for the rating of the citizens, the one for rating of the businesses, and the one for rating of the Government Officials. And here is illustrated one of the first Orwellian Problems of the “equality”: everyone is seemingly equal, but some parties appear to be more equal than all the rest.

This list of the claims provides the solid basis of the constraints, that do not allow to make the sustainable conclusions on the efficiency of the social Credit System project, on the effectiveness of the outcomes of the entire procedures and on the ethics of the System from the perspective of the privacy, of the exclusive ownership of Persona on its private data, the ethics of the System as the System, determining in fact the behavior of Man and actually violating his/her rights on making the personal choices and acting in the certain personal freedom.

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Innovations as a Factor of Agriculture Development in Russia

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Abstract. The rate of change in the global universe has strengthened the role of innovations in the economic development of enterprises, industries, and states. Today, agriculture is one of the Russian economy drivers, and it has sustainable production growth and strong positions at the world food market. Russia intends to develop export supplies of agricultural products in order to increase contribution to solving the world food problem. The solution of this task is impossible without increasing an innovative activity of agricultural producers. The author identified the factors that contribute to the current development of Russian agriculture and assessed the role of innovations in the process of economic growth in the industry. The methods of theoretical and economic and statistical analysis were used to study special aspects of Russian agriculture and world and national trends in the innovative development. The results allowed to conclude that the agricultural production growth in Russia was provided by an integrated influence of extensive and intensive factors of the economic development, and the contribution of innovations to this process was very small. The analysis of current features of innovation processes in agribusiness allowed the author to work out measures to increase an innovative activity of agricultural producers.

Keywords: Agriculture · Economic development · Innovations · Russia

1 Introduction

Today, the level and dynamics of the country's economic development, industry or specific organization is determined by the ability to adapt to changing environmental conditions, resist the impact of unfavorable factors and threats, and make the best of conditions and opportunities of the business environment. It is possible to achieve competitive advantages only through the use of various innovations in engineering, technology, management, and other activities. Consequently, the development potential of any economic system is determined by its ability to implement qualitative changes, perceive and use innovations, as well as innovate. According to the results of scientific studies, 50% or more of economic growth can be achieved through innovations [14].

Russia has rich natural resources, high intellectual potential, and conditions to produce ecologically clean and natural food. An increase in agricultural raw materials and food supply to the world market is a strategic goal of the state. Innovations implementation is one of the most important conditions to ensure competitive advantages in production and sales. It will be possible to solve an ambitious task to double

the exports potential of the Russian agrifood industry only through the expansion of innovative activities. In this regard, it is very important to assess a current state and problems of innovative development of the agricultural production in Russia, as a basis to elaborate measures to intensify it.

2 Methodology

General scientific and special methods and techniques of economic research were used in this research. The methodological basis of the study is a review, analysis, and compilation of academic papers of national and foreign scientists and practitioners who are interested in the problems of innovative agriculture development and the role of the state in this process. A theoretical analysis of the papers allowed the author to identify the features of innovative processes in agriculture. Compilation of the best practices and scientists' recommendations helped to develop measures to enhance innovations in the agrifood industry.

The trends in the development of Russian agriculture, the dynamics in indicators of innovative activity of agricultural producers, and the factors affecting them were determined through the use of economic and statistical methods. The research was based on official data from Federal State Statistics Service of Russia and the Ministry of Agriculture of the Russian Federation. These data let identify the trends in the agriculture development in Russia and determine the factors that are responsible for an increase of industry's main indicators. The analysis of the dynamics of agricultural raw materials and food exports was based on data from customs statistics on the foreign trade of the Russian Federation, published by Federal Customs Service. To analyze the development of innovative processes in agriculture in detail, the author used data from studies conducted by National Research University Higher School of Economics. The research process was based on systemic and integrated approaches to the subject, and this ensured the validity of conclusions and measures.

3 Results

The Russian agrifood industry and its central sector, agriculture, is a strategic branch of the economy that provide the country with food and economic security. Today, agriculture is one of the drivers in the Russian economy. This industry demonstrates sustainable development trends, which were triggered by implementation of the import substitution program adopted in response to imposed sanctions. According to official statistics, the volume of agricultural production increased by 7.6% in 2018 compared to 2015 (Table 1). According to preliminary estimates from Federal State Statistics Service, the index of agricultural production also had a positive trend in 2019 and amounted to 104% (compared to the previous year).

Table 1. Main indicators of agricultural development in the Russian Federation

Indicators	2015	2016	2017	2018
Agricultural production indices in enterprises of all types (at constant prices), %				
By the year 2015	100	104.8	107.8	107.6
By previous year	102.1	104.8	102.9	99.8
Growth rate of product exports in agribusiness industry, %	86.0	104.7	121.4	119.3
Sowing areas of crops at enterprises of all types, thou. hectares	78,635	79,312	80,049	79,634
Livestock inventory at end of year at enterprises of all types, mln. heads:				
Cattle	18.6	18.3	18.3	18.2
Swine	21.4	21.9	23.1	23.7
Sheep and goats	24.6	24.7	24.4	23.1
Poultry	544	550	556	541
Mineral fertilizers used per one hectare of total sowing area, kg:	42	49	55	56
Purchase of new equipment in agricultural organizations (% , at end of year):				
Tractors	3.0	3.3	3.6	3.4
Combine harvesters	5.3	6.6	6.4	5.6
Energy power capacity per:				
One worker, hp	74.3	77.1	74.5	80.2
100 ha of sowing area, hp	197	200	198	200
Index of physical quantity of capital investments in nominal capital of agriculture by 2015, %	100	112.2	116.5	121.5
Productivity index against the previous year, %	104.2	102.6	105.3	101.0

Source: author based on [4].

The volume of agricultural products makes it possible to meet not only the country's food needs, but also to increase its exports potential. The growth rate of exports exceeds the expansion rate of output of products. According to official customs statistics on the foreign trade of the Russian Federation in 2018 and 2019, the annual volume of exported agricultural raw materials and food amounted to almost 25 billion US dollars, which is 1.5 times higher than the same indicator in 2015 [2]. It is planned to increase the exports supply of agrifood products to 45 billion US dollars by 2024. Russia can achieve such a high indicator only through the further increase in the volume of agricultural production and product competitiveness.

Table 1 shows that agricultural production growth in 2015–2018 was achieved through the integrated use of extensive and intensive development factors. Not only sowing areas of crops, livestock, and poultry increased within the period under review, but also the intensity level of agricultural production was on the increase. Mineral fertilizers per 1 hectare of sowing area were used more. Due to the growth of investments in nominal capital, purchases of new tractors and combine harvesters increased, which led to an increase in energy security and power supply per production unit. The production intensification contributed to the labor productivity growth. At the

same time, when analyzing the indicators of agricultural development of the Russian Federation, it is necessary to note the trend of slowing the growth of indicators or even a slight decrease in 2018, which was caused not only by unfavorable natural and climatic conditions in agricultural production (typical for that year), but also by the gradual exhaustion of reserves for production growth due to extensive factors. Therefore, to increase production, more attention should be paid to the intensive factors of economic growth, that is to say, innovations.

The innovative activity development of enterprises in the agribusiness industry is one of the options of strategic development of the Russian Federation. State programs and projects have been developed, and budget funds have been allocated in accordance with this strategy. We can observe the results of these measures in agriculture through analyzing the dynamics of indicators of enterprises' innovations in the industry (Tables 2, 3).

Table 2. Indicators of agricultural enterprises' innovations in the Russian Federation

Indicators	2016	2017	2018
Sales of innovative goods and services, bln. roubles	22.2	28.4	33.8
Innovative goods and services as a percentage of total sales, %	1.4	1.8	1.9
Expenditures on technological innovations, bln. roubles	15	15.8	22
Expenditure on technological innovation as a percentage of total sales, %	0.9	1.1	1.2

Source: author based on [5].

Table 3. Implementation of various types of innovations in agricultural production in the Russian Federation (2018).

Economic activity	Enterprises engaged in innovations of specific type (% of all enterprises)			Overall level of innovations, %
	Technological innovations	Organizational innovations	Marketing innovations	
Growing of non-perennial crops	5.2	1.0	0.4	4.0
Growing of perennial crops	2.2	0.7	0.3	1.4
Plant propagation	14.3	–	–	5.6
Animal production	4.7	1.1	0.7	4.2
Mixed farming	16.3	–	–	9.4

Source: author based on [5].

The volume of innovative goods and services produced by agricultural enterprises increased by 1.5 times over the period 2016–2018, which is significantly higher than the growth rates of similar indicators in the food industry and an average of the Russian economy, 19% and 3.5%, respectively [9]. At the same time, the share of innovative goods and services as a percentage of total sales in agriculture does not exceed 2%,

which indicates an extremely low performance of innovation. The reason is a low involvement of agricultural producers in the innovation process. On average, only about 4% of agricultural organizations carry out various types of innovations [20].

Technological innovations aimed at improving the production efficiency prevail in agriculture, which is typical for most labor-intensive and capital-intensive sectors of the economy [18]. Expenditures on technological innovations increased by 46.7% (from 15 to 22 billion roubles) over the period under review, and their share in the total cost of innovations was almost 99%.

Technological innovations in 2018 were actively used by agricultural enterprises engaged in both crop farming and animal husbandry, that is, mixed farming, and enterprises planting propagation material, 16.3% and 14.3% of the total number of these organizations, respectively (Table 3). However, the contribution of these types of economic activities to the total volume of agricultural goods does not exceed 1%. Therefore, they cannot affect the overall innovation activity in the industry. The structure of agricultural production in the Russian Federation is dominated by animal husbandry and growing of non-perennial crops. Only 4.7% and 5.2% of enterprises used technological innovations in these types of activities.

There were 72.6% of process innovations and 27.4% of product innovations in the structure of expenditures on technological innovations. Process innovations in agricultural production are represented by the development and implementation of new or advanced production methods, new methods to build production processes, and management innovations. Product innovations include the use of new materials that increase the agricultural production efficiency (fertilizers, plant protection products, animal feed, etc.), the use of selection and genetic innovations (new plant varieties and improving genofond in animal production), as well as the production of fundamentally new products [13].

The most popular technological innovations in agricultural enterprises are purchases of machinery and equipment. 62.4% of total expenditures on technological innovations were allocated to buying new machinery and equipment in 2016, and the share increased to 66.3% in 2018. Technical re-equipping and modernization is gaining strength, and it is extremely necessary because there is a current lag in technology between national agriculture and farming in developed countries. The focus on the digitalization in agriculture assumes that agricultural producers have current technology and equipment. Today, large agricultural enterprises and holdings take the largest interest in innovative and digital technologies in Russian agriculture [1, 8]. The penetration of new technologies in agricultural production of small businesses is significantly low, and the innovations tend to be ameliorative in nature [20]. Seeing that about 1/3 of the total output belongs to households of citizens and 12% belongs to peasant (farm) households, the overall volume of digital technologies is small. According to scientists' estimates, only 10% of arable land in Russia is processed with the use of precision farming technologies, and no more than 5% of Russian agricultural producers use elements of Internet of things [19]. 1% maximum of Russian agricultural enterprises used the organizational type of innovations in 2018. According to Federal State Statistics Service data, 69.2% of these enterprises implemented modern quality control systems and certification of products, works, and services. 61.5% of enterprises introduced new schemes (methods) of labor motivation, and 50.0% implemented measures to promote personnel.

Marketing type of innovations is less common in agriculture in the Russian Federation. Only 0.7% of enterprises that produce livestock products and 0.3–0.4% of farms that grow crops used this type. The most popular marketing innovations in these organizations were the following. 81.3% of enterprises, which implemented marketing innovations, significantly changed product packaging. 75% of organizations implemented a new marketing strategy aimed at expanding the part of consumers or sales markets, as well as used new techniques to promote products. 68.6% of enterprises used new pricing strategies when selling goods and services.

Organizational and marketing innovations do not require high expenditures on their implementation, but they can bring a significant effect to the production and enterprises' economic activities, ensure the growth of product competitiveness, and increase the added value of end products. Extremely low level of innovative activity of agricultural enterprises in these areas is unjustified. Various types of innovations are closely interrelated. For example, technical updating of production requires personnel development, affects production processes and production activity, and generates a need for managerial innovations. All in all, innovation activities should be integrated in nature and ensure interconnection of all types of innovations. Under these circumstances, it will be possible to achieve the effect and return on investment.

4 Discussion

Analysis of the reasons of agricultural production growth in the Russian Federation let arrive at the conclusion that the increase was achieved due to the integrated influence of extensive and intensive factors of the economic development, and the role of innovations was insignificant. The innovative development of agriculture is inertial. Russian agricultural producers implement some innovative projects, but the introduction of innovations in the industry remains extremely low, which hinders the growth rate in the agricultural sector of the economy.

Further economic growth in the agrifood industry and solving an ambitious task to achieve a significant increase in agricultural raw materials and food exports is possible only through a substantial increase in the innovative activity of agricultural producers, as the opportunities for extensive growth and industrialization are limited.

Globally, innovations based on digitalization have replaced the traditional drivers of economic growth. Digitalization is currently one of the most significant trends in the world, and it has and will have an impact on the agricultural sector [6]. In the digital economy, the main role is given to such options as artificial intelligence, robotics, quantum calculations, and development of information and communication technologies and computing infrastructure [12]. Digitalization significantly changes the world economy, our environment, and the quality of life.

The Russian agricultural economy needs to be involved in this process in a more active way. Since 2019, the Ministry of Agriculture of the Russian Federation has been implementing the institutional project “Digital Agriculture” [3]. There are already positive results of effective use of precision farming technologies, precision animal husbandry, and Internet of things by national enterprises and peasant (farm) households [8].

The fact that digitalization supports significant economic, social, and environmental benefits is widely recognized. The potential demand for these innovations is several times higher than their actual usage level. This is due to the fact that the introduction of new technologies both in Russia and all over the world is associated with some obstacles. Scientists and researchers study the factors which affect the process of introducing innovative technologies in agricultural production in order to identify the reasons for delay of innovative technologies penetration into the industry. Foreign scientists distinguished the following factors: relative advantage, motivation, and complexity of adoption process [15], small size of cultivated lands [16], collision of ethical points of view and legislative obstacles [7], climate variability and economic risks [17], and others. Most of these factors are also relevant for Russian farmers.

The research conducted by National Research University Higher School of Economics allowed to identify the factors that mostly constrain the innovations usage in the Russian agriculture [11]:

- economic factors (shortage of personal funds and state financial support, and high cost of innovations),
- internal factors (shortage of qualified personnel, low innovation potential of enterprises, and lack of information about new technologies),
- other factors (natural, climatic, and biological risks associated with living systems in agricultural activities; regular risks associated with ensuring constant quality of agricultural products; delay in results of scientific and technical innovations in agriculture).

To neutralize the factors that hinder the innovative activity of agricultural producers, it is necessary to develop special mechanisms. First of all, this is ensuring accessibility to innovations for all farms in the agrifood industry. As potential consumers of innovations in Russian agriculture have insufficient funds and low borrowing capacity, innovation processes are impossible without the state participation and effective state support. Private investors unwillingly invest in the agricultural production development, as it requires a lot of money and does not guarantee quick return on investment.

The practice of innovation processes development shows that the state should play a key role in building the innovation environment and promoting business structures, as well as in financing fundamental science and inventions [18]. Public-private partnership guarantees good results in combining forces of the state, science, and business in innovation area. Public-private partnership in foreign countries is a popular mechanism to promote innovations. This is a brilliant example of common efforts where private actors integrate their resources with the ones of public sector organizations, such as government agencies and universities, in a long-term collaboration to provide added value for all involved [10].

To involve small businesses in innovative processes, it is necessary to develop the rural information and consulting services activity. Such services are available in all developed countries. The more the society is developed, the higher the level of demand for these services is, the more these services are powerful and their activity is efficient, and the more the state invests. Current Russian information and consulting services need to use digital technologies of data sharing in a more active way. The large use of

mobile technologies increases the access to information about innovations, market conditions and finances for small farmers and private households, and makes consulting and training more accessible. The Institute of Agricultural Consulting can become a center of innovations distribution providing agricultural producers with information about innovative technologies and helping them implement innovations in production. The Institute can also serve as a link between small businesses and science to form orders aimed at conducting scientific researches. National and foreign experience shows that these events can increase innovation activity in the agrifood industry.

5 Conclusion

There is a significant potential to increase the production and exports of agricultural raw materials and food through intensification of innovations in Russia. The study showed that this direction of economic growth in agriculture is used on a very limited scale due to the low involvement of agricultural producers in innovative processes. At most 5% of agricultural enterprises introduced technological innovations over the past 3 years, and the share of organizational and marketing innovations did not exceed 1%. At the same time, the potential demand for innovations significantly exceeds their implementation. The best practice attests to the fact that the key role in the innovation process development should belong to the state. There is a need to implement measures aimed at increasing the introduction of innovations in all categories of farms in the agrifood industry. An effective chain of interaction between agribusiness, the state, and research institutions can be achieved through the use of public-private partnership. Involvement of small businesses in the innovation process is possible through intensification of rural information and consulting services activity. Only the cooperation of agricultural producers, scientific institutions, and the state's forces can make breakthrough in the innovative development of the Russian agriculture, and thus provide long-term competitive advantages to the national agrifood industry.

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The Concept of Shared Value in Ensuring Territories Inclusive Development

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Abstract. The article analyzes the concept of CVS value from the point of view of ensuring the inclusive development of individual territories. It is assumed that the relationship between social and economic progress can stimulate new waves of global development. The research used such methods as benchmarking, the method of scientific abstractions, and methods of analysis and synthesis. Conclusions are drawn on the possibility of creating economic value through the formation of social value; the criterion for evaluating genuine social entrepreneurship is considered in terms of its ability to create shared values, not only social benefits, and to ensure the inclusiveness of the development of territories where the company is present, value must be created not only for shareholders, but also for society as a whole.

Keywords: Concept of shared value · Creating shared value (CSV) · Inclusive development index (IDI)

1 Introduction

The current state of national economies, the uneven development of not only individual countries, but also territories within them, has prompted scientists and practitioners to search for new forms of assessing the economic development of countries and territories. The inclusive Development Index has become such a form [9], which was agreed upon at the World Economic Forum in Davos in January 2018 [19]. The WEF report states that the emergence of such an index was due to the fact that “Decades of prioritizing economic growth over social justice have led to historically high levels of inequality in wealth and income. This has forced governments to skip a virtuous cycle in which growth is enhanced by wider distribution and generated without excessive environmental pressure or burdening future generations [5]. IDI is a comprehensive indicator that is formed from values such as growth and development; inclusiveness; and intergenerational equity and sustainability.

As a rule, the inclusive development includes governments of countries and regions. However, we suggest that companies can have no less influence on the inclusive nature of the development of their territories of their presence, including through the creation of shared values. The idea of creating shared values is not new.

The ideologists of “humanistic capitalism” Porter and Kramer suggested the concept of creating shared value (CSV), the idea of which is to strengthen the relationship between social and economic progress, which can become the source of a new wave of global development [13].

The CSV concept was presented as a “Big idea” that could help treat the “ills of capitalism”, namely uneven development and social inequality. As a result, the concept of CSV is firmly rooted not only in the field of business strategies, but also in the broader context of finding solutions to overcome the disappointing consequences of the financial and economic crisis of 2007–2008. The concept of CSV consists of constant practices and policies implemented by the company, aimed, on the one hand, at ensuring competitiveness, and on the other, at creating favorable socio-economic conditions for the communities within which the company operates. In this case, the value itself is defined as the ratio of the received benefit and the corresponding costs, and not just as a benefit itself.

The discussion about the complete collapse of the financial system and the following Great Recession has been led by many authors, including Chang [2], Cristiano, Eichenbaum, Trabandt [3], Crouch [4], and others. In recent years, the debate has become even more fundamental, with economic commentators such as Mason [11] and world-famous scientists such as the economic sociologist Streeck [16] even predicting the imminent demise of the capitalist system. Even before the beginning of the pandemic, almost all developed countries of the world faced economic instability, uneven development of various regions and territories of these countries, and in 2020, these problems only increased. The concept of CSV is an important contribution to one of the most acute economic debates of our time, which deserves attention and further study.

2 Methodology

The analysis presented in this article does not address the question of how to fix capitalism or the macroeconomic consequences of the Great Recession. The focus of our attention is the concept of CSV and ways to implement it in a comprehensive way. First, we analyzed the rating “Change the Word list” – “List of companies that change the world for the better”, compiled by Porter and Kramer [13]. 51 companies out of 200 studied were included in the rating. The assessment was based on a set of criteria including the following:

- innovative approach to doing business,
- social effect that illustrates the scale of changes in the lives of a large number of people,
- availability of competitive advantages for the company as a result of using the CSV concept,
- the impact of “shared value” on the company’s primary activity.

Then we looked at how the CSV concept can be used out of the companies. According to the concept of CSV, companies participate in different markets to create social and economic value, but Porter and Kramer do not analyze the nature of markets and do not explain how social value is created using market mechanisms [13]. To

conduct the research, we used such methods as benchmarking, the method of scientific abstractions, methods of analysis and synthesis, which provide a systematic, integrated approach to a complex (multi-element) object of research, which is the concept of CSV.

3 Results

So, we analyzed the Change the Word list rating, as well as the practices of such companies as Google, IBM, Intel, Johnson and Johnson, Nestlé, Unilever, Wal-Mart. As a result, we have identified new challenges for the development of the theory and practice of the CSV concept.

The first task is to create a system for measuring the created benefits. The shared values that arise from implementing business strategies that offer benefits to both clients and companies (as well as the markets in which they are created) differ from each other and are embodied in different combinations of resources and capital. To study these complex effects and benefits, new research methodologies and flexible approaches to assessing changes based on social, environmental, and management indicators are needed. If the methodological work is successful, then over time, companies that support CSV will be able to get reliable information and declare their contribution to the achievement of sustainable development goals [15]. Table 1 provides a list of possible measurement focus, as well as an explanation of what, for what, and for whom to measure.

Table 1. Defining goals for measuring the benefits created within the CSV concept*

The measurement focus	What we measure	Why we measure it	For whom we measure
Stability	the effectiveness of the company's use of resources, the nature of product improvements and their impact on the community of the company's presence territory	reduce the negative and increase the positive impact on the presence territory	- leadership; - external stakeholders
Reputation	how does social influence contribute to a company's reputation	to manage reputation	first of all, the management
Accordance	compliance with legislation, public policies, standards and codes	- guarantee application and compliance; - to preserve permission for activities	- leadership; - external stakeholders
Determining the degree of influence	the degree of long-term impact of the company's activities on the social and economic development of the territory of its presence	assess the dynamics of changes in the impact on the social and economic development of the presence territory	- external stakeholders
Common values	unity of business and creation of common values	increase the total created value	- first of all, the management; - external stakeholders

Source: authors.

The second task is to create “rules of the game”. Some of the pioneers of the CSV movement – such as Nestlé or Unilever claim that many of their enterprises initially worked with the interests of society, but failed to significantly influence the basic values of capitalism. This fact suggests that the system will not change until there are new laws, institutions, and standards of business practice [14].

The third task is to publicly demonstrate the achievements of companies using the CSV concept. Google, IBM, Intel, Johnson and Johnson, Nestlé, Unilever, and Wal-Mart are among the companies that are actively involved in creating shared values.

The fourth task is to raise awareness about the possibility of combining the solution of social problems with the simultaneous implementation of profitable strategies. Volans company consultants (London), identified three possible options for the future of the CSV concept [18]:

1. option - rollback and depression,
2. option - gradual, “unhurried” movement forward,
3. option - a revolutionary breakthrough (exponential development).

Which of these scenarios will become a reality depends on the willingness of corporations and key stakeholders to join forces to create a new context in which entrepreneurs’ focus on creating economic, social and environmental values that meet the needs of all involved parties will become the accepted norm of business behavior.

It should be noted that at the present stage, there are a number of factors that determine the contradictory attitude of business to the concept of CSV, namely:

- business, as a rule, does not consider the solution of social problems as an opportunity to create economic value,
- as a rule, both state structures and numerous public organizations view success either from the point of view of a social result, or from the point of view of spent funds. This also creates difficulties in implementing social entrepreneurship projects,
- the process of forming a generally accepted idea of the potential and tools of implementing the CSV concept is still in progress.

Many experts also consider the concept of CSV as a kind of “Corporate social responsibility” (CSR) or a contribution of companies into the “Sustainable development of society”. For example, Borzakov, in his work “Development of the concept of corporate social responsibility: creating common value”. Judging from the title, he considers the concept of creating common value as the development of the concept of CSR [1]. But comparing these two concepts, he reveals clear differences (Table 2).

Table 2. Comparative analysis of CSR and CSV

Corporate social responsibility (CSR)	Creating shared value (CSV)
Values: activities for the benefit of society	Values: economic benefits and social benefits comparable to costs
Citizenship, charity, sustainable development	Joint work of the company and the community on creating values
Programs are implemented at the sole discretion of companies or under pressure from outside	Inextricably linked to competitiveness
Lack of connection with activities aimed at maximizing profits	Inextricably linked to activities aimed at maximizing profits
The programs “Agenda” is defined by external reporting tasks and personal preferences	The “Agenda” reflects the specifics of this company and is formed within the organization
The impact/effects are limited by the corporation “operational footprint” and the CSR program budget	Complete restructuring of the company’s budget
Example: Fair/mutually beneficial trade	Example: Reorganization of work with suppliers in order to increase profit and product quality

Source: authors based on [1].

A number of authors liken the concept of CSV to the concept of “sustainable development”. To clarify the situation, we conducted their comparative analysis, the results of which are illustrated in Table 3.

Table 3. Comparative CSV and the concepts of “Sustainable development»*"

“Sustainable development” concept	Creating shared value (CSV)
Promoting sustainability is a broad concept that reflects the need for public goods, systemic changes and measures to prevent difficulties arising from current social and/or environmental issues	CSV is a business strategy and/or decision-making practice aimed at obtaining competitive advantages in the process of business activity carried out considering the population needs. By applying the CSV concept, companies view society’s requests in the context of business and discuss them in market terms
The sustainable development strategy is designed in order to better manage risks and achieve greater social results without any special deviations from the established business model	The use of CSV offers new opportunities to generate profits and/or explore new markets while addressing complex issues such as unemployment, climate change, inequality, etc. For example, thanks to the Ecomagination initiative, which is focused on the development of energy-saving technologies, the American corporation “General Electric” (GE) has almost doubled its revenues within five years

Source: authors.

As you can see, the CSV concept can be considered as a specific approach to company development for the following reasons. Firstly, the CSV concept differs significantly from the “normal” business in its innovation, in its various manifestations, since the “shared value” is usually the result of the development and implementation of a new product, model or technology. As an example, we can analyze the experience of “Discovery” insurance company (South Africa), the leader of the global insurance market. She offered her clients the “Vitality” insurance program, which promotes a healthy lifestyle and radically changes their approaches to doing business. So, firstly, for visiting fitness centers, “Discovery” customers received incentive points that affect the amount of discount from insurance premiums. Today, this insurance product has evolved into a system that covers not only physical education, but also many other aspects, including nutrition approaches. The unified database integrates information from the “Vitality” company’s card, launched jointly with partner organizations (health food stores, swimming pools, etc.), as well as information from smartphones, which are reliably recorded in the database and processed automatically by Big Data algorithms [7].

Secondly, a study of the practice of implementing the CSV concept has revealed that innovations that contribute to the emergence of a common value are a variable combination of 20 models and work methods that have been recorded nowadays. For example, in the framework of the project to support women entrepreneurs in India (Project Shakti), “Unilever” uses a microfinance model, and the Norwegian fertilizer producer “Yara” stimulates the growth of the local economy by creating corridors for the development of agro-industrial clusters in Africa [10].

Third, CSV can be implemented as a business strategy that generates market advantages in the process of solving social problems. Thus, the company, taking care of the environmental safety of its products, can increase the volume of its sales. An example of implementing such a strategy is “Unilever” company, which has doubled the size of its business by betting on the environmental safety of its products, showing customer orientation. The company has included tasks that reflect the implementation of the CSV concept in the corporate “The Sustainable Living Plan” [17].

Fourth, the CSV concept implements large-scale initiatives that are commensurate with the business sizes. For example, by developing enterprises in its supply chain, the retail chain of TFG fashion stores improves the economic situation of many local ateliers, design firms and clothing factories, creating conditions for inclusive economic development.

Fifthly, the investors, clients and partners support of the CSV idea awakens the interest of the companies to innovative activities developing that can find new business consumers who are limited in access to certain products and services, that is, again implementing the principle of economic development inclusiveness. Earlier organizations that have already gone through the most difficult stages of developing and launching CSV initiatives are likely to retain their leadership status, and less agile companies will follow their example, or lose the trust of stakeholders and further prospects. Combining social values in the form of investments that are directed to social and environmental goals and business values in the form of investments in long-term competitiveness and creates a common value in the form of investments in long-term business competitiveness that meet the social and environmental goals of society,

creating conditions for inclusive development of the territories where these companies operate. Levels of shared value creation can be described as follows. Revising the concept of productivity in the “cost-value” chain allows to optimize processes in terms of their efficiency and productivity, as well as reduce the risk of social problems. If a company analyzes existing social problems from the perspective of shared values and finds ways to solve them, then we get increased synergy and conditions for inclusive development.

Rethinking the concepts of products and markets takes place by expanding access to products and services that meet the customers needs, which also meets the principles of inclusive development. Today, such categories as the structure of demand and the mechanisms of its formation are studied in detail, but not enough attention is paid to the aspects of the product’s utility for the consumer. Isn’t this the basis of customer orientation?

The development of local (territorial or cross-territorial) clusters creates conditions for improving the environment that affects business and alleviates social problems, due to the fact that no company is self-sufficient and its success depends on related organizations and the surrounding infrastructure, which in turn creates conditions for small companies to access it. In Table 4, we illustrate what social and business outcomes can occur at each of the levels of shared value creation.

Table 4. Social and business outcomes that occur at various levels of shared value creation*

Level of shared value creation	Social results	Business results
Redefining the concept of productivity in the value chain	<ul style="list-style-type: none"> - reducing emissions of harmful substances into the atmosphere; - improvement of health conditions; - improved nutrition; - improved education 	<ul style="list-style-type: none"> - increased revenue; - increased market share; - market volume growth; - increasing profitability
Rethinking the concepts of products and markets	<ul style="list-style-type: none"> - reducing the amount of used energy; - reducing water consumption; - reducing the natural resources consumption; - employees professional development; - growth of employees’ income 	<ul style="list-style-type: none"> - growth of labor productivity; - reduced logistics and operating costs - increased security of supply; - improving the quality of products/services; - increasing profitability
Promoting the development of local clusters	<ul style="list-style-type: none"> - increasing access to education; - growth in the number of workplaces; - reducing the level of morbidity (occupational diseases); - growth of the population income 	<ul style="list-style-type: none"> - cost reduction; production - increased security of supply; - improvement of products/services distribution infrastructure; - increasing access to the workforce; - increasing profitability

Source: authors.

There are also objective obstacles to the spread and development of the CSV concept. First, the interests of shareholders still dominate the tasks of social development, so many corporations still focus on short-term horizons and pay increased attention to financial indicators. In addition, companies in the financial sector broadcast “profit priority” to companies seeking loans, which, in turn, seek to meet the requirements of investors.

Secondly, the social sentiments are that people do not believe in business altruism. Such sentiments were predetermined by the practice of corporations, which often created or aggravated environmental and social problems, so it is very difficult to believe in their intention to fix the situation - even though the activity of entrepreneurs has already saved many people from poverty in different countries.

Third, corporations use social programs for effective “PR”. Companies are actively demonstrating social responsibility in times of increasing tension in society. Enthusiasm fades over time, and the habit of loudly proclaiming good deeds (unrelated to the core business and corporate culture) remains. This process can be traced in the current conditions of the Covid-19 pandemic, as the pandemic prolongs and we become more accustomed to new conditions of existence, reports of actions by companies designed to reduce the problem of inequality in the state of certain regions and population groups are reported less often.

4 Discussion

What are the conditions for successful implementation of the CSV concept in business practice?

1. The culture of innovation. A corporate culture that encourages the development of new ideas will facilitate experimentation on new growth strategies.
2. Support of senior leadership. It is critical for senior leadership (CEO), to encourage shared value thinking, set the appropriate tone, and encourage the energy and creativity of the company as a whole in this direction.

We can emphasize leaders features that can set a similar tone. We analyzed the experience of active CSV participants and identified common qualities that allow CSV leaders to promote and execute complex initiatives in the dynamic context of the modern world [8]:

- the ability to see common goals for business and society is an important quality that is usually combined with the desire of leaders to solve a social problem and a willingness to take deliberate risks based on a clear understanding of the capabilities and needs of their organizations,
- system view helps CSV champions recognize signs of upcoming changes in their own industry, region, or on the global stage. For example, after seeing the need for diabetes prevention in hard-to-reach communities in South Africa, Brazil, India, and Mexico, Tracy Sims, the head of the Global Citizenship Group of Eli Lilly and Company (USA) company shared with colleagues his thoughts on the possibilities of business participation in solving the growing problem [6]. His ideas became a

source of motivation for the creation of an intersectoral partnership in the field of noncommunicable diseases (the Lilly NCD Partnership), which supports medical institutions and many patients in developing countries with the active assistance of the UN and in collaboration with national funds, programs and scientific institutions,

- the ability to interact with different players in a network format is critical for the implementation of CSV strategies, the success of which largely depends on mutual understanding between organizations and actors that have different ideas on the ultimate goals and ways of achieving them. By skilfully coordinating the discussion, leaders help their partners form a common view of the origins of social problems and make strategic decisions that allow them to achieve a positive effect for all involved parties [12].
3. Involved local management. High commitment and management are important at the level of business units and regional structures, as local managers have a better understanding of local needs and conditions.
 4. Intergovernmental interaction. CSV strategies require the support of all the necessary structural divisions of the company for synergy and integration of work into everyday activities.
 5. Focus on long-term success. Leadership focused on a long-term CSV strategy must have the patience to see beyond short-term challenges and take advantage of the opportunities for long-term benefits that are included in effective inclusive development of communities, regions, and even countries.

5 Conclusion

As a result of our research, we came to the following conclusions. Firstly, the ability to create economic value through the creation of social value contributes to the emergence of new ideas on the customers needs, productivity and external influence on the corporations success. Secondly, the focus should be on meeting multiple human needs, serving large new markets, the internal costs of existing social disadvantages, and the competitive advantages that arise from addressing social problems and creating conditions for inclusive development. Thirdly, those who had very limited resources – social entrepreneurs and companies in developing countries were the first to form shared values, for which the challenge of ensuring inclusive development is particularly acute. Fourthly, the criterion for evaluating genuine social entrepreneurship should be its ability to create shared values, not just social goods. Fifthly, in the process of creating shared values, the line between commercial and non-profit organizations is gradually blurred. Sixthly, the greatest opportunities for creating shared values are formed by the company’s core business. Seventhly, in the process of creating shared values, companies solve social problems that they do not create. Eighthly, the concept of CSR implemented by many companies is a corporate “cosmetics”, and a strategic approach is necessary. Ninthly, the concept of CSV should be embedded in all business

processes of the company. Tenthly, to ensure the inclusiveness of the development of the territories where the company is present, it must create values not only for its shareholders, but also for society as a whole, especially in the territory of its presence, which is already not an isolated example.

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Experience of Innovations Institutionalization: Interaction of the World Scientific Community

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Abstract. Institutionalization of innovations at all stages of the scientific and technical revolution of the second half of the twentieth century was carried out through the interaction of technological, economic, organizational and social factors. The research goal is to analyze the role of scientists and their interaction in the process of innovations institutionalization. Archival documents studied by the authors, materials of correspondence between Soviet, American, European, and Japanese scientists are of high research value. The article considers interaction directions of Soviet scientists with foreign colleagues to solve the most important problems of world science in the 1950s and 1960s in the field of research on the structure and properties of polymers, physical organic chemistry, electrochemical thermodynamics, creation of scientific bases for selecting catalysts to process oil and natural gases, and transmission of electricity over long distances. The authors studied approaches to solving problems of innovations institutionalization, analyzed factors that contributed to the exchange of technologies and ideas in the most relevant scientific areas. The examined documents reveal a close cooperation of the world scientific community in the first phase of the technological revolution and allow us to draw conclusions about the personal involvement of scientists in institutionalizing innovation.

Keywords: Institutionalization of innovations · International innovations · Research institutes · Scientific community · Scientific and technical revolution · Soviet science

1 Introduction

The relevance of this research is determined by the need to understand the role of scientists and researchers in the modern technological revolution. Analyzing and understanding of this issue is possible, in our opinion, with a deep consideration of the interaction experience of the world scientific community. To analyze this problem, the authors studied the correspondence of scientists who discussed current issues of the global science at the initial stage of the scientific and technical revolution. The research objectives are to identify the main research areas that were relevant for the Soviet and foreign scientists; to analyze approaches to solving scientific problems. The key task is to study factors that contributed to the institutionalization of innovations.

The period between the 1950s and 1960s was marked by researchers as the “Golden two decades» for the “staff structure” of the Soviet science. New opportunities

of that time were due to the release of tension between countries at the peak of the first stage of the scientific and technological revolution. Vizgin and Kessenich noted that scientists were promoted to one of the first places among all social institutions of mankind [13]. Currently, due to the expansion of the information space and fundamental changes in the society and economy, new views are being formed. Schwab draws attention to the multilateral cooperation which is necessary to create a unified concept in which not only scientists, but everyone can participate in the current institutional transformations [12].

2 Methodology

The nature of interaction between scientists is analyzed through the prism of anthropological methods. This approach allowed us to comprehensively consider the role of the scientist in the process of innovations institutionalization. In addition, the authors used a combination of typological and comparative analysis methods.

Documents from the Russian State Archive in Samara (RSA) were used to study the problem. The most important sources were materials of the main research institutes that were engaged in fundamental developments in key sectors of the economy at the first stage of the scientific and technical revolution. Among the documents, the main place is occupied by funds of L.Y. Karpov, the Head Research Institute of Physics and Chemistry (HRIPhCh), funds of the Energy Institute named after G.M. Krzhizhansky, funds of All-Union Design and Research Institute “Hydroproject” named after S.Y. Zhuk.

3 Results

Letters of scientists allow us to consider cooperation areas of the Soviet scientists with foreign colleagues to solve the most important tasks of the world science in 1950–1960, the most relevant research directions in the field of physics, chemistry, electricity. The correspondence of Shcherbakov from the Siberian Research Institute of Energy with a colleague from France, Gérard de Leman, scientific director of the company “General De Electricite”, was justified by the desire to solve problems of long-distance transmission of electricity. “Similar tasks are beginning to arise in various parts of the world, and I think that it will soon be possible, not to mention the distant Siberian transmission lines, to anticipate the implementation of half-wave transmission lines in other parts of the world. Therefore, I would like to ask you to indicate to me the references of your recent published works on this topic”, - Leman wrote in a letter to Shcherbakov. The company “General De Electricite “was well known to the Ministry of Energy and Electrification of the USSR, many engineers visited Moscow more than once, there was an exchange of information, but personal correspondence allows us to trace the depth of scientists’ experiences about what was happening. “I am an old electronics specialist myself < >, so I am confident in the correctness of your judgments about the use of half-wave lines for transmitting electricity at 50 Hz over very long distances. < > If you continue to work on this task and

are optimistic about its solution, it would be interesting to consider the conclusions reached by your laboratory along with the conclusions of our own research departments,” – Leman’s words in a letter to Shcherbakov sound so deeply interested. The subsequent correspondence is extremely respectful, a kind of mixture of academic writing with a friendly tone: “I was very pleased to learn from your kind letter that you continue to be interested in our work in the field of half-wave power transmission. < > We do not doubt the possibility of practical use of the operating voltage of about 1200–1300 kV in the near future and there is full confidence in the operability of power transmission at a distance of 1500–4000 km. < > I will be happy to keep in touch with you in the future,” - Shcherbakov wrote to his French colleague [1]. The letters clearly show the reality of the existence of scientists in a single community, their activities as representatives of a certain scientific school, one generation and a certain era. “We are glad that professor Yanishevsky and you are working in the same field as our institute,” Shcherbakov replied in a letter to his Canadian colleague professor Robertson - “Unfortunately, in our time we do not have final results and conclusions on the problem of alternating current transmission over long distances yet, but we hope to get them by 1975. < > We remember your visit to Novosibirsk and will be happy to see you again” [2]. All official negotiations related to the visit to the institute were conducted through the Ministry of Energy and Electrification of the USSR. The correspondence did not discuss state problems, but the scale of research allows us to draw conclusions about the existence of common scientific, global problems that scientists worked together to solve. In a letter to Dr. Shcherbakov: “It would be a great pleasure for me to take the opportunity to visit your institute in October 1968 and discuss some issues with you < >. We recently received an order from the Canadian Federal Department of Energy and Mining to design a 1,600-mile line with a voltage of about 1,500 kV to transmit electricity from oil and gas fields in the Canadian Arctic to load centers in the mid-Canadian West. This project should win the competition with pumping gas and oil through pipelines. It would be very valuable for us to visit you again and discuss our topic, get acquainted with the current state of your research. < > Sincerely yours, S.D. T. Robertson” [2]. The request for a visit was made by the Canadian National Research Council of the USSR Academy of Sciences with the participation of the Canadian Embassy in Moscow.

Of particular research interest are the correspondence materials of scientists of the Head Research Institute of Physics and Chemistry named after L.Ya. Karpov. In the 1950s and 1960s, this institute focused on the most important research areas, including: the use of atomic energy in chemistry, physical and chemical support of nuclear power, the study of the structure and properties of polymers, the creation of scientific bases for the selection of catalysts, especially for catalytic processing of oil and natural gases, the use of highly efficient oxidizers for reactive technology, the study of properties of semiconductors, etc.

Despite the fact that the texts of letters to foreign colleagues were coordinated with the Institute Directorate and the Foreign Department of the State Committee on Chemistry, and the editors often “corrected” the text at their discretion, the content preserved the emotional side of the relationship between scientists. “Dear Nikolai Nikolaevich! < > We would be very much obliged if you could discuss with us some issues that are closely related to your work and if we could get acquainted with your

views on the work in the field of reactivity of ions in the gas phase, which we are currently engaged in. < > We would like to show you Prague very much < > if you could come in September or early October, when we still have good weather < > We both remember about the warm welcome that was given to us in Moscow and we all look forward to welcoming you. With heartfelt greetings to Professor Tunitsky, Dr. Ganesh, Dr. Chermak.” Answer to the letter of Professor Tunitsky’s Czechoslovak colleagues: “ < > I trace your highly interesting works in literature with great interest and would be very happy to discuss with you many questions arising from them. Unfortunately, < > , in September-October, I have a lot of urgent work. < > I would be very happy to get acquainted with your work and the institute in the coming year. With greetings, sincerely respecting you, Professor N.N. Tunitsky” [3].

Scientific contacts were often established during international congresses and conferences, and developed into friendly relations. Between scientists there was an exchange of not only scientific research, but also materials for experiments. In a letter from a research specialist Pravikova (HRIPhCh), we found a sincere interest of a colleague from Prague, Miloslav Kubina, in the opportunity to assist in obtaining parts of devices for conducting experiments. [4]. As a result of this correspondence, scientists not only discussed scientific topics which were interesting to them, but also came to a mutual agreement on the possibility of participating in international events. Response of Sakodynsky to the letter of R. Utwick: “I just recently returned from a vacation that I spent in the Crimea, and I received two of your letters. I am very grateful for your invitation to participate in the V International Gas Chromatography Symposium in Brighton. I have a small hope of going to the Symposium. < > Regarding Your intention to come to the USSR to demonstrate instruments and make presentations, I would like to inform you that we would be very happy to receive you here in Moscow. I have sent your letter to the State Committee for the Coordination of Scientific Research in the USSR. < > In my opinion, you should write another letter directly to the Coordination Committee and formally state your proposal. I hope that this trip will take place. Sincerely, K.I. Sakodynsky, Moscow, 1963” [5].

The correspondence of the research associate of Head Research Institute of Physics and Chemistry R.P. Ozerov with the Japanese Professor Sadanaga testifies to the close links with the scientific community of Japan. The Japanese scientist requested copies of published works performed in the laboratory by G.S. Zhdanov, Yu. Venevtsev and other scientists for the employee of the Japanese Telegraph and Telephone Corporation, Dr. Kirobayashi, in the course of correspondence with Ozerov [6]. The letters contain mutual requests to promote certain works to the press. Correspondence of Professor Bagdasaryan and a scientist from Tokyo, Shigeru Hutami led to the agreement to publish the work of a Soviet scientist in Japan: “ < > I do not object to the fact that professors Seizo Okamura and Minoru Imotu wrote additions and notes to the Japanese edition of my book. I am well aware of the work of these scientists and I have no doubt that their notes and additions will be written at the highest level. I will be happy to receive copies of the Japanese edition of my book. I wish you success in your work. I am sending this letter via the international book service. Sincerely yours, H.S. Baghdasaryan. Moscow, May 30, 1963” [6].

The contribution made by Japanese scientists to the development of the theory of polymerization processes as a method for producing important synthetic polymers is

well known. Scientific research, which received rapid development after the World War II, was supplemented by the work of the Soviet scientists in this important field of chemistry. Dr. S. Khutami took the hard work of the Japanese translation of a book written in the Russian language [7]. Scientists often translated their own works. In most cases, translations were made at the Translation Center of the all-Union Institute of Scientific and Technical Information (ISTI).

Often, through correspondence, scientists agreed on a possible exchange of technologies. In a letter from Piskunov, a research associate of HRIPhCh, a request was made to send a description of the paramagnetic resonance device developed by the British company Marconi Instruments [8]. Establishing personal relations between scientists from different countries allowed more effective use of technology. In contract No. 69/1756 of December 14, 1960 with the British firm “Polymer consultants limited” and the Soviet organization “Mashpriborintorgom” for the supply of devices to study light scattering in the USSR, additional clarifications were made from the personal letter of a research associate of HRIPhCh Vyrsky: < > I would be very grateful for all the advice and guidance you could give regarding details of the device. We need the ordered equipment very much. < > Please keep me informed about your new developments in the field of modern polymer research methods” [8]. Correspondence between Soviet and foreign scientists was carried out for the joint publication of scientific monographs. The proposal of the University Professor Gold from London, who worked in the field of physical organic chemistry, with a request to write an article for the first volume “Advances in physical organic chemistry”, was received by Professor Shatenstein (HRIPhCh) in 1962. Confirmation of the possibility to accept the offer of Professor Gold was obtained from the Director of the Institute Professor Kolotyркиn. Response letter by Schatenstein was grateful for the invitation to be among the authors of the first volume of the publication, which “will certainly be accepted by chemists from different countries with great interest” [9]. In 1963, this work was published in England: “Dear Prof. Gold! The publishing house “Academic Press” has kindly sent me a copy of the first volume of the series “Advances in physical organic chemistry”. Its contents allows to highly appreciate your initiative to create a new series that is interesting for a wide range of chemists. It is particularly gratifying that this collective work was carried out as a result of the friendly cooperation of scientists from different countries, including the Soviet Union. I would like to take this opportunity to sincerely thank you for your invitation to participate in the writing of the first volume and wish you success in your future work. With greetings, Prof. A.I. Shatenstein” [10]. Publication of this work abroad was appropriate for the Soviet science, since it was possible to cover the original scientific direction created in the USSR.

4 Discussion

The nature of correspondence between scientists from different countries is evidence of common interests and the need to interact with each other. World science in the middle of the twentieth century made an innovative breakthrough, in which the Soviet science played a significant role. The adjustment of the political course of the USSR in the direction of overcoming ideological biases regarding the circulation of knowledge,

technology and scientific ideas provided scientists with the opportunity for closer contacts with foreign colleagues. The conversation reflects one side of this interaction.

The expediency of trips to international events is partly reflected in the correspondence between scientists, although it is difficult to doubt the significance of many research centers visited by Soviet scientists for the world science. For example, CITCE – the International Committee of Electrochemical Thermodynamics and Kinetics in Tokyo and Kyoto (Japan), was the only international association in the field of electrochemistry in the 1960s, and Soviet scientists took part in its work for several years.

The bibliographic bulletin “New books abroad”, regularly published by the publishing house of foreign literature, allowed Soviet researchers to partially track scientific research in the world, including the identification of duplicated works. Some scientific discoveries of English scientists in the field of chemistry, published in the open press in the *Journal of the Chemical Society* in 1961, were previously made at HRIPhCh. In a letter to Dr. Iborn and Dr. Taylor, Professor Shatenstein reported about the performed work. The dialogue consisted in the possibility of closer contacts in order to avoid duplication of scientific work [10]. In a letter to Mr. Commen, the head of an American firm that translated Shatenstein’s book “Isotope exchange and substitution of hydrogen in organic compounds”, the Soviet scientist informed about receiving a copy of his book and expressed hope for “strengthening scientific contacts between our countries” [11].

5 Conclusion

The studied documents indicate the most important areas of interaction between scientists from different countries and opposite political systems for solving fundamental and applied scientific tasks in the mid-twentieth century. The institutionalization of innovations was carried out with the direct participation of scientists in a number of research areas, in particular, in the oil and gas industry, electric power, and polymer chemistry. Analysis and discussion of approaches to solving scientific problems took place at international congresses and conferences. Scientific and practical developments were reflected in open publications and monographs. In the 1950s and 1960s, the phenomenon of “big science” was formed in contrast to the “small” science in the conditions of the knowledge and ideas circulation. The key factor that contributed to the institutionalization of innovations was the state support for scientific contacts. It was manifested to the fullest extent in industries that form new technological structures of the economy. The goal of researchers engaged in scientific work in the main research institutes was to create breakthrough scientific and technological developments. The existing objective prerequisites, even in the conditions of ideological confrontation, contributed to the active expansion of the information space. From our point of view, letters reflect not only the content of tasks directly related to research and development of scientists, but also, to a large extent, convey the emotional side of this interaction. Friendly communication of scientists took place during the period when the USSR made serious steps towards integrating domestic and foreign practice. Social models created during the study period contributed to the interaction of scientists and significantly expanded opportunities for the formation of a new innovative economy.

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Significance of the Organization of E-Learning Management System in a Modern University

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Abstract. The article considers the advantages of distance learning as the most effective and least expensive method of training during the economic crisis. The introduction of E-learning (EL) in the educational process provides new opportunities for the growth of the global education market, provides everyone with the necessary knowledge, and develops digital literacy competencies. The authors consider measures taken by the Russian government to apply Internet technologies in the education, as well as targets set for a priority project aimed at the development of online education. The analysis of the degree to which IT technology penetrates the major segments of the education market in Russia is provided. The article summarizes some theoretical issues of LMS Moodle application both on the positive and negative sides, and offers practical suggestions for the qualitative integration of e-learning in the process of teaching and learning in the higher education institute on the basis of effective e-learning management and good management. The system of e-learning management is developed on the modeling method, the main purpose of which is to apply modern electronic technologies in the educational process, to prepare the methodological base of electronic educational resources, and to improve electronic educational technologies in the e-learning format.

Keywords: E-learning · E-educational technologies · E-learning management · LMS Moodle · Modeling method

1 Introduction

One of the most important trends in the economy today is to optimize business processes using information technologies. At the moment entrepreneurs, having exhausted the potential of automating routine operations, are moving to create new business models based on online interaction of all participants. The education sector has not escaped these changes either. Although modern economy is often called the knowledge economy, the introduction of information technologies in the sphere of their production lags far behind the sphere of trade, financial services and many others. Just look at how the work has changed over the past 20 years in banks, universities, schools and pre-school educational institutions. If banks were able to almost completely automate

interaction with consumers of their services and make it almost independent, the work of educational institutions has not changed much. The reason for this is the inflexibility of the management system of budgetary educational institutions and the need to follow the standards set by the state for many commercial educational institutions.

However, institutions that provide services in the field of business training, having evaluated the effectiveness of information technologies and e-learning, began to switch gradually to the electronic version. E-learning market, like any other market, follows the classical laws of Economics and is designed to establish direct links between buyers and sellers of educational services and materials. According to the calculations of Education International [6], the global education market has reached a volume of \$5 trillion in 2017, and the volume of educational services provided with the help of digital technologies amounted to 165 billion dollars, or 3% of the total market. According to the forecasts made in this study, by 2023, the volume of the online education market will reach \$240 billion, growing by 5% per year.

According to an optimistic version of the forecast the volume of this market will grow to this value by 2020 with an average annual growth of 17%. Thus the pedagogical community is actively discussing the issue of the educational system in the “post-viral era”. According to the expert assessment of the rector of the National Research University Higher School of Economics Kuzminov, there will be a total transition of University education and office work to an online format [7]. Taking into account the wider possibilities of transmitting materials in electronic form, it is difficult to disagree with the changes expecting the classical model, which translates knowledge in the classroom.

At the same time, much attention is focused on the positive opportunities that were previously insufficiently mastered. Thus, we are witnessing a new reality, which is based on the technological revolution and the achievements of industry 4.0. Not long ago e-learning was one of the possible forms of the educational process, but now it is becoming one of the leading functional technologies [5, 8]. So, according to Similarweb, the Russian online educational platform Uchu.ru entered the top ten sites in the world in the “Education” category in April 2020. According to the Zoom video conferencing service, the number of daily paid and free users exceeded 200 million in March 2020, while in December 2019 the maximum number of users per day was 10 million [9].

Therefore, in the near future, the development of e-education will largely depend on the quality of information technology. According to the report “State of Technology in Education”, presented by Promethean analysts, in the next 1–3 years, cloud-based tools for organizing and conducting classes will take the leading position (35.8%). This is followed by online assessment resources for students (31.4%), virtual and augmented reality (25.3%), programming and robotics technologies (21.8%), and distance learning (21.6%). Researchers are convinced that the absence of borders will be a characteristic feature of future education [4]. Thus, the first purpose of the research is to focus on the positive aspects of using EL in comparison with the traditional format in a modern University. The second one is to pay attention to the effective management of e-learning in order to improve the quality of education.

2 Methodology

At the meeting on the current situation in the educational system which took place on May 21, 2020, Vladimir Putin noted the tremendous opportunities offered by digital and telecommunications: “We have all gained a unique experience. And it should work to improve the quality of education, and to develop advanced distance educational technologies. It is necessary to accelerate our work on the development of modern informational infrastructure in education” [10]. Taking into account the data of a recent survey conducted by Houghton Mifflin Harcourt, the majority of teachers approximately 85%, view the potential of technologies very positively as they help them make the learning process more accessible and expand its capabilities [4].

E-learning becomes particularly important in the context of the introduction of the Federal state educational standards of higher education 3++, for which it is important to increase the independent content of students and reduce classroom work. According to the Federal state educational standards of higher education 3++, e-learning is seen as one of the leading functions of the electronic informational and educational environment of the University [3].

In recent years, open source platforms for creating online courses have become relevant. With the help of EdX, Google course builder, Coursera, Udacity, and so on, teachers can create massive open online courses MOOCs and BOOCs-platforms for open e - courses based on leading universities in Europe, the United States, and Russia, allowing them to receive education remotely using the Internet. Moocs can be integrated as part of the EL in the LMS. Most of these courses are free of charge, allowing anyone around the world to enroll these courses, attend them online, and receive certificates of education [2].

One of the most significant online platforms created at the state level and universities is Coursera, which has already more than 3,800 free online training programs, 65 million students, including 1.8 million in Russia, more than 4,000 courses from leading world universities and industry teachers, so Coursera has one of the largest datasets for identifying current trends in the field of competencies. According to the latest indicators (July 2020) of the global skills Index (GSI) from Coursera, Russia occupies a leading position among 60 countries in the field of technology, namely: human-computer interaction, programming, information systems protection, system software development, computer network and database skills, as well as in the field of data science, including: statistical programming and statistics, data management, machine learning, data visualization, mathematics. Russia ranks first in the field of technical skills due to high-quality technical education at the universities of Moscow, Saint Petersburg, Novosibirsk and Tomsk [2].

The ninth place according to the global skills index 2020 (GSI) from Coursera belongs to business competencies with a level of ownership of 87%, namely: marketing and sales, communication skills, accounting, Finance, management. This good position indicates the inclusion of a large number of active people in various governmental projects, for example, “Russia is a country of opportunities” and the development trends of Russian entrepreneurs who actively and successfully occupy the international market, such as mobile game developer Playrix, retailer Vkusville or the InDriver

app. However, more than 35% of graduates note insufficient development of business competencies in training, which is confirmed by a survey conducted by the ANO “Russia is a country of opportunities” [2].

Thus, the most sought-after skills on Coursera and business competencies relevant for further careers can help higher education institutes build a trajectory for their future development. According to the general director of Coursera Jeff Maggioncalda: “The recovery of the labor market after the pandemic depends on the opportunities for professional retraining. Government and business institutes should take the leading position in this process, giving people equal access to the skills they need to work in the future. The global competency index reveals key trends and insights that will inspire the public and private sectors and help them coordinate efforts to develop new skills and knowledge in the employed population.” Thus, one of the most popular competencies in connection with COVID -19 are risk factors and contact tracking, symptoms, public health, and the most popular course is the free “COVID-19 Contact tracking Course” developed by Johns Hopkins University [2].

However, one of the biggest challenges of these online courses is maintaining students’ motivation. So only 30% of students on the Coursera platform complete the training process successfully. Another important issue is the effective assessment of students’ knowledge, as well as the creation and management of a productive collaborative environment [2]. There is also a problem for students to familiarize themselves with multiple systems, as different teachers may use different systems.

3 Results

The higher education institute “Samara State Transport University” uses the LMS (Learning Management System) Moodle. This educational content management system has a number of positive features, the main of which are the ability to grant access rights (an administrator, a course creator, a teacher with or without editing rights, a student, a guest), keep track of students, show analytical reports, results of tasks and testing, use external informational systems and apply mechanisms for both synchronous and asynchronous communication, organize personalization. This online platform has great opportunities for organizing theoretical and practical classes, provides individual and group learning activities for students.

Moreover, LMS Moodle is characterized by a user-friendly and intuitive interface that allows teachers to fill the e-course with the necessary content themselves, using only the help system, and manage this course. Various elements of the course: tasks, lectures, wiki, Glossary, forums, chats, blogs, etc. are added to the e-course quite simply. The teacher can structure the course both calendar-wise and thematically.

In addition, LMS Moodle provides a large toolkit for creating tests and conducting training and tests, which is especially important for e-learning, where testing is an important form of knowledge control [1]. Despite a number of positive aspects, there are some negative aspects in LMS Moodle that do not allow us to teach students of “Samara State Transport University” well and, consequently, implement educational programs. One of the negative aspects of LMS Moodle at “Samara State Transport

University” is using of an imperfect system of technical resources. It is also impossible to say that these resources are actively used in the educational process.

Another significant negative side is the inactivity of the educational system at the University, which is not ready to respond effectively to the challenges of the present days, as well as the inability of teachers to organize the work of electronic educational content from a methodological point of view. It should also be noted the age of most of the teaching staff of the University – these are people of the third age, who do not doubt that the educational process is possible without the use of modern technologies. However, due to the rapidly changing situation in the modern world, the educational system requires specialists who are competent in the use of digital technologies, able to use new educational technologies to create a variety of electronic resources.

The situation of creating full-fledged electronic content at Samara State Transport University is aggravated by the lack of time resources for teachers due to their high workload. Moreover, it is necessary not only to create high-quality content, but also to update it in a timely manner in order to maintain it in a good condition because of constant changes. However, it is very difficult to make changes in time, that requires creating a network of universities, which today is quite difficult to assume when it will be implemented.

Moreover, the Department of technical and electronic learning tools, designed to help teachers provide technical support, effectively organize and administer online training on the LMS Moodle platform, does not have enough specialists. As a result, most of the courses developed by teachers are repositories of pdf format material. However, replacing a live lecture with an electronic textbook is a gross violation of the requirements of state educational standards. There is an obvious need to revise the curriculum and, as a result, make changes in Federal state standards.

In addition, the study of textbooks instead of “live” lectures, electronic textbooks causes great difficulties in mastering the material for students, since independent study of the discipline requires much effort. Low motivation of students also reduces significantly the quality of education in an online environment, where there are far fewer external factors that contribute to good academic performance. In many cases, students are left to their own devices during learning activities, and no one motivates them systematically to achieve their learning goals. As a result, studying according to the deadline during online learning can become difficult for students who do not have strong self-motivation and time management skills [11]. Taking into account the fact that the intermediate and final certification of students takes place in the format of tests, another tricky point of e-learning is the incompetence of many teachers in the preparation of correct tests that can effectively assess the results of the development of disciplines by students.

Therefore, the active use of low-quality online technologies is of great concern due to the deterioration of the level of training of students at this time, because even students studying by correspondence have a significantly higher level of training than students of distance learning. Consequently, there is a concern about the lack of demand for graduates of higher education institutes on the labor market due to low-quality training. This situation will not satisfy society, the state and students.

4 Discussion

Ensuring the quality and accessibility of education and as a result, the implementation of the priority goal of the higher education system, outlined in paper 69 of the Federal law “About education in the Russian Federation” – “training of highly qualified personnel of all main areas of socially useful activities in accordance with the needs of society and the state, meeting the needs of individuals in intellectual, cultural and moral development, deepening and expanding of educational, scientific and pedagogical qualifications” [3] is accompanied by a number of difficulties in the higher education institute “Samara State Transport University”. No doubt, effective e-learning management and good management can contribute to the qualitative implementation of e-learning.

We have developed e-learning management system at the higher education institute “Samara State Transport University” based on the modeling method (Fig. 1). In the scientific literature, modeling is considered as “the process in which the researcher studies the sides of an object of interest (including its hidden properties) and the construction of a model that reflects the features, properties, and connections of the object of study in a simple and visual form convenient for analysis” [12]. The basis of the developed e-learning management system in “Samara State Transport University” is a systematic approach, according to which the e-learning management process is seen as a system that includes a set of elements.

The developed e-learning management system at the higher education institute “Samara State Transport University” has the following management functions: planning, organization, motivation, coordination, control and consists of three interrelated elements: organizational and managerial; technological; documentation. The planning function involves creating of a conceptual framework for e-learning management, development of strategic and tactical plans of preventive measures, and development of resources for implementing of e-learning management technology. The organization’s function involves creating of a Department for e-learning management and delegating authority to manage e-learning and such resources as personnel, money, equipment. The motivation function is seen as the improvement of the informational skills of the staff, Department heads, deans, Directors of institutes and creation of an enabling learning environment; initiating intra-University competitions for the design of e-learning courses; development of an effective organizational culture among the staff of the educational institution, creating technologies for economic and moral incentives for e-learning management.

The coordination function examines the analysis of analytical materials for e-learning management; the discourse of problems regarding the e-learning management system on seminars, trainings, refresher courses, meetings; and assistance to users and responsible structural units when registering for e-learning system resources; work on the approval of local regulations confirming the expertise of online resources, development of open online courses (mooc and mooc format) for their placement on various platforms, including the University platforms; discussion with educational and methodological councils of institutes for assessing the quality of e-learning resources;

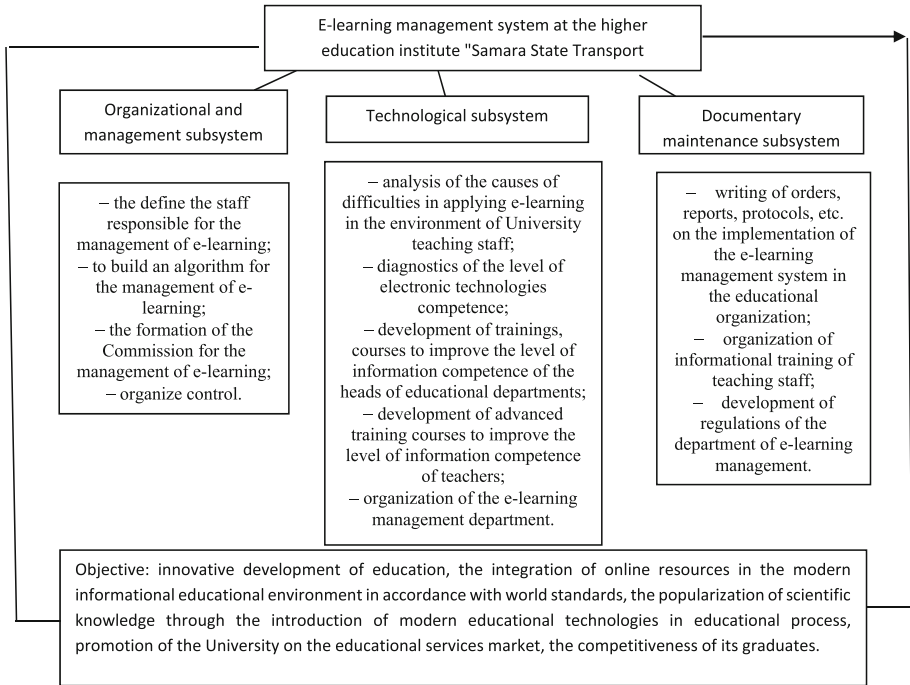


Fig. 1. E-learning management system at the higher education institute “Samara State Transport University” (Sources: authors).

writing guidelines for organizing effective e-learning courses; development of methods and technologies for training sessions using e-learning.

The control function takes into account the analysis of all programs and activities for e-learning management at the higher education institute “Samara State Transport University”; clarification of the circumstances of failure to implement the e-learning management plan; monitoring of the online platform Moodle; marketing of online educational programs; diagnostics of the frequency and duration of requests to the course and its modules by students and teachers; administration of databases, software, backup; establishment of expertise, developed online courses; writing reports on the implementation of e-learning at “Samara State Transport University”; making corrections of the e-learning management system.

5 Conclusion

The main goal of the development of an e-learning management system at the higher education institute “Samara State Transport University” is to develop innovative education, active use of e-learning in modern education in accordance with international standards, a wide spread of scientific knowledge through the use of modern educational technologies in the educational process, the popularization of the

University on the market of educational services, the competitiveness of its graduates. The basis of the e-learning management at the higher education institute “Samara State Transport University” should be the diagnosis of the level of the development of e-learning, the evaluation of in-house methods, forms and elements of the management system of electronic training. The electronic learning management system at the higher education institute “Samara State Transport University” should be focused on the development of the educational organization and management of e-learning, the development of a model of information competence of teachers; determination of goals and objectives for the development and implementation of e-learning; establishment of principles and strategic directions of e-learning; analysis of the results and correction of the e-learning management system. No doubt the electronic learning management system at the higher education institute “Samara State Transport University” should be based on a highly professional staff. Thus, the e-learning management system at the higher education institute “Samara State Transport University” is considered as an informational management system, the main purpose of which is to use modern electronic educational technologies in the educational process, in the preparation of a methodological base of electronic educational resources, and to improve electronic educational technologies of distance education.

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Globalization and Fragmentation Forces of the Current World Economy



International Financial and Information Security Strategies: Key Aspects of Preventing Criminal Threats

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Abstract. This work reveals the international legal framework for countering crimes in the digital sphere. The transnational nature of encroachments in the information sphere, due to technical possibilities, can cause irreparable damage to the economy of several states at once, and open up wide opportunities for the development of shadow business. This trend poses a serious threat to the entire cyberspace, because cyberspace and society are already inseparable for the current day. The research purpose: on the basis of system and comparative analysis, to study the international experience of criminal-legal counteraction to crimes committed using digital technologies, to identify advanced initiatives that can be used to optimize domestic legislation in this field. The study of the provisions of criminal legislation, as well as national plans for counteracting IT crimes in the countries of Western Europe, the United States, the Arabian Peninsula, South-East Asia and the CIS countries allowed to form a unified picture of counteracting digital crimes on the world stage. The study examines the features of criminal law risk assessment associated with the use of digital assets and other digital innovations for criminal purposes at the international and supranational levels.

Keywords: Digital technologies · Digital assets · Foreign experience · International experience · International organization · Legislation of foreign countries

1 Introduction

Digital economy is one of the main engines of growth and development of the world economy. At the same time, within the digital ecosystem, the state has a special role – timely legislative response, the role of an investor and co-investor in infrastructure, a moderator of inter-industry dialogue, as well as the role of a responsible leader of

changes [1]. Experts conclude that in the context of building a digital economy, relations between society and the state should follow the next trends and take them in the consideration: the cross - border nature of the digital economy; special attention to cybersecurity issues; promotion of non-cash payments and all types of mass digital communications and services; lawmaking for pre-emptive purposes: big data and artificial intelligence, autonomous platforms and the Internet of things, robotics, blockchain; regulatory impact assessment should take into account long-term development plans and economic forecasts for 10–20 years [2, 10, 12, 13, 20].

The main challenges associated with digital transformation include:

- the problem of ensuring information security,
- ensuring the confidentiality of collected data,
- increasing the number of potential attacks,
- increased social and economic damage,
- increasing the attacks complexity.

Analysis of the dynamics of the studied criminal violations in the world shows that the number of criminal assaults using digital technologies is steadily growing. According to experts, cybercrime will cost the world more than \$6 trillion in 2021, compared to \$3 trillion in 2015, and hacker attacks around the world that occur every 14 s will increase to every 11 s by 2021 [11]. According to the UN, there are regular reports of continuous attacks on health organizations and medical research institutions from different parts of the world. On average, attacks occur every 39 s. In general, in the first half of 2020, the number of potential threats exceeded 600% compared to 2019 [21].

2 Methodology

The research is based on a wide range of international sources, as well as data from international organizations, national legislation and scientific literature. As part of the research, we analyzed the initiatives and policies of a number of international organizations, such as the UN, OECD, FATF, WTO, and G20. These organizations aimed at criminal legal assessment of the risks associated with the use of digital technologies for criminal purposes and hindering the development of the digital economy. The research methodology includes historical, comparative, formal-legal and functional methods, and a systematic approach.

3 Results

Ensuring cybersecurity is a complex task with many different managerial, political, operational, technical and legal aspects. Taking into account the specifics of the problems analyzed in this study, we focused on individual concepts that form the standards for ensuring information security, countering IT crimes, and regulating legal relations arising from attacks in the IT sphere. Today we can distinguish several scenarios for ensuring cybersecurity:

- global initiatives of the UN in combating cybercrime as an integral component of cybersecurity,
- initiatives implemented at the level of international organizations and interstate associations,
- national strategies for ensuring cybersecurity, in particular, countering cybercrimes,
- initiatives implemented at the level of multinational corporations and technology companies.

Each of the international organizations analyzed in the study is more or less concerned with the need to understand the issues related to the emergence of new opportunities of the digital economy. Based on this, we can say that the main direction of international policy implemented within the framework of these international organizations is to study the prospects for the development and application of digital technologies, their impact on the traditional order of things, and the risks and consequences of their implementation. However, a single global agreement has not been adopted nowadays.

At the multinational level, there are two models for ensuring cybersecurity. The Euro-Atlantic system is based on the Council of Europe's Convention on Cybercrime and its additional protocol [3]. Nowadays, the convention has been ratified and is in force in 60 countries of the world, 4 more countries have signed it, and 7 more have been invited to join it. About 140 countries have used the convention text to create their domestic laws and more than 160 countries cooperate with the Council of Europe in the field of countering cybercrime [4]. Countries that support the consolidation of international legislation on the basis of the convention emphasize that the Council of Europe convention on cybercrimes has served as the main source for other documents and is a model for the domestic legislation of countries with different cultural and legal traditions, including some member states that do not consider joining the convention [19]. The Eurasian model is implemented on the basis of regulations in the field of information security adopted by the Commonwealth of Independent States, the Shanghai Cooperation Organization and the Eurasian Economic Union. At the level of interstate associations, the main focus is on solving specific problems related to the introduction of IT technologies in a certain area. Reports and notifications of international organizations such as the G20 [8], the WTO also raises concerns on the growth of crimes related to the crypto industry [27].

Protection against cyber threats requires a constantly integrated and automated approach to cybersecurity, as well as the adaptation of national legislation to such threats. At the state level, the implementation of initiatives in the field of countering cybercrime in most countries is carried out through the adoption of strategies and other comprehensive conceptual documents. However, there is a certain imbalance in this area: in some countries, strategies for ensuring information security and countering cyber threats are constantly updated, adequately responding to new emerging threats, while in other countries such documents are not available at all. This state of affairs significantly limits the ability to provide an effective global system for countering cyber threats with criminal legal means.

Speaking on criminal legislation, it is worth mentioning that 30 out of 168 countries have no criminal legislation on crimes committed using IT technologies [23]. In

percentage terms, the situation is as follows: 72% – have legislation in this area, 9% – legislation is being developed, 19% – legislation is missing, 1% – no information [25]. Based on a fundamental analysis of the crime state based on a survey of countries on the state of criminal legislation in the field of cybercrime, it was found that all 14 acts that are usually included in the concept of cybercrime are widely criminalized. In some countries, additional crimes do not mentioned in the UN questionnaire are prohibited under criminal law [25].

National approaches to the criminalization of IT crimes have significant differences. Crimes involving illegal access to computer systems and data differ depending on the object of the crime (data, system, or information). In some countries, access is criminalized as such, and the intent to cause harm is not necessary; in other countries, the situation is the opposite. There are different approaches to the intent in the crime when criminalizing interference in the functioning of computer systems or data. In most countries, interference must be intentional, while in other countries, careless interference is also envisaged. Acts characterized as “interference” cover acts from damage or deletion to modification, blocking, entering or transmitting data.

The criminalization of illegal interception of data differs depending on whether the offence is limited to or not limited to interception of non-public data, and also depending on whether the offence is limited to interception by technical means. Not all countries criminalize the illegal exploitation of computers. In those countries where it’s criminalized, there are differences depending on whether the crime involves the storage, distribution or use of software (such as malware) and/or computer access codes (such as the victim’s passwords). From the point of view of international cooperation, such differences may affect dual criminal responsibility.

A number of countries have special provisions for computer fraud, forgery and the use of personal data. In other countries, general provisions for fraud or theft are used, or crimes that reflect the constituent elements of the act, such as illegal access, data tampering and forgery become the basis of such provisions. The criminalization of data-related offences, especially those related to child pornography, is very widespread. In most countries, there is a tendency to tighten responsibility for illegal attacks in the IT sphere and continuous reformation of criminal legislation as a response to emerging threats. In our opinion, given the unlimited range of potential victims of criminal actions and the extent of the caused damage, tougher responsibility for attacks using information and telecommunications technologies should be implemented in domestic legislation.

4 Discussion

The international community has recognized the importance of ensuring information security and countering attacks in the IT sphere, and security issues in the information environment have been the subject of discussion a long time ago. In 2018, the UN made the speech to ensure information security and improve national legislation due to the steady increase in digital crimes in a General Assembly resolution [26].

1. Resolution adopted by the UN General Assembly on 17 December 2018 “Countering the use of information and communication technologies for criminal purposes,” notes that despite the enormous opportunities that ICTs offer for developing countries, they also create new opportunities for criminals and crime increasing, emphasizes the potential of new technologies, including artificial intelligence, in preventing and suppressing the use of information and communication technologies for criminal purposes, a separate item is indicated to increase the scale and diversity of the crimes committed in the digital world and their implications for the stability of the critical infrastructure of states, enterprises and people’s well-being [26].

The analysis of the report content presented at the 74th session of the UN General Assembly allows us to identify the main problems that are focused on the issue of countering cybercrime [24]:

- increasing risks associated with the mass use of low-cost “smart” devices that provide Internet access, thereby increasing the number of potential attacks and the cybercrime scale,
- increased risks associated with countries’ active development of mechanisms for decrypting information obtained from devices and/or applications, as well as mechanisms for skipping computer security,
- a proportional increase in the number of attacks in the digital sphere with the systematic promotion of the policy of “digital openness” and universal digitalization, which determines the storage of data in digital form.

The vast majority of countries emphasized the existence of legal barriers to effective counteraction:

- lack of involvement of technical experts in the development of relevant legislation and failure to take into account their recommendations, which leads to difficulties in understanding and applying these norms,
- limited national capacity and the absence (obsolescence) of domestic legal instruments to combating cybercrime in different countries,
- transnational nature and lack of unified mechanisms for countering digital crimes.

2. Initiatives implemented at the level of international organizations and interstate associations deserve special consideration.

All countries agree on the need to unify approaches to assessing criminal acts in the digital sphere. However, approaches to implementing this initiative vary. The Council of Europe’s Convention in Cybercrime [3] is the first international agreement on crimes committed using IT technologies (the Internet, computers and computer networks) [15]. The list of crimes specified in it is not exhaustive, and the legislation of any state that has signed the convention may provide for other acts recognized as criminal [22].

At the same time, European legislators continue to work on expanding the range of application of regulation criminal legal means in various areas of the digital economy. The discussion focuses on international cooperation expanding in the fight against IT crimes and introducing more effective ways to ensure the security of electronic

evidence required for criminal investigations. The adoption of a new protocol aimed at protecting evidence stored in the cloud, while respecting the guarantees established by the rule of law, will be another important milestone in the history of this agreement.

It should be noted that over the past two decades, the European Union has adopted a number of important documents (directives and framework decisions) and created a fairly extensive legal framework for the functioning of various segments of the digital economy. Most of the legal acts are aimed at regulating legal relations in the field of civil and financial law, but their provisions create the basis for the adoption of criminal legal norms, and significantly tighten the responsibility for criminal attacks in the IT sphere [16]. The current EU security policy for critical information infrastructure is based on five pillars: readiness and prevention; detection and response; mitigation and recovery; and international cooperation.

The PACE Resolution “Increasing co-operation against cyberterrorism and other large-scale attacks on the Internet” also seems interesting in the analyzed aspect. The text of the resolution notifies the need to create systems for the protection of critical information that do not depend on the Internet, for the purposes of national security, the security of the population and the economic well-being of states. To this end, it is recommended that all member states criminalize the production, distribution and use of malicious software designed to enable individuals to prepare or conduct large-scale cyber attacks [18].

In Directive (EU) 2015/849 of the European Parliament and of the European Union Council of 20 May 2015 it is emphasized that “the changing nature of threats related to money laundering and the financing of terrorism, which is facilitated by the constant evolution of technologies and funds at the disposal of criminals, requires rapid and constant adaptation of the legal framework for third countries with a high level of risk in order to effectively eliminate existing risks and prevent the emergence of new ones” [5]. In April 2018, the Directive was amended to strengthen control over cryptocurrencies. The new rules introduced mandatory registration of platforms and providers of cryptocurrency storage services. This measure is aimed at eliminating the anonymity inherent in cryptocurrencies, exchange platforms and virtual wallets. Platforms, like banks, will have to apply customer controls with due diligence, including customer verification requirements. The measures stipulated in the directives and framework agreements are aimed at harmonizing and unifying legislation on the territory of the EU countries and contributing to the international cooperation.

The Russian Federation, along with the countries that are members of the Shanghai cooperation organization, has not ratified the Council of Europe’s Convention on Cybercrime due to certain complaints on its content [3]. Thus, it is noted that the convention was developed in the late 1990s, and therefore it does not regulate many modern “inventions” of criminals, and allows for the possibility of violating the principles of state sovereignty and non-interference in the internal affairs of other states [9]. Noting the need to develop universal principles and norms, the Russian Federation supports the development of a new convention on combating crimes in the use of information and communication technologies under the auspices of The United Nations, which will take into account the current realities and principles of sovereign equality and non-interference in the internal affairs of states.

The Eurasian model of international information security is based on initiatives taken within the framework of the Commonwealth of Independent States, the Shanghai Cooperation Organization and the Eurasian Economic Union. As part of the activities of each of these organizations, strategic documents were adopted. They emphasize the need to develop the digital economy, which is the main factor of competitiveness and stable development of the national economy of each country, as well as the creation of an adequate system to counter threats and risks associated with its development.

The OECD recommendations are particularly important in assessing the risks associated with the use of digital technologies for criminal purposes at the international level. In the “Embracing Innovation in Government: Global Trends” report, the OECD notes that there is no risk-free innovation [17]. Governments need to learn how to make innovative decisions to ensure effective management and sustainable growth, which requires mandatory risk assessment and risk management strategies. Thus, the OECD sets a vector for innovation, noting the possibilities of using digital technologies, and, at the same time, emphasizing the need for international regulation of their implementation.

Of particular concern is the lack of international acts aimed at regulating the status of cryptocurrencies. The FATF stand out from international organizations in this issue. Its role in countering the laundering of criminal proceeds and the financing of terrorism in the context of digital transformation has acquired a new format. In June 2014, in the report “Virtual currencies: Key definitions and potential AML/CFT risks” [7]. For the first time, the FATF has spoken at the international level on the risks associated with the use of electronic currency for the laundering of criminal proceeds and the financing of terrorism. The FATF highlighted the following main risks associated with cryptocurrency: a significantly increased number of suspicious transactions reports; the use of cryptocurrency by organized crime; high criminological risks of using bitcoin; the use of cryptocurrency as part of drug trafficking; the growth of hidden mining; the use of cryptocurrency by cybercriminals; the spread of fraud using ICO and cryptomats. The enhanced work of the FATF over the past five years has made it possible to develop standards for countering the legalization (laundering) of proceeds from crime and the financing of terrorism (AML/CFT) in relation to cryptocurrency transactions [6].

3. Not to mention a national strategy for cybersecurity, in particular, combating cybercrime.

The UN appeals were heard by most countries of the world. Nowadays, cybersecurity strategies have been adopted in 100 countries around the world, and another 20 are under development. In some countries, cybersecurity strategies are re-adopted in order to respond adequately to emerging threats. Most countries face problems in working with partners in the prosecution of digital crimes in cases where these countries have limited capacity and/or have not updated their domestic legal framework, as well as have not prepared their investigative authorities to combat cybercrime, thereby minimizing the use of traditional international legal mechanisms for criminal prosecution [14, 23].

5 Conclusion

The analysis shows that the world community has long realized the importance of ensuring information security and countering attacks in the IT sphere. However, despite the efforts of the UN and other intergovernmental bodies, no global agreement on cybersecurity has been adopted nowadays. This is largely due to the lack of unity in views on ensuring international information security. Nowadays, there are two approaches to criminal law counteraction to crimes in the digital economy: Euro-Atlantic and Euro-Asian. A unified policy due to the transnational nature of the analyzed crimes is also necessary in the field of criminal law counteraction. The pace of development of IT technologies and their introduction into criminal circulation dictate the need for continuous improvement of the rules on responsibility for criminal attacks in this area. The lack of regulation in the sphere of circulation of blockchain technology and cryptocurrencies is also of particular concern. The long-term unsettled legal relations in this area leads to an increasing attractiveness of the region as a platform for the development of the shadow Internet with all its consequences.

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Legal Framework for Monetary Policy Coordination at the Global and Regional Levels

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Abstract. Subject of the research: historical, institutional and regulatory aspects of monetary policy coordination at the global and regional levels. The purpose of the research is to study the current aspects of international monetary policy coordination paying special attention to the prerequisites, legal and institutional foundations of such coordination. This study is predominantly based on scientific papers and documents issued by International Financial Regulators. The set of theoretical ideas generated on the basis of the analysis of the topical issues of international monetary policy coordination will enable to introduce the positive aspects of such coordination on the level of regional cooperation of Central banks within the framework of Eurasian integration associations, primarily the EAEU. The methodology of the research comprises historical, comparative, formal-legal and functional methods, systemic approach. The paper examines alternative (regional) financial support mechanisms (including bilateral currency swaps) implemented by Central banks. It is concluded that it is necessary to find ways of integration in the monetary sphere, bypassing the IMF, which is especially important in crisis periods of economic development. The conclusions given in the paper can form the ground for further studies of international monetary policy coordination in the context of globalization and regional economic integration.

Keywords: Bilateral currency swaps · Central banks · Group of Twenty · International monetary policy coordination · Monetary policy

1 Introduction

Among the main methods of cooperation between states in the monetary sphere, the coordination of monetary policy stands out, which can be effectively implemented both at the global and regional levels. In the first case, we are talking about the interaction of states within the framework of international organizations - the International Monetary Fund, the Bank for International Settlements, as well as informal platforms like the Group of Twenty. In the second case, on the coordination of monetary policy at the level of integration associations (for example, in the EAEU), as well as on interaction through the conclusion of bilateral agreements by central banks.

One of the main reasons for the increased attention of global financial regulators to the problems of international coordination in the monetary sphere is certain negative

phenomena of the crisis period, which affected, among other things, developing countries with market economies. Excess liquidity created by the FRS, ECB, Bank of England, Bank of Japan within the framework of the quantitative easing (QE) mechanism caused a number of currency problems in developing countries.

The problem of international coordination of monetary policy is receiving more and more attention in the economic and legal literature. Among the most significant should be noted the progressive work of Bruni, Serrate, and Villafranca “The quest for global monetary policy coordination” [4], full with proposals to optimize the existing mechanisms, the work of Bordo and Schenk on the history of monetary policy coordination [2], the works of outstanding experts of the Bank for International Settlements of Borio and Toniolo [3] and Taylor [11], as well as other authors [8, 10].

2 Methodology

To consider issues of international coordination of monetary policy, the historical method (in part of the history review of cooperation between central banks), the comparative method (to compare the role of the IMF (International Monetary Fund) and the BIS (Bank for international settlements) in a modern monetary legal system, the comparison of the role of the IMF and Central banks in crisis management mechanisms to maintain liquidity), formal-legal method (in the analysis of legal instruments of global financial regulators, a group of Twenty, IMF, BIS), functional method (in the analysis of coordination and crisis management functions of global financial regulators and central banks in the context of international monetary law), system approach (in terms of the analysis of the distinctive features of the modern monetary system) were applied.

3 Results

3.1 Coordination of Monetary Policy at the Global Level

International monetary coordination has exactly the same depth of historical retrospect as the history of the world monetary system. Bordo and Schenk traces the relationship between the degree of intensity and directions of coordination with the stages of development of the world monetary system and concludes that such coordination has not always been successful and necessary [2]. At the same time, terminologically, Bordo and Schenk distinguish *cooperation* and *coordination*. By «*cooperation*» they mean the exchange of information, discussion of typical problems, mutual lending and other operations between central banks in times of financial crisis. By «*coordination*», the authors refer to strategic measures officially agreed by the heads of central banks and finance ministers of different countries and aimed at achieving favorable results for the international system as a whole. Such actions may potentially conflict with the internal strategic goals of central banks.

Thus, successful communication between central banks took place during the Gold standard era (1880–1914) and during the so-called “Great moderation” (1985–2006);

less successful - during the gold standard period (1924–1936), during the operation of the Bretton Woods system (1944–1973) and in the early 1980s.

The authors believe that in monetary regimes that are rules-based, cooperation was most successful, and much less - in regimes that operate on the basis of discretion. In monetary regimes that are rules-based, cooperation was most successful, and much less - in regimes that operate on the basis of discretion. Monetary policy cooperation does not work when domestic and international strategic priorities are inconsistent, that is, when an international strategic rule (such as exchange rate stability) is in conflict with domestic goals of price stability or full employment.

Experts of the Bank for International Settlements (BIS) Borio and Toniolo [3] classify central bank cooperation in two ways. «*Restrained*» cooperation is an exchange of information between central banks, while «*high-quality*» cooperation is a joint action. Throughout the history of central banking, the first type of cooperation prevailed, especially after the establishment of the Bank for international settlements. The latter is mainly associated with large-scale financial turbulence.

A significant factor contributing to the intensification of cooperation between central banks on monetary policy issues was the global financial crisis of 2007–2009.

The G20 summits held in the period 2013–2019 highlight three aspects that were discussed there and included in the final declarations or communiques on the results of these summits:

- recognition of the negative effects of the QE policy and the subsequent “devaluation race”,
- calls to return to traditional monetary policy,
- promoting cooperation between central banks.

The G20 initiatives are supported by a dozen and a half standard-setting bodies, among which the BIS and the IMF are primarily involved in the monetary sphere. The BIS is a very important platform for cooperation between central banks today. It also provides interaction between monetary, microprudential and macroprudential policies.

The Bank for international settlements has three main communication platforms: the Global Economy Meeting (GEM), the Economic Advisory Committee, and the All Governors’ Meeting. In addition, the BIS have a Central Bank Governance Group and the Irving Fisher Committee, with a broader membership than GEM.

The BIS has long questioned the benefits of cooperation in the monetary sphere. However, he later pointed out that achieving a more effective result would require increased cooperation, including special joint actions, and perhaps even an agreement on the rules of the game that limit domestic politics. Today, the BIS proposes to go beyond the national mandates of central banks and consider the internationalization of financial regulation as an example for monetary policy.

Bruni and his colleagues, based on the reports of the BIS, believe that the heads of central banks should *regularly and officially discuss and agree on certain strategic provisions of their monetary policy*, and inform markets on their decisions. She believes that this discussion is not in contradiction to national mandates; moreover, at the international level, coordinated solutions are already the norm in micro - and macroprudential regulations, which are increasingly linked to monetary policy principles [4].

As for *the European Central Bank*, it usually combines orthodox statements about the inevitability of internal orientation of monetary policy with the liberal recognition that global general shocks and international flows justify the search for some informal and implicit coordination of monetary policy [6].

Some authors provide *evidence of the benefits* international monetary policy coordination [7, 9, 11]. Using various econometric indicators, they find that GEM participants have a significantly higher correlation of monetary policy decisions due to their greater coordination.

Today's monetary policy makers face a problem called "*normalization*". For many years, international liquidity creation has relied on non-traditional instruments: this has been due to extremely low interest rates. The BIS (following the G20) believes that with the global recovery and the end of deflation fears, it is time to return to the traditional monetary issue and interest rate as a monetary instrument [1].

The term "*normalization*" describes a gradual exit from the extraordinary (unconventional) monetary policy that was adopted to combat the effects of the global crisis. *Competitive monetary easing* "*narrow normalization path*" is overcome within the framework of the so-called "*narrow normalization path*". At the same time, new quantitative easing programs launched in order to overcome the negative economic consequences of the COVID-19 pandemic (for example, the ECB program called the "*Pandemic emergency purchase program*", PEPP) call into question the timing of the transition to long-term normalization of monetary policy.

Bruni and colleagues point out that the national mandate of central banks should not be an insurmountable obstacle to reaching an agreement on *coordinated normalization*. To be in accordance with national mandates, "*coordinated strategies*" will be the *«least common denominator»* of national provisions on what should be done in the monetary sphere. Hence, it is obvious that the set of coordinated decisions will be smaller than the set of all measures taken by individual central banks, which will act within their autonomy [4].

Since none of the platforms of the BIS or the IMF seek explicit and formal coordination of monetary policy, this allows us to make proposals for moving towards such coordination. So, Bruni and his colleagues suggest creating a new platform at the Bank for international settlements – the "*Global Monetary Policy Coordination Meetings*" (GMPCM). The expert suggests that these meetings should be considered as a partial replacement (or as a component) of a more comprehensive initiative, the Mutual Assessment Process (MAP) [4].

Creating a legal framework for international monetary policy coordination nowadays has research prospects. In particular, we can mention a similar study conducted at the Max Planck Institute in Germany. The project is called "*Law of international monetary policy coordination*". The author of the project Kanad Bagchi notes that in recent years, along with the IMF, several other institutions, both formal and informal, have begun to play an important role in promoting monetary policy coordination and mitigating international monetary conflicts; against this background, the main task of the project is to conceptualize the legal framework for monetary policy coordination by analyzing the institutions, formats and mechanisms through which such coordination is carried out on an international scale.

3.2 The Role of Central Banks in Creating the Crisis Management Mechanisms of Financial Support

The increased initiative of central banks in terms of international coordination is also evident from the objective increase in their status in times of crisis and the parallel decline in the role of the IMF and its anti-crisis mechanisms. The mechanism for states' adherence to international obligations has become blurred and less strict, largely due to the increased international activity of central banks during the crisis and post-crisis periods. An example of such activity is the transnational *swap agreements* that have called into question the role of the IMF as an international lender of last resort (ILOLR).

The practice of swap agreements between central banks, which appeared in the 60s of the last century, was significantly activated during the global financial crisis of 2007–2009. At the same time, the researchers asked the question: why did many emerging market countries (EMEs) choose to resort to bilateral swap agreements rather than access the formalized multilateral and regional instruments of the IMF to overcome their liquidity problems?

As noted by Duran [5], this movement had two phases: the 2008 crisis management, which demonstrated a preference for special currency swaps, and the post-crisis consequences, which formalized these swaps into regional measures based on networks of bilateral currency swaps).

These are primarily swap agreements between the FRS (Federal Reserve System) and the central banks of Mexico, Brazil, Singapore, and South Korea, as well as between the Bank of Japan and the central banks of Indonesia, South Korea, and India. The role of the FRS in overcoming the liquidity problems of a number of countries was so great that the concept of “sovereign international lender of last resort” was proposed. Among the prerequisites for this choice of EME countries in the literature are the following:

1. If we consider alternatives, the accumulation of foreign reserves in the central bank is associated with increased fears of dependence on the international monetary environment. And as for the IMF's programs, as noted by E. Helliner, a two-way swap is more accessible to countries than the IMF's support programs due to its automaticity.
2. The international monetary system is becoming not only more fragmented, but also more diverse, aiming for multicurrency: swap agreements have been formalized in hard currencies (i.e. the US dollar), as well as local currencies such as the Chinese yuan and Korean won [5].
3. Currency swaps have a unique legal structure: currency liquidity, without any ex ante transfer to an international organization, is “in the hands” of national banks until the swap is activated.
4. The specific design of these new measures reflected an increased role for central banks in monetary transactions, rather than delegating this role to international organizations. This is especially true for the central bank in times of crisis, while in quiet times power reverts to the finance ministries [5].

The global role of central banks is changing the institutional nature of monetary cooperation even in the post-crisis period. So, in 2013, the FRS, the Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank and the Swiss National Bank jointly announced the creation of a permanent network of bilateral currency swaps.

4 Discussion

Based on this, it should be noted that the institutional design of international cooperation in the monetary sphere leads the world to a more fragmented and multi-currency system. The paper examines the historical, institutional and regulatory aspects of interstate cooperation in the monetary sphere: international monetary policy coordination, regional financial support mechanisms. Particular attention is paid to the reduced role of the IMF in the international monetary order, as well as to the increased role of agreements between central banks in order to overcome liquidity problems.

The analysis of current issues of international monetary policy coordination allows us to form a set of theoretical ideas that can allow us to transfer the positive effects of such coordination to the level of regional interaction of financial and monetary regulators within the framework of integration associations in the Eurasian space, primarily the EEU. The practical significance of the obtained results is to improve the legal and institutional framework for integration interaction of the EAEU member states in the monetary sphere.

5 Conclusions

Based on the results of the study, the following conclusions can be drawn:

1. Due to the decline in the role of the IMF as an “international lender of last resort” and an international coordinating platform in the crisis and post-crisis period, alternative legal forms of interstate monetary cooperation (without the mediation of the IMF) have become more important: bilateral currency swaps, regional financial support systems, and coordination mechanisms based on the BIS (international monetary policy coordination).
2. The positions of modern global financial regulators agree in recognizing the importance of central bank cooperation on monetary policy issues at the global level. The policy of quantitative easing (which translates negative factors from developed to developing economies) is replaced by a paradigm of monetary policy normalization. This normalization should be carried out in conditions of international coordination on formal or informal platforms. Empirical studies prove the usefulness of this coordination for the economies of the countries involved in this process (primarily on the basis of the BIS), as well as for global financial stability in general. The legal doctrine justifies the need to develop legal forms of such coordination.

3. Being In the initial phase of the next global economic crisis (caused by the COVID-19 pandemic), it is important to pay increased attention to central banks as actors in international monetary relations, the specifics of their international legal status, the correlation and interaction of alternative anti-crisis legal mechanisms in the international monetary order with traditional intergovernmental legal mechanisms formed by the IMF.

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Legal and Economic Implications of Central Bank Digital Currencies (CBDC)

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Abstract. The issue of creating a new unit of account - central banks digital currencies (CBDC), has been actively discussed in the past two years, both at the level of individual states and the international community. The discussion is based on the legal possibility and economic feasibility of expanding the list of financial instruments by creating a fundamentally new model of digital payments. However, despite the importance of this issue, states and the digital community have not yet come to a common understanding of the starting points on which the concept of a national digital currency (CBDC) should be based. In this regard, the purpose of this study is to identify the legal and economic advantages and disadvantages of two types of CBDC: direct and hybrid. To achieve this goal, the theoretical views on this issue were studied, as well as the conclusions made by experts in the course of a practical study of the CBDC possibilities.

Keywords: CBDC · Central bank · Digital currency · Means of payment · Legal regulation · Financial system · Financial security

1 Introduction

A logical stage in the development of the digital economy was the development of the central banks' digital currency model (CBDC). The question itself on the possibility of launching CBDC was caused by the fact that during its short history, the digital decentralized currency has proved its efficiency in terms of speed and payment security, but nevertheless revealed a number of problems associated with the inability of central banks to control financial flows and the use of cryptocurrencies for money laundering and drugs and weapons selling.

The CBDC model, according to its developers, will be able to minimize the risks of traditional cryptocurrencies and at the same time give the state financial system the necessary flexibility, speed and transparency. The problem, however, is that in most countries the discussion of the CBDC concept is largely academic. And only a few states have officially announced their intention to introduce a digital equivalent of the national currency (China, Singapore, Thailand, Sweden, Canada, etc.). At the same time, many countries are considering the possibility of introducing such practices in the

future (Argentina, Brazil, the Great Britain, the Netherlands, India, Malaysia, the United States, Tunisia, France, South Africa, etc.).

The emergence of a new payment form, digital money from central banks, is comparable in nature and historical significance to the replacement of gold and silver coins with paper banknotes, or the rapid replacement of these banknotes with payment cards and mobile payments. It is obvious that the introduction of a new model can lead to unexpected legal and economic consequences associated with a lack of understanding of certain aspects of the problem. The concept of CBDC itself is clear at first glance, but a more detailed examination reveals a number of issues that need to be addressed at the initial stage of the issue. In particular, it is important to understand what CBDC will create and release, who will control it, who will be responsible if the system fails or data leaks, and what are the prospects for implementing CBDC in countries with weak economies and undeveloped digital infrastructure. Some of these issues will be discussed in this paper.

2 Methodology

In the course of this research, the authors evaluated the theoretical views and empirical conclusions accumulated nowadays from the point of legal pragmatism [1]. This approach involves taking into account the position of the legislator, his political will, which dictates both the very initiation of monetary reform, introducing CBDC, and the fundamental characteristics of the system of state digital money. The approach of legal formalism was not left without attention. The literal interpretation of legal norms assumed by this approach makes it possible to determine the legal grounds (or lack thereof) for the introduction of new settlement instruments in the current law. In addition, the same approach helps to find a strategy for adapting CBDC to legal norms that are not directly related to the financial sphere; for example, the law on personal data protection and the law on information and information systems. The risk-based approach is central to the methodology of this work [5]. The introduction of CBDC is inevitably associated with the emergence of circumstances, many of which would be difficult to predict today. However, some of the risks of CBDC can be extrapolated to CBDC-like systems. These include, in particular, systems of existing settlement instruments: cash, electronic money, and bank payments. This work is devoted to the analysis of these risks and determining ways to minimize them.

3 Results

3.1 The Authorities of the Central Bank

Analysis of the variety of theoretical views on CBDC and their empirical research has allowed us to define the digital currencies of central banks as a unit of account, the circulation of which as a form of legal tender is directly or indirectly provided by the central bank of this state. The main legal and economic risks of introducing CBDC, as well as possible ways to minimize them, were divided into the following four groups.

Traditionally, central banks exercise full control over cash, introducing it into circulation, withdrawing it from circulation and controlling the cash supply in the state.

The creation of an additional form of money will give the central bank another leverage to manage the financial situation within the country, and in the case of countries whose currency is widely used in international commerce - and beyond (for example, China). The procedure for implementing such powers is not provided for by current models of legal regulation, and the possible positive and negative consequences of their application have not yet been sufficiently studied [3]. In particular, central banks cannot simply start issuing CBDC as a replacement or “improved” form of cash, since CBDC are fundamentally different from cash [11].

On the other hand, the authority to manage CBDC can replace the authority to manage cash circulation, the need for which is significantly reduced in many countries of the world [14]. Thus, experts of the Bank for International Settlements believe that the introduction of CBDC will not significantly affect the mechanisms for implementing monetary policy by the central bank [3].

It is expected that replacing cash with CBDC will increase seigniorage (revenue from money production) by 90%, since spendings of physically producing money and transporting it will be eliminated [12]. So, in 2016, the South Korean authorities spent about 44.5 million US dollars on the production of coins only [19]. In the case of a hybrid CBDC, the central bank’s expenses for servicing the money supply can be significantly reduced, since most of the infrastructure will be supported by commercial intermediary companies.

3.2 CBDC Traceability

All CBDC projects involve the introduction of a certain traceability percentage of transactions with CBDC for the purpose of compliance with the law. If such “traceable” CBDC become the dominant form of payment in the state, they can give unprecedented control over money circulation both at the international and state level, as well as at the level of individual citizens and organizations. In this case, the CBDC will become the perfect tool for combating a wide range of any crimes related to money settlements, including Anti Money Laundering and Counter-Financing of Terrorism (AML/CFT), fighting corruption, tax evasion, export of funds abroad, currency crimes, etc. In case of refusal of cash and the CBDC introduction, the crime of counterfeiting will become impossible [12]. However, such “financial omniscience” can be associated with a number of difficulties. For example, in the case of a CBDC that is fully controlled by the central bank, it will force the central bank to constantly interact with financial and tax control authorities, with judicial and administrative authorities, to ensure confidentiality in a complex system, and to perform other powers that the central bank may not be ready for or not to have the authority to perform it.

On the other hand, the hybrid CBDC, to which citizens get access through specialized companies, will be spared from this problem, since the responsibility to collect and transmit customer information will be assigned to these companies, which are quite accustomed to this procedure. This is what has been done in China, where control over operations with CBDC will be assigned to existing banks and payment companies [4].

Another issue related to the traceability of CBDC transactions is the issue of protecting the personal data of individual CBDC users.

It is assumed that the history of operations with CBDC will only be available to the central bank and, in the case of hybrid CBDC, to intermediary companies that provide interfaces for CBDC. Thus, it is being noted in the draft of the Bank of England that a possible English CBDC will provide anonymity in mutual settlements, but will allow authorities to track transactions with CBDC for law enforcement purposes [3].

3.3 Antimonopoly Law and Consumer Rights Protection

There is a risk that if the entire CBDC system is controlled by the central bank, then a person, even if mistakenly underprivileged from the right to open an account/wallet with CBDC, will be cut off from the financial system. This issue can be resolved by making the process of opening CBDC accounts as easy as possible, and bans on this are allowed only for the purposes of compliance with the law, including (AML/CFT) regulations [10, 11]. Alternatively, the issue can be resolved in the case of hybrid CBDC hybrid CBDC, where citizens can access the CBDC system through many different firms.

On the other hand, the introduction of hybrid CBDC will lead to the transformation of intermediary companies into natural monopolies due to the high cost of organizing such a turnover and the actual impossibility of competition in this area [18]. Nowadays it is unknown, how the competition between agents will be performed, if it will be, as there is a market consisting of such companies.

Finally, it is believed that the accelerated implementation of CBDC with an equally rapid rejection of cash circulation may negatively affect the elderly and the population without bank accounts [2]. This issue is considered in a number of countries that are developing CBDC (Canada and China), whose projects provide for access to a new settlement facility without having to be connected to the banking system in any way.

3.4 National Security

The penetration of CBDC in countries with weak financial institutions and high inflation may lead to a situation in which individuals and companies decide not to exchange hard CBDC for local currency, but to accumulate it at home and pay in it, which will quickly lead to the complete loss of state control over monetary policy in the country [18].

Similar cases have happened in the past. A striking example is hyperinflation in Zimbabwe, where the US dollar has displaced the national currency to the point that the authorities in 2015 set out to recognize the US dollar as lawful currency [17]. It can be assumed that the Chinese CBDC after launch can significantly affect the economy of a number of African countries, which will be facilitated by China's active economic activity in the African region [15].

On the one hand, there is a possibility that CBDC will help strengthen national security. In particular, it is noted in the bank for international settlements that the COVID-19 epidemic has significantly increased the need for CBDC as a contactless payment method that is resistant to such systemic shocks [2]. On the other hand, various system and infrastructure shocks can disrupt or destroy the insufficiently reliable CBDC system that relies on this infrastructure [13].

It is possible to overcome this danger in two ways. Firstly, creating a CBDC system that is as independent as possible from vulnerable infrastructure, including the banking system, Internet, electric grids, etc. Examples of CBDC projects that address these vulnerabilities are the Canadian and Chinese CBDC projects. Secondly, it is possible to keep cash in circulation so that it can act as a backup option in case of unforeseen circumstances [8].

4 Discussion

Despite the obvious attractiveness CBDC, modern law has not developed the legal status of these assets and has not proposed a universal model for their classification. In particular, the questions of CBDC typology in the modern literature find only partial solutions and only within the framework of solving applied problems. In 2018, experts identified two types of CBDC: general purpose CBDCs or retail, available for use by anyone wholesale, which are available to a limited number of people, for example, for mutual settlements between private banks [3]. Another classification has been proposed by R3 researchers, who identified three types of CBDC [6]:

- 1) Direct CBDC. CBDC that are issued, provided and fully controlled by the issuing central bank. An example of a direct CBDC is e-krona, developed by the Sweden bank [6]. A number of authors believe that under the CBDC system, the central bank will be able to perform taxation much more effectively, which will reduce the tax rate [9].
- 2) Indirect CBDC or synthetic CBDC. This type of CBDC is issued by third-party organizations, such as private banks or payment companies, but the cost of such a CBDC is provided by the reserves of the central bank [18]. It is a fair opinion that this system can harmoniously complement the existing banking system [16].

An extreme form of synthetic CBDC (quasi-CBDC) was described in one of the projects of the Bank of England, in which means providing the cost of a digital currency issued by private firms, will not be the reserves of the central bank, but will be the means of these firms in custody of the central bank [6].

A real example of quasi-CBDC is already in operation in China, where payment companies WeChat Pay and Alipay were charged with storing customer funds in the central bank in the form of reserves [18].

- 3) Hybrid CBDC. Such payment instruments are created and destroyed only by the central bank, but their use and circulation are provided by other organizations. The advantage of hybrid CBDC is that the responsibility for the order of their turnover and use (including AML/CFT control) is assigned to the banks that work with the CBDC, and not to the central bank. As an example, we can cite Chinese CBDC and one of the projects of the English CBDC.

As demonstrated above, the two-level system inherent in hybrid CBDC, is superior to other forms of digital currencies in many ways. Other authors, in particular, came to the same opinion, noting that competition between intermediary companies can have a positive role in strengthening the CBDC system [7].

5 Conclusion

Summing up the results of this research, it should be concluded that the CBDC concept is a natural stage of digitalization of the financial sector both in individual states and in the global community as a whole. However, the implementation of this model will require significant changes in the current legislation and, firstly, in terms of minimizing certain legal and economic risks. Currently, it is a two-level system of hybrid CBDC CBDC that allows you to neutralize or minimize most of the risks associated with the introduction of CBDC into circulation. This model can be almost painlessly integrated into modern law, since it does not differ significantly from the existing systems of bank settlements or electronic money settlements. Most of the responsibilities related to ensuring the work of the CBDC and compliance with control functions (the role of tax agents, customer identification, and AML/CFT supervision), as today, will be assigned to intermediary organizations. And non-price competition between them will help to maintain a high level of quality of the CBDC system, both from the point of view of the state and citizens who use CBDC on a daily basis.

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Non-standard Contractual Structures in the Operation of Digital Energy Trading Platforms

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Abstract. The article is devoted to the analysis of economic and legal issues related to the revolutionary processes taking place in the world economy, including in the field of fuel and energy, and the application of digital technologies in this sphere. The formation of approaches to the definition of non-standard contractual structures is directly dependent on the impact of the energy transition on public relations. In this regard, urgent measures are required to create an effective legal framework for the use of digital technologies for remote energy trading, and to promote the development of distributed energy in general. Of particular importance in this context is the emerging cryptocurrency market, whose legal regulation at the state level has an initial, non-systemic character.

Keywords: Automated agreements · Digital platforms · Distributed energy · Energy sector · Non-standard contractual structures

1 Introduction

The crisis related to COVID-2019, which humanity is experiencing today, has affected almost all spheres of public life. On the one hand, we are witnesses of how the era is being reset, and then the reformatting of the world will begin, the world which has already become familiar for humanity over the past decades – belle époque, which has gone irrevocably. On the other hand, there is an acceleration of processes related to the transition to virtual reality, which today have reached the level of 2030. The forced changes in public relations have shown a significant dependence of humanity on electricity and the need to obtain electricity in the isolation mode. These changes also demonstrated a transition to a new level in the use of contactless technologies for the transfer of goods and services. In this regard, a careful study of prerequisites for the use of digital technologies in the energy sector is required in order to develop solutions that would allow the full use of high-tech advantages for energy consumers in the framework of isolation. As for the use of innovations in the energy sector, it is necessary to emphasize the complexity of such processes due to the regulation of relations within

the framework of digital energy only in combination with the digital economy. In this regard, the task of digital energy is to reduce the cost of transactions for the transfer of energy between consumers using innovative technologies. Accordingly, changes will affect, first of all, not technological processes, but relations between participants in civil turnover.

2 Methodology

Considering the analyzed processes in the aggregate, we should agree with the opinion that if a lawyer is not used to looking at the development of positive law in a broad socio-economic, ethical and cultural context, he is powerless to model economic and other practical consequences that will lead to the adoption of a particular norm. In this regard, the objectives of this study include a comparative analysis of the applicable legal framework and draft legal acts of the considered countries (the USA, UK), as well as the impact of “energy transition” (Energiewende, Energy Transition – the transition from the use of carbon raw materials to renewable energy sources) on the transformation of public relations in these states.

3 Results

In 2019, the Global Commission on the Geopolitics of Energy Transformation compiled a report that noted that the use of digital technologies in the field of energy, such as Smart Grids, Internet of Things (IoT), Big Data and Artificial Intelligence accelerate the use of renewable energy sources in new intelligent energy generation and distribution systems [1]. As recent months have shown, the architecture of centralized energy with a single hierarchical electricity and capacity market and centralized dispatch management implemented in existing power systems has proved to be unable to work in emergency situations in different countries of the world [4].

The use of digital platforms for remote energy trading implies the possibility of entering into contractual relations with several participants of the energy system at the same time, which requires a new approach to solve problems related to the complexity of management. Under various names (Internet of Energy, Transactive Energy, Energy Cloud, FREEDM Systems), this approach is being developed and tested in different countries around the world. In Russia, this paradigm is the basis for the formation of a technological vision within the framework of the “Energynet” direction of the National technology initiative (“roadmap”) and is the basis for the current development of IDEA (Internet of Distributed Energy Architecture).

The importance of using this approach is evidenced by the fact that on 03.04.2020 the Government of the Russian Federation approved the Russian Energy Strategy for the period up to 2035, assigning an important role in building NTI Energynet digital energy in Russia, and emphasizing the creation of an “Energy Internet” in Russia as a priority for the implementation of the NTI Energynet roadmap. Despite the fact that the spread of the coronavirus epidemic “equalizes” countries in taking urgent measures to digitalize processes in the energy sector, it is necessary to consider foreign experience

in the development of distributed energy, which served as a catalyst for changes in this industry. In particular, the transition from a state monopoly of energy supply to a decentralized management system in the UK can be attributed to the adoption of the energy supply act (the 1989 Electricity Act). The specifics of this decentralization were the emergence of many participants in the management of energy supplies and the formation of the capacity market.

A report prepared by the UK Department of Trade and Industry assessed the expected benefits of projects managed and owned by energy communities [2]. The joint participation of community members in controlling the generation of electricity from different sources was highlighted, which, according to the authors of the report, allows them to significantly reduce the cost of purchasing electricity and attract additional investment in this sector. The roadmap for energy development (Energy White Paper) assumed the use of a local method of energy production, indicating as one of the priority directions of energy policy the provision of affordable electricity to each resident of the country [7]. It should be noted that support for distributed energy projects in this country had a number of distinctive features.

First, such approval by public authorities was considered as a foundation for implementation of distributed energy across the kingdom and did not involve the use of existing divisions responsible for the application of innovative technologies in the energy sector. At the same time, executive bodies had the right to participate in state programs and could directly participate in the distributed energy development projects, but their participation did not mean their responsibilities to control financing and implementation of these initiatives in the energy sector, and did not provide the authority to control and coordinate the actions of participants in such projects. All the powers to implement programs with state support were granted to public organizations directly involved in their work, which allowed them to actively use opportunities presented to them for the application of new technologies and the formation of local energy systems. Thus, the trust of state bodies in public organizations has significantly accelerated the transformation of public relations and attracted new participants in projects related to distributed energy. Secondly, there was no unified strategy for implementing distributed energy and elements of the digital economy in the processes related to the production and transfer of energy within local communities. Each of the above-mentioned programs arose, to some extent, independently, on the initiative of various government departments, and agencies created for their implementation carried out only minor coordination between the project participants and local governments bodies. However, the lack of a unified strategy has led to a variety of distributed energy initiatives. Third, the influence of territorial units of public administration and local self-government bodies on energy policy was carried out by agreements and approving new projects involving the application of new developments, including the development of power systems with a capacity of less than 50 MW. The project approval process was carried out by local governments and state authorities, taking into account the distributed energy development programs, related goals and objectives existing within these territorial units of the United Kingdom [3].

The development of decentralized energy with the application of modern technologies was considered only in combination with the use of renewable energy sources, in accordance with the position of the official authorities of the United Kingdom [6].

This position was taken into account when compiling plans for the development of the energy sector at the level of territorial units of the state (regional spatial strategies - RSS) and local governments. It is worth noting that in the 2000s, a large number of programs for the development of decentralized energy and renewable energy sources were approved by the public authorities of the United Kingdom. Only in 2004, researchers counted a total of 509 projects in the field of distributed generation [3]. The increase in the number of projects in the field of renewable energy was due to the fact that the UK authorities considered the development of distributed energy as a priority task to reduce carbon emissions in the framework of obligations under the Kyoto Protocol. However, it is noted that as a result of the adoption of a huge number of programs, there was a situation where many projects were simply duplicated, due to the lack of coordination between the entities responsible for their implementation [3].

The development of distributed energy took a different path in the United States of America, which is considered to be one of the countries that pioneered the development of new technologies in this area. The reason for this interest in decentralized power systems was the oil crisis of the 1970s, as a result of which the authorities paid attention to new technologies in energy production and began to actively develop distributed generation to reduce dependence on hydrocarbon supplies (in the 1970s, the US still had no experience in shale oil and gas production). In addition to distributed generation, the power industry has opened up new opportunities for energy saving and demand management technologies. A classic example is the “demand rationalization program” (demand management), launched in the 1970s in the United States, aimed at saving electricity by encouraging consumers to reduce energy consumption during peak periods of demand or shifting the time of energy consumption to off-peak periods of demand [9]. Today, there are many projects in the United States that involve the use of digital technologies in the energy sector. At the moment, the use of smart systems in the energy sector, such as the “Internet of things”, allows operators of power systems to receive real-time information about processes within the network. At the same time, due to the large number of disasters that have hit the country in recent years, interest in the development of microgrids that can work independently in crisis situations for the central power system has increased [4]. One of the very first examples of energy trading using distributed ledger technology occurred in New York in April 2016. As part of the LO3 Energy project, a deal was made to sell energy using the Ethereum platform.

To obtain energy in an autonomous power system from various sources and create a sustainable energy consumption by the American company Grid Wise, the term “Transactional energy” (TE – transactive energy) was proposed for the purpose of designating methods for managing the generation, consumption or flow of electricity in an electric power system through the use of market structures for the sale of energy within the network between its participants. On the basis of TE systems in near real-time mode, on a digital platform, auctions are provided with the participation of owners of a wide variety of distributed energy facilities, including electric vehicles, solar cells, home storage, as well as with the participation of existing energy supply and sales companies, aggregators, system and network operators. Predicting the needs and marginal prices of each participant, forming supply and demand, pricing and making decisions about transactions in this market are provided with the help of intelligent

systems. As a result of such auctions, reliable distribution of electricity from multiple suppliers to multiple consumers, distribution of loading and unloading capacity, are distinctive features of the platform that distinguishes it from other projects.

4 Discussion

If we consider the development of digital technologies in the energy sector only in the context of reducing carbon emissions, then taking into account the slight reduction in hydrocarbon consumption, we can assume that the UK budget funds are spent inefficiently. Since such a reduction would require a huge number of heat guns and power plants running on biomass, requiring energy, the cost of which would significantly exceed the amount of budget funds allocated for projects for the development of distributed energy. However, it is worth noting that initially promoting distributed energy projects was not considered as a priority of energy policy, but was associated with the economic crisis in agriculture that engulfed the British society in the early 1990s. The development of local communities that use renewable energy sources for energy supply in agriculture has helped to eliminate the crisis that has arisen, not least because of high electricity prices. Therefore, projects that encourage the development of energy generation based on renewable energy sources were considered primarily as a way to provide new sources of income for rural households suffering from a decline in production and economic collapse.

At the moment, the use of local systems in combination with energy storage and the use of digital platforms enables possible savings of 17–40 billion British pounds by 2050 [5]. Thus, support for projects offered by energy communities allowed the UK government authorities to provide funding for technologies in the field of distributed energy, which have so far gone beyond market-based subsidy mechanisms. The key feature of this method of supporting the development of digital technologies was the use of energy communities (although more applicable is the name “energy environment” in view of the multi-functionality of participants within such a system), which defined its “non-commercial” legal status, that allowed to allocate state subsidies directly, rather than bypassing the existing legislation. Since the legal framework of the United Kingdom does not provide energy trading on the basis of smart contracts, in this case, a legislative definition of cryptocurrencies will be required.

From another perspective, at the state level, a regulatory framework is already beginning to take shape that will speed up the development of autonomous power systems, which in the United States are known as “micro grids”. For example, the Governor of California on 19.09.2018 approved the bill on micro grids (Senate Bill No. 1339), which obliges the commission on regulation of tariffs and utilities (Public Utilities Commission) to develop measures aimed at the commercial use of distributed networks by large energy companies [8]. The bill also defines a microgrid as a system for transferring energy and its capacity between consumers, including the use of energy obtained using distributed energy technologies, which include energy storage devices (they use digital applications that allow forecasting and analyzing energy consumption to reduce peak loads in the network). In this regard, there is a certain improvement of the regulatory framework, which previously restricted the use of micro-networks.

Specific features of legal relations regulation within local power systems is that in the United States, at the legislative level, micro-networks are recognized as a means to provide power during disasters and emergency situations, in cases of technical impossibility to obtain energy from the central power system. The development of micro grids is also considered as a way of economic development, as it contributes to the creation of energy markets and the diversification of energy supplies. The combination of these two components will allow the USA to speed up the process of forming a legal framework for energy trade relations using automated agreements within energy systems in the near future.

5 Conclusion

Despite the absence of definitions of non-standard contractual structures in the legislation of most countries of the world, there is a practice of using in the test mode projects on energy trade between participants of power systems using non-standard contractual structures within the framework of “roadmaps” and social movements that are funded by public authorities. Based on the experience reviewed in the United Kingdom and the United States of America, the following conclusions can be drawn. First, approaches to defining non-standard contractual structures necessary for the operation of digital energy trading platforms are not systematic and depend on the specifics of distributed energy development in a particular region of the world. Secondly, the formation of approaches to the definition of non-standard contractual structures depends on the impact of the energy transition on public relations. Third, since the full use of the advantages of contactless energy trading on digital platforms using automated agreements is possible only if the legal status of cryptocurrencies is determined, which is not yet provided by the legislation of most countries, public authorities support projects in the field of digital energy through public organizations. Without studying the world experience of using non-standard contractual structures in the energy sector and the impact of energy transfer on public relations, it will be difficult to implement initiatives that can provide energy consumers with necessary resources in any situation.

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Stability Analysis of Enterprises and Methods for Assessing the Likelihood of Bankruptcy

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Abstract. At the present stage of development of the Russian economy, it becomes obvious that any enterprise must skillfully adapt to the requirements of the surrounding reality in order to maintain financial stability and long-term competitiveness. The need to assess the financial condition and forecast its changes is experienced by both the economic entity itself and its counterparties, investors and other interested users of the reporting. As a result, the identification of adverse trends in the development of the enterprise, risk factors leading to bankruptcy and methods for assessing them are of paramount importance. Forecasting the financial insolvency of an economic entity is based on an assessment of its financial condition using methods such as crisis management policy, official bankruptcy forecasting methods and criteria, as well as quantitative and qualitative models for assessing financial condition. The paper assesses the possibility of applying well-known bankruptcy forecasting techniques to large telecommunications companies in the Samara region such as PJSC Megafon, PJSC MTS, PJSC Rostelecom based on observations of their activities during 2017–2019. Using the conducted financial insolvency analysis, it is planned to find out whether these market participants can support the region in the implementation of the national project “Digital Economy”.

Keywords: Bankruptcy · Digitalization of the economy · Economic subject · Insolvency forecasting models

1 Introduction

One of the most developing segments of the Russian economy is the communications and telecommunications market. This is largely due to the national project “Digital Economy of the Russian Federation”, which began its operation in October 2018 [10]. The Samara region for many indicators occupies a leading position among the regions of the Volga Federal District and is characterized as a region with a high level of development of information technology and communications. In 2019, our region also began implementing the national project “Digital Economy”, which involves improving the entire public administration system, further developing digital technologies and creating a digital model of the region. The high positions that the Samara region holds in terms of the level of development and implementation of information technologies are achieved largely with the help of large participants in the communications and telecommunications market in our region. Therefore, I consider it appropriate to analyze the financial

condition of leading telecommunication companies and find out whether they can increase the investment, what projects they are ready to surprise with in the near future, what collaborative, including with authorities, is expected to be done in 2019–2024. To determine the possibility of bankruptcy, enterprises can use various models of both foreign and domestic scientists. Among them are the 5-factor model of Altman [1], the model of Taffler [13], the model of the Canadian scientist Springate [12], as well as the forecasting models of Belikov [2] and Savitskaya [11].

2 Methodology

The inevitable reform of enterprises, according to the conditions of a market economy, implies the creation of legislative prerequisites for the development of effective relations between various economic entities. One of such prerequisites is insolvency law, the implementation of which should contribute to the improvement of the entire system of financial relations between market participants, and to prevent the onset of bankruptcy. In the Russian Federation, the concept of “insolvency” is reflected in the Federal Law “On Insolvency (Bankruptcy)” of October 26, 2002. No. 127-FZ: the debtor’s inability recognized by the arbitral tribunal to fully satisfy the creditors’ claims for monetary obligations, for the payment of severance pay and (or) for the remuneration of persons working or persons who worked under an employment contract, and (or) to fulfill the obligation to pay mandatory payments [6].

At present, there are both Western and domestic models for predicting bankruptcy of enterprises. Western models raise different opinions about the possibility of their use in Russia, since their development did not take into account risk factors specific to Russian enterprises: the financial situation in the country, credit conditions, tax features, inflation, etc. Therefore, for an objective assessment of the financial condition of selected economic entities, it is also necessary to apply domestic forecasting techniques. Table 1 presents the indicators calculated by the model of Altman [1].

Table 1. E. Altman’s model for non-production enterprises

The final probability of bankruptcy	Calculation formula: $Z = 6.56 * X1 + 3.26 * X2 + 6.72 * X3 + 1.05 * X4$ if $Z * > 2.6$ - financial stability zone (green zone). if $1,1 < Z * < 2,6$ - the zone of uncertainty (“gray” zone). if $Z * < 1.1$ - financial risk zone (“red” zone).								
	PJSC Megafon			PJSC MTS			PJSC Rostelecom		
	31.12.17 (1)	31.12.18 (2)	30.06.19 (3)	1	2	3	1	2	3
X1 = Working capital/Assets	0,157	0,152	0,101	0,180	0,167	0,150	0,115	0,137	0,148
X2 = Retained earnings/Assets	0,011	0,028	0,011	0,274	0,121	0,043	0,556	0,475	0,483
X3 = Operating Profit/Assets	0,024	0,039	0,018	0,138	0,114	0,054	0,034	0,032	0,032
X4 = Equity/Liabilities	0,362	0,341	0,311	1,292	0,565	0,213	0,567	0,507	0,552
Z=	2,95	1,71	1,15	4,36	2,8	1,71	3,39	3,19	3,34
Bankruptcy Probability	Green area		Gray area		Green area		Gray area		Green area

Source: author.

Based on the data presented in Table 1, we can conclude that all the enterprises under study are in the green zone of financial stability, but by 2019 there has been a negative trend in such organizations as PJSC Megafon and PJSC MTS. That is why you should continue your analysis with the help of other foreign models, such as the Springate model [12] and the Taffler [13] model (Table 2).

Table 2. The main parameters of the models of Springate and Taffler

Model parameters	G. Springate model	R. Tuffler model
Calculation of the integral indicator	$Z = 1,03X1 + 3,07X2 + 0,66X3 + 0,4X4$ $Z < 0,862$ the probability of bankruptcy is high	$Z = 0,53 * X1 + 0,13 * X2 + 0,18 * X3 + 0,16 * X4$ $Z < 0,2$ — the probability of bankruptcy is high; $Z > 0,3$ — the probability of bankruptcy is low.
Factor calculation	X1 = Working capital/balance sheet; X2 = EBIT/Balance sheet; X3 = EBT/Short-term liabilities; X4 = Revenue (net) from sales/Balance sheet.	X1 = Profit from sales/short-term liabilities X2 = Current assets/(Short-term liabilities + Long-term liabilities) X3 = Long-term liabilities/Total assets X4 = Total Assets/Revenue from sales

Source: author.

Tables 3 and 4 show indicators calculated by the models of Springate and Taffler.

Table 3. Springate model for non-production enterprises

Indicators	G. Springate model								
	Megaphone			MTS			Rostelecom		
Period	1	2	3	1	2	3	1	2	3
Bankruptcy probability	0,9	0,84	0,78	1,29	1,06	1,03	0,6	0,52	0,53
	Medium	High	High	Low	Low	Low	High	High	High

Source: author.

Table 4. Tuffler’s model for non-production enterprises

Indicators	R. Tuffler model								
	Megaphone			MTS			Rostelecom		
Period	1	2	3	1	2	3	1	2	3
Bankruptcy probability	0,45	0,42	0,42	0,59	0,47	0,45	0,32	0,31	0,3
	Low	Low	Low	Low	Low	Low	Low	Medium	Medium

Source: author.

Based on the analysis using the models of Springate and Taffler, it was also possible to note that in almost all objects of the study, the financial condition is deteriorating and in 2019 the degree of probability of bankruptcy becomes significant. However, the two foreign models presented above gave excellent values about the probability of bankruptcy risk for such enterprises as PJSC Megafon and PJSC Rostelecom. Thus, with the help of foreign models, a clear idea of the probability of bankruptcy of the studied organizations was not received. Therefore, we consider it appropriate to consider domestic forecasting models, which, according to their authors, are deprived of many of the shortcomings of foreign models.

In the Russian practice of forecasting the threat of bankruptcy, many specialists apply the rules developed in accordance with the Federal Law “On Insolvency (Bankruptcy) of 10.26.2002. No. 127-FZ [6]. This regulatory document defined the domestic system of indicators for assessing the insolvency of organizations. But, despite the large number of different models for assessing the degree of bankruptcy risk, in modern economic science there is no single formalized approach, each model is based on its own group of indicators and normative values.

One of the first Russian bankruptcy forecasting techniques is Belikov [2], proposed in the 90s (Table 5).

Table 5. Bankruptcy forecasting model of Belikov

The final probability of bankruptcy	$R = 8.38 * K1 + K2 + 0.054 * K3 + 0.6 * K4$ $R < 0$, the maximum probability of bankruptcy $0 < R < 0.18$, high probability of bankruptcy $0.18 \leq R < 0.32$, average probability of bankruptcy $0.32 \leq R < 0.42$, low probability of bankruptcy $R > 0.42$ minimum probability of bankruptcy								
	Megaphone			MTS			Rostelecom		
Period	1	2	3	1	2	3	1	2	3
C1 = Working capital/Assets	0,157	0,152	0,101	0,18	0,167	0,15	0,115	0,137	0,148
C2 = Net Profit/Equity	0.041	0.112	0.012	0.525	0,085	0,248	0,032	0,022	0,014
C3 = Revenue/Assets	0,614	0,525	0,114	0,538	0,392	0,202	0,5	0,508	0,241
C4 = Net Profit/Cost	0.027	0,081	0,038	0.428	0,058	0,45	0,033	0,019	0,025
R =	1,41	1,46	1,22	2,32	1,547	1,79	1,04	1,241	1,28
The degree of probability of bankruptcy for 2019 and subsequent years	Minimum probability of bankruptcy								

Source: author.

According to the data obtained, it can be said that the results obtained for some of the enterprises analyzed are significantly different from the final values obtained using Western methods. Therefore, it would be advisable to conduct an assessment using another domestic bankruptcy forecasting model - Savitskaya [11] (Table 6).

Table 6. Bankruptcy Forecasting Model of Savitskaya

The final probability of bankruptcy	$R = 0.111 * K1 + 13.23 * K2 + 1.67 * K3 + 0.515 * K4 + 3.8 * K5$ R < 1, the maximum probability of bankruptcy (bankruptcy company) R < 3, high probability of bankruptcy $3 \leq R < 5$, average probability of bankruptcy $5 \leq R < 8$ small risk of bankruptcy R > 8 minimum probability of bankruptcy								
	Megaphone			MTS			Rostelecom		
Period	1	2	3	1	2	3	1	2	3
C1 = Equity/Current assets	0,244	0,242	0,193	0,126	0,105	0,078	1,181	0,197	0,148
C2 = Working Capital/Capital	0,614	0,525	0,114	0,538	0,392	0,202	0,5	0,508	0,241
C3 = Revenue/Assets	0,011	0,028	0,003	0,115	0,011	0,043	0,015	0,009	0,006
C4 = Net Profit/Assets	0,266	0,252	0,233	0,219	0,127	0,175	0,469	0,411	0,399
C5 = Equity/Assets	5,457	5,235	3,888	3,592	2,617	2,186	18,691	5,353	4,180
Bankruptcy Probability	Low	Low	Average	Average	High	High	Minimum	Low	Average

Source: author.

The results obtained using this model are largely similar to the values already obtained in the model of Belikov. This technique also confirms the negative dynamics of the financial condition of organizations for the analyzed period.

3 Results

Comparing the results obtained using various foreign models and methods of domestic authors, it can be noted that the coincidence of the final values is minimal (Table 7). One can agree with the aforementioned opinion that most foreign bankruptcy forecasting models do not take into account industry specifics of the Russian economy. Because of this, it is very difficult to use the values of the coefficients in domestic conditions. However, foreign models themselves, with numerical values that would correspond to the Russian market, could be applied if domestic accounting and reporting always provided sufficiently representative and reliable information about the state of the enterprise. Also, the absence in Russia of statistical materials on bankrupt organizations does not make it possible to adjust the methodology for calculating weighting factors and reference values applicable to the Russian economy.

Table 7. Comparative table of coefficients of various bankruptcy models

Author	Altman	Springate	Tuffler	Belikov	Savitskaya
Coefficients					
C1 (X1)	6,56	1,03		8,38	
C2 (X2)				R (own capital)	13,23
C3 (X3)				0,05	
C4 (X4)			0,16		
C5 (X5)					

Source: author.

From the above Table 7 it is seen that domestic bankruptcy forecasting models use at least one coefficient from foreign practice. However, the Belikov model is supplemented by an indicator not mentioned in the comparative models: an indicator of return on equity. Also, the main advantage of the presented Russian models is that during their development the statistics of domestic enterprises were used, which makes it possible to judge the greatest accuracy of the predicted data. These factors influenced the receipt of significant deviations in the forecast values obtained using Russian and Western forecasting techniques. Of course, obtaining a forecast of the future state of an economic entity, the possibility of its bankruptcy occurring (non-occurring) is the main goal of the study, but for the head of the enterprise this is an intermediate goal, because it is more important for him not to predict possible negative events, but to avoid them and ensure sustainable development. It is technically impossible to build a digital society of the future without relying on mobile solutions. The transmission of information via radio channels enables each of us to connect to a single information space, to be constantly in touch. For this reason, mobile operators are active participants in this national project.

At the forum “Digital economy the role of telecom”, the governor met with representatives of branches of such large companies as PJSC Megafon, PJSC MTS, PJSC Rostelecom and listened to their proposals for the development of a digital society (Table 8) [4].

Table 8. New opportunities for digitalization of the economy of the Samara region

Name of market participant	Suggested innovations	Number of users
PJSC Megafon	<ol style="list-style-type: none"> 1. The development of 5G networks and the Internet of things (IoT); 2. Work with big data; 3. Mobile operators have information about their subscribers, it is necessary to direct its use in the interests of users, for this the company wants to combine the big data processing systems with IoT technologies 	Mobile users-45% Internet users-30%
PJSC MTS	<ol style="list-style-type: none"> 1. Search for innovative solutions (an investment center and a venture fund have appeared in the structure of the company) 2. Attracting promising start-up companies (since 2017, more than a thousand start-ups have been considered, about 60% of companies are developing successfully today, in large part thanks to the investment of MTS PJSC) 3. An example of a startup is a digital solution for managing companies in the housing and communal services sector “Smart Resident”, which will be included in the product line of things from MTS 	Mobile users-45% Internet users-60%
PJSC Rostelecom	The foundation for a comfortable life for residents of the Samara region is laid. On optical communication networks, you can deploy video analytics, telemedicine, distance education and many other interesting and necessary projects for people	Mobile users-10% Internet users-10%

Source: author.

Digitalization is not only an integral part of the industrial revolution, it is a huge opportunity to improve the lives of citizens. The implementation of digital technologies will allow, based on a large amount of data, to make more effective and efficient decisions, make optimal use of resources, make it more convenient to receive services in the field of medicine, education, and increase the efficiency of public administration. According to experts, by 2030, digitalization will ensure Russia's GDP growth of 19–34% and the growth of gross regional product in the Samara Region by 62–134 billion rubles. Of course, obtaining a forecast of the future state of an economic entity, the possibility of its occurring (not occurring) bankruptcy is the main goal of the study, but for the head of the enterprise this is an intermediate goal, because it is more important for him not to predict possible negative events, but to avoid them.

Special analytical procedures help identify events that signal the threat of bankruptcy, as well as assess the impact of internal and external factors on the financial stability of the enterprise. Examples of such events are: sales decline, frequent losses from significant transactions, shortage of working capital, negative difference from cash inflow and outflow, suppliers' denial of credit, growth of doubtful receivable accounts, etc. The use of analysis allows us to identify and evaluate the effects of negative factors, to assess their impact on financial performance.

Based on the study, the minimum probability of bankruptcy is inherent in PJSC MTS and Rostelecom PJSC, the financial condition of PJSC MegaFon is at an average level. In order to improve the quality of management decisions in the field of financial and economic activity, special attention should be paid to the methods used to calculate indicators of financial stability of an economic entity, as well as analytical techniques. The studied organizations that are participants in the telecommunications communications market, the industry specifics of their activities directly affects the structure of the balance sheet (the value of non-current assets, in most cases, exceeds the amount of equity), which results in a negative value of working capital. Analyzing the reporting of three telecommunications companies using the classical formulas of financial analysis, we can see that they demonstrate a negative value of the fundamental indicator, although in reality these enterprises are developing, at least 2 from 3 have a fairly stable financial position. Therefore, the generally accepted formula for calculating own current assets does not reflect the actual financial situation of participants in the communications and telecommunications market.

$$OWC = E - NA \quad (1)$$

where OWC - Own working capital; E - equity; NA - non-current assets.

For example, in PJSC Rostelecom as of June 30, 2019. the OWC value calculated by the classical formula takes a negative value of –276882.3 thousand rubles, in PJSC MTS –586094978 thousand rubles, in PJSC Megafon –424668049 thousand rubles, which indicates the absence of the organization working capital - a sign of financial instability. Thus, the deficit of funds needed to finance non-current assets is experienced by all three research enterprises, despite this, PJSC MTS and PJSC Rostelecom are successfully developing and are financially stable companies.

In connection with the inconsistencies in determining the magnitude of the OWC, we offer a modified formula for calculating this indicator. Telecommunication companies to finance non-current assets, to a greater extent, use short-term and long-term loans and borrowings, as well as turn to long-term valuation obligations. Using the adjustments made, the formula will take the form:

$$\text{OWC} = E + \text{STLaB} + \text{LTLaB} + \text{EL} + \text{AP} - \text{NA} \quad (2)$$

where STLaB - short-term loans and borrowings; LTLaB - long-term loans and borrowings; EL - estimated liabilities; AP - accounts payable in terms of suppliers and contractors.

However, it should be taken into account that the use of short-term borrowed funds in order to finance current activities is possible only if the operating cycle of the company exceeds the term of use of short-term borrowed funds. We will recalculate the own working capital of LLC Rostelecom only using the modified formula:

$$\begin{aligned} \text{OWC (06/30/2019)} &= 244736600 + 36094775 + 194393546 + 12926420 + \\ &73886277 - 521618859 = +24409144 \\ \text{TR (turnover ratio)} &= 24409144/94980991 = 0.26 \end{aligned}$$

For PJSC Megafon:

$$\begin{aligned} \text{OWC (06/30/2019)} &= 153860616 + 38773356 + 358290379 + 3993694 + \\ &47626175 - 578528665 = +24015555 \\ \text{TR (turnover ratio)} &= 24015555/70882917 = 0.34 \end{aligned}$$

For PJSC MTS:

$$\begin{aligned} \text{OWC (06/30/2019)} &= 127967078 + 145484473 + 313520476 + 5964731 + \\ &48742085 - 714062056 = -69463795 \\ \text{TR (turnover ratio)} &= -69463795/83440171 = -0.83 \end{aligned}$$

The adjusted formula takes into account the industry characteristics of these organizations, thereby showing the real financial situation of the participants in the communications market. Despite this, the participants in the communications and telecommunications market need to increase their own capital, because it should be the basis for financing current activities, as it does not generate profit.

In our opinion, a preliminary diagnostic analysis, which includes several groups of indicators to determine the signs and threats of financial insolvency of an enterprise, is no less effective: a group of absolute indicators; a group of indicators of liquidity and solvency; a group of indicators of financial stability; a group of indicators of the turnover of receivables and payables; a group of profitability indicators. These indicators are also aimed at calculating the probability of bankruptcy of the organization under study.

4 Discussion

Forecasting bankruptcy of enterprises is an important topic both from the point of view of many practical applications, and from the point of view of research. In the context of digitalization in world practice, a number of approaches have been developed to forecast financial insolvency. Basically, in the scientific literature in recent years, methods based on machine data analysis and forecasting have been proposed. At the same time, a number of studies are devoted to the narrower problems of machine learning [3]. Within the framework of using the Big Data system, researchers are offered new industry and regional insolvency forecasting models for small, medium and large industrial enterprises [5, 9, 14], based primarily on the use of coefficient financial analysis. In other works, the optimization of existing models to the conditions of the new economy is carried out by adding quality indicators based on the analysis of textual information [8], relational data and top management and company directors [15]. In general, a positive trend should be noted for improving models for assessing the probability of bankruptcy, which use only financial (quantitative) indicators for analysis, which are especially actively emerging in the context of digitalization. It is worth noting that the introduction of additional parameters into the financial insolvency forecasting model often leads to greater reliability of conclusions and, as a result, the adoption of more qualified managerial decisions.

5 Conclusion

Prediction of financial insolvency on the basis of models for assessing financial condition, the development of various modifications of formulas (indicators) applicable to the telecommunications industry, of course, help to identify weaknesses in the activities of the studied economic entities. However, do not forget that the successful development of the industry requires not only innovation, but also investment. In our opinion, the state is one of the important investors and regulators of the telecommunications industry. In the Russian Federation, participants in this field of activity are controlled by several government agencies that are guided by the Federal Law “On Communications” dated 07.07.2003 No. 126-FZ: the Ministry of Information Technologies and Communications of the Russian Federation, the Federal Service for Supervision of Communications, the Federal Agency for Information Technologies, federal communications agency, regional governance structures [7]. In 2018, investments in telecommunications activities amounted to 447.5 billion rubles, which is 3.4% more than in 2015. In connection with the launch of the national project “Digital Economy of the Russian Federation”, we can conclude that investment in the telecommunications industry will only grow. Therefore, it is equally important to conduct an investment analysis to consider the effectiveness of investments, return on investment, etc. That is why the study should be continued in the context of investments made in the telecommunications and communications industry, and in particular, in the organizations under study.

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Role of Integrated Information Systems for Modern Organizations

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Abstract. The article is devoted to the study of the role of integrated information systems in an unstable external environment characterized by negative development trends in modern conditions. The analysis of the situation on the information technology market allowed us to identify the main advantages of integration of such systems in the organization’s activities, and predict the effect of their implementation. Special attention is paid to the issue of forming relationships with customers, the use of analytics tools that provide an assessment of the quality of work for departments responsible for customer relations, the effectiveness of sales tactics, communication with customers through various channels. An algorithm for implementing integrated information systems is proposed, taking into account specific features of implementing the system in the organization’s activities from the initial stage, and an algorithm for embedding it into an existing system in the organization is also considered. Recommendations have been developed for the implementation of integrated information systems aimed at improving the competitiveness of organizations in modern conditions, allowing them to respond flexibly to changes in the conditions of limited use of labor resources.

Keywords: Advantages · Customers · Functionality · Information system · Information technology · Loyalty

1 Introduction

The market of enterprise management systems is currently the most attractive and fast growing. The current economic situation, which is largely determined by global social trends, also plays a significant role in the emerging dynamics. The impact of the COVID-19 on the economy digitalization is incredibly strong. The coronavirus accelerated the digitalization of the world economy by at least 10 times [10].

Analytical reports of marketing, information and consulting agencies have recently massively revised the trends they indicated earlier. The main source of change was the impact of the pandemic on the end user, who will completely change their behavior in

the post-pandemic period due to the digital experience they have gained. Business is forced to adapt.

The proof is the volume of increase in e-commerce. According to the Russian Association for Electronic Communications (RAEC), Runet's contribution to the Russian economy in 2019 amounted to 6.4 trillion rubles [7]. During the stabilization period of the industry's development (2016–2019), the growth rate was 15–20%. According to analysts, with a moderate development of the crisis scenario, the growth rate of the Internet market volume will be 6–10% in the first and fourth quarters of 2020 [9]. These processes set a very important task for organizations – implementing a strategy to attract customers in the context of changing preferences, habits, declining social standards of living, etc. Each organization should address the issue of implementing a modern way to quickly update information and data to understand customer needs, as well as quickly remove from offers what is no longer relevant [3]. If the company can provide customers with the ability to manage the digital experience, it will get information about their wishes and needs quite quickly.

Moreover, almost all organizations are forced to work not only in the face of an increasing number of information threats and attacks [11], but also with reduced staff, according to the requirements of social distance. In these conditions, it is integrated information systems and their implementation that can create a competitive advantage and help to keep the organization in the zone ensuring the effectiveness of financial and economic activities.

2 Methodology

Analytical reports of consulting agencies, static information, and Internet resources were used for the analysis. The study was conducted on the basis of traditional qualitative analysis of materials, as well as identifying patterns of the situation development by applying quantitative methods of analysis. In general, the research purpose to study the situation on the information technology market in order to develop recommendations for improving the competitiveness of organizations in modern conditions by implementing integrated information systems that allow flexible response to changes in the conditions of limited use of labor resources.

3 Results

In order to solve the tasks set in the study, the SAP S/4HANA and SAP CRM systems were considered in detail. The SAP S/4HANA system is an intelligent integrated ERP system based on the in-memory SAP HANA database. Like any ERP system, it can reliably store a large amount of data and provide all the necessary information in the specified format. SAP S/4HANA (the system replaced SAP ERP) is an advanced platform in the SAP product line that extends capabilities of previously existing solutions. SAP S/4HANA combines advantages of the well-known SAP ERP platform,

best practices of process and industry expertise, and advanced technologies for processing, storing and transmitting data. SAP S/4 HANA has a number of significant technological advantages that provide record-breaking computing speed and comprehensive business automation in accordance with the ERP II concept. It can act as the main platform for complex business automation, and successfully complement the existing IT landscape [4, 8]. It has ready-made built-in tools for integration with other SAP solutions and other external systems. It has a modular structure that allows to use separate blocks to automate business processes and scale the solution as needed with minimal costs and maximum quality of the final solution.

The process-oriented architecture of SAP S/4HANA ensures the application of the world's best automation practices, while maintaining extensive tools for customization when creating an enterprise ERP system. Centralization of SAP S/4HANA information flows allows to increase the speed, quality and control of information support for key and supporting business processes of the enterprise. The distributed architecture of SAP S/4HANA makes it possible to get high speed of calculations, representation and data transfer regardless of the number of remote branches of the enterprise. SAP S/4HANA includes a set of tools that take into account the industry specifics of business: manufacturing, retail, distribution, construction, telecommunication, etc. Information security and a well-established policy for differentiating access rights to information are also present in the system, technological superiority due to the use of advanced developments in the field of database management system, cloud solutions, IoT, Big Data, Blockchain, etc.

The implementation of SAP S/4HANA creates additional opportunities for improving the performance of both individual employees and the company as a whole:

- combining all the company's divisions in a single information space, creating a "single source" of data,
- optimization of the business architecture through the use of the world's best practices of enterprise management,
- improving the quality and reliability of information by typification and system control of data entry, eliminating duplicate data entry points and automating the main volume of transformations and calculations,
- improving the quality of accounting, its transparency, and control of operations (measures to increase employees' motivation using a simple and visual KPI system),
- reducing the number and cost of servicing used IT systems and applications by applying the universal SAP S/4HANA platform,
- 20–80% faster input, search and processing of information in the ERP system.

SAP CRM is a software that allows you to combine personnel, processes, and company management methods into a single information space to achieve the goal of improving the quality of interaction with customers.

First of all, the SAP CRM system is oriented and pre-configured for the main business processes of absolutely any company. This increases the effectiveness of marketing interaction with the customer base. This kind of effect allows you to minimize the sales cycle, which reduces the cost of servicing the consumer. Ultimately, it simplifies the decision-making process, thanks to instant data analytics and so on [1].

Using the SAP CRM electronic platform allows you to coordinate the key processes of the organization aimed at mutually beneficial relations with the client. The CRM system optimizes sales, marketing activities, service, analytics, e-commerce procedures, and so on. The SAP CRM product enables the company to maximize the use of all communication channels for effective interaction with customers. Deep integration of the CRM system with modules for informational communication with the customer (telephony, web chats, e-mail distribution systems, SMS communications) ensures the flow of data from customers to employees of the service department and back on the basis of a single digital platform.

The entire history of interaction with a specific customer is stored in a separate profile, which gives the manager all the necessary information (the used product, contact history, personal data, etc.) in real time [2]. Due to this, the specialist is able to provide timely support for a customer or offer additional services. At the same time, the system allows you to integrate as painlessly as possible into any SAP-based solutions of the company. This provides an incomparable advantage for doing business and reduces the cost of integration interactions between systems.

SAP CRM creates a closed system of relations with the client base, providing solutions for working with Big Data, Predictive Analytics tools and business process automation across all management verticals. Since further we will talk about additional SAP products, such a system as SAP CRM can be used as a tool for maintaining price lists, in particular when communicating with the company's customers. Its use reduces the company's risks and helps optimize pricing, increases productivity and makes business processes more convenient. A single customer base when interacting with pricing policy allows you to effectively maintain and select the desired price lists for a specific range of customers of the company.

However, when it comes to suppliers or providing customers with personal access to the price list database, there are problems with the appropriate use of the SAP CRM system. This, unfortunately, is a disadvantage of this system, but the solution itself can only be relevant when interacting with the company's customers or when the company's business is absolutely customer-oriented.

4 Discussion

There is no single solution when it comes to migrating of SAP S/4HANA, and each organization is at a separate stage of SAP S/4HANA readiness. Some companies decided to start cleaning by implementing a new system or approach from scratch [6]. Other businesses prefer to perform a complete system conversion or a "Brownfield" approach because it doesn't disrupt their existing business process. And for those companies that want to consolidate their current system landscape in SAP S/4HANA, they can choose to transform the landscape.

Since each methodology has its own advantages and challenges, you need to look at the database, platform, and configuration before deciding which route might be most appropriate for a particular situation. Each methodology is analyzed below to help the company come up with a specific best option for implementing the SAP S/4HANA system. An approach from scratch requires a new implementation of SAP S/4HANA. This can be a tedious and time-consuming project, especially in terms of change management, since you need to start from scratch. The advantage of this path is that you can redefine and simplify business processes and take full advantage of the capabilities of S/4HANA. This does not guarantee that the new embedded system will actually work on the operating side, but there will be time to configure it.

Going through this re-implementation path can lead to confusion, because the system will undergo drastic changes. Therefore, if you follow this path, you need to make sure that the company is ready for the entire reengineering process. Taking into account all the consequences of the “from scratch” approach, there is an alternative path: the “from scratch” route. This is the latest SAP recommendation for existing customers who work on SAP ECC and want to upgrade it to S/4HANA, but still retain their investment in the current system.

With the transformation of the system, the entire system and business processes will be transferred to the new S/4HANA platform. This approach can offer a better solution if the organization does not allow any changes in the business process operations. In fact, this allows you to do business with less interruptions, since this is a technical transformation of the system. The disadvantage is that there may be possible technical problems, but SAP has provided conversion tools and recommendations for this. Therefore, the risk can be reduced.

The focus of landscape transformation is not the entire system conversion, but rather individual parts of the business process that the company wants to migrate. Using SAP landscape transformation, you can selectively migrate data to SAP S/4HANA or consolidate your business landscape into a single global system. This means that the process that gives the best and fastest ROI for migrating to S/4HANA is selected first. Basically, SAP clients choose this path.

Choosing the right approach requires the organization to conduct extensive analysis and evaluation of both the technical and functional aspects. The existing system environment, business functions, and user readiness are a few things to consider. More importantly, the organization needs to look at its own roadmap for digital transformation. That is, determine where the company is located and where it wants to go in the coming years. After determining the path, it's time to prepare for the actual migration by planning the exact steps necessary for the successful implementation. If you decide to run a new implementation using the initial stage approach, there is a whole methodology called SAP Activate that explains each required step (Fig. 1).

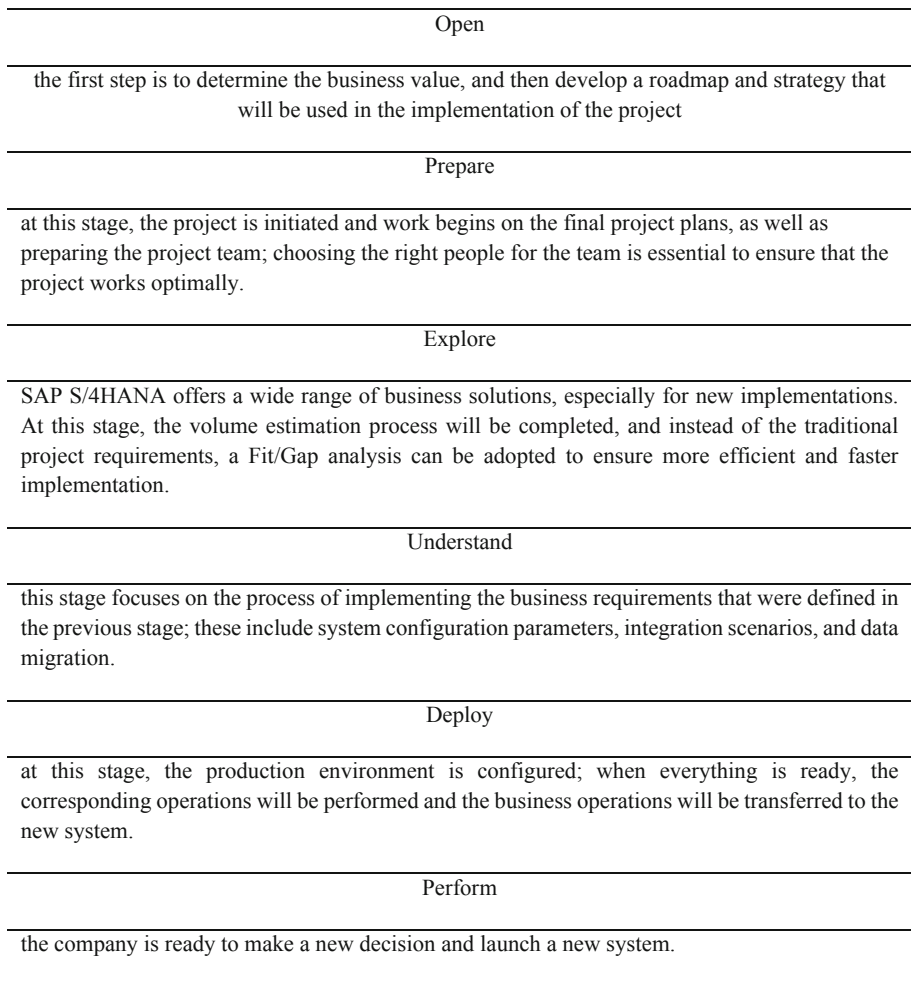


Fig. 1. Stages of implementation of the integrated information system from the initial stage (Source: authors).

On the other hand, if you decide to perform a system conversion or landscape conversion, there is a sequence that the organization has to follow to ensure smooth operation. The process is divided into two phases: preparation and implementation (Fig. 2).

Preparation stage
System requirements and planning
this assessment should be conducted to analyze the existing system and then determine the best possible solution to perform the migration;
Pre-conversion check
checking the compatibility of any add-ins or business functions that are active in the current system is necessary to make sure that they can technically be converted to S/4HANA. SAP provided a simplification element check to determine the required steps before converting an existing system.
Migrating user code
this step will check the user code for compatibility with S/4HANA; this is important, especially if there are improvements in the current system.
Implementation phase
System installation
after the preparation stage, you can start converting to SAP S/4HANA; this step includes database migration and data conversion.
Subsequent actions
after the technical transformation, all the relevant adjustable parameters should be transferred.
Checking data consistency
as SAP S/4HANA collects all relevant components from financial accounting (FI) and controlling (FI) into a single data pool called a universal log, you should perform reconciliation between a reconciliation between accounting data of components; in this way, the data can be combined correctly in universal log.
Iterative testing
when the configuration is complete and all the data is migrated, you need to run test iterations to make sure that the system is working correctly.

Fig. 2. Integration stages of information system in an organization (Source: authors).

The transition to S/4HANA is inevitable for every SAP client. It’s not a matter of “if”, but only “when”. However, the migration process can be intimidating for clients because they don’t really know what to expect from the process. This is why choosing the right approach will be important for business transformation. In this regard, it is

very important to pay attention to the issues of training, updating the knowledge and competencies of both performers and individuals who influence the process of making management decisions in this area [5].

5 Conclusion

The conducted research allows us to conclude that the solution of current problems of modern organizations through the introduction of integrated information systems should be treated very carefully. For example, the CRM system allows you to: track the effectiveness of the sales department; use Predictive Analytics to set strategic goals; generate individual offers for each client; and respond to changes in customer needs in a timely manner.

Tools provided by the CRM system make it possible to differentiate marketing campaigns, quickly create personal offers based on the needs of individual customers and build long-term relationships with them. Planning and analytics modules of the CRM system allow you to track marketing moves and manage expenses, focusing on the market situation and customer behavior.

SAP CRM has built-in analytics tools that provide an assessment of the quality of customer relations departments, the effectiveness of sales tactics, and differentiation of communication with customers through various channels. The functionality of end-to-end analytics of the CRM SAP platform also includes: monitoring KPI indicators of call centers, sales departments and other divisions; analysis of key factors of business processes: the effectiveness of solving issues from the first call, and so on; increasing customer loyalty through high-quality interaction between departments.

CRM SAP includes the necessary resources for automating key business processes: a single segmented customer database; a user-friendly interface; data about existing and potential customers. SAP CRM provides centralized control of interaction with customers by collecting information about the work of specialists. In addition, the CRM system organizes compliance with the implementation time of projects and proposals through modules for reminders of important meetings, newsletters, and other things. It also distributes responsibility for work through modules for assigning responsible persons for various projects of the organization, and so on.

Additional useful features of CRM SAP include working with advertising tools. Analysis of customer attraction using the resources of advertising offers and assessment of their quality is available for each category of employees. Another useful feature is the loyalty module for implementing loyalty offers based on the automatic analysis of each client's bonuses in a shared database.

CRM SAP solves tasks of transaction analysis, sales planning, customer data management, and sales not only over the phone, but also through mobile applications. An important point regarding the customer interaction is to keep up-to-date the pricing processes and the price list management tool.

CRM SAP has a number of advantages when implementing: instant automation of business processes; increasing functionality at the right speed; all key business processes are included in the price. CRM system support is available both with the help of a personal specialist and by searching for solutions in the general "knowledge base".

As a result, the organization that has implemented the system will receive a single customer base, monitoring the effectiveness of the business promotion direction, data protection, and ready-made solutions for the loyalty system.

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Country Dependence on Commodity Resources and Exports

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Abstract. The purpose of this study is to assess the importance of carbon raw materials for the economy of the state, in particular - Russia. Governments can rely on oil and gas rents without realizing much more needs to be done. On the other hand, many countries are content with the commodity structure of budget revenues. The authors consider the role and importance of hydrocarbon raw materials for the economy of the country. Russia is currently trying to diversify and modernize its economy, overcoming not only natural obstacles, but also market manipulation and internal resistance. In this study, we will provide facts that should convince a reader interested in finding the truth about Russian impressive achievements over the past decade in the field of recovery, restructuring, diversification and modernization of the oil and gas sector. Knowing that Russia is not economically disabled, as it is constantly portrayed, will help avoid a clash with Russia and move to cooperation. Accurate data will help investors make profits, and politicians will help maintain peace.

Keywords: Dependence of countries on raw materials production · Economic diversification · Hydrocarbon raw materials · Oil exports

1 Introduction

The myth of the “gas station country” and the fact that Russia is entirely dependent on hydrocarbon exports and without them the country will simply disappear, has been spreading around the world with Ronald Reagan’s easy hand for 40 years. The myth is not only very convenient, but also very alive and very contagious, and spreads like influenza virus. Naturally, it is not that the Russian economy is in perfect condition, it is far from it. On the other hand, in which country can the state of the economy be characterized as ideal? The true state of affairs in the oil and gas sector of the Russian economy should be understood not only by Russia’s competitors, but also by its own government.

It was believed that the United States and Saudi Arabia had destroyed the Soviet economy by the collapse of oil prices. However, the simplest analysis of the USSR budget shows that the decline in world hydrocarbon prices was accompanied by an increase in the country’s oil export revenues. At the same time, it should be taken into account that the formation of oil and gas revenues of Russia in the market economy is

provided by rents and taxes, while in the USSR in the Etationist economic system - by direct seizure of gross product.

The growth of oil exports was facilitated by the discovery of the largest fields: for example, Samotlor was opened - and by this moment everything in the world was already ready for the meeting of Soviet oil. The era of coal is over, consumption of gasoline, aviation fuel, petrochemical raw materials has grown rapidly. The state had in its hands a resource that allowed us not to think about the contradictions that had already begun to slow down the economy. It is no accident that immediately after the light oil money appeared, the economic reforms started by Kosygin were reduced. This led to huge problems already in the 1980s. Abroad, first of all to social networks, many other goods were supplied - from cardboard and fertilizers to machines and cars.

Budget revenues of the USSR grew in a geometrical progression: 1970–156.7 billion rubles, 1975–218.8 billion rubles, 1980–302.7 billion rubles, 1985–372.6 billion rubles... 1990–471.6 billion rubles. The growth rate of budget revenues remained constant even during the period 1989–1992 [10]. A relative slowdown was observed between 1986 and 1988.

The same trends were observed in the turnover of foreign trade of the USSR from 22.079 million rubles in 1970 to 109.74 million rubles in 1980 and 60.76 million rubles in 1990. The share of fuel and electricity in exports grew from 15.6% in 1970 to 46.9% in 1980 and 40.5% in 1990. The share of fuel and electricity revenues in the USSR budget is 1.15% in 1970, 7.69 in 1980 and 5.22% in 1990.

The share of fuel revenues in the USSR budget was due to the fall in hydrocarbon prices, which began in 1986, but was compensated by the amount of produced raw materials and exploration and development of new fields. In 1988, 624 thousand tons of hydrocarbons were extracted from the subsoil and the USSR became the leader in oil production in the world, ahead of the United States. A decline in food imports was among Gorbachev's mistakes made in the face of declining currency inflows.

The peak was reached in 1988, when 624,000 tons were extracted from the subsoil. And then in Russia began a long-term fall in oil production. Today, in the context of the coronavirus pandemic, prices have fallen again. To prevent collapse, all countries will have to cut production. But the consequences will be different everywhere. The share of oil in the US economy is only 0.2%, Russia - around 6%, Arab countries - on average 16%. The problem is not that the share of the oil and gas sector in exports is too large, but that there was no transfer of money earned in the oil sector to more promising sectors of the economy.

2 Methodology

Various methods of scientific knowledge were used in the course of the study. The method of materialist dialectics was used as the main one, allowing for the production and analysis of the problem. The use of a comparative legal method has led to a systematic analysis of the studied phenomena. The formal-logical method allowed to justify the conclusions and basic provisions of the study. The analysis and comparison of statistical data revealed comparison benchmarks, the comparison of which provided the basis for the study. Energy modelling and forecasting as a basic method is due to

the fact that it takes more account of the peculiarities of national institutions of management and statistical description of modelling objects.

3 Results

According to the results of 2018 (data of the UN and US EIA) [14], the share of oil exports in GDP of Russia amounted to only 8%. For comparison, the share of oil exports in Norway's GDP exceeds 11%. In the GDP of Kazakhstan - 27%; Saudi Arabia and Qatar, shape their GDP from oil by 45% and 25% respectively. Fuel exports in 2018 amounted to \$286.7 billion (an increase of 35.2% or \$74.7 billion). Of this, fossil fuels (oil, gas, coal) amounted to \$201.1 billion (growth by 34.8% or \$51.9 billion), processed (mainly petroleum products) - \$85.6 billion (growth by 36.2% or \$22.8 billion). Mineral exports in 2018 amounted to \$4.44 billion, with an increase of 14.3% or \$0.56 billion. Russia's non-fuel exports in 2018 reached an absolute record of \$162.6 billion and increased by 11.6%. The previous record was \$156.4 billion in 2012. Record export values reached a number of industries.

Export of Russia (according to the methodology of customs statistics) in 2018 amounted to 449.3 billion dollars. This means an increase of \$25.6% billion or \$91.5 billion by 2017. Total exports, which also include fish and seafood issued outside the customs control zones and partial trade charges with the EAEU, exceed the customs figure by \$2.1 billion - \$453.1 billion.

There is another scale for assessing countries' dependence on commodity production, namely annual oil and gas production per capita. According to this indicator, the "main gas station of the world" took the 14 place in the rating. Russia is bypassed by Canada (12th place), Norway (4th place), Qatar (1st place). This proves not only the relatively low role of oil exports in Russia's economy, but also why the "oil social policy" of the Qatar or UAE format is impossible in our country. And, the Russian territory is approximately 1478 "Qatars".

According to 2018 data [14], the share of oil and gas revenues in the consolidated budget of Russia (that is, the budget, which includes regional and local budgets), is only 21%. "Share of oil and gas revenues," according to the norms of the Ministry of Finance [14], is formed by the following articles: tax on mining (oil, gas and gas condensate), as well as export customs duties on crude oil, gas and goods produced from oil. At the same time, oil export implies VAT reimbursement, that is, return and transfer of amounts of previously paid tax from the treasury to the exporter. That is, if the taxes levied by the oil industry increase, the share of oil and gas in Russia's budget increases. In addition, a large part of oil revenues during the years of ultra-high oil prices were formed in the Reserve Fund and the National Welfare Fund, and this advance measures allowed to pass another man-made collapse of the oil market in 2014–2017.

Value-based export criteria allow you to look at the problem in question in a slightly different perspective. In 2005, Russia's total export value was 245.3 billion US dollars. The share of energy resources (oil, gas and processed products) in the total volume of these exports was 53.2%. In 2017, the export figure was 357 billion US dollars. The share of energy resources remained almost the same as in 2005-59.18%.

The price of oil in 2005 was around \$50 a barrel, in 2017 after the collapse, the price was exactly the same. Against this background, budget revenues grew due to the increase in non-commodity exports carried out all these years on revenues derived from the sale of raw materials.

For any country, there is no point in giving up energy export revenues, at least without having something to replace it. Therefore, all these years the percentage of dependence did not grow, but also did not fall. At the same time, however, production, infrastructure were built on the proceeds and prepared to increase the level of non-oil revenues of the country.

Growth of non-oil non-energy exports of Russia in the first half of 2017 increased by 17%. In 2016 and 2015, after the introduction of counter-sanctions, he also grew. And the growth in the first half of 2018 and at all became record - 23% relative to the previous period. As a result, at the end of 2018, in the total volume of supplies abroad non-oil non-energy exports occupied 33%. According to plans, the volume of non-oil exports by 2021 should be increased by another 20%. Already now the flags of substitution of raw materials exports are not just goods with high added value, but leaders of high technologies - peaceful atom, aircraft industry, military equipment, metallurgy, environmentally friendly agro-industry and IT sphere.

The manipulation of oil prices creates a reverse multiplier effect in which currency speculation and re-export of revenues buy up cheap assets and redistribute funds. The extra profits of currency speculation ensure the outflow of capital from the real sector, which is forced to seek assistance from the Government. Such a picture shows very different vectors in the competence and directive of conduct of the government and the central bank. Cheap loans spread across banks for currency speculation, and did not get into industrial enterprises and the oil and gas complex. The stock market financial bubble burst immediately after falling oil prices and the outflow of foreign speculative capital.

Both in 2008, 2014 and now the fall of the ruble has far exceeded the possible impact of the decline in oil prices. This is evidenced by the relative stability of the national currencies of other oil-producing countries. The exchange rate regime, not oil prices, determines the volatility of national currencies. Oil-producing countries such as Saudi Arabia, Uzbekistan and Azerbaijan have maintained the stability of their currencies against the background of the oil crisis and the COVID-19 pandemic because they apply regimes for linking the exchange rate not to oil prices, but to another currency at the established value and a fixed exchange rate within the horizontal corridor. The collapse of oil prices has put the state financial system in a difficult situation. The collapse of the Russian-OPEC oil cartel is not a goal, but a consequence of the financial crisis, when Saudi Arabia's oil-dependent economy demanded extensive price retention by declining world output. After all, oil prices were maintained at many times the equilibrium of real demand and supply thanks to financial speculators and this cartel agreement. After its collapse, the collapse of oil prices may last for a long time. Maintaining economic condition through foreign exchange reserves, high-cost production of shale companies, profitability of Canadian and English oil companies requires fundamental changes not so much in oil trade as in the global financial system.

Fluctuations in oil prices are subject to long-term patterns of technological change. The increase in zero years is a typical manifestation of the beginning of the change of technological patterns. When the dominant technological order reaches maturity, the growth rate of the economy, together with the profits of leading corporations, falls. To preserve their own profits, monopolists raise prices. Best of all it turns out at corporations in the fuel and energy sector, which is characterized by maximum capital intensity and minimum elasticity of demand from price. After the structural adjustment of the economy on the basis of the new technological order, triggered by a sharp jump in energy prices, is completed and its energy intensity is reduced many times, energy demand is inevitably decreasing and prices are falling [6].

Hydrocarbon prices will remain relatively low in the coming decade. This means a significant deterioration of Russia's trade and payment balance and the need to diversify the economy. It can be mitigated by the advance development of non-commodity exports, which, however, cannot be achieved within the framework of the current monetary policy, as it requires large-scale long-term lending of very capital-intensive investments in the development of petrochemicals and other high-tech sectors of the economy. If monetary policy is not changed fundamentally, it will be necessary to survive the further devaluation of the ruble and the inflation wave caused by it. Against the background of the compression of the state budget, this will cause a tangible decline in the income of the population. It will be exacerbated many times by the continued fight against inflation by reducing monetary supply and final demand [3].

4 Discussion

In 2019, the energy industry was rocked by a record number of bankruptcy, which did not spare even large oil companies. According to Reuters [11], a total of 50 energy companies filed for bankruptcy last year, including 33 oil and gas producers and 15 oil services companies. Meanwhile, Chevron, Schlumberger and Royal Dutch Shell announced a several billion dollar fall in asset value, noting an unfavourable macroeconomic outlook. There are fears that debt-burdened oil services companies will be hit. North American oil services and drilling companies bear the burden of \$32 billion in debt, which will have to be paid until 2024. A chilling prospect, given that oil prices have fallen to 20-year lows.

The poor condition of oil services companies is clearly reflected in the VanEck of Vectors Oil Services ETF, which has fallen 72% since the beginning of the year, well below the 30% fall of the S and P 500. Moody's analyst observed that the rapid spread of coronavirus, the deteriorating outlook for the global economy, falling oil prices and falling asset prices are creating a major credit shock worldwide, across multiple sectors, regions and markets. When oil prices began to fall, North American producers declared bankruptcy totaling \$121.7 billion since 2016. According to Moody's, the nominal debt of the U.S. oil and gas industry is \$86 billion over the next 4 years, one of the highest figures for any sector [9]. Against the background of falling oil prices, these companies are particularly difficult to meet their debt obligations.

For example, in the period from 2020 to 2030, annual tax revenues to the consolidated budget of the Russian Federation from oil and gas companies are expected to

decrease by 20.5%. Among other things, it should be borne in mind that at present, not the amount of funds spent on exploration, but the volume of production is important for tax purposes. Since the tax is levied immediately, the economy of any project is automatically deteriorated, and it often becomes unprofitable due to the fact that the NDPI is not tied to financial result and additional income. There is another experience: the UK tax system was based on the same principles as the current Russian tax system. It was a combination of profit taxation (corporate tax additional fee, oil production tax) and taxation of the volume of oil produced (royalties). In 2004, royalties were cancelled, and the cancellation of royalties (equivalent to the Russian NDPI) did not lead to a decrease in revenues to the budget.

Moreover, there has been an increase in revenues from the taxation of profits of oil-producing companies: From 5,115 million pounds - in 2004 to 9 million pounds - in 2005, and then to 12,393 million pounds - in 2008. Currently, with oil prices falling more than twice in relation to profitability, it may raise the question of the very existence of oil producing companies [15].

The total effective UK profit tax rate is 60% for “new” licences and 80% for “old.” This applies a tax barrier to offshore activities, and capital costs are allowed to be deducted in the year in which they are produced. Incentive deductions from additional tax for individual stock categories are also applied [16].

Since 2019 a tax manoeuvre started in the field of oil industry in Russia. Its purpose is to gradually increase tax payments for mining, while reducing excise for the export of oil and gasoline abroad. This will inevitably affect the domestic fuel prices that ordinary citizens will face. Any tax manoeuvre provides for a change in the tax system and the receipt of payments to the budget. Depending on the objectives pursued by the legislator, the directions of the manoeuvre may include the replacement of one or more taxes with other levies, proportional redistribution of revenues to the budget, the introduction of barrier duties and incentives for domestic enterprises.

In the oil industry, tax manoeuvres are carried out regularly. In the period from 2020 to 2024 there will be a gradual reduction and elimination of excise for export of oil and fuel abroad (in 2024 the excise rate should be 0, except for certain types of oil products); In the period from 2020 to 2022, the rates of NDPI (mining tax) will be increased, while maintaining the existing benefits and preferences. For enterprises producing and selling fuel on the domestic market, reverse excise on fuel has been introduced, which should eliminate risks of increasing wholesale and retail prices;

Additional support measures are envisaged to implement GSF within the country and slow price growth. At present, the main source of income from the oil industry is the excise fee for the export of crude oil, processed products and GSM. Excise is directly related to oil price rates on the world’s leading exchanges and markets, so forecasting budget indicators is significantly difficult. The introduction of new tax and excise rules will allow the budget to reduce dependence on world oil prices. These indicators cannot be completely ignored, so oil exchange rates will be applied when imposing additional duties and providing support measures to enterprises with a large share of domestic production.

The key goal of the manoeuvre is to gradually increase the share of the NDPI in the revenue part of the budget, with simultaneous reduction of excise rates. In practice, such rules will be implemented as follows:

1. The reduction of excise rates will take place for 6 years, and will end in 2024 with the establishment of a zero rate.
2. The mining tax (including oil) will increase proportionally, but will reach planned rates by 2021.

Between 2020 and 2024, the share of revenues to the budget from the NDPI will grow, while the excise component, on the contrary, will decrease. Given that the Arab OPEC countries control the market and flood it with oil, the excess of oil could reach a staggering 1 billion barrels in a few months. Output volumes are not comparable to fallen demand, even U.S. government plans to purchase 77 million barrels of oil for strategic reserves are limited to two million barrels a day. Not only does coronavirus continue to crush global demand, but also the elementary absence of oil storage reserves when it was poured into all possible capacities. Against the backdrop of low demand, pandemic and price war, it is foolish to try to reach the bottom of this energy market.

Now oilmen are fiercely trading with the government about compensating for lost revenues, and helping with just survival issues. In Russia, diversification of exports of oil and petroleum products to chemistry and its products may change the situation, but this will take a considerable time. Oilmen insist on 100% compensation of export premium, which will require from the budget about 200 billion rubles tax incentives annually. That is almost as much as those Russians who will be delayed in retirement will not receive it for next year.

The strategic objective of energy policy is to create a sustainable and self-regulating energy security system, taking into account the optimization of the territorial structure of production and consumption of fuel and energy resources. The lack of functioning of mechanisms for using fuel and energy balances for forecasting and managing the development of the fuel and energy complex at the federal and regional levels is one of the main problems solved in the Energy Strategy of Russia for the period up to 2035. In Russia, NDPI and excise are distributed among federal and regional budgets, and the share of regional budgets grows every year. In conditions of uncertainty, we are talking about the need to develop and implement mathematical models, methods and means of solving the hierarchy of multicriteria problems arising in energy management. At the same time, the task of economic efficiency should be implemented not only at the federal level, but also at the regional level, which acutely raises the question of the demand for predictive and analytical systems to support management decisions, fuel and energy balances, on their basis to assess energy efficiency and energy security of the regional and federal economy. Energy as an integral part of the economy [2] needs regulation and protectionism [5].

The most pragmatic interest for us was Russian research in the field of modeling and forecasting of energy, as it takes into account more the peculiarities of national institutions of management and statistical description of modeling objects. Currently, energy modelling and forecasting technology developed at the Institute of Energy Research of the Russian Academy of Sciences (INEI RAS), which is successfully used for forecasting both Russian and world energy, deserves the most attention [8].

Iterative harmonization in the system of forecasts is carried out through energy balances formed in general for the country and individual regions, production

characteristics and financial balances of industries of the fuel and energy complex, closed on intersectoral balances of the national economy. The peak of production should be attributed to 2022. Then the decline will begin at a rate of up to 10% per year, and by 2035 the volumes will collapse by half - from 11 to 6 million barrels per day. In this amount, oil is consumed by Russia itself, which means that exports will have to be zero. At the end of the year, Russian oil companies will receive 553 million tons of crude oil, by 2021 production will reach a peak of 570 million tons. If nothing is done, from 2022 the decline of production will begin and within two years production will collapse almost 14.

The authors note that despite the close decline, oilmen continue to increase production without even thinking about the decline in its volume. For example, Saudi Arabia's foreign exchange reserves declined by \$27 billion in March, which represents an anti-rekord of the country's foreign exchange reserves for gold. Simple calculations show that at March current pace, the sheikh's foreign exchange reserves would have been sufficient for only 1.5 years of oil wars, after which they would have gone around the world. Probably even less would have been enough, given that even after the decline in oil production in the world, prices still fell. The main news trend for today is the rapid reduction of free tanks for storage of oil and oil products. South Korea stated that its capabilities in this regard had been fully exhausted, and in a total of only one week and only on oil tankers it had become more than 50 million barrels. And now more than 350 vessels are used as storage facilities.

Lukoil has transferred its refineries in Europe to processing Russian oil. In Europe Lukoil owns wholly or a stake in four refineries in Romania, Bulgaria, Italy and the Netherlands. Their total processing capacity is more than 40 million tons per year. Rosneft also has a refinery in the EU countries. In Germany, the company holds shares of 24%–54% in the MiRO, Bayernoil and PCK refineries.

5 Conclusion

The oil market conditions are now profitable for the buyer, and the world largest oil buyer is China. World prices have collapsed to multi-year lows, and the country is ready to reap not only geopolitical advantages, but also economic benefits. China imports up to 70% of the country's energy consumption. Still, some analysts believe that low prices are creating problems for state-owned oil companies in terms of production and investment. They also believe that low prices do not automatically reduce consumer fuel prices due to internal price controls. They don't see the big picture [4].

Russia, Saudi Arabia and the United States hope China will support their oil industries hit by the recent price crash. U.S. oil companies are demanding that their government press Beijing, and it has increased oil purchases as part of the first phase of a bilateral trade agreement. China buys more oil from Russia and Saudi Arabia.

Increasing the probability of centralization of the economy and power against the background of the narrowing of rights and freedoms in the country (in extreme manifestations - the establishment of totalitarian regimes), in particular the phenomenon called the "basic law of oil policy" [1, 12, 13]. The state of the economy in the sphere of oil and gas production and sale in the rental system made it possible to approve the

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Non-state Pension Funds as Participants of Investment Process and Their Social Responsibility

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Abstract. The article deals with the peculiarities of investment activities of non-state pension funds (NPFs) as an institutional investor, its social responsibility. Institutional participants in the asset management market, can play as medium-term funding sources. Their interest in infrastructure projects, as revealed by the study, is associated with the fact that such projects have long-term, stable profitability, although not the highest in the investment market. The authors analyzed the experience of investing in infrastructure projects by non-state pension funds. The analyses of institutional investments in infrastructure projects confirmed that institutional investors, NPFs in particular, have enormous resources and are successful investors. Creation and support of non-State pension provision is a form of business social responsibility expression. The system ensures participation of the State, as well as of the employer and the citizen, in the development of a decent standard of living, thus affecting the organization and implementation of effective social protection for pensioners.

Keywords: Institutional investors · Investment in assets · NPF · Principles for responsible investment · Regulation socially important projects · Social responsibility of business

1 Introduction

The current situation in the economic and social spheres shows that the social insecurity of a significant part of the population has become an integral feature of the transformations in Russia. According to the pension reform concept, a radically new pension system is being formed in the country, which includes state pension provision sub-systems, compulsory pension insurance and voluntary pension provision, involving pensions covered by employer contributions under collective and individual agreements and independent pension savings of the working population. Today, many large industrial and commercial enterprises provide their employees with supplementary income through the non-state pension funds system, thus compensating for the inadequate level of employment pensions [10]. Business as a source of social responsibility does not get enough assistance from the state in solving strategic

development issues. Business investments in corporate social responsibility are not promoted by the state, therefore, the growth in such investment is not significant. The situation is exacerbated by continuing mistrust of Russian companies in social investment and by lack of available information regarding the situation in this area of activity. Thus, in conditions of low level of state pensions, the issue of ensuring an acceptable level of supplementary pensions through established corporate pension systems is relevant for enterprises of all forms of ownership. It is obvious that the issue on corporate pension systems creation and development is very important. However, under conditions of the radical pension reform, implemented in the Russian Federation, a number of topical issues related to the corporate pension systems creation and development remain outstanding.

Investing in the real economy depends on increasing its competitiveness and survival. However, private capital and state financial resources investments should be impartial, ensuring the effectiveness of their use. One of the vivid examples is pension funds which have a huge amount of money waiting to be used. And it is important to consider this resource not as a source of financing current needs, but as an opportunity for the development of long-term projects that are socially significant and can change the quality of life. Indeed, capital of the institutional investors can even completely replace public funding at the federal budget level in some projects. Funds of NPFs provide the opportunity for long-term projects investment such projects are socially important and can change the quality of life.

Infrastructure investments are more appropriate for investments by pension funds and insurance companies, as they are independent from the business cycle and do not correlate with other asset classes and have a stable operating cash flow. The issue of long-term investments belonging to pension funds is important in the projects implementation infrastructure.

2 Methodology

In this work, we used a systematic approach and general scientific methods to identify the characteristics of non-state pension funds (NPFs) as institutional investors in modern socio-economic conditions. The methodological basis of this study is a systematic and comparative analysis, which allows us to identify the specifics of the issue under review and draft a trend for further forecasting. The approach and methods implemented in the study made it possible to identify evidence characterizing the process of reforming the Russian pension system, as well as to consider the possibility of investing funds of NPFs in the real economy. In this work we took into account data on the socio-economic development of the country, statistical materials on the activities of insurance funds, NPFs and institutional investors.

3 Results

The issue of population ageing and working population reduction is relevant for most countries of the world and needs to be addressed. The pension models analyzed showed that the problem of population ageing posed a threat of traditional distribution pension systems funds shortage in developed and developing countries [7]. Within the framework of reform process ongoing in these countries, multi-level pension systems were created with a mandatory funded component, designed to ensure a high level of well-being of pensioners and a replacement rate of at least 60% in future. The Russian multi-level pension system reflects international experience. However, it is necessary to take into account that there are no completely identical pension systems in the world, all national practices reflect certain specificity.

Analyzing the causes of the funded system crisis in Russia, several conditions for its stability and development can be determined, for example, the pension savings formation on a model based on private law rather than public law relations with the maximum determination of the contract terms by the parties without state involvement, while such freedom and effect can occur within state-defined requirements for standardized products; the ability to determine the rate of contributions to the system, based on the economic capabilities of participants, the accumulation period, the amount and timing of the pension, and other significant circumstances; introduction of mechanisms for the distribution of financial responsibility for the formation of savings between the employee, the employer and the state, “diversification” of the dependence and responsibility of the employee and the employer, etc. [1]. It is important to note, that funds of NPFs currently represent a rather significant amount of possible investments in the economy of the Russian Federation. According to the Central Bank of the Russian Federation, 47 non-state pension funds operate in the pension market with valid licenses, of which 14 funds are engaged in non-state pension schemes only, 31 funds operate both under the compulsory pension insurance system and non-state pension schemes [2]. Funds working with NPF schemes only account for more than 2/3 of all pension reserves and only 1/3 of all participants of non-state pension schemes programs (that means that funds specializing in non-state pension schemes have a high level of funds per client). Meanwhile, the assets of these NPFs make up only 1/4 of the assets of all funds operating on the market [2].

According to the Central Bank of the Russian Federation, the amount of pension funds of NPFs was 4273 billion rubles at the end of 2019. The pension savings funds of NPFs amounted to 2858 billion rubles, and pension reserves funds of NPFs - 1414 billion rubles [2]. This imbalance of shares (pension reserves and assets) is due to the fact that the total amount of pension savings in the market is much higher than the pension reserves value. There is stagnation in the corporate non-state pension provision market. According to experts, the non-state pension provision is, to some extent, connected with the current stage of the pension market development and with the changes in the conditions for the implementation of non-state pension schemes (abandonment of the individual pension capital concept, the appearance of a draft bill on a new product - a guaranteed pension product, a legislative initiative to preserve the retirement age for participants of non-state pension provision programs, etc.).

In such circumstances, employers are not ready to introduce new corporate pension programs. The unfavorable economic environment in the country, rising inflation, identified the issue for NPFs, namely, the growth of return on deposits and the need to earn investment income for future retirees. In general, 2019 was quite successful for most funds: they showed a return above the inflation rate and used investments to increase the accumulation of savings both in securities of private companies and in projects related to public-private partnerships. The increase in pension funds ensured their investment results. For the funded part development, the participation of employers in its formation through the development of the corporate component is also necessary. To achieve that, it is necessary to work out an industry-wide system of corporate pensions, which should have the force of law and serve as the basis for creating corporate systems at enterprises of specific industries.

Investing in the real economy depends on raising its competitiveness and survival, the volume of financial resources investment of the state and private capital should be carried out on an objective basis, and ensure the effectiveness of their use. The functioning of the collective investment system in the social aspect is the improvement of the citizens' well-being by participating in increasing the capitalization of the country's economy, since the activity is carried out through the investment mechanism, there is a process for the efficient distribution of necessary resources for the economy and their integration into financial turnover. The strategic plan, designed to solve the issue of business survival, is, to some extent, used to select attractive sectors and activities in order to ensure business competitiveness in real economy sectors [4, 9].

An increase in involving household savings in long-term investments on the stock exchange contributes to the development of the institutional investors market in Russia; we can say that the share of investments in securities in the real sector of the economy is growing; it also helps to reduce the dependence of the dynamics of Russian stocks on foreign investment, which, in its turn, makes it possible for the population to invest their funds in non-state pension funds (in pension savings) and insurance programs.

4 Discussion

The funds of NPFs provide the opportunity for long-term projects investment, the projects, which are socially important and can change the quality of life. Indeed, capital of the institutional investors, in some projects, is even able to fully replace state funding at the federal budget level. Infrastructure investments are more appropriate for investments by pension funds and insurance companies, as they are independent of the business cycle and do not correlate with other asset classes and have a stable operating cash flow. The issue of long-term investments by pension funds is important in infrastructure projects implementation. In recent years, a model for infrastructure projects financing involving funds of NPFs has been implemented through concession bonds. In Russia, the regulator restricts the ability of funds and insurance companies to participate in infrastructure projects, limits the terms of entry into the project, possible instruments and risk calculation rules, which imposes restrictions on the investment portfolio structure. The analysis showed that the portion of shares of most NPFs has significantly decreased.

When placing pension reserves funds, the funds are guided by the principles of safety, profitability and information openness of the investment process. Until recently, NPFs mainly invested in government bonds and “blue chips”, this was due to the securities reliability, but, as a rule, the return on such securities is not high. The investment portfolio of pension funds of NPFs increased by 2.5% for the 2nd quarter of 2019. The main growth driver is the positive investment performance of the funds [2].

A slight slowdown in the pension savings portfolio growth rate, compared to the previous quarter, is due to the fact that in January-March 2019 there was a transfer of funds from the Pension Fund of the Russian Federation (PFR) according to the results of the transitional campaign of 2018 and it affected the indicator [11]. Without taking into account the influence of this factor, the growth rate of pension savings accelerated [2].

The intermediate results of 2019 transition campaign indicate a significant decrease in the number of citizens submitting applications for the transfer of pension savings from the PFR to NPFs. In the context of a possible reduction in the volume of funds transfers from the PFR by the end of 2019, the growth rate of pension savings of NPFs will be more dependent on funds investment return than in previous years.

At the end of June 2019, the investment portfolio of pension funds of NPFs exceeded 4 trillion rubles. Pension reserves for April-June 2019 increased by 2.6%, pension savings - by 2.4% (+3.1% a quarter earlier). Excluding the funds transfer from the PFR, the growth rate of pension savings of NPFs was about 1.5% in the 1st quarter of 2019. In the 2nd quarter of 2019, the positive growth rate of pension savings was ensured by investment results. The average annualized return on pension savings investment reached 10.4% for the first half of the year. The indicator for VEB's expanded pension portfolio was lower and amounted to 8.4% [2]. All funds showed a positive return on pension savings investment (a year earlier, the result was negative for 16% of funds). The return on pension reserves placement amounted to 8.3% [3].

Favorable stock market environment contributed to profitability growth; with a high share of investments in such instruments in NPFs investment—more than 90% in pension savings and more than 70% in pension reserves. The real sector still prevails in the investment structure of NPFs; however, in the unfavorable situation on the financial markets, there was an increase in investments in government securities through a flexible repo transaction mechanism. At the same time, slow growth of equity portion of the portfolio may be an indication of NPFs' reluctance to assume additional risks: for the quarter, it grew slightly, but remained low. NPFs risk appetite reduces, among other things, the requirement for break-even position of pension savings investments over a five-year horizon [4].

In the 2nd quarter of 2019, NPFs increased the share of investments in non-financial sector companies [2]. In the pension savings portfolio - due to an increase in the oil and gas, engineering and transport sectors investments. In pension reserves investments - due to the communications, telecommunications and information technology industries. Investments in steel and mining companies increased in both portfolios.

After reviewing the structure of pension reserves and savings, we can conclude that most of them are concentrated in banks and financial institutions. Experts believe that risk of demand is a rather high risk of infrastructure investments, for which funds of

NPFs are raised; projects may be unnecessary. It may happen that the implemented project will be of no demand and it will not bring the promised return: for example, no one will go to a private hospital for treatment. Another issue is that there is a great number of funds in the Russian NPF market, large funds are much more likely to invest in infrastructure than smaller ones. The collective investment market, due to its ability to accumulate and efficiently distribute the institutional investors' resources, has the ability to direct and increase liquidity, as well as contribute to fulfillment of social obligations for which the investors are also responsible.

By 2020 the Russian collective investment market should significantly increase its weight in GDP, and play an important role in infrastructure projects in the financial system of the Russian Federation. Today, a characteristic feature of the development of the Russian financial market is the dominance of banks, but the collective investment system should occupy a higher position combining resources and their involvement in financial turnover. Creation and support of non-state pension provision system is a form of social responsibility of business. The system ensures participation of the state, as well as of the employer and the citizen, in the development of a decent standard of living, thus affecting the organization and implementation of effective social protection for pensioners.

5 Conclusion

Speaking of the development of the NPF and long-term insurance markets in 2020, it is necessary to perform some tasks: sustainable development of social security and social stability, as well as the stability of the pension system based on the funded distribution principle, the generation of a long-term investment resource. The current model of the pension market and long-term life insurance carries out its functions partially. The main reasons for such development are the low level of social guarantees by the state, low income and low levels of state savings, inadequate taxation of pension funds and life insurance companies, low level of participation of funds of NPF and investment sales insurance companies. Russia faces demographic problems - there is a sustained population decline with an increase in the number of pensioners and a decrease in the number of people employed in the economy.

Despite the fact that in recent years there has been a fairly rapid increase in income, Russia on this indicator is still very much behind the level of the developed countries. Moreover, savings diminish the level of citizens, that is, people prefer not to save money, but to spend money immediately. Thus, the savings of citizens do not turn into investments. According to OECD experts, the Russian multi-level pension insurance system, developed over the recent years, is in line with international experience and recommendations [8]. The purpose of its implementation was to improve financial sustainability of the pension system by introducing the mandatory funded component. At the same time, in the macroeconomic environment, with the need for increased income of current and future pensioners, the need of the generation of long-term investment resources in the economy, without proposals to optimize the pension system and reduce government spending on it by diversifying its funding sources, as well as developing the potential of voluntary or "quasi -voluntary" personal contributions, the

sustainable development of funded pension programs, will always remain questionable [5]. In the world today, where socio-economic changes occur quite quickly and often, we should remember that under such circumstances people and organizations require not only changes, but also stability. Therefore, one of the most important tasks is to balance changes with the desire for stability and help people to maintain this balance at work and in life [5, 6].

How to change the attitude of the economically active population to pension programs (models), so that, entering their working life, employees are ready for actions to accumulate pension investments (as an investment in the future, since there will be a transition to a different social status)? This requires psychological and socio-psychological support for this process at the micro- and macro-levels of socio-economic systems. Motivational resources that reveal the person's abilities to shape innovative attitude will be constantly updated over time. Therefore, motivational resources are resources of the 21st century, and their implementation in the socio-economic systems management is an important and rapidly developing management practice. Industry consolidation leads to the consolidation of funds, as evidenced by the dynamics of the ratio of the median and average values of pension savings and reserves. The long-term investment potential of NPFs cannot be fully realized - in fact, management companies that operate the assets of NPFs convert long-term assets into short-term ones, since almost 70% of assets of NPFs are placed for a period of less than 1 year.

The existing tax system does not contribute to the investment resource creation. The financial markets crisis, associated with the spread of coronavirus infection in March 2020, did not cause a significant decrease in the value of investment portfolios of NPFs, due to the predominance of debt financial instruments in them, 27.8% of which are estimated at amortized cost and therefore are not dependent on market volatility [3]. In contrast to most Western countries, Russia's contributions to pension funds and their investment income are taxed and pensions, on the other hand, are non-taxable. There are numerous groundless obstacles in the regulation of allocation of assets of NPFs and insurance companies. The target model of NPF market and long-term life insurance assumes overcoming these restrictions and effective performance of all tasks in the future.

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Warehouse Services: Content, Types, Development Trends

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Abstract. The article analyzes the content of warehouse services as a special type of business services that have specific characteristics and common types of services. Individual components of warehouse services are described: logistics, marketing, information, credit and financial, and production. The content of the activities of service organizations, operators of warehouse services, is released. The study highlights the growth of the market, changes in the structure of demand, insufficient development of warehouse outsourcing and complex warehouse services as the main trends in the warehouse services market. The evaluation of the current condition of the warehouse property market that determines the quantity and quality of storage services, the focus is on the development of new warehouses formats (wholesale distribution centers, self-storage warehouses and warehouses of “last mile”), a significant part of “custom” warehouses marked as a trend.

Keywords: Outsourcing · Trends in the market of warehouse services · Warehouse real estate

1 Introduction

With the development of entrepreneurship and in the course of market transformations in the Russian economy, the service sector has rapidly developed, including the market for transport and logistics services, which is dominated by cargo transportation, forwarding and warehouse leasing, and the share of complex logistics services is only 8%. The same indicator for EU countries is 19% [2]. The average annual growth rate of the Russian market of transport and logistics services for the period 2017–2020 may be 7.5%. Part of the transport and logistics market is the warehouse services market, its share is only 3% [2], but it is fundamentally important for the development of the country’s economy.

In the works of Russian and foreign scientists, insufficient attention is paid to the study of warehouse services. In most scientific works, these services are considered exclusively as logistics. As a result, certain types of services that are currently provided by warehouse complexes and complement the main warehouse services are ignored, which does not allow to fully use the potential for improving this type of service in practice. In addition, scientific publications did not adequately reflect the development

of new formats of warehouse real estate, which determine the development of the market and the expansion of the capabilities of service organizations specializing in warehouse services. The purpose of this article is to develop the theory of warehouse services for enterprises and organizations by analyzing the development of its new forms. To achieve this goal, you need to solve the following tasks:

- highlight the main characteristics of the warehouse service and clarify the content of warehouse services,
- show the components of the warehouse service content,
- identify the main trends in the warehouse services market,
- demonstrate new formats of warehouse real estate and types of warehouse operators' services for the Russian market.

2 Methodology

The research is based on such conceptual bases as service, business service, and outsourcing. A service is considered as an action, a benefit provided in the form of an activity or short-term use of a material values (lease); a business service is a service that is provided to enterprises and organizations, is an economic good and has an impact on the growth of the customer's capital and improving the efficiency of its activities. Outsourcing is the transfer (partially or completely) to external organizations on a contractual basis of functions that were previously performed by the organization on its own. When studying the warehouse services market, a systematic approach was used, in particular, the warehouse real estate sector was considered from the standpoint of a systematic approach. The analysis of the state and development of warehouse real estate was also carried out using the method of multidimensional segmentation, which is widely used in marketing. This allowed us to identify promising and growing segments of warehouse real estate.

The main method of research was a theoretical method that allowed us to objectively assess the features and content of warehouse services based on the use of methods of abstraction, analysis and synthesis, generalization, conceptual and terminological, as well as the use of an empirical method of comparison. The research is based on the works of Russian and foreign authors, practical experience of service organizations that provide warehouse services. The dialectical combination of quantitative and qualitative assessments of the development of the warehouse services market made it possible to identify its main problems.

3 Results

Warehouse services are understood as work or actions related to the formation and organization of the movement of goods flows, as well as providing customers with conditions for performing these works on their own (such conditions are the leasing of warehouse premises). The characteristics of warehouse services, as any type of service, are their immateriality, impossibility of storage, impermanence of quality and

inseparability from the source of provision. At the same time, they have a number of specific characteristics: they are provided mainly in the business market, meet the production needs of customers in various sectors of the economy, have a positive impact on the efficiency of consumers (customers), the volume and quality of warehouse services directly depend on the development of warehouse infrastructure [2, 6, 8, 12]. Warehouse real estate allows you to carry out interrelated operations that ensure the safety of inventory during their movement in the distribution channels, and increase their readiness for production consumption or for sale. Recently, there has been a steady growth trend in the Russian warehouse real estate market, which is most actively developing in the Moscow region and St. Petersburg.

In the Moscow region, a record number of warehouses were put into operation in 2019: 957,000 sq. m. or 19% more than in 2018 (805,000 sq. m.). In total, the region now has more than 15 million square meters of high-quality warehouse real estate. In other Russian regions, 995,000 sq. m. of A and B classes warehouses were rented and purchased, demand reached a 10-year maximum [9].

The coronavirus pandemic did not have a devastating impact on the warehouse real estate market due to increased demand for warehouse services from grocery operators and e-commerce. However, in the first half of 2020, only 132 thousand sq. m. of warehouses were commissioned in the Moscow region, which is 53% less than in the same period of 2019. According to experts, the volume of new construction by the end of 2020 will reach 560 thousand sq. m. It is 30% less than it was introduced in 2019 [5]. The main share of demand for warehouse spaces in the first half of 2020 was accounted for retail chains, online retailers and logistics operators. The vacancy rate in the first half of 2020 was 3.2% [9].

In the capital region, the number of projects for a specific tenant and the number of areas leased/purchased at the construction stage has increased significantly. According to the forecasts of market operators, in the future, the construction of new warehouse areas will be mainly based on the built-to-suit (BTS) scheme, i.e. construction taking into account the individual requirements of the customer. In the regions of Russia there is a predominance of the speculative construction of warehouses. Taking into account the shortage of warehouse centers with multi-temperature areas, a set of additional services for processing, packaging and storage of products from farms and other agricultural producers, wholesale distribution centers (WDC) are increasingly being built. It is a format of premises where wholesale lots of agricultural products are stored, processed and distributed.

An important innovation for the Moscow market is the construction of warehouses within the city limits or “last mile” warehouses, including multi-storied warehouses that differ from standard class A warehouses, for example, two-storied buildings have access for freight transport to the upper floor. According to experts’ forecasts, the number of “last mile” warehouses will increase in 2020, as there is a significant demand for their services from online retailers and logistics operators serving them [8].

The self storage format is being further developed in Moscow, St. Petersburg, and in other cities with millions of users. The total area of self-storage facilities in Europe as of the end of 2018 is 9.7 million square meters. In the Moscow market, the area of self-storage warehouses is currently approximately 160 thousand square meters, and the share of available space is in the range of 5–15% [8].

One of the trends in the warehouse services market is the development of outsourcing. Outsourcing of warehouse services is not yet fully developed due to the unwillingness of many industrial enterprises to transfer the functions of warehouse supply to third-party organizations. One of the reasons for low development outsourcing is the problem of choice of outsourcing provider, which is evident in the lack of clear mechanisms of systematization and formalization of a set of criteria that should guide companies to customers when choosing a service provider.

4 Discussion

Warehouse services in a number of studies of domestic and foreign scientists are considered as part of transport and logistics services, and this is quite reasonable, since the condition for providing the main types of warehouse services is the availability of material resources and goods in warehouses, where they are imported by transport and then delivered to customers using vehicles [1, 4, 6, 11, 12]. At the same time, warehouse services have nothing in common with transport services in terms of their content and variety of types. They should be considered, studied, monitored and analyzed as an independent market segment.

Of course, the warehouse services of service organizations are based on logistics services provided to industrial or institutional consumers, but in addition to the logistics component, warehouse services include: marketing, information, financial and credit services and services for preparing material resources for consumption. Sharing the point of view of the study authors [11], who reveal the content of warehouse services of an intra-corporate outsourcer and their components, it should be clarified that these components of warehouse services with slight differences are also present in the services of independent service organizations operating on the market.

Thus, logistics services for fulfilling customer orders include: acceptance and processing of customer orders; placing orders with suppliers; storage; inventory management; distribution of resources to customer enterprises; acquisition of delivery or release batches, and, if necessary, delivery of batches of goods to customers. Delivery service is currently an important factor of competitiveness due to the growing demand for services from online commerce.

Information services of a service organization consist in informing customers about the operating mode, terms of lease or provision of other types of services, the terms and frequency of delivery of goods to customers. Marketing services of a service organization should include conducting market research on individual product markets based on customer orders, as well as promotions to stimulate demand for services. Financial and credit servicing of client enterprises consists in providing commodity credit and various payment methods for rendered services. Production services are services for preparing material resources for production consumption: cutting long materials, packaging materials in small containers, forming sets of goods, etc.

When analyzing the development of outsourcing in scientific research, little attention is paid to the segment of warehouse services. In the works of Mustafayeva, Malkarova, Stapan [7, 10] and other scientists, the models and the importance of outsourcing for achieving competitive advantages are considered, but the outsourcing

of warehouse services is not studied enough. Meanwhile, large Russian and international companies provide warehouse services to industrial enterprises, retail chains, and online commerce on the terms of outsourcing, but not to the same extent as abroad. A new form of outsourcing in Russia – fulfillment – is becoming more and more developed. It involves the fulfillment center performing a complex of operations from the moment the customer places an order to the moment they receive the purchase. The basis of this service are traditional warehouse operations. This service is fulfilled mostly for the online stores in terms of outsourcing. Taking into account the increasing processes of globalization and increasing competition, it is necessary to study the factors that hinder the development of this form of warehouse services [3].

5 Conclusion

Warehouse services of service organizations that are provided to industrial enterprises and organizations in other sectors of the economy are classified as business services in terms of their economic content. The peculiarity of warehouse services is their heterogeneity, and at the same time, their complexity, the close relationship of their individual components (logistics, marketing, information, financial and credit and production), which allows us to talk about the increased value of such services for customers. Warehouse service providers are specialized warehouse operators of logistics services, wholesale intermediaries operating on the market, and service organizations that operate as part of large manufacturing and trading companies.

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Borrow, but not Pay: Psychological Characteristics of Deviant Economic Behavior

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Abstract. Deviant economic behavior is considered as a variant of deviation from generally accepted norms of behavior in the economic sphere. The paper describes the results of an empirical study. The total sample was 1158 respondents, aged 18 to 82, with different experience in loans and debts. Inventories used: Author’s questionnaire for socio-demographic data and subjective economic well-being, Debt Behavior Questionnaire, Debt and Credit Tolerance/Frustration Questionnaire. Cluster analysis (k-means method) revealed four main types of debt behavior: Non-optimal blaming, Non-optimal benevolent, Optimal blaming, Optimal benevolent types. It was found that different types of debt behavior have differences in the experience of borrowing and repaying debts as well as in credit and debt tolerance and frustration. Based on the study, a forecast on the possibility of deviant debt behavior for different types is given. The most unfavorable in debt repayment is the Non-optimal blaming type. Statistics: descriptive statistics, cluster analysis, one-way ANOVA in SPSS 22.0.

Keywords: Borrowing · Debt · Debt behavior types · Deviant economic behavior

1 Introduction

The total amount of credit debt of Russians in 2019 reached 16.2 trillion rubles. The average family directs almost one third of all earnings to repay loans [15]. Why do people borrow money but don’t pay it back? Can this behavior be considered deviant? What are the psychological characteristics of deviant economic behavior? These issues were addressed in more detail in this study. In the social sciences, deviation means actions that differ from generally accepted norms or standards of behavior [2, 7]. In organizations, for instance, it could be a conscious, purposeful resistance or deviation from the norms or a discrepancy caused either by neglect and ignorance or by inability to comply with the norms based on the lack of appropriate abilities [16]. It is important to distinguish between illegal and deviant behavior. If the illegal behavior refers to the violation of laws created and regulated by national and international authorities and is

the field of legal sciences, then deviant behavior could be associated with violation of social, cultural and/or ethical standards and more often becomes the object of study by representatives of the social sciences. Thus, deviant behavior can be unethical, cast doubt on or contradicts moral principles that determine the values and behavior of the group, but not be illegal.

Although it is clear that deviants are people or groups whose views and actions are in contradiction or violation of generally accepted social standards, it is important to emphasize three further aspects. Firstly, the concepts of deviance have a negative connotation and most often associated with a harmful or socially unacceptable behavior. However, deviance can be constructive and represents positive changes in behavior as well. "Positive deviance" refers to the adoption of unusual practices that can lead to beneficial results, for example, the ability to solve problems in innovative ways or employee deviance leading to favorable outcomes [4, 12]. Secondly, deviance is not a simple status - it is a social constructs and can be attributed to both individuals and groups. Individuals or groups can accept deviant identities in order to distinguish themselves from others and pursue certain social or political goals [1]. Thirdly, since the concepts of deviance are socially grounded, behavior that can be recognized as deviant at certain period of time by one group of people, at other times and for other people, may not be considered deviant.

2 Methodology

Our study was carried out in the framework of economic psychology, which deals with the problems of deviant behavior, for example, in the fields of tax behavior [5], labor market behavior [13] and consumer behavior [3]. Our study focuses on debt behavior and based on the fact that taking loans is normal for modern society, credit is one of the conditions for the development of the economy, but it works only if people keep their promises to pay loans. Even when considering not institutional loans, but borrowing from other people, such practices in some cultures are generally accepted and act as a kind of norm. While the return of an equivalent amount of money or goods is not obligatory, some kind of reciprocity is assumed [8]. At what point does borrowing turn into deviation? It is likely that when loans begin to have a compulsive character and the willingness to borrow significantly exceeds the ability to repay [14]. Thus, under the *deviant debt behavior* is understood such borrowing behavior, which is characterized by the presence of *repeated violations* of the terms and amount of payment. In the case when the principles of urgency and completeness of the loan repayment are violated, different types of deviant behavior can occur: ranging from violation of generally accepted norms that do not cause serious harm, to delinquent behavior, and, in some cases, criminal debt behavior.

The aim of this study is to distinguish between types of debt behavior and identify those who are prone to deviance. As a basis for our typology, we used two criteria (1) representations and actions that corresponded to social norms and increase the likelihood of fulfilling obligations on time and in full amount, (2) attitudes towards debtors. *Hypothesis*: Respondents with deviant debt behavior have beliefs that are different from accepted social norms and negatively relate to debtors.

Methods. Authors questionnaire, including social demographic data, information about subjective economic well-being (SEW), experience of borrowing and debts (n = 427). Standardized Debt Behavior Questionnaire (DBQ), contains scales: “debt rationality”, describing beliefs and actions aimed at repaying debt on time, in general, the statements were related to the idea of the regulatory component of debt repayment; scale “conviction of debtors” - includes statements describing a negative attitude towards people who violate agreements and norms in the field of debt behavior (n = 1158). Before processing the results of Debt Behavior Questionnaire values were converted to Z-values.

Since, according to other researchers, debt attitudes are related to the presence of debts [6], Standardized Debt and Credit Tolerance/Frustration Questionnaire (DCTFQ) was included in the research program (n = 377). The DCTFQ contains 4 scales: Debt Tolerance - a psychological characteristic that describes the ability not to experience emotional and mental stress in a debt situation. Debt Frustration - reflects the tendency to experience stress in a debt situation. Credit Tolerance is a tendency (behavior) of a person to easily borrow money. Credit Frustration - a tendency to avoid any form of borrowing [10]. The total sample was 1158 people, aged 17 to 82 years, average age 24.9 years. Statistics: descriptive statistics, cluster analysis, one-way ANOVA in SPSS 22.0. Data collection takes place in a “matrix form” (all respondents filled out part of the general methodology: socio-demographic data, DBQ, then the methods varied depending on the purpose of a particular stage of the study: SEW, DCTFQ and others). This publication provides selective results.

3 Results

Based on the cluster analysis (k-means method) of the results of the Debt Behavior Questionnaire, 4 types of debt behavior were identified. Cluster 1 is *Non-optimal blaming type*: they have low values on the “debt rationality” scale and high values on the “conviction of debtors” scale (N = 77), cluster 2 is the *Optimal benevolent type*: they have high values on the “debt rationality” scale and low on the scale “conviction of debtors” (N = 293), cluster 3 – *Optimal blaming type*: they are high on both scales “debt rationality” and “conviction of debtors” (N = 337), cluster 4 - *Non-optimal benevolent type*: have low values on both scales (N = 351).

The distribution of respondents by clusters depending on borrowing/debt experience is as follows: the Non-optimal blaming type (N = 26) has the following ratio of respondents with different borrowing experiences: 61.5% without loans, 19.2% have loans and 19.2% have debts, the Optimal benevolent type (N = 137), respectively, 75.9% without loans, 23.4% have loans and 0.7% have debts, the Optimal blaming type (N = 159), 66.7% do not have loans, 27.0% have loans and 6.3% have debts, the Non-optimal benevolent type (N = 105), 61.0% do not have loans, 35.2% have loans and 3.8% have debts. The lowest number of debtors is observed in the “Optimal benevolent type” cluster, the largest number of borrowers is observed in the “Non-optimal benevolent type” cluster and the largest number of debtors is in the “Non-optimal blaming type” cluster. Then, a comparison of respondents’ level of subjective economic well-being in the clusters was made. The results showed that average level of subjective economic well-being (“There is enough money for food, clothing and

durable goods, but for very expensive items (apartment, cars, a summer residence, etc.) is not enough, we are adjusting our expenses”) were most frequent in all four clusters (Non-optimal blaming - 80%, Optimal benevolent - 60%, Optimal blaming - 53%, Non-optimal benevolent - 73%). Thus, it was revealed that the majority of respondents in all clusters have an income, which allows them to satisfy basic needs, which have not undergone significant changes recently, that is, material difficulties are not the cause of debts. Non-optimal blaming type has highest number of people who satisfied with their income and at the same time the highest number of debtors. To check if the cause of debt was in psychological characteristics we analyzed their credit/debt tolerance and frustration (Table 1).

Table 1. Descriptive statistics of the Debt and Credit Tolerance/Frustration Questionnaire (n = 377)

	Credit tolerance		Credit frustration		Debt frustration		Debt frustration	
	M	SD	M	SD	M	SD	M	SD
Non-optimal blaming type (n = 14)	17,9	6,5	20,9	8,1	18,5	6,6	14,3	5,3
Optimal benevolent type (n = 93)	14,1	3,5	26,4	3,9	23,6	3,4	13,5	4,1
Optimal blaming type (n = 115)	14,1	3,9	27,1	4,6	22,3	3,9	13,4	4,0
Non-optimal benevolent type (n = 155)	16,0	4,1	24,9	3,9	21,7	3,7	14,5	3,8
Total (n = 377)	15,0	4,1	25,8	4,5	22,3	4,0	13,9	4,0

Source: authors.

M - mean, SD – standard deviation.

A one-way ANOVA showed significant differences ($p = 0,000$) on all scales except for Debt Tolerance ($p = 0,086$). Tukey’s HSD test for non-equal samples was performed to determine which groups differ.

As a result, it was found that the Non-optimal benevolent type and the Non-optimal blaming type significantly differ from the Optimal benevolent type ($p = 0,002$, $p = 0,005$) and the Optimal blaming type ($p = 0,001$, $p = 0,005$) with a higher level of Credit Tolerance. Thus, there is a difference between optimal and non-optimal clusters, but there are no significant differences were found within the optimal and non-optimal clusters for readiness for borrowing.

On the Credit Frustration scale, all clusters differ from each other, except for two optimal clusters ($p = 0,614$). That is, the stronger negative emotions in the situation of borrowing experience the Optimal blaming type ($p < 0,001$) and the Optimal benevolent type ($p < 0,001$), significantly lower - both clusters of non-optimal respondents

($p < 0.001$). Non-optimal blaming type ($p < 0.001$) have significantly lower level of Credit Frustration than Non-optimal benevolent type ($p < 0.001$). Thus, on Credit Frustration we have significant differences between optimal and non-optimal clusters and within non-optimal clusters. According to the Debt Frustration scale, the “Non-optimal blaming type” have significantly lower results than all other clusters ($p = 0.001$, $p = 0.003$, $p = 0.016$). Non-optimal benevolent type significantly differs from the Optimal benevolent type ($p = 0.001$). The Optimal blaming type differ only from the Non-optimal blaming type ($p = 0.003$). The Optimal benevolent type differs from the Non-optimal blaming type ($p < 0.001$).

4 Discussion

According to results on the “Credit Tolerance” scale, there are differences only between optimal and non-optimal respondents. Attitude to the debtor does not matter. According to the “Credit Frustration” scale, both optimal and non-optimal respondents and non-optimal respondents with different attitudes to debtors differ significantly. According to “Debt Frustration”, there are differences between Optimal and Non-optimal blaming types, Optimal and Non-optimal benevolent types; between the Non-optimal benevolent and Non-optimal blaming types and the Optimal blaming and Optimal benevolent type (at the level of the trend). No difference in Debt Tolerance between type is not surprising, earlier in Lea, Webley, Levine was shown that while debtors were less disapproving of debts the group differences in attitudes were not large [9] In our typology both attitudes to *debt* (cognitive and behavioral aspects) and attitude to *debtors* (emotional aspect) are taken into consideration. According to Mewse, Lea, Wrapson problem debtors are filing stigmatized both generally and personally [11]. In our research respondents who are Non-optimal benevolent type, are tolerant of debtors, but experience greater stress in a debt situation, than respondents who are of Non-optimal blaming type. Perhaps condemnation of debt in others, allows those of Non-optimal blaming type not to experience stress in a debt situation. In general, our hypotheses about considering deviant debt behavior as a result of combination of beliefs about debt that contradicts social norms and negative relation to debtors is proved. Non-optimal blaming type is characterized by highest number of debtors and have the most differences from other types on debt/credit tolerance and frustration. The deviant nature of this type is also indicated by the lowest number of respondents assigned to this type.

5 Conclusion

The most “problematic” type in terms of forecasting the fulfillment of debt obligations is the “Non-optimal blaming type”. They have beliefs about debt and debt behavior that do not meet social standards, namely, they are not ready to live according to their income, restrict spendings and adjust their budget, these characteristics are combined with the condemnation of those who borrow, they feel negative about them and are not ready to lend money even to friends. It is important that they do not condemn debt as a

phenomenon, but borrowers and debtors. At the same time the largest number of debtors is observed in this group, so we can assume their projection of own debt problems to other people. They have the highest credit tolerance and the lowest credit and debt frustration. The most “promising” ones in meeting debt obligations are representatives of the “Optimal benevolent type” – those are respondents who have beliefs that correspond to social norms in the field of lending, most often aimed at avoiding debt situations in combination with a willingness to lend money to others and tolerant attitude to debtors. Among them, the smallest number of debtors is noted. They have high credit frustration and low credit tolerance. “Optimal blaming type” – are those respondents who characterized by beliefs that are consistent with social norms in the field of lending, combined with condemnation of debtors. The number of borrowers and debtors among them is higher than among respondents of the “Optimal benevolent type”, but loan situation is uncomfortable for them, as evidenced by low credit tolerance and high credit frustration. “Non-optimal benevolent type” – among this group of respondents there is the largest number of borrowers and a rather small number of debtors. Their credit tolerance is higher than that of the optimal types, but lower than that of the “Non-optimal blaming type”, which allows them to easily borrow. Sufficiently high debt frustration makes them to fulfill their obligations and, therefore, remain within the social norm.

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Financial Flows in Logistics Under Economic Modernization

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Abstract. The success of the enterprise is achieved due to the quality of financial management at the enterprise and its financial services in general. Issues of rational management of financial flows at the enterprise are of particular relevance. In the course of the study such methods as analysis, direct counting method, the horizontal and vertical analysis have been used. It was concluded that measures to improve financial flow management in logistic systems would be the most preferable for the research object. The enterprise has the potential to develop and improve the management of financial flows in logistic systems, this can be achieved by implementing the proposed measures.

Keywords: Financial flows · Logistics · Modernization of the economy

1 Introduction

In the modern world, issues of rational management of financial flows at the enterprise are of particular relevance. The success of the enterprise is achieved due to the quality of financial management at the enterprise and its financial services in general. All this suggests the need to study the financial flows that arise in the enterprise at the moment of movement of non-monetary values. This is related to logistic budgeting issues. In order for the enterprise's operations to be profitable and the enterprise itself to be financially stable, it is necessary to pay special attention to the structure of effective financial flow management. It should be balanced according to various criteria: the volume, time, and level of financing of economic resources and the enterprise systems. The financial well-being of an enterprise depends on the stability of revenue flow, that is, incoming financial flows. In this regard, much attention is paid to the issues of income generation, which is obtained through the management of assets and liabilities of the enterprise [3, 5]. These issues are particularly relevant in the context of the crisis, when many businesses and individuals are losing the ability to provide their payable accounts with financial resources. Due to this, other enterprises have overdue accounts receivable, which may lead to cash gaps. In an unstable economic situation, without the use of theoretical foundations and practical developments in the field of financial flow management, it becomes almost impossible to achieve this goal.

2 Methodology

The main research methods used in this study are analysis, direct counting method, horizontal and vertical analysis. The existing financial activity of the enterprise has been studied, shortcomings have been identified, and specific proposals on optimization of financial flows in the enterprise's logistic systems have been developed. The theoretical basis of the work is the works of domestic and foreign scientists devoted to the main theory of logistics, as well as specific areas of its application [5, 9, 10]. The work has also used analytical resources published on the Internet, materials of scientific and practical conferences, articles and reviews of the periodical press, legislative and regulatory acts of the Russian Federation, and practical developments on financial services, streaming processes of industrial enterprises.

3 Results

In this article, the management of financial flows at the enterprise is considered on the example of LLC "MTK-Povolzhye". The company does not have a specialized department that deals with logistic issues. Sales, supply and warehouse departments perform its functions. They perform such functions as:

1. Monitoring the state of inventory for all product line groups.
2. Optimization of the procurement policy considering changes in consumer demand, seasonal fluctuations, deadlines of implementation.
3. Conducting regular analysis of statistics on product groups and individual product positions, determining profitable, low-profit and unprofitable groups of products, ensuring the adjustment of procurement policy based on the results of such analysis (ABC/XYZ analysis).
4. Making a decision on the necessary changes in the terms of work with specific suppliers required by the company, as well as a decision on the amount of further purchases or their possible termination).
5. Study of marketing information, commercial offers and advertising materials in order to identify sustainable demand for new groups of goods and materials and changes in demand for goods from the existing range of the company.
6. Control of payable accounts.
7. Organization of claims activities with manufacturers and suppliers in case of violation of their contractual commitments, control of performing calculations on these claims, approval of changes in the contract concluded with them.
8. Preparation of alternative options: less expensive and more profitable purchases.
9. Organization of logistics (search of motor vehicles, checking on drivers, owners of vehicles and cars in order to exclude fraudulent schemes), updating and maintaining the database of carriers.

Supporting logistic functions such as warehousing, product acceptance, and protective packaging are performed systematically, and are also the responsibility of the supply department and the warehouse.

Logistic chains in the company are built as follows:

1. Products are delivered to the warehouse in Samara from manufacturers directly, or through an intermediary in Moscow with a transfer markup (1–2% + transport tariff).
2. Moving products to the structural division of Ufa is carried out mainly from the Samara warehouse.
3. At the break bulk point, all products are accepted by warehouse employees and accumulated in warehouses for further sale.
4. Delivery to the company's customers (factories, large wholesale organizations, small wholesale organizations, construction sites) is carried out by its own or hired transport from the company's warehouses or directly from the manufacturer.

The main financial flows arising in the functioning of the logistic system are:

- payments to customers and suppliers on the main types of products,
- costs on storage and maintenance of warehouses,
- payments to intermediaries and other counterparties that are an intermediate link in the logistic chain,
- payments to drivers and transport companies that work for hire,
- expenses related to the execution of contracts and agreements.

The main problems on financing logistic operations and processes are related to inefficient inventory management, which increases the costs of warehouse storage. The lack of coordination of the enterprise's divisions can lead to interruptions in deliveries, which also leads to increased costs. Inefficient sizes and principles of warehouse management can also generate unreasonable costs.

In relation to the analyzed enterprise, it can be noted that each division of the enterprise has its own goals, objectively determined by the specifics and priorities of its specific activities. The supply department is aimed at purchasing at minimum prices and improving the reliability of deliveries. The sales department is aimed at meeting customer demand as quickly as possible. The main problems from the point of view of warehouses can be considered unsystematic storage of inventory. This significantly slows down the speed of processing order and increases the likelihood of re-sorting due to a large number of different positions. All these goals are important for the effective functioning of each division separately, but objectively they conflict with each other. The supply department may reduce its costs by placing orders more infrequently, but on a large scale. The managers responsible for transport orders strive for a full load of vehicles. This fact does not agree with the sales department according to the delivery time. Financial flow management in the logistic system must be considered in a number of factors: management of the progress and deadlines of orders, transport management, inventory management, and product delivery management. As mentioned earlier, in the course of financial analysis, it was revealed that the main issues that need to be resolved quickly are inventory management issues. The main part of the problems of logistics activities managing in LLC "MTK-Povolzhye" occurs at the stages of placing an order and delivering it to the warehouse, as a result of shortcomings in the organization and planning of work with clients. It includes the duration of order execution and errors in their formation (configuration) and transfer to customers.

The reasons for such problems are: 1) inconsistency of sales and supply plans related to disadvantages in the organization of management at enterprises, 2) errors and shortcomings in orders planning due to the lack of reliable data on customer needs for the planned period, 3) shortcomings in the regulation of the order implementation, due to the multiplicity and insufficient information on the delivery time of products, 4) unsystematic storage of stock reserve. In order to analyze the financing of logistic processes at the LLC “MTK-Povolzhye” enterprise, let’s compare the actual and most preferred aspects of this issue (Table 1).

Table 1. Analysis of logistic processes’ financing of LLC “MTK-Povolzhye”

Aspect of the logistic process	Fact	Preferred mechanisms
The purchases financing	Financing purchases on the terms of delayed payment for 10–30 days	Financing purchases on the terms of delayed payment for 10–30 days
Terms of the purchase delivery	Delivered directly to the warehouse, or through intermediaries in Moscow	Always delivered directly to the warehouse
Optimizing the order size	Conducting ABC/XYZ analysis	Conducting ABC/XYZ analysis
Optimizing the delivery frequency	Determined by the supply department	It is determined by drawing up joint plans using software
Order delivery terms	Delivered to customers by the enterprise	Delivery by the enterprise, or the possibility of pickup
Optimization of transport and warehouse tasks	Performed by department managers	Zoning and barcoding systems are used, and delivery routes are optimized

Source: authors.

Based on the results obtained in considering the main aspects of the logistic process, it can be concluded that only two of them actually coincide with the preferred operating mechanism – procurement financing and order size optimization. In terms of delivery, it is preferable to make purchases only directly to the warehouse, since when acting through intermediaries in Moscow, the additional time spent on delivery is 5–10 days.

Optimization of the order frequency is actually performed only by the supply department, which does not always correlate with the sales department’s plans and, therefore, additional storage costs may arise. It is more logical to optimize this process using common software and data from ABC and XYZ analyses. Delivery of orders to customers is carried out only by the enterprise. The best option is to add the possibility of self-pickup, which will reduce time and transport costs. Optimization of transport and warehouse tasks is carried out by department managers. This is the reason for all controversial points. This significantly slows down the speed of order processing. The use of a zoning and barcoding system can significantly simplify the task.

In order to understand when it is possible to optimize the logistic system, it makes sense to consider the financial cycle as part of the logistic process. It is important to understand the time spent on certain operations carried out in logistics, so that you can quickly optimize them. The financial cycle of an enterprise as part of the logistic process is shown in Fig. 1. As you can see from the diagram, temporary losses occur when receiving orders through intermediaries and when transferring orders to consumers. The time spent in this case varies within 10–20 days. As mentioned earlier, to avoid these temporary losses, you need to work with manufacturers directly and add the ability to pick up orders for customers. Therefore, these factors should be modernized in the process of improving the financial flow management system in the logistic activities of the enterprise.

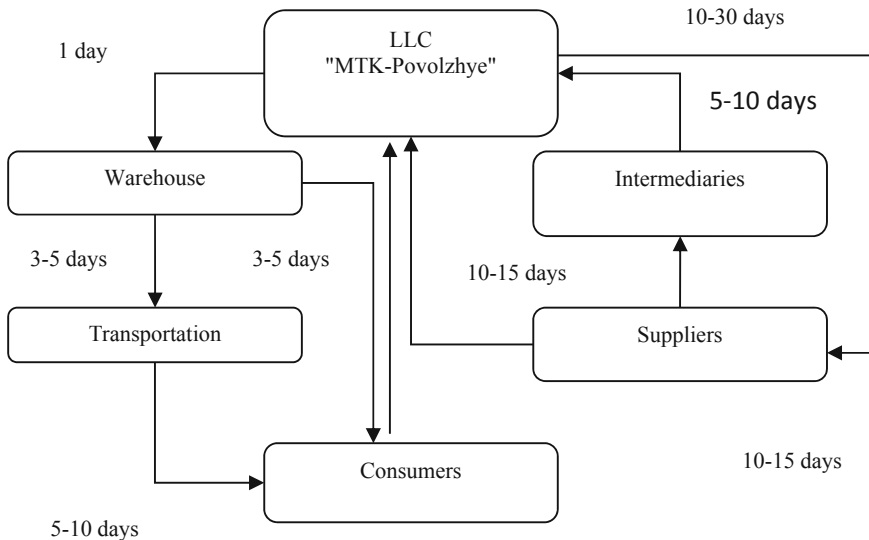


Fig. 1. Financial cycle within the logistic process of LLC “MTK-Povolzhye” (Source: authors).

4 Discussion

Baah, Jin, and Tang analyze finance issues in logistics in terms of the influence of related parties on the management methods used by enterprises in logistic systems [2]. The authors note the importance of long-term investments for managing financial flows at the enterprise. De Goeij, Gelsomino, and Steelman analyze the strategic position of logistic services providers in supply chains, which allows to increase the company’s margins [3]. The article analyzes new services designed to ensure effective management of financial flows in the enterprise. Hofmann, Solakivi, Töyli, and Zinn talk on the dependence of financial indicators of logistic service providers on changes in the cost of oil on world markets, which is especially relevant when oil prices are volatile in April 2020 [4]. Li, Shao, Ye, Xu, and Huang suggest a platform that will allow financing logistic activities through the use of blockchain technology [5]. This platform is

designed to facilitate e-Commerce financing. Negreeva, Tsymbalist-Kolesnikova, and Shevchenko write on the need to consider many factors in the distribution of financial flows in logistic systems, which increases the relevance of management tools selection [6]. Andronova writes on the measures taken to improve the efficiency of financial flows management in the logistic system of the enterprise [1]. She writes that for the successful functioning of the enterprise, it is necessary to organize and plan the movement of financial resources and effectively manage the financial flows of the enterprise and correctly choose the flow patterns of financial resources, which was taken into consideration when analyzing the research object.

5 Conclusion

According to the research results, we can conclude that for the enterprise the most preferred will be the measures to improve management of financial flows in logistic systems, which consist of changes in the organizational structure, implementation of the addressed storage system, bar-coding and zoning of the warehouse and introduction of software product 1C:WMS Logistics. By optimizing the storage space and product placement, it is assumed that the occupied space will be reduced. The free space is offered to rent, this will allow you to earn additional income. Summing up, we can conclude: nowadays, LLC “MTK-Povolzhye” has the potential to develop and improve the management of financial flows in logistic systems, it is possible to implement the proposed measures.

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Socio-economic Problems and Perspectives of Globalization in the Context of Coronavirus Pandemic

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Abstract. The article analyzes phenomenon of globalization in the modern world, touches its aim and essence, positive and negative aspects. The authors pay special attention to the new model of «digital globalization». The main idea of the research is that the recent events in the modern world are changing much the process of globalization. And Coronavirus pandemic can be interpreted as a real instrument for the global world transforming. The authors try to find out whether the post-coronavirus world will become de-globalist or it'll be totally globalized, on the contrast. The authors are sure the coronavirus pandemic will have two main social consequences: it'll cause an increasing growth of globalization by total digitalizing and social distancing practices. But the growth of de-globalist tendencies in the modern world is also obvious. Coronavirus can be considered as a symbol of de-globalization. It turns out that confrontation between globalism and de-globalist tendencies in the modern world will be continued. The coronavirus pandemic has highlighted and intensified the most essential contradictions between them.

Keywords: Coronavirus · De-globalization · Digital globalization · Digitalization · Globalization · Pandemic

1 Introduction

It's absolutely clear today that the world and the society won't be the same after the coronavirus pandemic. It's quite possible that the life of people on our planet will be divided into «before» and «after» – before the pandemic and after it. What does it mean exactly? The most dramatic effects of the pandemic can be already seen today. These are the closing of state borders, the entering of quarantines and self-isolation of the whole countries. And all these life-changing decisions are made at the level of national governments. Their defensive reaction to the pandemic challenges has led to the fact of national selfishness and elementary absence of mutual aid. It's really surprising, but several states – the well-known modern leaders of European integration – refuse to supply medical masks and medicines to their EU (European Union) partners. And the modern Italy wonders why the EC (European Commission) doesn't hurry to save their stressed economy.

When there is no stability and a comfortable way of life is collapsing before our eyes, the humans begin to behave in an absolutely new way. Dehumanization, distrusting and even aggression against all kinds of «outsiders» manifest themselves under the pressure of mass panic. When the surrounding world looks like a threat to life, every person instinctively wants to run away, to hide himself and to boarder from the others. If this situation continues for a little longer, everyone who travels a lot will be perceived as an enemy – a potentially dangerous subject, posing a real threat to the society and its members.

It's clear that in the current situation discussions between supporters of globalism and de-globalism are escalating. Following the general spirit of our times, the authors try to find out whether the post-coronavirus world will become de-globalist? Or, on the contrast, it'll be totally globalized after the epidemic? And all countries will combine their efforts in the fight against an invisible enemy?

2 Methodology

The main methods of the article are dialectical, comparative and prognostic. They are consistently used to form a full image of the problems and perspectives of globalization in the context of coronavirus pandemic. Dialectic method seems important to give a true version of meaningful events taking place in the modern world. They need to be considered in the dialectical way to fix their interrelations and mechanisms of development. This allows finding out connections between social events from a wide variety of areas – economic, political, healthcare and many others.

Comparative method allows revealing the contrast between the opposite strategies of globalization and de-globalization. It gives a chance to assess their reality and effectiveness in the modern conditions. Prognostic method helps to predict future correlations between globalization and de-globalization. It's very important in the context of the Coronavirus pandemic taking place nowadays. But it's also necessary to mention that the modern world is facing a challenge it hasn't been faced before. So, it's impossible to give unambiguous and absolutely reliable forecasts. We can only make assumptions. And we can illustrate them with a help of analysis of the most significant social and economic trends of our days.

3 Results

3.1 Globalization, Its Aim and Essence

The modern world is rightly called the «global». People of different countries increasingly use the same models of transport, wear the same clothes, consume the same food, watch the same films and TV shows, listen to the same news. The modern technologies, goods, services, information and so on created by the modern civilization enter deeply the lives of different people bringing them the feeling of closeness to each other. That's what the concept «globalization» means in general. In particular, «the

ongoing process of globalization implies the continuing expansion and intensification of economic, political, social, cultural and judicial relations across borders» [2, p. 78].

The essence of globalization is an expansion and complication of relations and interdependencies between the people and states all over the world. Besides, globalization is an objective process that aims to generate the united world space functioning according to the general rules and the single solutions for everybody. In other words, globalization tries to strengthen planetary and universal social relations. This leads to the global integration of all spheres of social life and activities. We can see it in action through the phenomena of planetary information space, the world market of capital, labor and goods, etc.

3.2 Positive and Negative Aspects of Globalization

First of all, let's note the positive aspects of globalization. They are the same: an availability of information all over the world, changing and improving the quality of education, development of cultural relations and tourism, etc. The digital economy is also rapidly developing. It's a special type of economy based on «the unity of information technologies and global production institutions..., or more precisely, a system of information technologies and institutions adequate to them» [3, p. 142]. Globalization has resolved the contradictions of market systems of the XX century, united regional markets and created international production links. Thus, the global economic system was formed. It was an excellent innovation in the sphere of economy providing extensive consumer opportunities, the fixed structure of industries and the stable role for states in it.

But along with all the positive aspects, mentioned above, globalization entails a number of negative consequences. For example, a side effect of informatization is a wide spread of disinformation. And as for information itself, it is no longer a state, corporate or personal secret. It often becomes available against the wishes of its owners. Today an ability of distribution and using information is equivalent to economic power or impact on competitors. Thus, the process of global informatization has become a hostage of the economic and political development.

The actual problems of the global economy are the growing imbalance and the social polarization. The gaps between developed and developing countries, the rich and the poor ones are increasingly growing. The international contacts can be interpreted as a provoking factor for the global terrorism development. They also activate the inter-ethnic and inter-religious conflicts. In addition, there is a threat to the health and lives of people due to epidemics. We can actually observe it during the coronavirus pandemic sweeping the modern world.

3.3 Phenomenon of Digital Globalization

Today we can observe a change of traditional type of globalization to its new model. Today it's obvious that starting from the XXI century digitalization has become the main instrument to realize the process of globalization. The idea of digitalization is closely connected with conception of technic development of the modern world and with the relating ideology of trans-humanism [5]. Besides people all over the world are

sure digitalization is one of the natural manifestations of the modern life – something similar to the alternative energy or resources. But the fact is that digitalization is significantly changing not only the human lives, but also their worldview. This aspect of the problem is just beginning to attract attention of the modern researchers [4].

Today we can see a process of replacing the traditional way of globalization with its new type. Universal digitalization entails formation of the special «digital globalization» [8]. «Digital globalization in the 21st century is characterized by accelerating and increasing flows of data and information» [11, p. 7]. It's also determined by increasing of e-commerce, emergence and development of digital platforms. These platforms are the most successful competitors of the multinational corporations. They are no longer dominated by production systems, but by software products.

In the context of the global digital economy the leadership will belong to the country that'll be the first in the field of digital platforms, their quality and quantity. Digital platforms forming on the basis of Big Data have a great impact on the growth of modern consumption. Consumption of material objects and immaterial products (such as information) is strongly activated with their help. Besides, digital platforms influence public opinion on various questions – social, economic, political, etc.

3.4 Coronavirus Pandemic as an Instrument for the Global World Changing

As we have already mentioned above, globalization is a process of worldwide integration and unification. However, if we analyze this problem deeply, the world governance and power belong to a small social group – the world's richest people. Its members set the rules for integration and unification. It turns out that globalization is a controlling process. And it depends a lot on those who are governing. It's organized on absolutely subjective qualities and principles. Having this circumstance in view, we can assume coronavirus can also be used in the personal interests of the ruling minority, for example, to start a global reform of the whole social structure.

The fight against coronavirus has already caused rejection of cash money and wide application of non-cash payments all over the world. Two leading political groups in the USA are trying to use the current events to discredit their opponents. A number of European countries are trying to solve their problems of migrants. As for the modern Russia, there's a real increase of digital technologies' implementation taking place in various spheres of life and work. With a help of various kinds of fake information, an attitude of population to the chipping project is carefully examined. It's clear that most people don't accept it or treat this project negatively.

During the world-wide coronavirus pandemic we can observe radical changes in the character, growth rate and prospects of globalization. In short, the coronavirus pandemic creates the most favorable conditions for initiating process of total digitalization. It covers all the spheres of social life including the state, the society and the humans. Maybe it's a real interest of the transnational governing structure? If this project comes to life, it'll be a turning step towards total digitalization and a global control over the world's population. The aim of this project is to reach the maximum level of governance of the planet society. Something like this is already taking place in modern China with its social credit system. The main value of the modern Chinese society is honesty

which should be manifested in everything – from the virtual behavior to the family life. The positive qualities are purposefully developed. So, everyone in China has a special personal rating. Its points are awarded if the person respects law, pays taxes regularly and practices active social activities. Points are deducted in the case of various bad or illegal actions. If you don't get a right number of points, normal life becomes impossible.

4 Discussion

As it is known, American authors were the first who have begun to talk about «globalization». The term was used by Levitt in 1983. «Globalization» for him is a phenomenon of merging markets for individual products produced by large multinational corporations (MNCs). He noted that companies must learn to operate in such a way as if the world is a huge market, ignoring external regional and national differences [7]. In his turn Adda noted that distribution of the market mechanisms on the whole planet is the most significant phenomenon of globalization [1]. The essence of globalization was deeply studied by Hoffmann [6]. In «The clash of globalizations» he described its three types having place in the modern world. These are economic, political and cultural globalizations. But as it follows from the essence of the process, globalization is first of all a market-based phenomenon. It's necessary to mention that the classic understanding of «globalization» is closely connected to the famous conceptions of westernization, financial and economic globalization, world-system globalization. But there are also alternative versions of globalization, giving us a «new knowledge about strategies of entrepreneurs, domestic and multinational firms, governments, and international organizations facing increasing globalization» [2, p. 46], taking «an international, multidisciplinary approach to understanding globalization and assessing its economic, social, and environmental effects» [10, p. 7]. The modern changes of the globalization process in the XXI century are successfully discussed by scientists of different countries, for example, Schilirò [11] and Novikova [9]. They both analyze the concept of «digital globalization», forming the basis of the research activity in this innovative area. The present article is an attempt to continue and develop this perspective way of analysis in the context of the recent events related to the coronavirus pandemic.

5 Conclusion

The authors are sure the coronavirus pandemic will have two main social consequences with a planet effect. First of all, it'll cause the further growth of globalization by the widespread using of total digitalizing and social distancing practices. These tendencies are clearly visible nowadays in relation to the anti-epidemic measures taken by different countries. Among them there are entering of quarantines, transfer of education sphere into distance learning and cultural events – into distance format, priority of working at home, etc. So, after the end of the coronavirus pandemic, globalization will continue to

develop, but its model will be changed radically. Globalization in its traditional sense will give place to the digital globalization.

On the contrast, the growth of de-globalization tendencies in the modern world is also obvious. For example, the world leader, the United States refuses to sponsor WHO (World Health Organization). They didn't save humanity as they have been claiming before. And they don't even help other countries. «Dog-eat-dog» and «Every-man-for-himself» are the typical situations in the modern world. There was a great scandal when it was turned out that the United States were buying protective equipment from Italy and trying to take out doctors from the European Union. At the same time, humanitarian aid from Russia to Italy or the United States has caused a powerful negative response in the modern society. And there are the strongest anti-Chinese mind-states all over the world. Certainly, the crisis of globalization hasn't arisen from nothing. This process has been increasing since 2014–2016 having a number of obvious prerequisites. Among them there are the Brexit, the Europe's first hesitant protests against the US's leading intervention in their politics, for example, in the Nord Stream case. And now, in the context of the coronavirus pandemic, all these processes have been increased many times. To some extent, coronavirus should be considered as a symbol of de-globalization. It turns out that confrontation between globalism and de-globalization tendencies in the modern world will be continued. The coronavirus pandemic has highlighted and intensified the most essential contradictions between them.

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Intermediary Agreements in International Trade

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Abstract. The development of globalization processes in the world economy and the increasing interdependence of business entities in different countries contribute to the growth of international trade scale, which, in turn, leads to an increase in the number of intermediary operations. The purpose of this article is to identify conclusion and execution features of intermediary agreements in international trade under conditions of the globalized world economy. The main method used in the study is complex analysis, since the legal regulation of intermediary agreements in international trade cannot be considered in isolation from the economic content of these relations. The wide use of intermediary agreements in international trade is determined by a number of undeniable advantages. And their regulatory design makes them a tool for expanding the scope of activities of many economic entities by attracting the intermediaries' services. The materials of this research work may be of interest to both practicing lawyers and economists, and can also be used for further theoretical research on the problems of legal regulation of intermediary contracts.

Keywords: Foreign economic transactions · Intermediary agreement · International trade

1 Introduction

The mediation in the process of foreign economic activity plays a very important role in the world trade. The economic need and rather high efficiency make it possible to speak of trade mediation as an important element in international trade. Based on the analysis of long-term experience of economic activities of large, medium-sized and small enterprises in the foreign market, it can be concluded that when attracting intermediaries that connect producers with consumers of goods and services, they can expect a much higher result than from the organization of their own supply chain. This is due to the fact that in this situation, the manufacturer will have to raise the price of their goods and services in order to cover the increased costs associated with the organization of sales, which, in turn, will reduce its competitiveness in the foreign market.

The development of mediation in the sphere of commodity circulation, including international one, is an objective process, it is the result of the social labor division. The use of intermediaries allows manufacturers and sellers to significantly save both labor and material resources, which, in turn, allows them to speed up the process of making trade transactions, and also contributes to improving the quality of such transactions.

This is primarily due to the fact that intermediaries tend to have higher competence and professionalism in a particular area. In addition, it should be noted that the institution of mediation will be most effective in the formation and implementation of a competitive strategy. As, for example, Putinsky noted "... the use of intermediaries gives manufacturers and wholesale trade organizations significant savings in labor and material resources, allows you to speed up the execution of trade operations and improve their quality, since the intermediaries are highly professional in their field" [14, p. 47]. Contracts for the provision of intermediary services are also called intermediary agreements or, as these documents are called in the professional environment, intermediary transactions.

2 Methodology

In the research process on this topic, the following methods were used. Firstly, the method of comparative law, which is based on the study and use of legal regulation of similar relationships. In cases where this method is used, not only the content of a particular legal institution is subject to research, but first of all, reasons for its origin in this national legal system, as well as development forms of this institution are studied, which makes it possible to establish both general, universal features and legally specific features in the studied institute. This, in turn, allows us to establish a certain basis for the purposes of a new research in this area and the formation of proposals for further improvement of legislation, taking into account national specifics. Secondly, the method of complex analysis was used. Thirdly, the method of complex analysis was applied. This method involves the use of tools that are used in other branches of science in the study of a specific legal phenomenon. In particular, it is impossible to consider the issue of legal regulation of intermediary contracts in isolation from economic science, and from processes that it studies. Since the legal formalization of economic relations will not take place if lawyers avoid analyzing the economic nature of these relations. As for the general formal-logical methods, the author applied analysis, synthesis and generalization in this research.

3 Results

Analysis of the world market indicators allows us to conclude that more than a half of foreign trade transactions is carried out with the help of trade intermediaries, which are economic entities independent of producers and consumers, and they also participate in the circulation of goods and services. The role of trade intermediaries in the international trade is also predetermined by the fact that the institution of mediation provides sellers and buyers with significant advantages that allow manufacturers to significantly improve the efficiency of foreign trade transactions. In the scientific literature, only some of these advantages can be found: there is no need to independently search for foreign partners; there are no or significantly reduced risks associated with foreign trade transactions; delivery, sorting and packaging of goods are simplified for the seller and

buyer; sellers (exporters) are exempt from the costs of forming their own marketing structures in the buyer's (importer's) country [10].

Traditional forms of mediation are considered to be assignment, agency service, and commission. However, in the context of the development and increasing integration of the national economy into international economic processes, including foreign trade activities, Russian entrepreneurs began to actively use other contractual structures that were previously unknown to our legislation. We are talking about such contracts as distribution and dealer ones. Due to the fact that these contracts are not mentioned in the normative acts, they are usually called "unnamed" in the legal literature. In addition, some legal scholars refer to such contracts as a mixed type of contracts, since they include elements of various contractual structures [17]. The same can also be called a consignment agreement. Consignment, as a rule, is considered as a contract that is widespread in foreign trade activities and international commercial practice [1].

The rights and obligations under the transaction made by the attorney arise directly from the principal. The attorney acts under a power of attorney, which leads to a rather ambiguous situation: which document should be given priority when determining the boundaries of the attorney's powers – the contract of assignment itself or the power of attorney issued on its basis. If we turn to the domestic judicial practice, it considers the power of attorney to be a priority. The attorney should act exclusively within the scope of powers entrusted by the principal. At the same time, the attorney has the right to deviate from the guidelines of the principal, if, based on the circumstances of a particular case, this is necessary in the interests of the principal, and the attorney could not previously request the principal or did not receive a response to his request within a reasonable time. The attorney is obliged to inform the principal of deviations made as soon as the notification is possible. The main duties of the attorney include: personal execution of the client's instructions, the transfer of the own duties to another person occurs only in extreme cases, when the interests of the principal are affected; accept a guarantee when a transaction is concluded with a foreign counterparty; prepare all necessary documentation for making trade transactions and currency transactions, as well as have the authority to sign a foreign trade agreement; control over the receipt of funds to the principal's account at the conclusion of the transaction; provide the principal with a report on the results of the own activities.

4 Discussion

In the international trade practice, there are several types of intermediary operations. The differences are due to the fact in whose interests the intermediaries act – in their own or the client's, as well as at whose expense they act - for their own or at the client's expense. The main types of intermediary transactions include: (a) agency operations; (b) brokerage operations [6, 11]; (c) dealer operations [16]; (d) commission operations, including consignment operations (consignment) [7, 8, 15]. However, since the current Russian legislation does not provide for any other intermediary agreements than commission, agency service and assignment, we will focus only on them in more detail. The content of the commission agreement is the obligation of one party – the commission agent to execute instructions of the other party – the committee of one or more

transactions on its behalf, but at the expense of the committee. The committee is entitled to receive remuneration for performing this duty. Under a transaction made by a commission agent with a third party, the commission agent acquires the rights and becomes obligated, even if the committee was named in the transaction or entered into direct relations with the third party for the transaction execution. A type of commission agreement, in relation to foreign trade turnover, is a consignment – a form of commission sale of goods, in which their owner (consignor) passes the goods to the commission agent (consignor) for sale from the warehouse of the commission agent [2]. In this form of business agreement, the supplier places goods at the customer's location without receiving payment until the goods are sold [4]. According to a number of scientists, consignment has the characteristics of a commission: the presence of consignment warehouses in possession, the retention of ownership of the goods by the consignor until they are sold, and the possibility of returning unrealized goods [9]. Belov generally calls the consignment agreement a product of international commercial practice [3].

Agency agreements also play an important role in the international trade. Agency agreements are very widespread as a type of mediation in foreign markets. Agency activity as an activity related to the provision of intermediary services in international turnover is formalized by a commercial agency agreement [12]. There are the following signs of commercial agency: (1) the subject structure: participation in the contract of a foreign counterparty (individual entrepreneur or legal entity); a commercial agent is a person who has a direct authority to perform actions on behalf of the principal and accept rights and obligations on his behalf; (2) the subject of a commercial agency agreement is broader than in commission and assignment agreements, since the commercial agent is charged with performing not only legal but also actual actions (for example, a commercial agent can realize not only functions of concluding deals or selling other people's goods, but also simultaneously conduct an advertising campaign); (3) commercial agency refers to business contracts, i.e. both the commercial representative and the agent are persons who have the status of an entrepreneur [13].

As for the assignment contract, in accordance with it, one party, called the attorney, undertakes to perform certain legal actions on behalf of and at the expense of another party that is the principal. However, it is worth noting that there may also be a variant in which the contract of assignment establishes obligations of the party to perform legal and actual actions so that neither of them can be considered subsidiary in nature [5]. It seems that actual actions should include, for example, conducting business correspondence, studying market conditions, checking the quality of the product, its packaging, transport support, and analyzing the documentation accompanying the transaction. As for foreign trade activities, it should be noted that it stipulates bilateral relations between the principal, which can be any business entity, and the attorney, which in this case will be a foreign economic organization, which has to perform specific assignments on behalf of the principal. The procedure for the attorney's actions is specified separately.

5 Conclusion

Mediation services are one of the business activities types. Mediation is performance by a certain person (an intermediary) of actions in the interests of another person. Moreover, such actions are aimed at establishing commercial relations of this (another) person with customers, usually buyers of his goods. The sphere of intermediary relations is quite specific, it does not exclude some conflicts in the interpretation of certain rules. Despite the fact that many intermediary agreements can be found in the scientific literature, Russian legislation currently recognizes only commission agreements, agency agreements, and assignment agreements as intermediary agreements. The practice of concluding mediation agreements is not a Russian legal tradition, but was borrowed from Western legal systems, primarily from England and the United States, where they are most often concluded for one-time actions by intermediaries, and the legislation of the Russian Federation, on the contrary, provides an opportunity to conclude such agreements for a long time or without specifying such a term. This circumstance makes it possible to expand the scope of their application and distribution, use in business and commercial activities of economic entities. Thus, advantages of entering into intermediary agreements are quite obvious. Taking into account the fact that their concepts are legally fixed, they play an increasingly important role in the commercial activities of many entrepreneurs by attracting intermediaries' services. In addition to buying and selling, intermediary agreements may also be concluded for the purpose of transferring certain "non-core" functions, for example, the transfer of transport security to other organizations that specialize in this sphere.

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Criteria for Assessing the Effectiveness of Monetary Policy of the State

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Abstract. This article investigates issues of assessing effectiveness of the monetary policy in terms of the impact on the country's economic growth and the welfare of the population. The authors carried out comparative analysis of the relationship between money supply in the country and level of well-being of the population on the example of Russia, the USA and Germany. Special attention is paid to the search for criteria of assessing effectiveness of measures in the field of monetary policy and state programs aimed at economic growth and growth in the level of real disposable income of the population.

Keywords: Disposable income · Economic growth · Efficiency of monetary policy

1 Introduction

Monetary policy is an important factor in economic growth. In particular, major component of monetary regulation is the level of money supply in the economy. Growth of its volumes should contribute to economic expansion, which is expressed in the increase of GDP and level of well-being of the population. Assessing the effectiveness of state's monetary policy is not an easy task from the perspective of an integrated assessment, which will demonstrate not only the fact of achieving the set goals (effectiveness), but also indicate the quality of the result, taking into account expended resources.

By changing the general market environment, central banks can directly influence spending decisions for households and firms. In theory, therefore, the monetary policy of central banks has a direct impact on household spending, both by achieving the effect of a general balance of demand, supply and prices (by balancing prices, wages, employment levels), and by managing interest rates. This interpretation of general equilibrium at the same time logically lays down on the Federal Reserve Act of 1913 [5], which defines the Federal Reserve's statute as the body providing maximum employment, stable prices and moderate long-term interest rates.

In practice, however, the effect of general equilibrium cannot be achieved, since the impact on the markets, both through the liquidity channel and the channels of interest rates and unemployment management, is very limited. On the one hand, despite the increasing volumes of incentive programs by central banks, the dynamics of real disposable income (RIR) in the United States slowed significantly, although they are

closely related to the volume of money supply M2 (model correlation coefficient 0.98 and R-squared 0.967 (Fig. 1). In Europe (for example, in Germany) this relationship is also significant (correlation coefficient 0.94, R-squared 0.90 (Fig. 2).

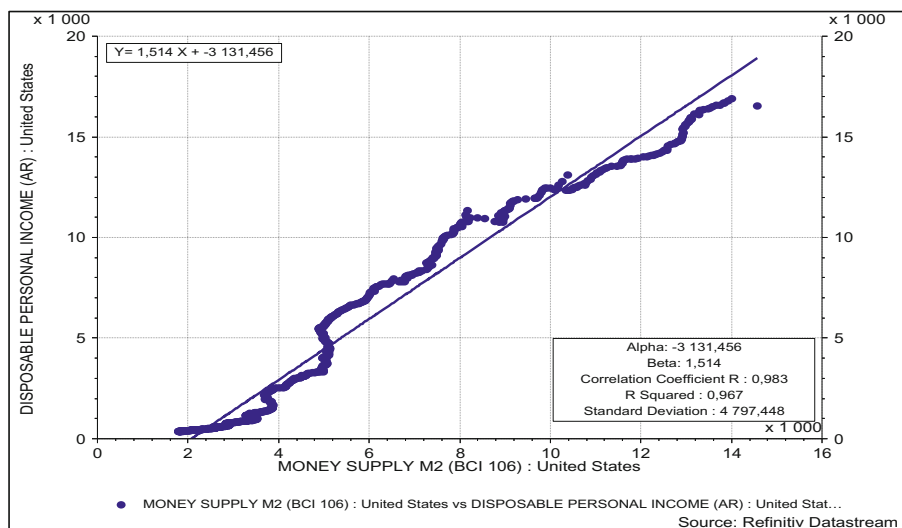


Fig. 1. The relationship of M2 and RDI in the United States (Source: authors based on [10]).

On the other hand, there are significant imbalances in the redistribution of funds as part of incentive programs in the economic system. The fact is that a stimulating (expansionary) monetary policy reinforces the inequality in income and consumption. The Gini index in the USA reached its historical maximum (Fig. 3).

Based on the correlation-covariance matrix we have constructed, the correlation coefficient in the dynamics of the US Gini index and the Fed's decisions to introduce the next phase of ultra-soft monetary policy was about 91%, and the determination coefficient was about 98%. At the same time, on the basis of the given historical data, an accelerated growth of social inequality in the USA is observed precisely during the periods when the Fed made decisions on easing credit conditions. So, the accelerated growth of the index in 1992–1993, the actions of the Fed to soften credit conditions in the face of slower economic growth, as well as the last impulse wave of growth of the indicator, falling in 2008–2019 coincides with the three large waves of quantitative easing and the subsequent expansion of the global liquidity channel.

On the other hand, in Europe, under conditions of a similar ultra-soft monetary policy, there was no similar effect reflected in the accelerated redistribution of the surplus product created in the economy in favor of the most wealthy social groups. Regarding QE type measures, an analysis focused on the four largest eurozone countries shows that the Asset Purchase Program (APP), on the contrary, has led to a reduction in income inequality. The described effect in the EU can mainly be explained

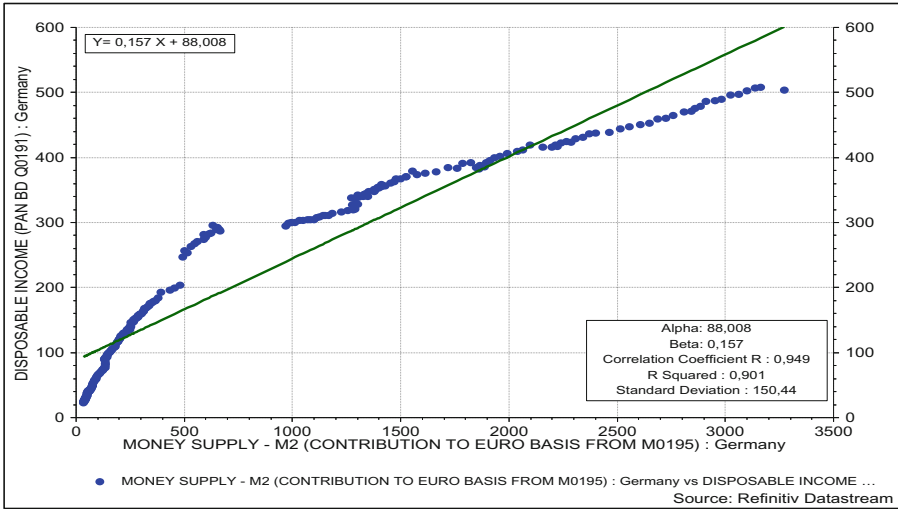


Fig. 2. The relationship of M2 and RDI in Germany (Source: authors based on [10]).

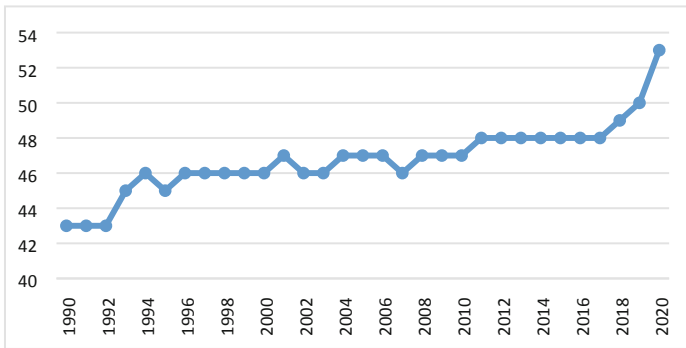


Fig. 3. Dynamics of the US Gini index (Source: authors based on [9]).

by a significant drop in unemployment in low-income households, due to the implementation of stimulus measures by the ECB.

A study by Rosati [7] also noted that social policies in European countries such as Portugal, Italy, Ireland, Greece, and Spain are unable to withstand poverty and unemployment and change social and economic conditions.

In Russia, against the background of institutional imbalances the situation is aggravating. Statistics show a stagnation of real disposable incomes of the population, as well as slowdown in GDP growth [10]. The correlation between the dynamics of M2 and the dynamics of real disposable income is low (0.15, R-squared 0.023 (Fig. 4)).

A study by Bazhan [1] noted that Russian monetary policy is mainly aimed at reducing inflation, which ultimately leads to stagnation of the economy. Nevertheless,

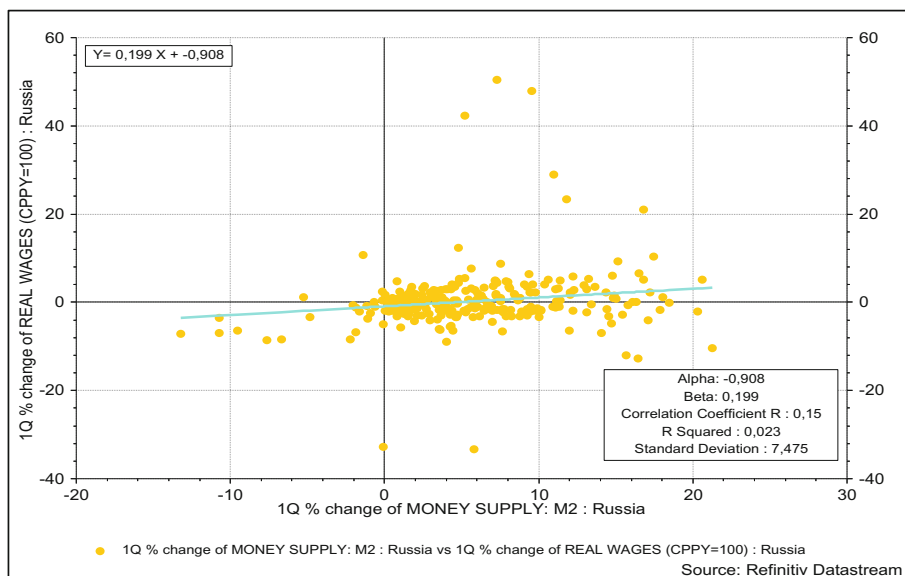


Fig. 4. Model of the relationship between the dynamics of M2 and the dynamics of the RDI of Russia (Source: authors based on [10]).

there has been a tendency to reduce social inequality in the context of expanding money supply by the Central Bank of Russia (Fig. 5).

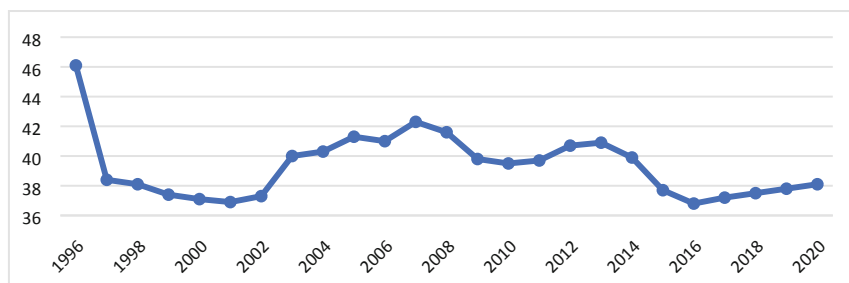


Fig. 5. Dynamics of the Gini Index of Russia (Source: authors based on [9]).

Based on the above information, the key objective of the study is to solve two problems:

- assessing the effectiveness of a key element of the state's monetary policy - money supply, by evaluating its impact on economic growth using the example of the USA, European countries and Russia,
- determination of the relationship and mutual conditionality of the dynamics of money supply and the level of social inequality in the USA, Europe, Russia.

2 Methodology

Works of such authors as Semilov [8], Dubova, Kuznetsova [4], Bazhan [1], Rosati [7], de Mendonca, Nascimento [3] was the methodological base of the study. As criteria for the effectiveness of monetary policy, Dubova, Kuznetsova proposes to consider a combination of quantitative and qualitative indicators: GDP, labor productivity, refinancing rate, lending volumes, inflation, unemployment, employment, living standards, savings, liquidity, reliability, risks and etc. However, the approach based on the construction of a complex integral indicator is difficult to analyze. de Mendonca and Nascimento consider relevant factors that influence the effectiveness of monetary policy: financial openness and globalization [3]. However, it is not possible to measure these factors. Semilov uses the tools of correlation and regression analysis to assess the impact on the growth of direct investment of factors such as the volume of lending, money supply and the level of interest rates in the economy [8]. However, the volume of direct investment is one of the factors that affects the growth of the economy. Author use such major indicators of the monetary policy effectiveness as: GDP and the RDI level.

Major sources which prop up the economic growth are: the amount of money supply (X3 Money supply M2), the volume of loans to the corporate and private sector (X1 Bank lending: corporate and personal loans), the volume of investment in fixed assets (X2 Fixed capital investment), the cost of Urals brand oil (X4). Investments act as the main regulator of economic growth. Adequate money is needed for successful economic growth. In case the money supply demonstrates long term pace, that differs from the production volumes growth, then the money in circulation at a constant speed of circulation may not be enough for the normal servicing of all payments and settlements, and then a payment crisis will arise [4]. Tools for assessing the degree of relationship between the indicators selected correlation and regression analysis.

3 Results

To solve the first task of the study, we provided analysis of the level of relationship between entitled variables and the GDP. The analysis indicates the significant impact of this factors (Table 1). To a greater extent, the resulting indicator is affected by the variables X2, X3, X4. Moderate relationship of the resulting indicator with X1.

Table 1. Model for the relationship of GDP to variables

Y (GDP)	X1 (Lending to individuals and legal entities)	X2 (Investment in fixed assets)	X3 (M2)	X4 (The cost of Urals brand oil)
Correlation coefficient	0,53	0,89	0,87	0,77
Regression model	$Y = 0X + 18994,93$	$Y = 1,906X + 14\ 506,73$	$Y = 0,144X + 16689,55$	$Y = 105,027X + 11870,66$
R-squared	0,28	0,79	0,76	0,60

Source: authors.

Confirmed hypothesis about the significant influence of the selected factors made it possible to construct the multiple regression equation.

$$Y(\text{forecastedGDP}) = 17802,8392 + 0,0001(X1) - 0,0293(X2) + 0,0362(X3) + 12,543(X4)$$

Reliability of the model is confirmed by the high value of the R-squared equation (0.91). Thus, we can build a forecast of the country’s GDP based on scenarios of forecast values of factors (Fig. 6).

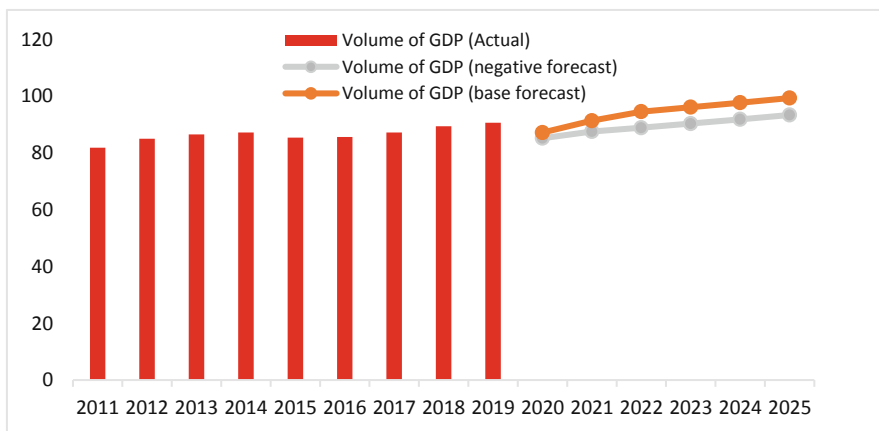


Fig. 6. Russia’s GDP dynamics (Source: authors based on [6]).

Projected GDP dynamics are based on medium-term scenarios of Urals oil price dynamics:

- when implementing the Baseline Scenario in the medium term (until 2025), Russia’s GDP will grow with an average growth rate of 2.8% year-on-year (based on the weighted average price per barrel of Urals in 2021 at \$42),
- in the case of the implementation of the Negative Scenario, the average forecasted GDP growth rate in Russia in the period 2025 will be about 1.8% year-on-year (based on the weighted average price per barrel of Urals oil in 2021 at \$34).

To predict the real disposable income of the population, the following factors were used:

- decrease in per capita incomes due to rising unemployment, lower wages,
- increases in consumer spending, growth in utility bills (average projected growth rate in 2020-4%) and other mandatory payments

In the historical period 2011–2019 real disposable incomes showed moderate growth with an average CAGR of 0.2% yoy. In the forecast period until 2025, the real disposable incomes of the Russian population will grow with an average CAGR of 1–1.5% (Fig. 7).

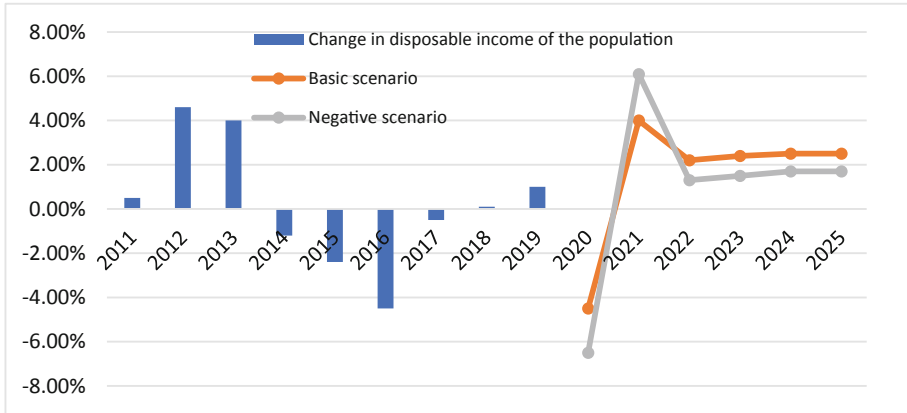


Fig. 7. Dynamics of real disposable incomes of the Russian population (Source: authors based on [6]).

Next, we turn to the second problem, the solution of which is posed in the framework of this study - the determination of the relationship in the change in the total money supply in the economy due to the implementation of incentive programs by the monetary authorities with the dynamics of the social inequality index.

Relationship of the total volume of money supply in the system with the growth of social inequality can be examined by analyzing four key channels that affect the distribution of income in the economic system. The revenue generation channel is the first channel that affects income distribution after monetary policy shocks. The redistribution of income through this channel is due to changes in the main sources of income (such as business income, financial and labor income, and cash transfers), which are heterogeneous for different households. The fact is that regardless of which type of non-conventional monetary policy the central bank would choose (whether it would be a reduction in short-term interest rates or acquisition of assets), this affects income, return on assets, wages or benefits asymmetrically, i.e. different types of households when implementing the described policies will be affected to varying degrees.

The second channel, due to the presence of information uncertainty in the financial markets, represents financial segmentation in the sense that traders with access to confidential information in the financial markets will respond more quickly to changes in monetary policy than agents with less connections, and therefore will benefit at the expense of the latter. This channel refers to distributional effects in a group of financial investors.

The third channel is a portfolio management channel. Households with disproportionately large net asset positions can benefit from expansionary (traditional or non-traditional) monetary policies by increasing the value of such assets. However, if their assets are not protected from inflation, such households may lose a significant share of their financial savings. If the expansionist policies of the Central Bank spur inflation, it undermines the real value of assets with a fixed nominal value.

4 Discussion

Returning to the analysis of the impact of the monetary policy of central banks on social inequality, we start with the Fed policy. Systematizing the analysis carried out in scientific studies of other authors and the statistics of household income dynamics, we conclude that the key channel of redistribution is the portfolio management channel. Thus, the data from the Consumer Finance Survey of the Federal Reserve System make it clear that the recent expansionary unconventional monetary policy in the United States has contributed to the growth of inequality, in particular, due to an increase in the value of corporate shares.

On the other hand, the increase in employment among the poorest layers had a redistributive role, but was weakened by a drop in real wages and difficulties in refinancing mortgage loans for households with limited credit opportunities. We obtained similar results for Bank of England quantitative easing measures. We also found that expansionary substandard monetary policy in Japan expanded income inequality in the late 2000s, mainly due to the portfolio management channel. Review of the monetary policy impact on social inequality in the EU indicates a high cross-country heterogeneity. Unconventional monetary policy tends to increase income inequality, the more significant the more funds are stored in financial assets.

On the other hand, according to some authors in Europe, redistributive fiscal policies can mitigate or offset the impact on households' net income. So, Casiraghi, Gaiotti, Rodano, Secci use the Banca d'Italia (BIQM) quarterly model of the Italian economy [2] to simulate the impulses of monetary policy regarding a set of data on the income and wealth of Italian households. The authors believe that recent unconventional monetary policy measures by the ECB have had little impact on social inequality in Italy. Expansionary policies are detrimental to households with significant liquid assets, reducing their income from wealth. More importantly, expansionary monetary policy raises labor incomes, which benefits, in particular, households without significant wealth.

The purchase of long-duration sovereign debt by the ECB reduces the amount of long-term debt held by households. A decrease in the expected return on long-term bonds leads to a rebalancing of the portfolio towards corporate capital and foreign assets, which leads to an increase in investments and real effective depreciation. The lower expected return on long-term bonds also reduces private savings, leading to increased consumption. Strengthening domestic demand and net exports means increased real GDP and higher (demand-driven) inflation. According to our model, the correlation coefficient in the dynamics of the consolidated Gini index for the countries of the euro zone with the dynamics of the aggregate money supply is about -0.2.

5 Conclusion

Thus, we come to the following conclusions about the relationship in the implemented monetary policy of large central banks with the level of social inequality:

- there is a high level of inverse correlation in the volume of money supply that is issued to the market as part of non-conventional incentive measures by the federal and the level of social stratification in the USA (the greater the volume of incentive measures. The higher the level of social inequality),
- in contrast, there is a slight negative correlation in the dynamics of the volume of money supply and the level of social stratification in the euro zone.

The obtained forecasting models of real disposable income and Russia's GDP allow us to quantify the effect of the infusion of cash into the economy on the level of welfare of the population. The results of the study indicate the low efficiency of monetary policy in Russia. In the current conditions, monetary factors do not contribute to a balanced growth of the country's economy and the welfare of the population. It requires diversification of investments and the comprehensive implementation of a project approach to governance at the state level (if we talk about the active participation of the state) or a decrease in the share of participation and increased responsibility through the active development of institutions. It is necessary to revise the system of indicators for assessing the effect of cash injections into the economy, the principles of financing key projects in industries, and most importantly, to improve the institutional environment. In particular, fight institutional traps (shadow economic activity).

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Interests of Russian Entrepreneurial Structure Participating in Automotive Strategic Alliances

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Abstract. The study has analyzed the representatives of the Russian automotive manufacturing that are a part of global value chains. They are JSC “AvtoVAZ” and JSC “Sollers”. It has been noted that enterprises taking part in the global value chain have chosen different forms of integration. The main general-theoretical methods of analysis, synthesis and comparison were used. As a result, it has been concluded that an important role is assigned to the compliance of “Strategies of scientific and technological development of the Russian Federation” companies’ interests in matters of import substitution, inclusion in global value chains and increasing the level of localization. At the same time, there are also differences regarding the forms of cooperation, goals, and involvement. Nevertheless, the effectiveness of this cooperation remains undeniable and is confirmed by the entry of Russian enterprises into new links in the value chain and increasing the level of production localization.

Keywords: Automotive manufacturing · Entrepreneurial structure · Global value chains · Interests · Strategic alliances

1 Introduction

In the current situation, the functioning of an enterprise within the framework of a strategic alliance can provide it with greater stability than in the case of a single operation. This is due to the fact that the financial well-being of one enterprise in the chain is closely linked to the well-being of all other participants and the chain as a whole. Therefore, when there is a shift in the indicators of any of the links in the chain, other participants can help links to stabilize the situation [3]. Both Russian enterprises and foreign partners have their own interests in such cooperation. Analyzing it, we can say that foreign partners are able to operate in the country of the partner enterprise and enjoy its preferences. The domestic enterprise gets an opportunity to enter the world markets and get support from foreign partners.

2 Methodology

The study has used the main theoretical methods: analysis, synthesis and comparison. To get the results, we have analyzed the information base, which included research by domestic and foreign authors in the field of financial interests conciliation processes

and issues related to the functioning of value chains, as well as local legal acts of JSC AvtoVAZ and PJSC SOLLERS. We have also compared the interests of the largest domestic automotive enterprises that are part of the global value chain.

3 Results

Analyzing the features of research objects' financial interests, it should be noted that they correlate more with the goals of the Strategy of scientific and technological development of the Russian Federation [9]. The point of the main goals is reduced to the inclusion of Russian enterprises in the global value chain, the implementation of import substitution policy, increasing the degree of production localization and the development of their own production of high-tech products.

Joining global value chains allows enterprises to increase implementation volumes by entering global markets, and also by expanding their influence on the already employed ones [1, 2]. Most of the times, the inclusion of a company in the global value chain is associated with the beginning of partnerships with foreign manufacturers. In this case, foreign partners launch their own production facilities on the territory of Russia on the basis of domestic enterprises, and the resulting profit is distributed among the involved partners. In this regard, the domestic enterprise can receive additional financial resources not only from the expansion of the marketing area, but also from the production of cars made by foreign partners.

Then, it is important to consider the importance of such cooperation for import substitution increasing [4, 8]. Production of cars with foreign brands in Russia makes it possible to avoid importing cars of these brands, and to implement produced in Russia cars. At the same time, capital and financial resources are redistributed to the country of the manufacturing company [6]. This situation is beneficial for both sides. Foreign enterprises will be able to avoid customs duties, while Russian companies will be able to actively participate in the implementation of the import substitution policy, as well as receive additional profit.

The issue of import substitution leads to the issue of increasing the degree of production localization. The more raw materials, parts and components are produced on the territory of Russia, the more the policy of import substitution will be implemented. It can also reduce the cost of purchasing imported components and increase your own profit. The design and production of components are represented by stages with high added value. Thus, the organization of own production of imported components will have a positive impact on Russian enterprises from the point of view of financial interests.

The increasing degree of localization is complicated by the fact that Russian enterprises are often not ready to produce imported components. As it was mentioned earlier, it is usually high-tech components that are imported. There are not enough knowledge, skills or production capacity to produce them. In this case, foreign partners significantly contribute to the development of domestic enterprises. They are also interested in increasing the degree of production localization, as well as in production placing on the territory of Russia. At the same time, they want to get the necessary quality components in the necessary quantity. Therefore, they train domestic

manufacturers to the developed production methodologies of various components, they also finance the development of domestic partners production, the purchase of equipment, training of employees, etc. In other words, foreign partners finance the comprehensive development of Russian enterprises, which allows the latter to save their own resources, while continuing to develop.

These are the common financial interests of Russian companies that are members of automotive strategic alliances. They are determined by the current strategy and are common to all enterprises. Within the framework of these main financial interests, the interests and operating features of each individual company participating in the strategic alliance may vary. We want to consider this on the example of JSC AvtoVAZ and PJSC Sollers (Table 1).

Table 1. Comparison of interests and features of JSC “AvtoVAZ” and PJSC “Sollers” functioning

JSC “AvtoVAZ”	PJSC “Sollers”
<ul style="list-style-type: none"> - interest in global markets entering; - focus on the passenger cars segment; - participation in one strategic alliance; - full dependence on the strategic alliance; - the desire to increase the degree of localization. 	<ul style="list-style-type: none"> - interest in entering new niches and expanding the share of those who are already employed; - operates in several segments at once; - creation of joint enterprises with several foreign partners at once; - division of ownership of joint enterprises between partners; - maintaining the current localization level.

Source: authors.

First, let’s consider the interests of JSC AvtoVAZ. Interest in entering global markets is interpreted by the company’s development strategy. The share of AvtoVAZ in the Russian market is quite large, so the next stage was chosen to enter a new, global market. The participation in the international strategic Renault-Nissan-Mitsubishi alliance is facilitated to this. The focus on the passenger car segment is due to the fact that the enterprise has not previously had experience in other related segments, and has never produced passenger or cargo transport. In addition, all the enterprises that are part of the alliance and whose brands of cars are produced at JSC AvtoVAZ are also manufacturers of mainly passenger cars. This is why this solution is the most understandable.

Participation in one strategic alliance is explained by the fact that several large foreign automotive concerns are co-operating in it, which allows JSC AvtoVAZ to work with several partners at once. At the same time, the joint work of all enterprises is coordinated within one alliance, which allows you to solve issues with all representatives at once. In this regard, in order to simplify coordination and simplify interests, a complete dependence on the strategic alliance was formed.

The desire to increase the degree of localization is also consistent with the interests of the entire alliance. At the moment, the production of cars at JSC AvtoVAZ is

localized by 50%. It is planned to increase the degree of localization to 75%, which is explained by the desire to move most of the production to Russia.

Next, we should analyze the interests of PJSC “Sollers”. The interest in entering new niches and expanding the share of those already employed is also reflected in the society’s development strategy. The enterprise has chosen to strengthen its position and expand its areas of influence by entering into numerous partnerships with various foreign manufacturers. This is due to the fact that the company operates in several segments, and it is difficult to enter the world market in several of them at once, and the lack of strict dependence on partners allows you to develop a strategy based on your own interests. The division of ownership of joint enterprises between partners gives the company the ability to influence management decisions.

The enterprise operates in several segments at once, since the enterprise has already experienced working with cargo and passenger transport, so the enterprise have already had its own place in this niche. In addition, a number of partners with whom joint enterprises were established, have already specialized in various segments. Therefore, the organization of work was greatly simplified. In addition, this allows the enterprise to maintain a more stable position. With changes in one segment, implementation volumes in other segment may remain stable. It confirms the logic of the developed strategy.

Creating joint enterprises with several foreign partners at once also stabilizes the company’s position. If one of the partners decides to leave the market, PJSC “Sollers” will suffer less losses than if it were the only partner. In addition, returning to the issue of activities implementing in various segments, this allows us to develop production in several directions at once, and, as a result, increase implementation volumes. Maintaining the current localization level is explained by the fact that localization is already at a fairly high level (60%) [5]. No further increase is planned due to the fact that enterprises do not see the point of increasing capacity and expanding by working in a related industry, and do not want to risk the quality of imported components. It can be concluded that the specific financial interests of Russian companies, participating in automotive strategic alliances, are focused on the main tasks that are set for them by the state. However, the enterprises themselves have certain benefits. At the same time, each of them can act towards an expected outcome the way they want, so they could achieve their final goals.

4 Discussion

According to the classical model of Porter, the level of industrial competition is determined by the impact of five competitive forces on enterprises. It is these competitive forces that influence competition in the industry. It is assumed that the activities of enterprises are influenced by firms operating in this industry, operating in a related industry, potential competitors, suppliers and buyers [7]. In the case of corporate participants of value chains, it is assumed that all enterprises that operate in a particular industry compete with each other and depend to a significant extent on their suppliers. In other words, there is competition within a single value chain. Competition in the

industry between enterprises largely depends on the growth of the number of participants, who are approximately equal in relation to each other.

In the classic view, corporate participants of the value chain work under the conditions described above, their behavior is formed according to the Porter model, and the main goal of the enterprise is to maximize its own profit. All participants in the chain compete with each other, trying to buy raw materials and components as cheap as possible, and sell their own products as expensive as possible.

Nowadays, the situation has changed significantly. Corporate participants in the same value chain do not compete with each other any longer. The main task was to maximize the welfare of not only your own enterprise, but also other participants of the same production chain. Competition is reaching a new level – the level of value chains. Now the initial goal is to increase the competitiveness of the chain as a whole.

5 Conclusion

The study has analyzed the representatives of the Russian automotive manufacturing that are a part of global value chains. They are JSC “AvtoVAZ” and JSC “Sollers”. It has been noted that enterprises taking part in the global value chain have chosen different forms of integration. JSC AvtoVAZ has become a member of the strategic alliance and, as time passed, completely became its property. PJSC “Sollers” cooperates with several foreign partners at once, creating joint enterprises with shared ownership. Both Russian enterprises and foreign partners have their own interests in such cooperation. Analyzing it, we can say that foreign partners are able to operate in the country of the partner enterprise and enjoy its preferences. The domestic enterprise gets an opportunity to enter the world markets and get support from foreign partners. As practice shows, not all domestic enterprises want to enter international markets. For example, PJSC “Sollers”, in contrast to JSC “AvtoVAZ”, includes in its strategy the goal of expanding its influence on already occupied markets, rather than conquering new world markets. Speaking of the specific interests of Russian alliance members, an important role is assigned to their compliance with the “Strategy of scientific and technological development of the Russian Federation” in the issues of import substitution, inclusion in global value chains and increasing the localization level. At the same time, there are also differences regarding the forms of cooperation, goals, and involvement. Nevertheless, the effectiveness of this cooperation remains undeniable and is confirmed by the entry of Russian enterprises into new links in the value chain and increasing the level of production localization.

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The Concept of Cooperation in the Activities of Transnational Corporations

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Abstract. The goal of the research was studying of the experience of the concept of cooperation marketing in the activities of the transnational corporation. The following tasks were set: to estimate the quality of the planned marketing events and the expected effect from motivating measures as well as to characterize the peculiarities of partners relationships formation on the Russian market. The study of the factors of the external and internal environment of Nestle Samara LLC on the basis of SWOT analysis was carried out; key competencies and main threats were identified. PEST analysis allowed us to establish the most important factors for the growth of the company revenues. Particular attention was paid to the study of the nature of interaction of a manufacturing company with retail chains and intermediaries within the framework of the implementation of the concept of marketing cooperation. The study of the organization of internal processes of sales management and sales promotion with the participation of retail chains was conducted. The positive experience of the implementation of the marketing concept of cooperation of the company under research was revealed and the key elements for its use were identified.

Keywords: Communication · Consumer · Cooperation marketing · Intermediaries · Marketing · Partners

1 Introduction

Marketing as a business philosophy is widely used in various fields of activity, providing a sustainable competitive advantage on the account of the use of a set of marketing tools. The development of international trade and the creation of multinational corporations expanded the boundaries of business and led to the emergence of a broader concept of competition. In this sense, competition on the national markets takes place not only between national business participants, but also with the active presence of foreign entrepreneurs who have their own production enterprises in different countries. At the same time, the barriers and restrictions inherent in traditional international trade in the form of customs duties, fees and charges go away, but the competition for consumer loyalty becomes more intensive. The composition of market participants, including national and international manufacturers of products, of course, increases the general standards of doing business and the responsiveness of consumers to marketing programmes. In this regard, the nature of marketing activities of multinational companies

on the national markets and the revealing of success factors which can be useful for the development of domestic business and the practice of marketing theory use are of great scientific interest.

2 Methodology

The concept of marketing cooperation first appeared in the practice of market activities in the 1980s. It involves establishing of long-term mutually beneficial cooperation with suppliers and consumers. This requires a slightly modified communication activity and wider use of personal contacts. The value of this marketing concept is the provision of more stable relationships with partners and customers, the high importance of repeated transactions in the face of tougher competition. To understand the experience of applying of the cooperation concept on the Russian market, there was conducted the research of the marketing activities of LLC Nestle Russia based on open sources of information [8, 9]. The analysis of the use of marketing tools made it possible to identify the areas of activities that require new technologies for working with clients and partners.

As the basis for analyzing of the situation, customer surveys and calculations of indicators of perception of marketing activities, growth rates of sales, costs and profit from the implementation of the management decisions were used. Evaluation of the effectiveness of the applied marketing decisions for maintaining of long-term interaction with partners and consumers can be useful for the development of the marketing theory.

3 Results

In 1995 the Swiss company Nestle bought the controlling stake of the factory Confectionery Association "Russia" in Samara and from that time started active production of chocolate products for the Russian market and the markets of CIS countries. Currently, LLC Nestle Russia is a production branch of the Russian legal entity Nestle. The product range of LLC Nestle Russia includes the production of cocoa, sugar products and chocolate, the production of baby food, food enzymes and pet food.

Activities in the Russian market are determined by the specifics of solvent consumer demand, the influence of sanctions and inflationary processes. All these factors influenced the increase in product prices and a slight decrease in demand. As a result of the study the 12% decrease in the company revenues in 2019 was found.

Studying of the marketing environment of LLC Nestle Russia was carried out on the basis of PEST analysis, during which an assessment was made of the influence of political, economic, sociocultural and technological development factors. According to the results of the analysis it can be noted that the most important factors for the growth of opportunities are increase in the population and demand for confectionery products. The main threat for the company is the instability of the ruble exchange rate which affects both the solvent demand of customers and the increase of the company costs for the purchase of resources.

The detailed study of the microenvironment of the organization allowed us to draw conclusions about the main competitors of the company which include LLC Mars, LLC Mondelez Russia and LLC Unilever Russia. Thus, competition on the Russian market is taking place between large international participants with approximately equal competitive advantages and similar marketing strategies.

Particularly close attention was paid to intermediaries and partners involved in the sale of manufactured products and having a strong influence on the availability of products. Taking into consideration the specific character of the products, the bulk of sales is carried out through distributors and distribution networks, the largest of which are: X5 Retail Group (Pyaterochka, Perekrestok, Carousel), Thunder (Magnit), Auchan and Atak, Lenta, Metro, O.K., etc. [3].

The study of the factors of the external and internal environment of the organization was used to conduct SWOT analysis which made it possible to draw the following conclusions:

- the development of the key competencies of LLC Nestle Russia requires the deepening of the product range by the development of new types of production activities,
- the main threat is the vigorous activity of the competitors; therefore, it is necessary to strengthen interaction with partners and customers to maintain long-term cooperation.

Within the framework of the research of the peculiarities of cooperation between LLC Nestle Russia and its customers and intermediaries were studied in detail to identify the nature of the implementation of the cooperation marketing concept. The main intermediaries include transport companies that ensure timely delivery of orders to the places of destination. And in this area there is a well-developed interaction algorithm in case of non-standard situations and deviations from the intended delivery parameters. From the point of view of marketing, the most interesting is the cooperation with distributors and retailers which make the greatest contribution to sales.

To reveal the most popular retailers a survey with the use of the Internet was conducted with the target audience aged 20–44 years with above the average or average level of income, with an active lifestyle.

According to the survey, 43% of customers in Samara prefer Pyaterochka supermarket, 40% prefer Magnit. So, more than 80% of purchases of Nestle products are made at these retail chains, which is natural taking into consideration their convenient location. Thus, the main focus in terms of strengthening of cooperation with retail chains is directed precisely at these market participants. It should be noted that the marketing activities of retail stores are formed on the basis of the product range; and the allocation of individual items of the product range is not an end in itself of the retail chain. The store sells all the range lines and tries to increase customer traffic. Therefore, measures to stimulate sales of a particular manufacturer are possible only with the economic interest of all the participants.

At present special documents on communication with consumers are developed at Nestle, including: “Principles of Nestle Business” and “Principles of Communication with Consumers”. Interaction with customers is organized through the cooperation of the company’s internal services, including the customer support department, the order

support department, the sales department, product category specialists, the electronic document management department and warehouse managers. The company bears responsibility for the commercial success of manufactured goods, supports retail chains with special promotion activities and constantly monitors sales development through various distribution channels.

So, it can be stated that the company Nestle implements the concept of marketing cooperation in practice, maintaining partnerships between the links of the vertical supply chain, implements market segmentation and differentiates product offers on the basis the conditions of cooperation with each client.

In 2018, as a measure to develop the concept of cooperation marketing, Nestlé optimized order processing processes. The main objective of this was to strengthen business relationships with customers throughout the whole order cycle. A new phenomenon in this work was the continuation of interaction even after the execution of the order, including the work with complaints and claims.

Cooperation marketing can be really useful if a key participant, in our case LLC Nestle Samara, is focused on long-term cooperation with partners and customers and aimed at creating new values for customers and obtaining a result that is beneficial for all participants of such cooperation.

As a successful experience of cooperation with sales partners it will be interesting to speak about the promotion event of LLC Nestle Samara “Gifts Com’il faut” organized jointly with the retail network Pyaterochka. The essence of the promotion was to stimulate sales of boxes of chocolates with the provision of gifts to customers in the form of calendars, diaries and scarves. Bonuses of the stores of the distribution network provided by LLC Nestle Samara were differentiated depending on the number of customers attracted. Thus, the interests of all participants are taken into consideration in this promotion: customers, retail chains interested in increasing store traffic and receiving bonuses from Nestle and the manufacturer itself, which increases the loyalty of the sales partner and brand recognition.

LLC Nestle Samara incurred the main expenses but these costs are targeted and should provide benefits in the form of sales growth and increased brand loyalty. During the research we assessed the effectiveness of the invested funds and the expected effect. In order to preserve trade secrets, relative indicators for calculating the effect are given in Table 1.

Source: author.

Table 1. The Structure of Expenses of LLC Nestle Samara on the Promotion Event in the retail network Pyaterochka

Planned indicators	Expected results, %
Expert evaluation of revenue growth for the period of 7 days	+37.6
Nestlé total return from the promotion event for the period of 7 days	100
Expenses on the gifts for customers	27.5
Network margin	14.9
Additional expenses on production increase and packaging	24.4
General expenses of the promotion event organizer	66.8
Effect from the event	+33.2

The table contains relative indicators of sales growth under the influence of sales promotion, calculated on the basis of expert opinions. The total income of LLC Nestle Samara for the period of the promotion event was taken as 100%, which corresponds to 37.6% increase in the average revenue. The remaining elements are determined relative to their share in the total revenue of the company.

From the data given in the table we can make a conclusion that the planned event was effective for the manufacturer in terms of costs coverage. The additional effect is the strengthening of relations with the trade network for which all the costs were covered by the organizer of the promotion event. Consumers received pleasant gifts and greater brand loyalty as an additional bonus.

Consequently, strengthening of market positions in the face of fierce competition requires the use of marketing activities aimed at partnership development. The considered promotion event can have short-term effect in the form of revenues growth during the period of its holding as well as long-term effect associated with increased customer and partner loyalty.

4 Discussion

The concept of cooperation marketing (partnership marketing) was first formulated in 1983 by Berry and meant long-term cooperation with the client, maintaining and developing of these relations [2]. In this concept of marketing, the buyer and other participants of the processes of mutually beneficial exchange, viewed from the position of continuous interaction in the long term, become the object of management. Unlike traditional marketing, attraction of new customers is not the main priority of business development [1]. As it is rightly noted by the experts [4, 6] the process of new customers attracting is complicated by the combination of changes in the economic and demographic situation and increased competition, which makes it important to retain existing customers and to strengthen cooperation.

The use of the concept of cooperation marketing requires increasing of consumer loyalty to a brand and a store and reducing of switching to competitive offers because of bonus programmes as well as creating of targeted products. Cooperation marketing is aimed at creating values for consumers, partners and the organization itself by way of joint work in order to achieve a mutually beneficial result. The experts consider the decrease in the costs on attracting of new customers, creating groups of loyal consumers interested in using of new company products, creating barriers for competitors on the account of loyal consumers and company personnel to be the consequence of applying of the concept of cooperation marketing [7].

The practical application of this concept involves the use of a number of elements that create the basis of a new platform for communication between partners: culture and values, leadership, strategy, structure, employees, technology, knowledge, understanding and process [10]. Culture and values mean the coherence of the goals of interacting organizations and the absence of contradictions in achieving long-term results of cooperation. Leadership means the presence of a key participant in the chain of value creation that creates benefits for all the participants in the process of partnership interaction including consumers of products.

Strategy implies the ability to create value necessary for consumers involving partners and intermediaries in this process. Structure assumes the presence of organizational structure of the company that meets the tasks of implementing the chosen strategy and supports mutually beneficial cooperation of participants in the business process. Employees are the most important link in the implementation of interaction both within the organization and in the external environment, demonstrating with each action the focus on long-term mutually beneficial cooperation. Then marketing and customer support in the sales process become an integrated business process. Technology acts as a communication tool and includes modern equipment, software products that make it possible to accumulate, process and transmit information in order to maintain interaction including that with foreign market entities.

Knowledge and understanding as elements of the concept are focused on the constant search for new ways to meet consumer needs and to increase awareness of consumer behaviour. Process means a set of consistent actions combined into a common system, at the center of which there are consumers and partners working together to create values and benefits that are acceptable to the parties involved. High productivity of cooperation marketing concept is possible when we have a combination of these elements and the management of this system is carried out by the link that creates the largest share of consumer value in the value creation chain.

Inherently cooperation marketing means focusing on customer requests and in this regard requires serious information support through the introduction of computer programmes for customer management. Highly productive participants of the global market introduce position of a client management director that takes into account the interests of partners in the implementation of strategic and tactical development programmes. Most often customer orientation leads to the need of CRM-systems use in which interaction with customers is carried out in an automated mode [5].

CRM-system makes it possible to maintain an up-to-date customer base, monitor the sales department, to accumulate information on the quality of work with real and potential customers, to create an information basis for company strategies developing. The advantages of this system can be seen in the sphere of direct interaction with customers, where it is possible to monitor their contacts.

In conditions of the development of globalization under the influence of transnational corporations, there is an expansion of the borders of markets, the distribution of industries in various countries to remove barriers to international trade and to obtain the best opportunities to satisfy customer needs. In such circumstances customer orientation becomes an urgent need, and overcoming of competition with highly productive participants in the global market contributes to the economic growth of national economies.

The development of international business in modern conditions also affects the concept of cooperation marketing when national and international corporations create partnerships and alliances for the best use of resources, technologies and the creation of competitive products. Thus, cooperation marketing aimed at maintaining of customer loyalty creates aggregate customer value by way of long-term, mutually beneficial partnership. The experience of LLC Nestle Samara functioning on the Russian market reflects the productivity of this concept for building of relationships with partners and successful resistance to growing competition and fluctuations in demand.

5 Conclusion

The marketing concept has been a reliable tool for successful business for many decades. After the active introduction of transnational corporations to the Russian market, it became possible to study and master marketing techniques carefully for practical application by domestic companies. Of course, the scale of business of transnational corporations is not comparable with that of the other participants in terms of financing of marketing campaigns, but the behaviour model can become the basis for the developing of their own managerial decisions in the field of marketing and strengthening of cooperation with partners and customers.

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State Financial Support During the Crisis and Its Impact on Business Development

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Abstract. The article discusses the main directions of financial support for business by the Government of the Russian Federation in the conditions of economic imbalances caused by the COVID-19 pandemic. The purpose of the article is the analysis of state financial support as a single model, formed taking into account national specifics. The objectives of the study include the analysis of forms and tools, the objectivity of such support, its feasibility and scope. The authors analyze as common elements that make up the financial support of the governments of many countries, and the specifics of its organization in the Russian Federation are highlighted. As a result of the study, the authors concluded that in Russia a national model of state financial support for business has been formed, it is aimed at providing business with funds for uninterrupted economic activity. In this model, the state does not undertake to fully finance the activities of commercial organizations. The government provides businesses with the opportunity to survive temporary difficulties, but at the same time maintains market competition. The article substantiates the proposals for providing state financial support to certain types and areas of business in the post-crisis period, its tools.

Keywords: Budget subsidies · COVID-19 crisis · Fiscal incentives state support · State guarantees · Tax benefits

1 Introduction

The modern world economy was in a crisis situation, which was provoked by the COVID-19 pandemic. To protect the population from viral infection, many governments were forced to introduce a number of administrative restrictions that caused a drop in national production, solvent demand, increased unemployment, a decrease in the share of services in national production and other negative consequences. Bankruptcy risks have become a reality for a significant part of the business, especially for small and medium-sized businesses. Some commercial organizations were forced to suspend their business activities. In order to prevent the economy from sliding into a crisis, the state has developed a set of measures to support business, including financial ones. Each country has its own specifics of financial support.

It depends on the level of economic development, its national characteristics, the external environment for the functioning of the business, the financial capabilities of

the government itself. The government is creating a certain model of financial support for commercial organizations. The model includes forms and tools. Their use allows the government to develop a strategy in the field of their support related to the determination of the purpose, scope, differentiation of organizations, and the timing of support. The Russian Government has developed such a model of financial support for entrepreneurship. The implementation of this model is aimed at maintaining a competitive business and systemically important commercial organizations, small and medium-sized enterprises, as well as the development of new areas of activity.

2 Methodology

The problems of identifying the main directions and instruments of state financial regulation of business are historically based on the traditional concepts of Keynesians and Neo-Keynesians, monetarists, and the theory of the public sector Stiglitz and Rosengard [17]. Each theory in its own way assessed the degree of influence of state financial instruments on the stabilization of the national economy through the financial support of commercial organizations. The material of the article is based on the fact that a certain convergence of these approaches has occurred. All concepts of state regulation of the economy differentiate differently financial instruments that are used by the state, but use approximately the same composition. In conditions of market imbalances caused by the COVID-19 pandemic, all known financial instruments are actively used (budget subsidies, interest rate subsidies on loans, tax rates and incentives, government procurement, etc.). Theoretical conclusions about the need for financial support for business are the basis of real financial decisions made by the government. In 2020, the actual mechanism for using financial instruments is enshrined in the anti-crisis government plans [6]. Such a plan was adopted in the Russian Federation, and served as the basis for the article. The article discusses the goals and objectives of emergency financial support for a business, its forms and tools, scope and conditions. This approach allows us to consider the activities of the government as a special model of financial regulation in force majeure. The effectiveness of the used financial instruments, their preference is assessed by independent experts, for example, Ernst and Young [7]. Their opinion is given in the article and serves as a certain confirmation of the conclusions made about the features of the Russian model of financial regulation of business in a pandemic. The obtained results of the analysis served as the basis for the proposals made in the article on the future development of this model. The article provides evidence and statistics that make conclusions reasoned and reasonable. This study is based on actual official data for the first half of 2020.

In the research process, analysis, synthesis methods, comparative analysis, generalization, etc. were used. The objects of financial support of the state are both commercial and non-profit organizations. The crisis of COVID-19 seriously affected non-profit organizations that lack financial resources in more stable conditions [9]. The object of research in this article is commercial organizations.

3 Results

Instability in the economy caused by the consequences of the spread of the new pandemic is accompanied by a decrease in business activity, disrupts relations between business entities, reduces solvent demand and generally changes the conditions for financial and economic activities of commercial organizations. Under these conditions, almost all commercial organizations experienced a shock in demand, and a violation of supply-chain communications led to a shock in supply. A significant part of the business was not able to reduce risks. Many organizations stopped operating, some of them were in bankruptcy, others had a sharp deterioration in their financial condition, and others left the market. The trends towards stagnation and a decrease in economic activity have begun. In these conditions, the state was forced to develop effective measures to financially support commercial organizations in order to neutralize the negative consequences of the crisis and create conditions for financial sustainable development in the future. State financial support was provided based on individual measures or plans taken by the government. For example, anti-crisis national plans were adopted in Germany, China, France and the Russian Federation. Governmental actions based on them were more focused and coordinated [13]. The plans identified the types of business that need support, its tools and sizes.

Typically, governments support the following businesses: 1) the most affected activities that provide mainly services to the population (tourism, cultural and recreational services, entertainment, catering, restaurant business, beauty salons; transport services, retail, etc.); 2) small and medium-sized enterprises (hereinafter referred to as the SMB, SME). They are the main suppliers of innovative developments, additionally provide employment, actively master new activities; 3) backbone organizations (air and railway transport, construction), whose activities were suspended due to falling demand from the population.

The objectives of providing state financial support to these activities:

- providing business with liquid funds,
- provision of financial stability of the company (borrowed funds to replenish working capital),
- dismissal of employees,
- support of strategically important types and directions of activity (digital economy, bioengineering, robotics, export activities).

The government selects the appropriate tools for each form of financial support. A direct form of support provides financial resources to companies, while an indirect form of support reduces their payments. Direct support involves the provision of subsidies. For example, in Russia, SMEs received free financial assistance at the rate of 12,130 rub. per employee. This money can be spent on any expenses of SMEs, including salaries. Similar employment support measures used in almost all European countries, while unemployment benefits are provided in the United States. Such payments stimulate employee empowerment rather than retention [13, 16]. The second tool is the reduction of taxes and compulsory insurance contributions (social insurance contributions) paid by companies. In Russia, companies may not pay compulsory

insurance premiums for 6 months. In Australia, companies may not have to pay mandatory premiums until the end of 2020. Such a benefit will provide companies with additional liquidity [13].

Public procurement, they provide the state demand for services and goods of SMEs, and thereby support the activities of SMEs. In Russia, the rule has reduced requirements for government contracts in which organizations can participate. Small businesses are required to provide security for applications of procurement participants if the amount of the contract is more than 5 million rubles. Previously, such a requirement was for contracts of 1 million rubles. State guarantees for bank loans make it possible to obtain loans to commercial organizations under more favorable conditions or for a longer period. This government support tool should be used with great care by the government. As Russian practice shows, it can lead to additional budget expenditures and an increase in state debt.

State guarantees as an instrument of state financial support should be provided to competitive, financially sustainable organizations that can act as drivers of economic growth [1]. The rules for their provision should provide temporary financial support to the business, and in the long term strategic activities [16]. Indirect business support includes: coordination of measures with monetary policy. Thus, a decrease in the key rate of the Central Bank of Russia has created great opportunities for lending by credit institutions. The foreign experience of providing cheap loans to commercial banks was similar [10]; the possibility of restructuring loans will reduce the level of loans to entrepreneurs; lending to companies from the affected sectors for the payment of salaries to employees will be carried out by banks with the support of the Central Bank at 0% per annum, but provided that the borrower maintains 90% of jobs; changing the deadlines for submitting tax returns, a moratorium on tax audits; the introduction of a delay in the lease of municipal, regional federal property.

In the Russian Federation, the government adopted a set of financial measures that created conditions for maintaining business, especially for SMEs. One of the areas of financial support from the Government of the Russian Federation is financial support to systemically important commercial organizations, which occupy a significant share in GDP. They occupy 45% of industry (45%) and 15% of trade. Big business created on the basis of these resources turned out to be the most financially vulnerable and in need of state assistance. Financial support for such organizations includes obtaining soft loans to maintain working capital and maintaining jobs. The loan rate is subsidized by the Central Bank rate; 50% of the loan is secured by state guarantees. Loans are provided to systemically forming organizations to support employment at 2% per annum. The practice of Germany, France, the UK also indicates the active use of government guarantee instruments to support systemically important large businesses [14].

Financial support measures are also being taken at the regional level. The regional experience of financial support for business is analyzed taking into account the specifics of the development of the subject of the Russian Federation, its industry structure. State financial support during the COVID-19 pandemic is provided simultaneously at the regional level, as a rule, to small and medium-sized businesses. The regional experience of financial support for business is analyzed taking into account the specifics of the development of the subject of the Russian Federation, its industry structure. Such financial support takes into account the specifics of the economy of the Federation.

It includes the creation of digital resources to inform SMEs about support measures, as well as financial support measures provided at the expense of regional budgets in the form of subsidies, microloans, tax cuts on special tax regimes, and exemption from rental payments. For example, the Tatarstan Republic Support Fund provides microloans to SMEs. The Moscow government provides subsidies to export-oriented organizations for engineering, and residents of the innovation cluster are granted a deferment in the payment of regional taxes. Obviously, due to the measures of state financial support in the Russian Federation, not only the current tasks of assistance are being solved, but also strategic groundwork is being created to ensure sustainable growth in the post-crisis period.

The crisis of COVID-19 forced companies to change their business strategy and tactics. Many commercial organizations quickly redesigned production for the production of popular and socially necessary products, for example, began to produce personal protective equipment, masks, and sanitizers. So, more than 10 large sewing enterprises of the Kirov region began to produce and supply masks from gauze, calico and knitwear. Even the large organization Coca-Cola HBC (Russia) redesigned part of its production for the production of face shields. Reducing the costs of re-profiling companies helped financial measures of business support from the state. As a result, the state solved the problem of saturating the market with important goods in a pandemic, and companies received significant profits.

Costs of companies increased due to the improvement of new business processes, the transfer of employees to remote work, and the increase in corporate social responsibility (state support of employed persons (65 years and older, testing, purchase of personal protective equipment). The federal government has allowed such costs to be included in costs, which in the future will reduce the tax base for corporate income tax. The regional government can additionally compensate part of such expenses to companies from the budget. For example, in Moscow, these expenses are 50% funded from the budget of the subject of the Federation. Foreign experience is interesting. In some countries, governments allow companies to include in the cost of reducing the taxable base for income tax, the cost of acquiring computer hardware and software for the possibility of remote work of its employees.

In response to the benefits and financial resources received from the government, systemically important commercial organizations during the crisis scattered charitable activities in the accommodation area. They supported the medical staff: provided lunch delivery, provided hotels for accommodation. Commercial organizations purchased mechanical ventilation equipment, personal protective equipment, and medications. The state also provided the opportunity for commercial organizations to receive a tax deduction for corporate profit tax (not more than 1% of sales revenue) when carrying out charity activities to non-profit organizations included in the register of NPOs. This indicates that the financial conditions for doing business in the context of the COVID-19 crisis have changed. Business has become more socially oriented, increased its social responsibility. New directions of mutual cooperation between the state and business have appeared.

The impact of the crisis on SMEs and the government's response to the crisis has been investigated by Welter, Wolter, Kranzusch [18]; Chen, Igan, Pierri, Presbitero [3] According to these studies, SMEs were more affected during the crisis, which is

understandable, since the service sector is the most affected. The most common measures of financial support for SME subsidies, including the payment of wages; provision of preferential or free loans. This is confirmed by studies and studies of foreign economists, for example, Drechsel and Kalemli-Ozcan, Liu [4, 10].

According to the EY study, in Russia, important measures of state support for SMEs are: a reduction in insurance premiums (31%), a reduction in rent payments (22%); non-application of sanctions for non-performance of the contract due to force majeure (20%) [7]. The mechanisms of state financial support aimed at supporting companies with the goal of retaining employees have also shown their effectiveness. So, according to the Ministry of Economic Development of Russia, in April 2020, the profit of organizations decreased by 33%, but the wage fund fell by only 16%, which indicates the preservation of jobs [11].

The study allows us to conclude that the forms and instruments of financial support in Russia correspond to the current economic situation, are justified and effective. But the goals of their application, the rules of granting and the beneficiaries will change in the context of the transition to sustainable growth. But governments will remain the center of economic recovery. In accordance with the goals of sustainable growth, state financial support will mainly be provided to companies that ensure the development of the economy in updated conditions. So, in the communiqué following the meeting of the Ministers of Finance and Central Banks of the G20 countries (April 2020), the government's commitment was fixed: "to commit to supporting an environmentally sustainable and comprehensive recovery" [5, p. 6].

To ensure the dynamic development of the organization in the post-crisis period, taking into account the goals of sustainable economic growth (a goal defined by the UN), it is important to launch a new investment cycle taking into account updated strategies. In this case, the demand for state (budget) investments will increase. Anti-crisis plans of the governments of Germany, Korea, Russia, the USA, France and other states include budget investments as a tool for ensuring sustainable growth. In the post-crisis period, promising, for example, will be promising state financial support for activities using low-hydrocarbon raw materials, environmentally friendly production; development should receive a green economy [8]. In our opinion, here you can use tools in the form of tax deductions and lower insurance premiums. Fiscal measures will stimulate such activities.

The next area is financial support by the state for energy-efficient activities of commercial organizations. The state may introduce financial incentive measures: subsidies, tax breaks and public procurement. Some decisions can be made through the implementation of joint investment projects. As Agrawala, Dussaux and Monti noted, "measures include direct grants, tax incentives for investing in efficient operations and potential recycling schemes for inefficient household appliances. Good experience in applying such measures has been gained as a result of incentive measures after the 2008 financial crisis" [2, p. 30]. The development of public-private partnerships in the field of infrastructure, including the social sphere, the use of state guarantees for its financing can be considered as a promising direction of state support for business [16].

The next area of post-crisis business development is still digitalization. The use of digital technology is expanding the customer base of all commercial organizations. Also promising are virtual and augmented reality, changing technologies that can be

supported at the federal and regional levels, including as part of the national project “Digital Economy of the Russian Federation” [15]. Automation of business processes in the service sector affects the special conditions for their provision, taking into account the requirements of social distance. In our opinion, during the period of economic recovery and growth, the Government should support this area, using the provision of state guarantees, grants to companies and tax benefits.

The study allows us to formulate some proposals that increase the effectiveness of state financial support for business in a crisis and post-crisis development. The main proposals, in our opinion, are the following: extend the deadline for the provision of measures to restore the financial conditions of the business; summarize the best practices of regional state support for business and present it on a single information resource in order to use effective fiscal instruments by other subjects of the federation; more widely apply government guarantees for debt obligations subject to the rules that will create long-term incentives for development, including through public-private partnerships. In this case, there will be no need for payments on principal’s obligations at the expense of budget funds; establish target indicators reflecting the effectiveness of state financial support measures for each financial instrument - saved jobs, the share of SMEs in GDP, the proportion of SME workers; strengthen a differentiated approach to the volume of financial assistance and its instruments; introduce mandatory standards for deductions from profits in reserve funds, regardless of the legal form of commercial organizations; compliance with the principles of sustainable development of all companies and the inclusion of these indicators in the assessment of the organization.

4 Discussion

The crisis of COVID-19 provoked a discussion in the scientific and practical economic literature on the boundaries of state intervention in the economic life of organizations. But unlike previous periods, in modern conditions, both theorists and practitioners agree that the state is the “savior” of national business. It should be noted that on the part of the state, the financial support strategy has undergone certain changes. The Government of the Russian Federation has built a differentiated system of financial support. It is ready to support both commercial and non-profit organizations, individual entrepreneurs, but is not ready to fully finance their activities. Another important area of scientific research is the selection of financial instruments with which the state supports, for example, employment, sustainable development, etc. The discussions concerned the choice of priorities: either the fiscal or monetary policy of the Central Bank. Practice has proved that the most effective is a reasonable combination of fiscal and monetary policy instruments. It is possible that the current situation, which caused an unplanned increase in government spending, will find a response in the popular modern monetary theory (Modern Monetary Theory, MMT), which justifies the economy of public debt, equity financing of state budget expenditures for employment [12]. Formed sovereign and reserve funds in individual countries allow their governments to use another channel of financial support for commercial and non-commercial organizations in the current crisis. We do not yet know how the active use of these

resources will affect the economy, but it is clear that they are an addition to both equity and debt financing.

The discussion on the scope of support has come to a definite conclusion. The government has built a “pyramid” of organizations: backbone companies that provide the main employment in the region or municipality, SMEs, and organizations that have shown the ability to adapt to changing conditions, but experience temporary difficulties, non-profit organizations that are socially oriented. The government has repeatedly emphasized that the created financial support system is temporary and will be transformed later. The author’s vision of the directions of this transformation is given in the article. The dilemma of financially supporting or not supporting the business by the government received an answer. Not all types of business and business activities need support, as a business must learn to work in conditions of various risks. Scientific discussions often discussed the choice of financing instruments and their preferences, conditions of use: payment, gratuitousness, urgency, target or non-target use, targeted or general nature. In the modern period, instruments have been identified that make up financial assistance to companies: budget subsidies, tax incentives, interest rate subsidies, and other payments benefits. In the previous decade, there was a lot of discussion about the appropriateness of public-private partnerships, which are gradually becoming the reality of any national economy. Russia had its own problems in organizing joint public-private projects. Perhaps financial cooperation between the state and business will be more effective in the post-crisis period. The state will take over the functions of a guarantor in the performance of debt obligations by business. The article proposes to supplement the participation of the state in PPP by providing state guarantees. An analysis of the situation of the modern period will allow researchers to take a fresh look at the role of the state. Studies concern the role of the state in the national transformation of state participation in economic processes; motivation, assessment of feasibility and effectiveness.

5 Conclusion

In a crisis, the goal of state financial support is to provide business with liquid assets and to preserve jobs. The tools are budget subsidies, soft loans, reduced exemption from tax and compulsory insurance premiums of rental payments, and obtaining state guarantees. As the analysis showed, Russian practice is consistent with the best European experience in supporting SMEs. In the current crisis, the governments of national states used similar forms and instruments of state financial support. As the economic activity of the business stabilizes, fiscal measures, in our opinion, should stimulate the achievement of a stable financial position of organizations, using soft loans and expanding participation in the implementation of government orders.

As the crisis is fully overcome, the government should direct fiscal measures for the ongoing dynamic development of the business, taking into account the gained experience. The actions of the business will be aimed at: reducing part of the costs, including renting, optimizing sales chains, developing digital services, including delivery to customers; mutually beneficial cooperation with authorities and management. In this case, subsidies and grants in priority areas for society can be instruments

of financial regulation. Stimulation of investments in social, infrastructure, low-carbon raw materials, green economy can be carried out on the terms of public-private partnership, the provision of state guarantees. The state will support the efforts of the business in the field of bioengineering, the field of virtual and augmented reality, and digital technologies. Thus, in the future, fiscal measures will become not so much help as an incentive for business development.

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Financial Issues of Procurement Improvement in Russia Under Present-Day Conditions

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Abstract. The current issues of procurement activities and their development trends in the RF are analyzed in this paper. Today, the financial vehicle of procurement is being transformed in our country. That is caused overwhelmingly by the increased financial risks and technical sophistication of procurement procedures, as well as by the amplification of organizational and economic interactions among procurement system actors. All these factors have initiated further development of procurement regulatory and legal framework together with the Unified Procurement Information System (UPIS). The system to regulate financial risks has also notably evolved. Therefore, the increased efficiency at all stages of procurement, from planning to controlling and contract auditing, has become the ultimate task nowadays.

Keywords: Contract system · E-auction · Procurement activities · Procurement efficiency · State contract · Unified Procurement Information System

1 Introduction

In the Russian Federation, procurement activity is primarily based on the national contract system, which is an important tool for the development of the market economy. The ultimate goal of the Federal Contract System is presented by the joint framework that could allow the formation and the placement of state orders and the execution of state contracts. This framework should provide the fulfillment of public obligations of the Russian Federation, and the quality of goods, works and services supplied that is adequate to the needs of the public sector. The efficient use of financial resources and the professional financial risk management also have to be ensured within it. Under this framework the noticeable decrease in corruption should be achieved within the state sector.

Up to now the basic principles of the contract system, the legal status of participants in the contract system, the mechanisms of procurement activities have been defined by the legislation, and currently, the issues of control, audit, and monitoring in the procurement domain are being regulated [3]. In the process of goods, works, and services procurement, organizational and economic relations arise. The actors in these contract interactions include the following:

- state and municipal customers,
- authorized bodies and institutions,

- specialized entities,
- executive bodies that regulate procurement contract system,
- procurement controlling and supervisory bodies,
- electronic trading platform operators,
- suppliers (contractors, providers).

These interactions take place within the Unified Procurement Information System (UPIS) [1]. Controlling and supervisory bodies are integral subjects of procurement activities. These include: the Federal Antimonopoly Service of the Russian Federation and the Federal Service for Defense Contracts (*Rosoboronzakaz*), the Federal Treasury, and customers.

Social audit by citizenry, public unions and entities is provided in procurement. Open Data in Public Administrations and, in particular, the publications of public procurement (tenders) is a source of valuable information for the decision-making procedure. The analysis of public tenders can provide valuable information for the different stakeholders: politicians, public managers, project managers, executives and, indirectly, citizens [8].

Traditionally, the procurement process is distinguished into the following stages: planning of purchases of goods, works, and services; determining the supplier, concluding a civil contract, executing contracts and ensuring it, monitoring purchases, auditing in the field of procurement, and monitoring compliance with the legislation of the Russian Federation. Each of the stages has a regulatory framework that improves over time. The principle proven over many years by the experience of leading countries is laid in the basis of the Russian contract system. The idea behind this principle is to regulate the entire procurement cycle (planning - supplier selection – contract execution) with the mandatory use of control, monitoring and audit. A fully open information environment (based on the UPIS) should ensure transparency, competition and efficiency. Thus, in the foreseeable future, a qualitative shift forward from public procurement management to budget expenditure management is expected.

2 Methodology

The methodological approach taken in this study is a mixed methodology based on the provisions of economic theory, the theory of public and corporate finance, financial control, and the theory of risk management. The results of the leading foreign and domestic academic research on the problematic issues in financial support for the development of public procurement infrastructure in the Russian Federation (RF) were examined. The academic literature on the transformation of financial relations of procurement participants in the conditions of digitalization was analyzed. Various methods of scientific knowledge were utilized in this study to facilitate the investigation, namely, historical and logical, analysis and synthesis. The benefit of this approach is that provide a means to study the problem of the need to regulate economic processes through the public procurement system. The evidence for the analysis was selected from analytical and statistical data of the Ministry of Finance of the Russian Federation,

and from the research findings on the procurement system in Russia provided by the Higher School of Economics.

3 Results

The contract procurement system is a complex legal institution that combines the norms of different branches of law. The legal regulation of the contract system is based on constitutional provisions that define the common economic space in the Russian Federation, the parity of all forms of ownership, and establish the powers and competence of public authorities. It should be noted that the Federal law “On the contract system in procurement of goods, works and services procurement for state and municipal needs” has established its dominant position in the set of regulatory legal acts [3]. It is seen as a specialized regulatory act, and all other regulatory legal acts, including Federal laws, must comply with its provisions. Problems in the implementation of this law are related to its cumbersome nature, and the use of a large number of bylaws. The fact, that it contains numerous reference rules in which the regulation of a certain part of contractual relations is delegated to the executive authorities, complicate its implementation even more. One of the ways to coordinate a huge number of laws and regulations is the adoption of the Contract System Code in the Russian Federation, which will create an integral mechanism for legal support in the field of public procurement. Within the framework of the contract system, the principles of state and municipal procurement management were introduced for the first time, which, in particular, include the principle of openness. The principle of openness and transparency implies free access to complete and reliable information about the contract system in the field of procurement by placing it in a single information system.

The UPIS is a complex of information, information technologies and technical means that ensure the formation, processing, storage of such information, as well as its provision using the official website of the unified information system in the information and telecommunications network “Internet”. The UPIS includes such information modules as the register of contracts, the register of bank guarantees, information on procurement and contract performance; the register of complaints, planned and unscheduled inspections, their results and issued orders; procurement schedules, and the register of unfair suppliers. The UPIS was created on the basis of an already functioning official website *zakupki.gov.ru*, administered by the Federal Treasury. The use of the system developed by the Treasury of Russia for monitoring and analyzing the effectiveness of budget expenditures in the placement and execution of state and municipal orders for a number of years allowed it to be used in the creation of the UPIS. Both, the Treasury and the Ministry of Finance, have become an operator of the Government Integrated Information System (GIIS) «e-budget», which is a unified system. That is why it became expedient to combine the management of these information resources in one authority – the Federal Treasury.

Currently, the range of functions of the UPIS is expanding. Since January 1, 2019, the law provides for mandatory registration of all bidders in the Unified Procurement Information System. To do this, the Unified Register of Procurement Participants (URPP) has been created in the UPIS, where information about participants who have

been registered in the UPIS is automatically entered. Check-in at URPP allows automatic carrying out registration of participants of the procurement on electronic platforms. The Federal Treasury has been appointed as an authority responsible for the formation and maintaining the URPP. The sphere of state financial control is an important area for improving procurement activities. The law establishes three types of supervision in the field of procurement: monitoring, audit and control.

Monitoring is carried out by collecting, summarizing, systematizing and evaluating information about procurement from a single information system. Based on its results, a summary analytical report of the RF Ministry of Finance is created and published in the unified information system. Audit in public procurement at the federal level is conducted by the National Audit Office of the Russian Federation. In the constituent entities of the Russian Federation and municipalities they are control and accounting bodies of the RF subjects and municipal entities.

Audit in the field of procurement of goods, works and services performed by the objects of audit (control) is carried out in order to assess the validity of planning purchases of goods, works and services for public needs, the feasibility and effectiveness of these purchases. Performance of contract conditions in terms of duration, volume, price of contracts, quantity and quality of purchased goods, works, and services, as well as the pricing procedure and effectiveness of the contract management system are subject to evaluation [4].

Control is carried out by the authorized bodies, which include the Federal Antimonopoly Service of the Russian Federation, *Rosoboronzakaz*, and the Federal Treasury. The predominant control tools are planned and unscheduled inspections. The urgency of the following issues within the current contract system should be noted: increasing the parties' responsibility for the execution of contracts, the targeted use of advance payments, and bringing budget funds to the real sector of the economy. Therefore, it is important to shift the emphasis from the subsequent financial control to preliminary control, and to strengthen the control over the execution of state contracts by the Federal Treasury of the Russian Federation. In order to improve the efficiency and implementation of procurement activities, the Federal Treasury of the Russian Federation has been given the authority to maintain a register of contracts. Today, in the current economic situation, many commercial organizations are interested in participating in public procurement, seeking for guarantees of a certain level of economic stability. Maintaining the register of state contracts for the purchase of goods ensures the development of fair competition, openness and transparency in the implementation of such purchases, and the prevention of corruption and other abuses in order placement. Since 2018, the contract registry has been updated with new information. Based on Government Decree No. 443, the customer must enter the information about all co-executors, subcontractors, that belong to small businesses and socially oriented non-profit organizations and which have concluded contracts with the main supplier (contractor) under the state contract in the register of contracts [2]. In particular, the contract registry will contain information about the location of the co-executor (subcontractor), its Taxpayer Identification Number (TIN), date of conclusion and number of the contract (if any), the subject and price of the contract with the co-executor (subcontractor).

Planning is the primary stage in purchasing activities. An important element of the procurement plan is the “Purchase Purpose”. Today, based on the budget legislation, which assumes the broadest application of the program-target method of budget expenditure planning, the activities of state and municipal institutions are mainly carried out within the framework of state and municipal programs. While forming the program budget, the goals of procurement are to achieve the goals of state programs. The most important state programs of the Russian Federation with the largest amount of financial support provided by the Federal budget, that were published in 2018 are shown in Table 1.

Table 1. State programs of the Russian Federation outlined in the procurement plans with the largest amount of financial support in 2018 (mln. rub)

State program title	Amount of financial support
Transportation development	1 009 808
Healthcare development	534 201
Public order maintenance and combating crimes	319 048
Education development	195 278
Justice	186 193
Social support	153 757
Accessible environment	144 153
Culture and tourism development	132 369
Government finance management and financial markets regulation	128 589

Source: author based on [5].

A mandatory public discussion, which is held at the preliminary stage, is involved in the procurement contract system. This is relevant in cases established by law, for example, if the value of a future contract is estimated at 1 billion rubles or more. Discussion is a mechanism for public control over budget expenditures. The discussion is open to everyone. The total number of large - scale purchases, for which mandatory public comment procedures were completed, increased by 64% between 2014 and 2018, and reached 388 purchases (239 in 2014). The institution of public discussion is currently undergoing a crisis. In 2018, the results of mandatory public discussion for large purchases were taken into account only in 0.5% of cases. In total, during the period of public discussion functioning from 2014–2018, this indicator fell by 28 times. Among the positive changes, a reduction in mandatory public discussion procedures conducted with violations can be noted, from 62.4% in 2016 and 42.5% in 2017 to 21.1% in 2018 [6].

One of the problematic issues in forming a procurement plan is the choice of an object for a purchase. This was due to the fact that the customers did not have uniformity in the description of the same-named purchasing objects. Very often, technical tasks were too detailed and contained characteristics that do not affect the quality of products. The development of the common description for the objects of purchase is

seen as one of the ways to overcome the problems in the constituent entities of the RF. Standard documents should be developed in coordination with customers, suppliers, and manufacturers of individual products. The massive standardizing of products is the result of this work. Currently, the catalog of goods, works, and services generated in the UPIS provides serious assistance in preventing restrictions on competition in the description of procurement objects. This catalog of products, works, and services was developed by specialists and experts of the Ministry of Finance of the Russian Federation. It contains more than 36 thousand positions, of which 6 thousand are for medicines. This catalog allows getting comparable data about prices and expanding the planning options.

The Government of the RF regulates the order and the rules for formation and use of the catalog in UPIS. One of the most complex mechanisms for conducting procurement activities is the selection of suppliers, which is mainly carried out by using competitive methods. Among the competitive methods for the selection of suppliers the following could be named:

- tenders (open tender, limited participants tender, two-stage tender, closed tender, closed tender with limited participation, closed two-stage tender),
- auctions (e-auction, closed auction),
- request for quotation (RFQ),
- request for proposals.

According to expert data from scientists and analysts, in 2017–2018, customers mainly posted notices on the implementation of purchases by using the following methods for determining suppliers (contractors, performers) (Table 2).

Table 2. Share of purchases according to maximum starting price of contract among the posted notices for 2017–2018

Procurement procedure	2017 (%)	2018 (%)
E-auction	65,8	69,6
Single supplier purchase	18,8	13,5
Open tender	7,4	7,2
Tender with limited participation	4,3	4,3
Request for proposals	1,5	1,7
Request for quotation	0,9	0,8
Closed auctions	0,4	2,7
Other options	0,9	0,3

Source: author based on [5].

As it can be seen from Table 2, the electronic auction was predominant and its share increased. In comparison with 2017, the amount of maximum starting price of contract notifications in the framework of purchases from a single supplier decreased by 178 billion rubles, and their share decreased by 5.3%, falling from 18.8% in 2017 to 13.5% in 2018 [5].

According to the financial monitoring conducted by the Ministry of Finance of the Russian Federation, 969.8 thousand purchases were declared invalid at the end of 2018. In terms of value, the volume of failed purchases amounted to 3.36 trillion rubles (40% of the total volume of notices placed). Out of the total number of purchases declared invalid, 65% of purchases were declared invalid because only one application was submitted for participation in such purchases [6]. It should be noted that the level of competition in purchases made for the state and municipal needs in 2018 decreased compared to 2016 and 2017 (2.7 applications per lot) and amounted to 2.3 applications per lot. The relative economy of budgetary funds for the procurement fell from 7.6% in 2017 and 4.8% in 2018. Starting from January 1st of 2019 the procurement process can take an e-format only, namely in the form of an auction, a tender, a request for quotation, and a request for proposals. At the same time, a system of financial interaction is being actively implemented for 8 electronic trading platforms and 17 banks, where procurement participants can open special accounts to participate in auctions. In addition, the integration of the Automated System of the Federal Treasury with the UPIS is being achieved. When notices and contracts are placed in the register reconciliation with the limits of budget obligations will be made automatically with the assistance of this system.

4 Discussion

In the framework of macroeconomic theory, government procurement is a set of budget expenditures. They are not related to the payment of transfer payments to the population, nor are they related to subsidizing enterprises in certain industries. The need for state regulation of economic processes, including through the system of public procurement, is indicated in the works of foreign researchers. In Keynesian theory an important role was assigned to the state and mechanisms of state regulation of general economic processes. In particular, the government procurement was one of these mechanisms. There is no single understanding of the categories “public procurement” and “state contract”. However, most experts who have been studying these categories agree that:

- public procurement refers to a set of organizational and economic relations between the state and economic entities that arise when concluding and executing state contracts for the supply of goods, works, and services,
- public procurement is an integral part of a government contract, which is its final stage, directly related to the acquisition of goods, works, and services to meet state needs,
- government contract is one of the instruments of financial regulation of the economy, its role is to form and formalize the state demand,
- the effectiveness of public procurement is determined primarily by maximum budget savings.

Tammi, Saastamoinen, and Reijonen consider public procurement as a means of innovation. In their research, the scientists determine the features of the relationship between competition and the innovative activity of small and medium-sized businesses.

This paper contributes to the literature on the role of public procurement in encouraging innovations in the economy by empirically examining how the inverted-U relationship between competition and innovation is related to SME behavior in public procurement [10]. Various functions of public procurement in innovation policy are conceptualized in Uyarra, Zaballa-Iturriagoitia, Flagan, and Magro. The researchers consider public procurement as the main means of stimulating innovation, identify some possible roles of government in promoting diversification and transformation through public procurement, and explore the problems of implementing institutionalization of public procurement as part of innovation policy [11]. Other papers are devoted to the prevention of corruption in public procurement. Corruption in government procurement programs is a perennial problem. It is stated in Neu, Everett, and Rahaman that good internal controls in government departments, though highly desirable, are unlikely to make a significant dent in corrupt practices to secure government contracts. This paper examines the role of internal controls and monitoring practices in corrupt contexts and how these controls and practices shape the ethics and moral behaviors of organizational actors [7]. Sikka and Lenman suggested that the supply-side of corruption severely limits the possibilities of preventing corruption in government procurement [9].

5 Conclusion

Several trends can be identified in improving the procurement activities. There is an obvious need to improve the legal framework for procurement. The problematic issues with the implementation of Federal law No. 44-FZ are related to its bulkiness and the use of a large number of by-laws [3]. For suppliers it is difficult to apply this law since it contains various subtle details needed to be understood. The suppliers need to study a lot of legislation and regulations, and keep up with the innovations. The difficulty for customers is that at any stage of the purchase, if an error is made, the official has to bear administrative or criminal responsibility.

In this regard, one of the ways to systematize a huge number of laws and regulations could be the adoption of the Code for the contract system of the Russian Federation, which would create an integral mechanism for legal support for public procurement. The UPIS creation took the procurement efficiency to the next level.

Today, the UPIS is in the Top-50 of the key information systems in the RF. The UPIS unites about 400,000 organizations working under the legal framework of laws No. 223-FZ and No. 44-FZ. For instance, the number of requests to the UPIS per day increased from 140 million to 220 million in 2018. This increase is due to the expansion of functionality and business processes, such as the conclusion of an electronic contract, and in the context of integration with the Automated System of Federal Treasury of the Russian Federation – real time reconciliation with the limits of budget indicators.

The electrification of procurement procedures implies the mandatory registration of all the tender participants in the UPIS. To do this, the unified register of procurement participants has been created in the UPIS, where information about participants who have been registered in the UPIS is automatically entered. The Federal Treasury was appointed as an authoritative body, which is responsible for the URPP. The registration

in the UPIS allows automatic registration of participants of the procurement on electronic platforms. The transition of procurement into e-format assumes new interaction modes for electronic trading platforms and banks, and also expands the range of the means for analyzing procurement participants' activity.

The creation of a catalog of goods, works, and services formed in the UPIS has become a serious step towards improving the efficiency of procurement activities and solving the problems of preventing competition restrictions in the selection of procurement objects. This catalog of products, works, and services was developed by specialists and experts of the Ministry of Finance of the Russian Federation. It covers 25 areas of the economy and contains 44 thousand positions. This catalog allows getting comparable data about prices and expanding planning options. In 2018, 25000 out of 4 million contracts were concluded using the catalog's positions. The average price per unit of goods under contracts concluded under the catalog is 2–2.5 times less than the corresponding prices indicated by the Federal Statistic Service (*Rosstat*). Therefore, serious budget savings are achieved. The need to develop the public discussion of procurement, which is currently under crisis, is revealed. Discussion is an effective mechanism for public control over budget expenditures, which allows them to be optimized.

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Investment Attractiveness of Russian Oil and Gas Companies Under Economic Digitalization

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Abstract. The authors of the study consider the key factors affecting investment attractiveness of subsoil use companies and calculate the true and potential value of shares of Russian oil and gas companies. The determination of investment attractiveness requires the integrated use of both technical and fundamental analysis. It is a combination of two types of analysis that made it possible to trace the dynamics of companies and the growth in the market value of their shares. When forecasting the value of PJSC Rosneft Oil Company and PJSC LUKOIL Oil Company for the period up to 2023, the methods of discounting cash flow, the method of comparison with peers, and the calculation of the value of the company using the method of the fair price corridor were used. The study revealed that both companies are attractive for investment, especially the shares of PJSC LUKOIL Oil Company.

Keywords: Fair value of shares · Fundamental analysis · Investment attractiveness · Oil and gas companies

1 Introduction

In conditions of a high degree of turbulence in economic processes, the interdependence of various types of markets, and complex relationships between market and state institutions, there is an issue of finding ways to effectively invest capital to increase it. The positive dynamics of indicators of financial and economic activity of the subject is largely determined by its investment attractiveness. The key stage in the formation of investment attractiveness of the company is to understand the essence of this process and identify factors that influence it. Do not forget about the close relationship of investment attractiveness with the financial stability of the company [8]. Investors are interested in return on equity, the market value of securities, dividend policy. Investment attractiveness is also determined by such parameters as solvency, production structure, product line, use of digital technologies, etc. A special place is given to the efficiency of fixed assets and labor productivity. Investor interest may be determined by the company's investment strategy. Indeed, the availability and implementation of promising investment projects largely determines whether the company is highly competitive in the market environment, and what rate the market value of the capital invested in it increases [19].

Investment attractiveness is a complex characteristic of an investment object, which includes not only an assessment of internal factors of the company's activities, but also external ones. Investment attractiveness of the company is determined by investment attractiveness of the industry in which it operates, while the latter depends on the desire of the actors to invest in the economy of the country. This logic works not only in the industry, but also in the territorial context, when the micro level, for the sake of completeness, requires the consideration of macroeconomic processes occurring at the regional or country level. The unpredictability of structural changes, the presence of factors that impede sustainable economic development, technical backwardness, a high degree of depreciation of productive assets, and a significant tax burden adversely affect both the aggregate investment demand and the desire of individual investors to invest their money in the industry or the company.

In terms of investment analysis, it can be argued that investment attractiveness is determined through investment risk and investment potential, which is understood as a combination of legal, economic, political and social conditions inherent in the country, region, industry attracting and repelling investors. This approach is based on the international investment practice of portfolio investments, when investment attractiveness is understood as the totality of non-commercial risks of investors "entering" into a project [6].

Large-scale studies of the investment activity of economic entities clearly demonstrate their commitment to moderate investment strategies, when money is invested in securities of highly reliable companies to purchase "blue chips". The role of the energy sector in Russia is very large. It accounts for about 40% of federal budget revenues and 70% of export revenue [2]. Most companies in this market segment act as blue chips, that is, they are the most attractive from the point of view of investing funds of investors, not only Russian but also foreign ones, which requires the closest attention to the problem of assessing the fair value of their securities.

The volume of investments in the Russian oil and gas sector is constantly growing, even though over the past few years it began to lose its profitability. Most of the projects, except for NovaTEK and the Yakutsk fuel and energy complex, which demonstrate excellent profitability both in terms of investment and revenue, cannot boast of such indicators. PJSC Rosneft Oil Company and PJSC LUKOIL Oil Company are also exceptions, often resorting to buying their shares on the stock exchange and paying dividends to maintain the high exchange value of their shares. But Gazprom is systematically increasing costs from year to year, the profitability of this country's largest corporation is noticeably reduced, and the return on its investments may raise questions in the medium term.

2 Methodology

Determining investment attractiveness of shares of the oil and gas company is a difficult and very costly process, both in time and in strength. Two types of market analysis can help in this matter: technical and fundamental. Each of them has both a few advantages and disadvantages. Thus, a technical analysis can extremely quickly assess the securities of several companies, identify the main trends and is ready to

predict them. However, it will not be able to answer the question whether the shares of the company have an internal potential for growth. A fundamental analysis gives the answer to this question, since it allows you to comprehensively analyze the company, industry, country. The fundamental analysis includes three levels: general economic, industry and analysis of specific companies.

At the beginning of the study, it should be understood whether the economy of the country is in the stage of crisis, recession, or economic growth. It will depend on whether they will invest in the shares of companies in this country or not. Carrying out a macroeconomic analysis of the Russian economy, it becomes obvious and clear that investing in Russian securities is risky and unreliable. This situation is determined by some factors, both external and internal ones.

First, the tax institution often works inefficiently, moving significantly away from the optimum point of the Laffer curve. Every year there is an increase in taxes on certain categories. So, for example, the value added tax increased by 2% and amounted to 20% from January 1, 2019, which significantly affected the dynamics of prices of finished products. Secondly, do not forget that the Russian economy is under pressure from sanctions, and it, limiting economic cooperation between the countries, negatively affects the indicators of the trade balance, the exchange rate of Russian securities, including subsoil use companies. For example, shares of PJSC Rusal, an aluminum producer, fell almost 50% after the introduction of US sanctions. Thirdly, there is a process of weakening of the national currency. Ruble fluctuations reflect the dynamics of oil prices, which are also subject to strong external influences. External factors affect real incomes of citizens, narrowing their investment opportunities and adversely affecting investment attractiveness of the country [4]. The presence of many other economic and institutional Russian problems allows us to conclude that the investment climate is not too favorable, which is reflected in the rate of import of foreign investment into the Russian economy. The Russian stock market is mainly attractive to speculators.

Against the background of the low level of investment attractiveness of the country, the industry analysis of the oil and gas sector of the economy is qualitatively different. Oil and gas companies are the engine of economic development, with a high level of competitiveness on the world stage.

According to the IEA, the world's proven oil reserves reached 244.1 billion tons in 2018, an increase of 0.1% compared to 2017. Russia retains 6th place in terms of explored reserves, which makes up about 6.1% of world oil reserves. The share of Russia in world production has remained unchanged for many years, fluctuating around 12% [12].

In 2018, liquid hydrocarbon production in Russia grew by 9.2 million tons (+1.7%) after a decrease recorded in 2017 (by 2.1 million tons, or 0.4%) and amounted to 555.7 million tons. The main factor in increasing production was redistribution of quotas under the OPEC + Agreement in the second half of 2018 in the context of favorable pricing conditions on the world oil market [2].

The increase in oil production in Russia in 2018 was mainly provided by Rosneft (+5.5 million tons compared to 2017). Production was also slightly increased by Tatneft (+0.6 million tons), LUKOIL (+0.4 million tons) and Surgutneftegas (+0.3

million tons). Gazprom Neft's oil production in 2018 did not change compared to 2017, while Bashneft reduced production by 1.7 million tons.

In the face of rising world energy prices and the implementation of some large investment projects with foreign partners, the Russian oil and gas sector is very attractive for both Russian and foreign investors. This applies to securities of such oil and gas producing giants as PJSC Rosneft Oil Company and PJSC LUKOIL Oil Company. To assess their investment attractiveness, let us say a few words about the methodology of such an assessment at the micro level.

As a rule, the analysis of the individual company involves the calculation of some indicators that reflect both the overall investment attractiveness and the financial condition of the company. Among these indicators, EBITDA, P/E (Price/EarningsRatio), P/B (Price/Book Value Ratio), EPS (Earnings per Share), Gross Margin, FCF (Free Cash Flow) occupy a special place. FCF is perhaps the most significant indicator when assessing investment attractiveness of the company. It is calculated as the difference between operating profit and capital expenditure (business investment). This indicator helps to understand and predict the future revenue stream based on current assets, production capacities of the company [7].

3 Results

PJSC Rosneft Oil Company and PJSC LUKOIL Oil Company are the largest Russian companies whose main areas of activity are exploration, production, processing, sale of hydrocarbons, namely oil and associated gas. PJSC Rosneft Oil Company produces about 5.4% of the world's oil reserves, and PJSC LUKOIL Oil Company accounts for 2.4% of the world's oil reserves. Shares of these companies included in the first quotation list on the Moscow stock exchange are "blue chips". Blue chip shares have a high degree of liquidity in the market, as well as a high level of return. They are willingly included by investors in their investment portfolios.

However, you need to understand that the current affairs may be fleeting, and before you include the shares of these companies in your investment portfolio, you should conduct an analysis.

To determine the value of PJSC Rosneft Oil Company and PJSC LUKOIL Oil Company, it is necessary to discount the cash flow, and to do this, first calculate the discount coefficient. Determining the discount rate when calculating the value of the company is extremely important. Even minor changes in the method of its determination and risk parameters can have a significant impact on the calculation of the value of the company [18]. The calculation of the discount rate using the CAPM model (Capital Asset Pricing Model) seems to be the most acceptable option [5]:

$$R_i = R_f + b_i \times (R_m - R_f) \quad (1)$$

where R_i is the expected return on the i -th asset; R_f is the return on the risk-free asset; R_m is the profitability of the market portfolio (in the whole market); b_i is the systematic risk for the i -th asset (shows sensitivity of profitability of the market portfolio).

As the yield on the risk-free asset (R_f), it would be logical to use the yield on Russian Eurobonds (Russia-30). They reflect the degree of confidence of foreign investors in Russia and the risk of investing in the country based on country risk assigned by the leading world rating agencies (SandP, Moody's). In 2015–2018, yield of Russian Eurobonds was 6.8%–7.5%. Soon, according to analysts' forecasts, it will be fair to use 8.6% as the constant value of the yield of Russian Eurobonds.

As the return on the market portfolio, in most cases they resort to the return on the stock index, for example, the RTS index, equal to 12.84%. The coefficient b is the systematic risk for the analyzed asset, which shows sensitivity of the asset to profitability of the market portfolio. For the Russian stock market, b will show sensitivity of changes in the stock return of the analyzed issuer to the change in the yield of the RTS index for a certain period. The mathematical formula for its calculation is as follows:

$$b = \text{cov}(Y, R_m) / D(R_m) \quad (2)$$

where R_m is the index return; Y is the issuer's profitability.

Based on the foregoing, the calculation of the discount rate for PJSC Rosneft Oil Company will look as follows: $R_i = 8.6\% + 1.17 \times (12.84\% - 8.6\%) = 13.56\%$, where $b = 1.17$ is the systematic risk for PJSC Rosneft Oil Company. For PJSC LUKOIL Oil Company, the discount rate will be calculated as: $R_i = 8.6\% + 0.98 (12.84\% - 8.6\%) = 12.75\%$, where $b = 0.98$ is the systematic risk for PJSC LUKOIL Oil Company.

We assume that the annual growth rate of the company will be comparable with the average value of GDP growth over the past 10 years, we determine the value of the company by cash flow discounting. During the calculations, the following values were obtained: the value of PJSC Rosneft Oil Company amounted to 42.42 trillion rubles, the value of PJSC LUKOIL Oil Company - 9.73 trillion rubles.

At the next stage, we will determine the value of PJSC Rosneft Oil Company and PJSC LUKOIL Oil Company using the method of comparison with peers. The essence of the method is to compare individual indicators calculated for the company and for a group of analogues.

In this case, we used the ratio P/S (capitalization to revenue) as a comparative indicator. The algorithm for calculating the cost of PJSC Rosneft Oil Company and PJSC LUKOIL Oil Company by the method of comparison with peers is to determine the average ratio of the current market capitalization to annual revenue for the companies being compared (belonging to the same industry and having comparable fundamental indicators).

The main competitors of PJSC Rosneft Oil Company and PJSC LUKOIL Oil Company in the oil and gas sector are: PJSC Gazprom, OJSC Surgutneftegas, PJSC Tatneft, PJSC Transneft, PJSC NOVATEK, PJSC Bashneft Oil Company. Based on the collected indicators, we get that the value of PJSC Rosneft Oil Company is 9.6 trillion rubles, while PJSC LUKOIL Oil Company is 9.4 trillion rubles.

The final value of the company's value is determined by us as the sum of results obtained by two methods described above with the following weighting factors: 0.6 - for the method of comparison with analogues (since this comparison most accurately reflects the situation on the Russian market); 0.4 - for the discounted cash flow method.

While calculating, it turned out that the total value of PJSC Rosneft Oil Company was 16.2 trillion rubles, and PJSC LUKOIL Oil Company - 9.4 trillion rubles. Considering the outstanding shares of these companies, we get that the predicted value of one share of PJSC Rosneft Oil Company will be 1237.49–1525.64 rubles for 2023, and the predicted value of one share of PJSC LUKOIL Oil Company - 11580.36–12,590.98 rubles, which indicates high investment attractiveness of both companies. Forming the investment portfolio, you can safely include the shares of both companies in it and, over time, receive an increase in both their exchange value and dividends.

Comparing the companies with each other in terms of the amount of income received from investing their money in the purchase of their shares, it will be necessary to state that the shares of PJSC LUKOIL Oil Company have a greater investment attractiveness than PJSC Rosneft Oil Company. Firstly, there is no state presence in the share capital structure of this company. This fact allows the company to be more mobile in terms of making decisions regarding innovations, development and improvement of oil production and refining technologies. Secondly, the free float coefficient of PJSC LUKOIL Oil Company is 5 times higher than the same indicator of PJSC Rosneft Oil Company. This allows the shares of PJSC LUKOIL Oil Company to be more liquid, available to more professional participants in the securities market, and to trade in large volumes. All this contributes to the growth of the share price. Thirdly, the annual increase in the number of paid dividends without any recession attracts many investors to the shares of this company who are ready to receive an increase (even small) in dividends annually.

4 Discussion

As you know, investment attractiveness of shares of oil and gas companies is influenced by some factors, both external and internal ones [11]. External factors are: the activities of Organization of Petroleum Exporting Countries (OPEC); features of world prices for hydrocarbons; political factor.

Currently, the main mechanism for organizing OPEC, which affects investment attractiveness of shares of oil and gas companies, is the establishment of quotas for oil production. There is a simple economic rule of supply and demand. Limited supply always leads to higher energy prices [1].

Over the past four years, the OPEC organization has 4 times decided to limit hydrocarbon production. Both OPEC member countries and countries that are not members of this organization unanimously voted for this decision. All of this was immediately reflected in investment attractiveness of oil and gas companies.

Another external factor is the formation of world prices for hydrocarbons. Oil prices are based on the weighted average cost of exchange-traded futures. It is the weighted average cost of exchange-traded hydrocarbon futures that acts as the basis for concluding transactions in the spot market. Since a future contract rarely ends with the physical delivery of an asset, unlike a forward contract, the element of speculation is quite high. Large players, due to their speculative actions, sometimes have a significant impact on the fluctuation of hydrocarbon prices [14, 15]. So, for example, in 2008 the price of 1 barrel of oil increased more than two and a half times compared to 2007,

reached record levels and amounted to \$147. However, the investigation by CFTC revealed that 81% of oil contracts of the total value on the New York Mercantile Exchange were traded by large financial companies that speculated on behalf of their clients or on their own [9].

The political factor has a significant impact on investment attractiveness of oil and gas companies. It can easily deprive a country or industry of investment attractiveness for a long period of time. Currently, the world lives in the unstable geopolitical environment, when countries, instead of closely cooperating, developing economic relations, are waging a full-scale economic war, establishing sanctions against each other, trying to corner a competitor, reducing the number of sources of income [13].

In such an environment, it is very difficult for companies to carry out their activities, each time they face new difficulties, the solution of which is problematic, and sometimes impossible. Such interaction between countries is primarily reflected in the stock market. The stock market as a litmus test reacts to all changes in both the economy and politics [16]. For example, in 2014, the share price of PJSC Novatek Gas Company dropped by 9.63% due to sanctions, and exchange quotes of PJSC Rosneft Oil Company and PJSC LUKOIL Oil Company fell by 12.7% and 9.9%, respectively. The political factor has a major impact on investment attractiveness of shares of oil and gas companies around the world. In one day, investors can lose millions of dollars and it is extremely difficult to predict the onset of this fact.

The study showed that external factors have a greater impact on investment attractiveness of shares of oil and gas companies than internal ones. But you should not forget about the latter. These factors include diversification of the company, its resource base and corporate management system. As a rule, diversification of company's activities is the development of new types of company's activities in different directions, the expansion of the product range to increase competitiveness and financial stability [3, 10]. The presence of this factor in the oil and gas company allows it to be financially stable, minimize the impact of external factors, and therefore have a greater investment attractiveness compared to competitors. Analyzing the activity of PJSC Rosneft Oil Company and PJSC LUKOIL Oil Company, we can state that it is diversified: from hydrocarbon production to production of motor oils, which allows the market value of securities of these companies to be less susceptible to negative effects from outside.

Obviously, the welfare and investment attractiveness of the oil and gas company largely depends on the number of fields it owns or leases, or, in other words, on its resource base. The more oil and gas fields the company has, and the more hydrocarbons there are in these fields, the longer the period the company will be profitable, financially stable and attractive for investors [17].

Thus, PJSC Rosneft Oil Company is the largest oil and gas company in Russia and the largest in the world in terms of hydrocarbon reserves and liquid hydrocarbon production among public oil and gas companies. Increasing the resource base is one of the key priorities of PJSC Rosneft Oil Company. The company's share in oil production in the Russian Federation is about 41%, and more than 5% in world production. PJSC Rosneft Oil Company has several hydrocarbon deposits. As of January 1, 2019, PJSC Rosneft Oil Company holds more than 55 licenses for plots in the Arctic, Far Eastern and Southern Seas of the Russian Federation. Hydrocarbon resources in

these areas are estimated at 41.5 billion tons of oil equivalent. The main regions where the license areas of PJSC Rosneft Oil Company license areas are located are: the Western Arctic - the Barents, Pechora and Kara Seas (19 projects), the Eastern Arctic - the Laptev Sea, the East Siberian and Chukchi Seas (9 projects), the Far East - the Sea of Okhotsk and the Sea of Japan (20 projects), the southern seas of Russia - Black, Azov and Caspian (8 projects).

Using the example of the activities of PJSC Rosneft Oil Company, we can see that the larger the resource base the company possesses, the higher its investment attractiveness in the market. Thanks to a skillful management policy, a competent combination, and the use of its internal factors, namely the resource base and diversification of activities, the oil and gas producing company can skillfully resist external factors, for example, the political factor and the world oil price environment.

Each oil and gas company should conduct a comprehensive analysis of the environment of the direct and indirect impact, factors of the external and internal environment. All this will allow it to understand its weak points, advantages, and its future directions of activity. All this will give this company the opportunity to develop a strategic plan of action that minimizes the impact of environmental factors, while at the same time increasing its competitive advantages, and hence investment attractiveness.

5 Conclusion

Thus, to summarize, it can be argued that investment attractiveness of shares of companies is strongly influenced by both external and internal factors. Speaking about external factors, it is worth noting their extremely strong impact on investment attractiveness of shares of oil and gas companies. Thus, the decision to organize oil exporting countries, the conjuncture of world prices for hydrocarbons, the political factor, both together and separately, can significantly reduce investment attractiveness of shares of oil and gas companies. External factors affect investment attractiveness of shares of oil and gas companies both in a short period of time, for example, the daily average weighted price of oil futures, which can be strongly affected by the news background, and in a long period of time, for example, the decision of OPEC to limit production hydrocarbons, which usually lasts one year.

All these points must be considered when an investor evaluates the company, thinking about the possibility of investing money in it to make a profit. The study illustrates that the shares of PJSC Rosneft Oil Company and PJSC LUKOIL Oil Company have an average growth potential of 2.5 times by 2023. Comparing investment attractiveness of these companies, it can be argued that at the current time, the shares of PJSC LUKOIL Oil Company look more attractive than the shares of PJSC Rosneft Oil Company.

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Digital Transformation of Society in the Context of the Russian Culture

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Abstract. The aim of this research is to study digitalization process impact on the traditional culture values of Russian society. To achieve this goal, such documents as the “Strategy for the Development of the Information Society in the Russian Federation for 2017–2030” and “Digital Economy of the Russian Federation” were considered, the likely consequences of their implementation were analyzed. The relevance of the article lies in the tendency of the world development towards the digitalization of all spheres of public life. During the study, the following interrelated research methods were used: induction and deduction, theoretical and comparative analysis. The problem lies in the complexity of the process of introducing digital technology into an established system of population values. The results showed that the development of new information values in the context of the Russian traditional culture values is possible with the formation of a tolerant information environment and increased public confidence by ensuring a high level of digital security.

Keywords: Cultural values · Digital culture · Social consequences

1 Introduction

Currently, digitalization has come as a direction of world development in the economy and society instead of informatization and computerization [7]. Digital sources have already become an integral part of any field, regardless of their specification [3]. For example, by harnessing the potential of the Internet and its associated digital technologies, new business opportunities have emerged [11]. The new digital era brings the need for digital solutions in organizations [5]. So, digitalization has become a way of life [8]. Political and geographical barriers are erased, and the cultural values of the whole world become accessible to everyone.

In the narrow sense, digitalization is the transformation of information into digital form, leading to cost reduction, the emergence of new opportunities, etc. In a broad sense, digitalization refers to the direction of world development, which is based on the digital presentation of information and leading to an improvement in the efficiency of the economic sphere and an increase in the quality of population life.

Unlike informatization and computerization, digitalization does not consist in the simple use of computer technology and information technology for any operations, but

in the creation of integral platforms within which the user can formulate the necessary technological, methodological, etc. environment for solving complex tasks. The background of digitalization in the Russian Federation can be divided into four levels:

- the state includes the globalization of the economy, the creation of new and the functioning of existing economic zones, the development of Internet technologies and the emergence of digital startups,
- at the industry level, this is the presence of a large amount of information in the form of a main industry resource, the need to optimize existing business processes,
- organizational covers the need for company management to increase the efficiency of production in a competitive environment, the transformation of corporate culture based on digitalization,
- the level of individual households, includes the widespread use of personal computers, mobile devices and the internet [4].

Digitalization is a direction of world social development only if the digital transformation of information meets the basic requirements:

- it applies to all areas of public life, including industrial, scientific, entrepreneurial, social, etc.,
- its results are effectively applied and accessible to all users of digital information,
- users of this information are able to work with it.

Under the influence of a transforming communication system, changes are taking place in the established system of values of the population, which has been continuously formed for many centuries and determines the conditions for the existence of society as a whole. Digitalization largely determines the specific conditions of social life, it implies a high level of social adaptation of the population. In the case of a significant lag in the pace of digitalization from developed countries, our state may be aloof from scientific and technological progress, its role on the world stage will become catching up and there will be no prospects for innovative development, and, as a result, the country's competitiveness will decrease in the world market.

2 Methodology

In the work on the article, the methodology of theoretical literary and documentary sources analysis, as well as the analysis of secondary information, was used. In total, about 80 literary sources of domestic and foreign specialists were analyzed. The main ones are listed in the list of references to the used literature. The information base was compiled by regulatory documents governing the digitalization process in Russia. In addition, such general scientific research methods as induction, deduction, and comparative analysis were used. To identify the key problems of the impact of digital technology on the value system of the population, analytical, systemic and comparative approaches were applied. In the quantitative assessment of the drawn conclusions, a set of methods of economic and statistical analysis was used.

3 Results

In 2017, by decree of the President of the Russian Federation, the “Strategy for the Development of the Information Society in the Russian Federation for 2017–2030” was approved, which reflects the main formation provisions of a knowledge society and national interests, including the development of human potential, ensuring the safety of citizens and the formation of a digital economy while maintaining a - the semantic content of culture and the all-Russian identity of the country people [8].

Also in 2017, the Government of Russia approved the Digital Economy of the Russian Federation program, which defines the conditions conducive to the development of digitalization, these include: the formation of an improved regulatory framework, the development of education and human resources, the creation of technical resources and research competencies. According to the document, digital economy is understood as an economic activity in which the main factor of production is digital data. Neurotechnologies, artificial intelligence, virtual and augmented reality technologies, and the industrial Internet are far from a complete list of digital technologies that are part of the program; their implementation will entail both technological changes and changes in social relations. This program is aimed at improving the living standards of citizens of the Russian Federation by increasing the availability and quality of manufactured goods and services, including state ones, using modern digital technologies, increasing digital literacy of the population, and increasing national security [10].

To accomplish the tasks set by the national project, the autonomous non-profit organization Digital Economy was created, which supports socially significant projects in this area and establishes interactions between scientific organizations, the business community and government bodies in the field of digital economy. At the end of 2020, within the framework of the “Information Security” direction of this program, a platform will be launched that fights against illegal actions in the field of information and communication technologies “Submitting applications to law enforcement agencies online” to enhance the security of the information space. This resource will provide an opportunity to combat computer crime, the criminal and illegal use of information technology.

Digitalization of all public life spheres tends to increase the value of social wealth in general, but at the same time leads to a reduction in the number of people directly benefiting from productivity growth, since improved equipment is becoming more suitable for more complex operations and the number of people employed in highly automated industries is rapidly decreases. There is a risk that only a small part of highly skilled workers employed in the most competitive sectors of the world market will be provided with jobs and super-high wages, while the general level of wages in the country will be characterized by stagnation. Studying the problems associated with the introduction of digital technologies, it should be noted that elder workers face the greatest difficulties, and digital literacy training for employees in this category requires significant material and time costs.

4 Discussion

There is a number of publications in the scientific literature that examine the impact of digital technologies use on employment. So, according to a study of economists in 2018, 47% of US jobs are at risk of liquidation by 2033, in China this share can reach 77%, in Southeast Asia according to the forecasts of the International Labor Organization 56% of jobs risk disappearing [2].

Many authors believe that digitalization will increase the quality of life of the population of Russia, ensure long-term economic growth in the country and its competitiveness in the world market. In terms of the growth rate of consumption of digital services in 2018, the Russian Federation took third place in the world, while the level of digital literacy of Russian citizens decreased by 14.7%, this is due to the continuous growth of cybercrime [9].

The expected positive effects of digitalization include the following changes:

- improving the standard of the population living through better satisfaction of needs,
- an increase in the productivity of social labor,
- increasing the transparency of economic operations,
- reduction of enterprises transaction costs of, and as a result, acceleration of all business processes,
- reduced response time to market changes,
- synchronization of information flows, etc.

According to studies conducted in 2019, 45% of Russian citizens believe that knowledge of new technologies will help them find a more successful job, 24% of respondents fear losing their jobs due to digital illiteracy, and this is more acutely felt by qualified specialists, managers, Russians, with higher education and young people under 24 years old [6].

So, the most likely negative consequences of digitalization include a decrease in the total number of jobs in the country, the development of digital fraud, the spread of malicious content, etc. Despite the existing difficulties in the dissemination of digital technologies in the Russian Federation, a number of positive changes are already observed: the robotization of numerous production processes, the development of cybersecurity products, the widespread introduction of the Internet. The highest level of digitalization is observed in services, communications, trade, in the financial sector, medicine, the automotive industry, energy, telecommunications and the mediabusiness.

Legislative prerequisites for the rejection of the material media use in the field of employment and labor relations create the possibility of introducing information technology in the personnel document in the future, in the process of executing an employment contract, as well as in the field of labor organization for the development of remote employment. Experts are sure that effective digitalization of Russia is possible only with the full development of the information infrastructure, increasing the level of digital literacy of the population, including through the formation of a corporate culture aimed at studying new technologies [1].

5 Conclusion

As a result of the analysis of the impact of digitalization on the value-semantic content of culture, the main problems inherent in this process in Russia were identified, and its positive and negative consequences were identified. The system of values for Russians at this stage is undergoing a transformation under the influence of technological innovations development, the objective conditions for the existence of Russian society are changing. The introduction of digital technologies in our country is slow and rather laborious for certain social groups. It is necessary to create a tolerant information environment that contributes to the preservation of an established system of socio-cultural values for Russians. Increasing citizens' confidence in the latest digital technologies will also allow optimizing the digitalization process and, in the future, developing new information values within Russian society. Thus, effective digitalization in Russia is possible only with the full development of the information infrastructure, increasing the level of digital literacy of the population, including through the formation of a corporate culture aimed at exploring new technologies.

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Impact of Internal and External Determinants on Capital Structure in Russian Companies

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Abstract. The process of capital structure formation is one of the main issues of corporate finance, since the optimal proportion of equity capital and debt capital will allow a company to use its resources in the most efficient way. The main objective of this article is to test the hypothesis of the existence of determinants that may affect capital structure of Russian companies in the period from 2014 to 2018. This paper uses a systematic approach, including methods of statistical analysis. The work includes review of empirical researches on the subject. The article represents proposed hypotheses and carries out the results of the correlation analysis of selected factors for Russian companies. The results showed no relations between the selected variables (company age, company size, EBIT, ROE, ROA, MOEX index Russia, key rate, GDP, inflation, taxes) and the capital structure of Russian companies in the period from 2014 to 2018.

Keywords: Capital structure · Debt to equity ratio · Leverage

1 Introduction

The term «capital structure» refers to financial decisions made by company's manager regarding to what sources of financing, whether inner or external ones, will be used. To ensure the company's survival in an environment of market competition and crises, manager should strive for formation of an optimal capital structure [12]. The capital structure is considered to be optimal when the costs of capital are minimal, which leads to maximization of company's value [11]. While making financial decisions the manager should consider internal and external determinants which can have an effect on capital structure. Internal factors are company-specific and can be controlled by the management, while for macroeconomic factors the company can only adapt to. Information about the level of influence of these factors can help companies to make better funding decisions to ensure long-term growth [10].

The formation of the capital structure is considered as one of the most important decisions of company's management, since it directly affects company's financial results in the future. This subject had become particularly important after the publication of works by Modigliani and Miller [3, 4]. A huge amount of theories had been devoted to this subject, and many researches had been carried out about decisions on capital structure and its possible determinants. However, despite the enormous amount

of works dealing with this issue, there is no theory or research that can provide a precise answer as to what factors influence company's capital structure decisions [5, 7]. Currently, the business environment in Russia can be described as complex, volatile and fluctuant, as the economy is experiencing a slowdown in growth due to crisis, sanctions, and coronavirus pandemic. Therefore, it is even more important to find the way internal and external variables affect company's financial decisions in this complex economic environment.

2 Methodology

In accordance with previous researches the objective was set - to analyze factors affecting the capital structure of Russian companies from 2014 to 2018. The following hypotheses were proposed:

Hypothesis 1: Company Size Has a Positive Effect on Leverage of Russian Companies

The trade-off theory suggests that large companies use more debt financing as far as they are more diversified and less likely to go bankrupt compared to small companies which will be liquidated in case of any financial difficulties. Also, large companies have an easier access to the capital market [12]. The scope of small companies is limited, which means they do not need huge amounts of funding and this fact is considered by financial institutions to increase the probability of bankruptcy risk. For this reason, the process of obtaining loans is more complicated for small companies [7].

At the same time, according to the pecking order theory large companies borrow less due to the fact, that information asymmetry in large companies is less severe. In other words, this theory assumes a negative correlation between company size and leverage. Moreover, issuing stocks is more expensive for small companies compared to the large ones [12].

Researches conducted by Yousef [13], Ramli, Latan and Solovida [9], Fedorova and Persidskaya [2] showed a positive correlation between leverage and company size, however Deari, Matsuk and Lakshina [1] did not reveal a relationship between capital structure and company size. The study conducted by Pepur, Ćurak and Poposki [6], on the contrary, showed a negative correlation.

Hypothesis 2: GDP Has a Positive Effect on Leverage of Russian Companies

Gross domestic product (GDP) is widely considered to be one of the main indicators of a country's economic performance. According to the pecking order theory, during times of economic growth, leverage decreases since companies already have enough funds from internal sources.

On the other hand, investment opportunities are strongly connected with the state of the economy, so there must be a relationship between the profitability of companies and the growth rate of the economy. Companies will be capable of using more borrowed capital when the country has a higher level of economic growth [9]. A positive relationship between GDP growth and leverage was found in works by Deari, Matsuk and Lakshana [1] and Ramli, Latan and Solovida. [9].

Hypothesis 3: Inflation Has a Negative Effect on Leverage of Russian Companies

Economic theory suggests that increase in inflation leads to higher interest rates. Higher levels of inflation cause the growth in interest rates of commercial banks [5]. Inflation also can have an influence on the process of making corporate financial decisions on providing companies with debt financing. Creditors usually reject companies' request for long-term loan when country's inflation rate is high. Consequently, it is assumed that country's inflation rate has a negative effect on leverage [9]. Researches conducted by Deari, Matsuk and Lakshina [1] and Ramli, Latan and Solovida [9] show a negative correlation between inflation and leverage.

Hypothesis 4: Return on Assets Has a Positive Effect on Leverage of Russian Companies

According to the trade-off theory more profitable companies use debt capital more often as they are considered by other financial institutions as companies functioning at a lower level of risk. On contrary, the pecking order theory assumes that foremost companies prefer using internal sources of funding and external sources are second priority. That is explained by the fact that company's main objective is to minimize the capital costs and that internal ways of financing are cheaper compared to external [13]. Study performed by Fedorova and Persidskaya [2] shows a positive correlation between company's profitability and leverage, while finding from Yousef [13] indicates a negative connection.

Hypothesis 5: The Key Rate Has a Negative Effect on Leverage of Russian Companies

Borrowing money when the interest rate is low is more cost-efficient for companies and due to the fact that the key rate set by the Central Bank directly affects the rate of commercial banks, the key rate negatively correlates with leverage. Furthermore, since there are no taxes on interest expenses, using debt will allow the company to reduce costs and improve its financial performance [9].

A profitable company with a sustainable position on the market has more financial opportunities to pay for interests on loans. That is why it is considered that companies will more likely use external funding when the costs of capital are low [8]. Research performed by Ramli, Latan and Solovida [9] shows a negative connection between the key rate and leverage. For the analysis, were selected financial indicators of Russian companies in the period from 2014 to 2018. The variables used for correlation analysis are shown in Table 1.

Capital structure was calculated using the following formula:

$$\text{Capital structure} = \frac{\text{long-term liabilities} + \text{short-term liabilities}}{\text{shareholders' equity}} \quad (1)$$

The main criteria for selecting companies for the sample are the following: the cost of assets should be more than 60,000,000 rubles annually; the revenue should be more than 100,000,000 rubles annually in the whole period from 2014 to 2018.

Companies that belong to the financial sector, social sector and insurance companies were excluded from the sample. It is assumed that their financial policy is different. Most of the selected 10,000 companies did not have "long-term liabilities" and "short-

Table 1. The description of variables used in the correlation analysis

Variables	Calculation	Expected relation
Capital structure	Debt-to-equity ratio	
Age	Number of years since company’s registration	+
Size 1	Natural logarithm of assets	+
Size 2	Natural logarithm of sales	+
EBIT	Earnings before interest and taxes	+
ROA	Net Income/assets	+
ROE	Net Income/shareholder’ equity	+
GDP	Gross domestic product of Russia	+
KR	The key rate of the Central Bank of Russia	–
MOEX	MOEX Index Russia	+
i	Inflation rate	–

Source: authors.

term liabilities” in their financial statements, and since this data is crucial for calculating the capital structure, the number of companies was reduced. Thus, the sample includes 798 companies.

All internal company data (age, assets, EBIT, ROE, ROE) was obtained from the «SPARK» system. The key rate values were obtained from the official website of the Central Bank of Russia. Macroeconomic factors were obtained from the official statistics websites of Russia. The values of MOEX Index Russia were obtained from the official website of MOEX.

3 Results

A correlation matrix was constructed based on the selected variables. The results are shown in Table 2.

Table 2. Correlation matrix of the influence of macro and micro factors on debt-to-equity ratio in Russian companies in the period from 2014 to 2018

	D/E	Age	Size 1	Size 2	EBIT	ROA	ROE	GDP	KR	MOEX	i
D/E	1										
Age	-0,047	1									
Size 1	-0,004	0,084	1								
Size 2	0,008	0,032	0,711	1							
EBIT	-0,017	0,050	0,195	0,263	1						
ROA	-0,011	0,015	-0,055	0,138	0,531	1					
ROE	-0,016	-0,028	-0,036	0,000	0,109	0,026	1				
GDP	0,011	0,241	0,095	0,081	0,055	0,036	-0,004	1			
KR	-0,015	-0,088	-0,029	-0,010	0,038	0,069	0,013	-0,483	1		
MOEX	0,002	0,252	0,102	0,093	0,082	0,079	-0,004	0,942	-0,288	1	
i	-0,004	-0,173	-0,067	-0,052	-0,019	-0,007	0,015	-0,661	0,829	-0,638	1

Source: authors.

Since the amount of taxes paid by companies per year was given in «SPARK» system only for two years (2017–2018), for these variables a separate correlation matrix was constructed (Table 3).

Table 3. Correlation matrix of the influence of taxes on debt-to-equity ratio in Russian companies in the period from 2017 to 2018

	D/E	Taxes
D/E	1	
Taxes	0,0069	1

Source: authors.

As it is seen from Tables 2 and 3, correlation coefficients are close to zero which indicates that there is no connection between the selected variables.

4 Discussion

Identifying factors that affect the capital structure of companies and building a regression model could help small companies make their market position more sustainable and survive the crisis. The development of small and medium-sized companies is important both for individual consumers and for the whole economy of the country. However, at the current moment, even within the same period, the studies show different correlations. The contradictory results of researches conducted by different authors prove the complexity of the issue of the capital structure formation, which is still relevant. In subsequent studies, the period may be increased and a separate correlation analysis for each industry can be made. There can also be added such internal variables as the company's growth opportunities, liquidity ratios and the share of fixed assets in the total amount of assets. As for macroeconomic factors, the exchange rate and the cost per barrel of oil can be added.

5 Conclusion

Formation of the capital structure is an important part of the company's corporate policy and is represented by the debt-to-capital ratio. A large number of studies in different countries are touching upon the subject. In an uncertain market environment, the issue of formation of an optimal capital structure becomes even more relevant, as it will determine the company's competitiveness, financial stability and solvency, and, as a result, its performance. Managers can form an optimal capital structure that would correspond to the company's goals and contribute to the achievement of set goals and determine lending strategies. Determining the optimal capital structure helps companies to get on a path of sustainable development. The results of the correlation analysis showed an absence of relations between the selected variables (company age, company size, EBIT, ROE, ROA, MOEX index Russia, key rate, GDP, inflation, taxes) and the capital structure (debt-to-equity ratio) of Russian companies in the period from 2014 to 2018.

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Fiscal Policy as an Emerging Factor of Social and Economic State Formation

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Abstract. The relevance of the problem under study is due to the importance of having a visionary, competent fiscal government policy, in particular, the tax - one of the main methods to ensure stable socio-economic development of the state. The present work is aimed at understanding that the main tool of fiscal policy is progressive taxation. The leading method of research of this problem is the general scientific one, which allowed to substantiate the thesis that the progressive taxation is aimed at the maximum collection of taxes, at the creation of obstacles to evasion from their payment, at the formation and mobilization of financial resources of the state. The article substantiates the thesis that in a modern state, intending to become a developed social and economic state, the question should be not about the presence or absence of a progressive scale of taxation, but about the rates of this taxation, at what levels of income and expenses they should apply, etc. This scientific article is of practical value for law makers, politicians, researchers interested in natural, objective improvement of the institutions of the state and the law.

Keywords: Fiscal policy · Progressive taxation · Socio-economic state

1 Introduction

Fiscal government policy, in particular tax policy, is one of the main methods to become a high-developed social and economic state. Fiscal policy is aimed at maximum collection of taxes, at creating obstacles to tax evasion, at formation and mobilization of financial resources of the state [1, 2, 8]. Consequently, the main tool of fiscal policy, i.e., replenishment of the state budget, is taxation. The size of tax revenues to the budget directly depends on the size of the taxpayer's income, the bulk of which is wages. In the Russian Empire until the end of 1917, there was practically no single general income tax. In the USSR, income was taxed on a progressive scale of taxation - the higher the income, the higher the tax rate. This fact is considered both in science and in practice as social justice [9]. Today, in most developed countries progressive tax collection is legislated and actually applied, which allows them to develop successfully and further.

A single income tax rate of 13% was introduced in Russia in 2001. The previous tax scale varied from 12% to 30%. As a result of the introduction of a flat scale of taxation, budget revenues in the first two years increased by a quarter. Since 2015, the

main type of direct taxes in the Russian Federation has been called the Personal Income Tax (PIT), previously called “income tax”.

For residents (individuals, mainly citizens of the Russian Federation permanently residing in its territory, receiving income from sources located in Russia and from sources located outside Russia) the basic PIT rate is 13%. For non-residents (individuals, as a rule, foreigners who receive income from sources located in Russia), it is 30%. Von Stein - German philosopher, economist, the founder of the social state theory - unequivocally and repeatedly noted that “everyone’s tax liability is proportional to his income;... their collection should be as convenient and cheap as possible; the measure of tax is determined by the benefit of the individual from the administration” [19, p. 42]. The theory and practice of the social state is currently undergoing significant transformations that are damaging its development prospects [12]. Contemporary interpretations of the social state lose the potential that were formed by Von Stein, the author of the concept of social state for several decades of the twentieth century. In particular, in Von Stein’s understanding, the inherent, inviolable attribute of a social state includes the redistribution of income and social expenditures through the introduction of progressive taxation.

2 Methodology

The following methods were applied during the work on the article:

- universal methods, in particular metaphysics (considering the state and law as eternal and immutable institutions deeply disconnected from each other and other social phenomena) and dialectics (materialistic and idealistic; the latter, in turn, can act as objective or subjective idealism),
- general scientific methods - these are techniques that are used in all or most of the sciences and that do not cover the whole of scientific knowledge, but are applied only at individual stages, as opposed to universal methods. Among the general scientific methods used in this paper are analysis, synthesis, induction, deduction, system approach, functional approach, analogy, abstraction, historical method,
- private (or special or specific) scientific methods are techniques developed in special specific sciences and used to learn about public law phenomena based on special non-legal knowledge: technical, natural and human sciences. Among private scientific methods, the following were used in the work: statistical, cybernetic, psychological methods,
- private legal methods are the techniques, means, principles that allow the most profound knowledge of the state and legal regularities and are strictly legal: formal and legal, comparative and legal forecasting, used in writing this article.

3 Results

Today it is generally recognized that a civilized state needs an active, targeted policy of income regulation as the most important social instrument for the full implementation of national programs on education, healthcare, agriculture, affordable housing, etc. [3, 9]. In a modern state, which intends to become a developed socio-economic state, there is no doubt that there is a progressive scale of taxation, but what should be the tax rates and income levels, so as not to affect or discourage the middle classes of the society in any way [4, 10]. This task is quite achievable. There is no need to invent anything here, it is enough to be guided by the world experience, which confirms that the system of rates under progressive taxation can be such that it can bring benefits not only to the absolute majority of citizens, but even to the majority of entrepreneurs and highly paid employees [6, 13, 14].

On June 23, 2020, during his regular address to citizens, Vladimir Putin proposed to increase the rate of personal income tax from 13% to 15% on annual income over Rb 5 m from January 2021 [7]. The funds received will be used to treat children with serious illnesses. IT-companies will have lower tax rates, while the head of state suggested making the tax on income from foreign companies controlled fixed - 5 million rubles per year, and without additional reporting.

The currently existing flat scale of taxation (since 2001) allowed increasing the collection of taxes [7]. The state was able to spend these taxes on social tasks. But given the “new quality of administration” and the introduction of digital technologies, it has become possible to distribute the tax burden more differentiated, the President believes. Thus, the inevitable, natural for the development of the state introduction of a differentiated scale of taxation requires, at the same time, taking into account many nuances, involving a wide range of lawyers, economists, specialists in the field of information technologies.

4 Discussion

Over the last decade, Russia has been actively discussing the so-called “luxury tax” [11, 15]. Some aspects of this tax have already been introduced into Russian legislation. Thus, in 2014, the Federal Law “On Amending Article 362 of Part Two of the Tax Code of the Russian Federation” No. 214-FZ of 23.07.2013 came into force, which determined the calculation of the tax amount taking into account the raising coefficient for passenger cars with an average value of 3 million rubles or more [17]. As for the counterarguments pointing to the possibility of evading increased taxation by citizens with the highest income [16]. This possibility is related, for example, to the lack of elaboration of planned and already at the legislative level existing aspects of progressive taxation. Indeed, it should be noted that one of the important elements of a fair differentiated approach to tax collection is traditional not only mandatory declaration of income, but also control over expenditures.

Some steps to introduce such a method of fiscal policy as progressive taxation may not look too logical and clumsy, however, applying the figure of speech used by Erhard [5] - an outstanding German scientist, economist, politician, it can be said: “if the state

saves in this area, then soon we can say goodbye” to the social state. At the same time, such a measure to equalize the unacceptable difference between incomes as their reduction for some categories of citizens is of interest. For example, in 2015, the head of state reduced by 10% by the end of the year salaries of employees of the Presidential Administration, the Government Office, the Accounts Chamber, etc., the Kremlin administration. However, the greatest effect in achieving a decent standard of living will be achieved by raising the minimum incomes of citizens and bringing them closer to the incomes of the above-mentioned employees.

It should be stressed once again that it is now time to realize that the main instrument of fiscal policy, i.e. replenishment of the state budget, is progressive, differentiated taxation. In order for fiscal policy to fully meet its objectives aimed at maximum tax collection, creation of obstacles to tax evasion, formation and mobilization of financial resources of the state, the modern state, intending to become socially and economically developed, should not talk about whether or not to be a progressive scale of taxation, but about what should be the rates of taxation and at what levels of income and expenditure they should apply, so as not to affect or discourage in any way.

5 Conclusion

The actual reality of highly developed states convinces us that the social and economic policies adopted within the framework of the relevant legal systems, aimed at reducing excessive material inequality, have a beneficial impact on the further development of these countries. As a result of the irresponsible, short-sighted attitude of the government to the realization of social and economic rights of its citizens, the level of poverty, distrust and protest sentiments in the society is growing; the population is getting older and dying faster; morality and culture are falling; civil society is being destroyed; social interrelationships are being stratified, inequality is growing and the ground for extremism is emerging; legitimacy is being lost. The sustainable development of a social state always presupposes limiting the opportunities for the growth of bureaucracy in that state. Non-compliance with the requirements of social justice subsequently manifests itself in the social, economic, cultural and political spheres.

Proceeding from the above, it is necessary to conclude that for the formation of a developed socio-economic, democratic, rule-of-law state, it is necessary to observe and actively implement the theoretical principles of social state by Von Stein [18], supported by the practical achievements of modern advanced states. It is thanks, among other things, to the fiscal policy pursued by many states of the world have become highly developed and civilized to date. The introduction of the progressive scale of taxation contributes to the growth of incomes and at the same time leads to the mitigation of inadmissible differences in them.

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Charity as a Component of Corporate Social Responsibility of Business

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Abstract. Corporate social responsibility (CSR) is a concept that attracts the attention of scientists, specialists, owners and executives of companies around the world and at the same time takes a new resonance in world practice. This type of conduct goes beyond economic and legal obligations to meet the expectations of stakeholders. The article discusses the concept of corporate charity as a component of corporate social responsibility of business. The role of corporate funds in the implementation of corporate charity programs is formulated. The main motives for the charity activities of companies have been determined. On the example of practices, the main forms and approaches of the implementation of corporate charity were identified. The relationship between the goals of sustainable development and charitable projects is considered. Steps have been proposed to stimulate charity activities among Russian businesses.

Keywords: Corporate charity · Corporate foundations · Corporate social responsibility

1 Introduction

Corporate social responsibility enriches strategic management by providing new sources of competitive advantage, communication and strategy formulation, taking into account the interests of stakeholders and outlining new programs that attract employees [1]. The most important component of corporate social responsibility is the company's charitable activities, which include both charity and sponsorship projects. The combination of the two concepts is due to the fact that in most non-financial reports of companies there is a close connection between the implementation of charitable programs and, ultimately, the obtained indirect commercial effect. But at the same time, it should not be forgotten that sponsorship, unlike charity, pursues, first of all, a commercial goal, its choice is initially rational.

Russian scientists in their works in defining the concept of “charity” most often turn to the Federal Law of 11.08.1995 No. 135-FL “On Charity Work and Charitable Organizations”. In accordance with this law, charitable activity refers to the voluntary activity of citizens and legal entities by unselfish (free or on preferential terms) transfer to citizens or legal entities of property, including money, unselfish performance of work, provision of services, provision of other support” [7].

Corporate charity is the voluntary activity of a company (or its employees) to unselfishly transfer funds, provide property and services to charitable organizations, as

well as other assistance activities to support socially significant non-profit projects in various areas. Corporate charity is the active participation of commercial organizations in the community, aimed at improving this life and solving common problems and at the same time consistent with the company's commercial plans [2].

Despite the fact that charity is exclusively gratuitous, the contribution to this area of activity can ultimately bring companies many positive results, expressed in increasing trust, strengthening the authority and image of the company, accumulating social capital (consumer loyalty, employee involvement). Some studies confirm that corporate charity has a positive impact on the value of companies [17].

2 Methodology

In its modern form, corporate charity, as well as charity in general, began to develop in the Russian Federation much later than in the West - only at the beginning of 2000. On a large scale, the development of charity and philanthropy dominated pre-revolutionary Russia, when an extensive system of private and estate charitable societies operated. Immediately after the October Revolution of 1917, all funds of charitable organizations were nationalized in a short time, their property was transferred to the state, and the organizations themselves were abolished by special decrees [3]. In Soviet times, solving existing social problems in society was considered a "matter of the state," so the culture of charity ceased to exist as such. In the 90s of the XX century, after the collapse of the USSR, confidence in the newly created charitable foundations was undermined by scandals related to the loss of money in their accounts. According to representatives of the Donors Forum, the Vedomosti newspaper and the audit company PricewaterhouseCoopers (PwC), the last 10 years for Russia have become a time of active and vibrant development of Russian charity in general, this period for charity activities of companies has become just as breakthrough [18].

The Public Chamber of the Russian Federation conducted a study in which it was revealed that large business was most actively involved in charity activities (93% of respondents representing large business structures in the study) [13]. The methodology of corporate charity research in Russian companies uses quantitative and qualitative criteria. Within the framework of this study, qualitative characteristics were mainly analyzed: the concept of corporate charity, the goals of charity programs, the management system of charity activities in the company and the effect of charity activities, its impact on society.

3 Result

When developing corporate charitable programs, the specific characteristics of the company are taken into account. Large, small and medium-sized businesses differ significantly from each other. Business ownership is also important. The unique situation of the company depends on the choice of the beneficiary, and the technology of work, and the strategy and tactics of its social activity. The motivations for the implementation of corporate charity programs by Russian companies are:

- increase of social activity of the company, which helps to improve its image and business reputation [10],
- recognition of the fact that the public sector alone cannot solve all social problems of society,
- employees, representatives of “Generation Y” want to work in companies that oblige to solve social issues, in particular, create conditions for the development and implementation of charity programs [4],
- strengthening of corporate culture by involving employees in solving socially important problems of society,
- consumers switching to brands that support social initiatives, the company’s connection with a non-profit organization or project is presented for consumption as an element of product value [9],
- establishment of relations with public authorities,
- strengthening partnerships between business and society.

Compared to western countries in the Russian Federation, corporate charity occupies a significant share in the total amount of charity in general. According to the Donors Forum [5], in Russia this share is 90% of the total amount of charity, in the West corporate charity accounts for 10%. In the program portfolios of Russian companies there may be projects aimed at the development of social protection and ecology, medicine and education, charitable infrastructure, involvement of young people in the socio-economic development of the regions (Table 1) [5].

Table 1. Areas of corporate charity

Sphere of charity	% of companies in this area in 2019
Education	93
Ecology	68
Development of local communities	63
Health care	63
Sport and healthy lifestyles	60
Culture and art	50
Science and researches	43
Business development	43
Social protection	40
Inclusive projects	35
Employment and labour adaptation	23

Source: authors.

The main target groups for which charitable activities of companies are aimed: orphans; children from disadvantaged families; disabled children; children with disabilities, diseases; students, young entrepreneurs; adult seriously ill patients; people in difficult life situations; elderly people; religious organizations; animals and others. As a result of a study conducted on the materials of the Leaders of Corporate Charity - 2019 project, it was noted that all companies relate the areas of their corporate charity with

the OUN Sustainable Development Goals (OUN SDGs). Most companies pointed to the SDG-3 “Good health and well-being,” directly related to the areas of support for social protection, health, sports and a healthy lifestyle (90%), SDG-4 “High-quality education” related to supporting the education, science and development of local communities (88%), SDG-8 “Decent work and economic growth,” achieved by supporting the development of local communities (83%).

Traditional and strategic charity of companies is distinguished. Traditional corporate charity has the following characteristics: unselfishness, an attempt to satisfy all requests, the transfer of financial and material resources to the beneficiaries, a one-time donation and the lack of benefits for the company. The motive, as a rule, is the desire to share with those in need, satisfying their personal ambitions, to increase the social status of the management or owner of the company. One example of traditional charity can be large Russian companies that help social facilities, which were deprived of content “as non-core assets” during the privatization process. Small and medium-sized businesses are content mainly with one-time charity work.

According to the author, the traditional approach to charity does not solve acute problems, does not lead to a decrease in social tension in society. The distinguishing characteristics of strategic charity are: the long-term focus of the company’s attention, taking into account the interests of recipients of assistance, in addition to financial and material resources, the use of volunteer labor companies, and a systematic program approach in the provision of charity assistance. Companies correlate charitable programs with strategic goals for the development of their core business.

Unlike traditional charity, companies invest primarily in charitable programs that can affect their own development and reduce the negative impact of the problem on business. For example, “Elevator to the Future” is an all-Russian scientific and educational program [6], established by BF Sistema and Moscow State University named after Lomonosov, aimed at finding and developing talented youth, as well as supporting children’s and youth technical creativity, research activities and engineering design. “Elevator to the Future” contributes to increasing the personnel potential of high-tech companies AFK Sistema, as well as the formation of a reserve for knowledge-intensive domestic enterprises and promising industries.

One of the projects of Mercedes - Benz RUS focuses on teaching children the rules of safe behavior on the roads. The project is implemented through training in traffic rules in primary schools using a drawing competition, The production of road traffic videos in schools in their native language and taking into account national characteristics, Assistance in the construction of regional traffic training centres for children and adolescents, The establishment of mobile road safety laboratories for rural areas in countries in transition, creating a MobileKids - children’s traffic safety program for children from 8 to 12 years old. Over the past years, more companies have established corporate charitable foundations to carry out their charitable activities.

4 Discussion

The role of corporate funds has recently undergone some changes. It was traditionally believed that corporate funds are a separate legal entity from business and act as a “charity.” In a new sense, the corporate fund is seen as an organization integrated in a broader context into a company that creates “common value” (it refers to both business and social value). According to Sobolev, Chairman of the Corporate Social Responsibility Committee of the Association of Managers of Russia, the creation of corporate funds is relevant for holding structures whose enterprises operate in different markets, and charity programs have a large geographical coverage [12]. In other cases, the creation of corporate funds is unnecessary.

In international companies, twice as often charity is in the area of responsibility of an individual specialist, while in Russian companies charity issues are more often only part of the duties of employees. Corporate charity has different forms and approaches to implementation in the company. Let us consider the implementation of good-creative activities through the prism of some Russian companies. The company implements its own charity program, which corresponds to the charitable tasks of the organization.

As we noted earlier, education is the most popular area of charity. For example, many companies from the oil and gas industry are engaged in this area, in particular, the company PJSC TATNEFT has created the charitable foundation “Gifted Children” [20], created to support intellectually gifted schoolchildren.

Rosatom, a representative of the nuclear industry, provides support to Russian education, provides financial assistance for internships of teachers and heads of educational institutions, the installation of the latest equipment in schools for studying natural disciplines, and updating educational and methodological complexes in accordance with the requirements of new educational standards in Russia [14]. This direction is one of the main and corresponds to the charity tasks of the company.

The company participates in charitable projects (programs, promotions) developed by non-profit organizations so-called partner programs. The topic of ecology, concern for nature and assistance in the event of disasters is quite common among companies of banks in the Russian sphere. Some banks are members of the corporate club of the World Wildlife Fund (WWF): Alfa Bank, Promsvyazbank, Rosbank. There are environmental projects in Nordea Bank. Disaster relief was allocated to Deutsche Bank and UniCredit Bank as a systematic area.

The Sakhalin Energy partnership plan of the Regional Council of Authorized Representatives of Small Indigenous Peoples of the North (KMNS) of the Sakhalin Region is a plan to promote the development of small indigenous peoples of the North [16]. The program consists in improving the quality of life of the small indigenous peoples of the North, developing the capacity of communities, and helping to prepare for the subsequent creation of an independent fund for the development of small indigenous peoples. The company implements corporate volunteering programs with the participation of its employees and their families in voluntary activities. Corporate volunteering is understood as: participation in voluntary work for the benefit of local communities with the support of the company. Part-time or full-time corporations send volunteer employees as temporary workers to organizations working for the benefit of

the local community. Companies encourage and support the independent volunteer activities of employees and their families.

As part of the corporate program “Everyone has the right to help” [15], PJSC Rosbank supports the desire of employees to help by doubling their cash donations. Each employee in the workplace can make a donation to one of these organizations, the amount is determined by the employee himself, the bank doubles it. Each employee participating in the program is provided with a spending report and an opportunity to participate in the work of the organization to which he transferred the money.

The company provides free professional services to social change organizations, the so-called pro bono programs. Pro bono corporate programs are a win-win option for charitable activities: non-profit organizations receive the necessary support, companies build closer ties with their partners in the community, and employees have the opportunity to develop their professional skills. By enabling employees to apply their skills in a variety of “good deeds” environments, pro bono promotes employee creativity, productivity, and commitment. Pro bono also inspires new ways of thinking, which are often more entrepreneurial. Pro bono programs are actively implemented by the big four companies - PwC, KPMG, Deloitte and Ernst and Young - the largest legal audit companies in the world, which have branches in Russia. Employees provide their services free of charge to non-profit organizations.

The company carries out activities to raise funds to solve social problems by selling a specific product to the company with the condition of further transfer of part of revenue, income, percentage to solve social problems. The Naked Hearts Children’s Assistance Fund and the Inmarco company present a new mobile application for smartphones Smiled. Everyone can download the application, smile and place their photo on an interactive smile map [11]. For each downloaded picture, Innarko transfers 10 rubles to the Naked Hearts Foundation, supporting the foundation’s main programs: the development of free services for families raising children with developmental disabilities, and the construction of playgrounds and parks. JSC Alfa-Bank and the Life Line Charity implemented the Alfa-Dobro project: the Alfa-Cash Ultra business card became an Affinity Card. With each purchase made, Alfa Bank transfers 0.39% to the charity fund [19].

The company supports social entrepreneurship, one of the most important tasks of which is to the competition “Creation,” established by JSC SUEK, is aimed at supporting social entrepreneurs in the territories of their presence. Priority areas that the company supports in the framework of the competition: organization of social support and medical assistance to the population; social adaptation and support for vulnerable categories of citizens; promoting the early development of children; environmental protection and ecological culture; development of physical culture and amateur sports; leisure activities for different age groups, specific social problems.

5 Conclusion

Russian companies have gone many years in understanding the problems of society, developing a range of charitable programs to support citizens and building social partnerships with various groups of stakeholders. However, further effective action in this direction is not possible without the following steps:

1. Improving the legislative framework in the field of charity, creating a favorable tax regime [8].

The current tax legislation in Russia requires companies that are engaged in charity work to provide assistance only from the company's net profit. In this regard, companies are not exempt from income tax from those amounts that were allocated to charitable activities. We believe that tax relief will contribute to increasing the volume of social investments of business in solving a wide range of social problems.

2. Promoting a positive attitude in society towards charitable activities.

In general, little is known about charity in Russia, VTЦИОМ polls show: almost 60% of respondents cannot remember a single charity [21]. Most of the population in Russia does not understand what "civil society" is and why it is necessary, the "state" consciousness prevails, faith in the key role of the state in achieving well-being in the country.

The media play an important role in building culture and trust in charitable activities. Public opinion about charitable organizations remains largely unformed, access to information will allow the population to better understand the charitable activities of companies, and find their own motivation to participate in charitable projects.

3. Increase the professionalism and transparency of non-profit organizations.

The effectiveness of corporate charitable programs and the resulting social effect largely depend on the activities of non-profit organizations supported by companies. Therefore, non-profit organizations should develop their professional level, provide all interested parties with voluntary reporting on the work done and be an active participant in the communication process in discussing social problems in society.

4. Building partnerships in corporate charity.

Joint and coherent work between the various institutional benefactors - donors through partnerships - is not only about sharing information, but also about long-term, and each of the parties can contribute and be held accountable for the outcome. The funds of one benefactor to solve large social problems are sometimes not enough, so only in the framework of building partnerships this becomes possible. Thus, companies consider the implementation of corporate charity as an important component of corporate social responsibility of the company. Charitable programs make a practical contribution to the development of society, form a favorable social environment in the territories of the presence of companies. The implementation of measures to strengthen support from the state and society will increase the level of business participation in solving social problems of society.

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Assessment of the European Call and Put Options Cost of Innovative Projects

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Abstract. As part of the research, a method for assessing the cost of call and put options for innovative projects is suggested based on the stochastic model of Bass innovation. The resulting expressions can be used by investors to assess the value of the risk of funds loss associated with innovations. Based on the model innovation project, the assessment of project indicators is analyzed depending on various assumptions about the nature of changes and the possibility of their accounting using stochastic methods, interval mathematics and fuzzy sets. It shows possible approaches and methods for assessing the impact of changes in project data, related to both statistical properties of project revenue, and fuzzy information or uncertainty about their actual values.

Keywords: Assessment · Call and put options · Innovative project

1 Introduction

The development of an innovative project is carried out in stages. Initially, based on the project's forecast reports, such as the balance sheet, profit and loss statement, and cash flow statement, the net cash flow are estimated, the required investment amount and the cost of raised funds are estimated. Standard methods determine the main characteristics of the project, corresponding to the planned revenues from the project. During the implementation of the project, there may be numerous deviations from the planned parameters of the project. First of all, this applies to the revenues from the project. Therefore, at the stage of preparing the project for launching, you should evaluate the impact of possible changes in receipts on the project characteristics. It makes sense to analyze possible approaches and methods for assessing the impact of changes in project revenues related to both statistical properties of project revenue and unclear information or uncertainty about their actual values.

2 Methodology

Innovative projects can be understood as the development and implementation of new technologies, products, the use of new sales channels, etc. to describe the number of business entities that use innovations, the most appropriate stochastic models are those that somehow generalize the Bass basic model of innovation diffusion [1–4].

Bass’s mathematical model of innovation diffusion has the form:

$$\frac{dn}{dt} = (p + qn)(1 - n), \quad n_0 = N_0/M \tag{1}$$

Here $n(t) = N(t)/M$, where M -is the market potential, $N(t)$ – the total number of accepted the innovation to the moment t , p – the innovation coefficient, q – the imitation coefficient.

Generalization of the model assumes consideration of the influence of the non-captured part of the market $(1 - n(t))$ in the form of the presence of a stochastic process, $\sigma(1 - n)w(t)$, where $w(t)$ -a standard Wiener process with zero mean $E(w_t) = 0$ and dispersion $D(w_t) = E(w_t^2) = t$. The assessment of market volatility based σ on actual data $n_j = n(t_j)$ is $\sigma^2 = \hat{\sigma}^2/\Delta t$, where $\hat{\sigma}^2 = \frac{1}{m} \sum_{j=1}^m (n_j - \bar{n})^2$ and $\Delta t = t_j - t_{j-1}$.

The use of innovations requires investment and involves the risk of losing funds for the investor. One way to minimize risk is to use derivative financial instruments, such as call and put options.

The profit for the investor from the application of innovations at the time is t proportional to the number of people who have accepted the innovation $n(t)$.

A put (call) option gives the option holder the right (but not the obligation) to sell (buy) an innovative project at a fixed price at the time the option is performed. The practical application of options requires a fair assessment of their value.

3 Results

3.1 Stochastic Solutions of the Bass Equation

To find a solution of the stochastic Bass equation

$$\frac{dn}{dt} = (p + qn)(1 - n) + \sigma(1 - n)w_t \tag{2}$$

Let’s apply the ITO formula [9].

Let the random process $x(t)$ satisfy the equation $dx = a(x, t)dt + b(x, t)dw$ and the $G = G(x, t)$ – deterministic function x and t , then for dG is the ITO formula [5]:

$$dG = \left(\frac{\partial G}{\partial x} a + \frac{\partial G}{\partial t} + \frac{1}{2} \frac{\partial^2 G}{\partial x^2} b^2 \right) dt + \frac{\partial G}{\partial x} Bdw$$

We enter the function $u(t) = \frac{1}{1-n(t)}$. We emphasize that $\frac{\partial u}{\partial n} = \frac{1}{(1-n)^2} = u^2$, $\frac{\partial u}{\partial t} = 0$; $\frac{\partial^2 u}{\partial n^2} = \frac{2}{(1-n)^3} = 2u^3$ and $u_0 = \frac{1}{1-n_0}$

Applying ITO's formula to Eq. (2) we get a simpler equation:

$$du_t = (-q + (q + p + \sigma^2) \cdot u_t) \cdot dt + \sigma \cdot u_t \cdot dw \tag{3}$$

Solution (3) is the function:

$$u_t = Z_t \cdot \left(u_0 - q \int_0^t \frac{d\tau}{Z_\tau} \right) \tag{4}$$

where Z is the geometric Brownian motion satisfying the equation

$$dZ = (q + p + \sigma^2)Zdt + \sigma Zdw \tag{5}$$

It is not difficult to see that $u_t = Z_t \cdot \left(u_0 - q \int_0^t \frac{d\tau}{Z_\tau} \right)$ there is an equation solution (3) at $Z_0 = 1$.

Indeed, by calculating $\frac{\partial u}{\partial Z} = \frac{u}{Z}$, $\frac{\partial u}{\partial t} = -q$, $\frac{\partial^2 u}{\partial Z^2} = 0$, and applying the ITO formula, we obtain the equation: $du = (-q + (p + q + \sigma^2) \cdot u)dt + \sigma \cdot u \cdot dw$.

The geometric Brownian motion $Z(t)$ satisfies the Eq. (5) with the initial condition $Z_0 = 1$ and, its solution can be obtained using the ITO formula [9].

Indeed, we introduce a function $F = F(Z) = \ln(Z)$, for which $\frac{\partial F}{\partial Z} = \frac{1}{Z}$; $\frac{\partial F}{\partial t} = 0$; $\frac{\partial^2 F}{\partial Z^2} = -\frac{1}{Z^2}$, $F_0 = 0$, applying the ITO formula, we get: $dF = (p + q + \sigma^2/2)dt + \sigma dw$, from where $F = (p + q + \sigma^2/2) \cdot t + \sigma w_t$ and, hence, $Z = \exp(\gamma t) \exp(\sigma w_t)$, $\gamma = p + q + \sigma^2/2$.

Figure 1 shows graphs of the solution (implementation) $n(t) = 1 - 1/u(t)$, where $u_t = Z_t \cdot \left(u_0 - q \int_0^t \frac{d\tau}{Z_\tau} \right)$.

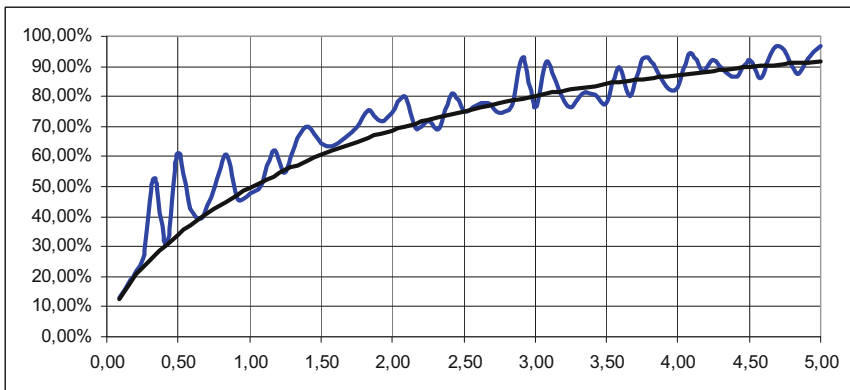


Fig. 1. Implementation $n(t)$ for $p = 0,03$; $q = 0,38$ when $\sigma = 30\%$ and $\sigma = 0$ (deterministic solution) (Source: authors).

3.2 Assessment of European Call and Put Options

The option exercise price is X the fixed market coverage share at the time of execution $t = T$.

The value of the European call option with the strike price at the time of execution X at the time of execution $t = T$ is proportional to the expression:

$$C(X; T) = \exp(-r_f T) \int_X^\infty (n - X) \cdot f(n) dn, \tag{6}$$

where $f(n)$ is the density of the distribution function of the value at a time, n at a time $t = T$, r_f is the risk-free interest rate.

The value of the European put option with the strike price X at the time of execution $t = T$ is proportional to the expression:

$$P(X; T) = \exp(-r_f T) \int_0^X (X - n) \cdot f(n) dn, \tag{7}$$

where $f(n)$ is the density of the distribution function of the value n at a time $t = T$.

The distribution density $f(n)$ cannot be explicitly obtained. Approximations of the following types are possible:

1) to obtain an approximation for $f(u; T)$;

2) knowing $f(u; T)$ can be considered known and the distribution function $f(n; T)$, since $P(n < x) = P(1 - \frac{1}{u} < x) = P(u < \frac{1}{1-x})$.

The value $Z(t) = \exp(\gamma t + \sigma w_t)$ has a lognormal distribution. The value Z_t/Z_τ also has a lognormal distribution. But the integral over τ from Z_t/Z_τ has a complex expression through special functions. It can be represented Z_t as an integral by τ : $\int_0^t z_\tau d\tau$, then under the sign of the integral will be the sum of two quantities having a lognormal distribution, for which there is an approximation also by a lognormal distribution and, further, perform numerical calculations.

In this paper, we will use simulation to calculate $C(X; T)$ and: $P(X; T)$

$$C(X; T) \exp(r_f T) = \int_X^\infty (n - X) \cdot f(n) dn \cong \frac{1}{K} \sum_{j=1}^K (n_j(T) - X)_+, \tag{8}$$

$$P(X; T) \exp(r_f T) = \int_0^X (X - n) \cdot f(n) dn \cong \frac{1}{K} \sum_{j=1}^K (X - n_j(T))_+, \tag{9}$$

where K – is the number of implementations, n_j – implementation and $(a)_+ = \max(0; a)$.

Implementations $n = n(T)$ are calculated based on simulation modeling of the value $u(t) = Z(t) \cdot \left(u_0 - q \int_0^t \frac{d\tau}{Z(\tau)}\right)$ at $t = T$, which allows for further finding $n(t) = 1 - 1/u(T)$.

Let's consider the integral $J(t) = \int_0^t \frac{d\tau}{Z\tau} = \int_0^t \exp(-\gamma\tau) \exp(\sigma w_\tau) d\tau$. Calculating, we get $J(t) = A + B$, here $A = \frac{1}{\gamma} \exp\left(\frac{\sigma^2 t^2}{4\gamma}\right) (\exp(-\gamma z_1) - \exp(-\gamma z_2))$, $z_1 = \sqrt{t} - \frac{\sigma}{2\gamma}$, $z_2 = -\frac{\sigma}{2\gamma}$,

$B = \frac{\sigma}{\gamma} \exp\left(\frac{\sigma^2 t^2}{4\gamma}\right) \left(\sqrt{\frac{\pi}{4\gamma}}\right) (L(z_2\sqrt{2\gamma}) + L(z_1\sqrt{2\gamma}))$, where $L(x) = \sqrt{\frac{2}{\pi}} \int_0^x \exp(-\theta^2/2) d\theta$ is the Laplace integral.

The Laplace integral is approximated to absolute error $5 \cdot 10^{-7}$ by the expression [6]: $L(x) = 1 - (1 + 10^{-6}x(c_6 + x(c_5 + x(c_4 + x(c_3 + x(c_2 + xc_1))))))^{-16}$, where

$$c_1 = 5,383; c_2 = 48,891; c_3 = 38,004; c_4 = 3277,626; c_5 = 21141,006; c_6 = 49867,347.$$

Figure 2 shows graphs of the cost of put options: $P(X; T) \exp(r_f T)$.

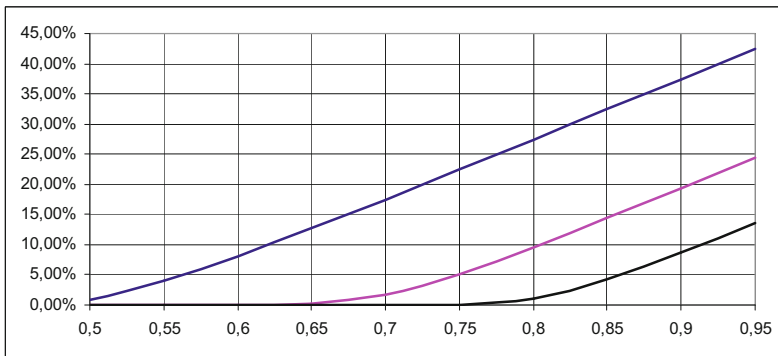


Fig. 2. Graphs of the cost of put options depending on the strike price X for T = 1, 2, 3 (from top to bottom) at $\sigma = 20\%$, $p = 0,03$; $q = 0,38$ (Source: authors).

Figure 3 shows graphs of the cost of call options: $C(X; T) \cdot \exp(r_f T)$.

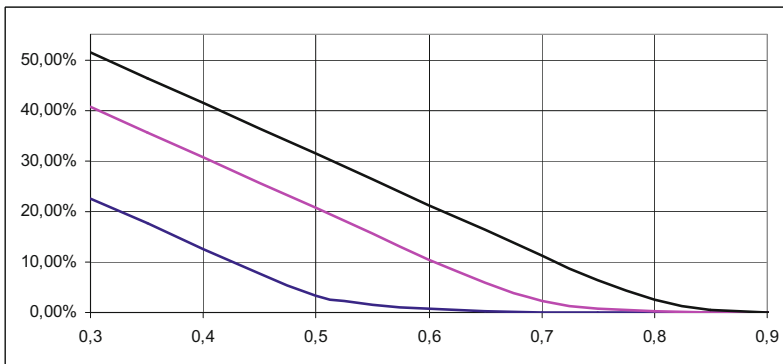


Fig. 3. Graphs of the cost of call options depending on the strike price X for $T = 1, 2, 3$ (from bottom to top) at $\sigma = 20\%$, $p = 0,03$; $q = 0,38$ (Source: authors).

4 Discussion

Considering the research on the impact of the cost of call and put options on the economic aspects of the functioning of both individual economic entities and the country as a whole, it can be noted that this issue has interested scientists in various time periods. So, at the end of the 20th century, scientists noted that with sharp fluctuations in the value of options, there are also fluctuations in the financial flows of most large organizations, which can affect the projects implemented in it [7]. Also, a large role in the issues of fluctuations in the cost of call and put options is given to their influence on currency fluctuations, which is one of the important factors in the analysis of innovative projects [8]. Other researchers use their own approach when assessing the impact of options' value, which is intended to show more clearly the impact of fluctuations on the economic components of projects [10]. A semi-closed analytical formula is also often used [6]. Special attention is paid to the analysis of the option price of precipitation derivatives using a stochastic model of daily precipitation [5, 11].

5 Conclusion

A prerequisite for the adoption of an innovative project should be an assessment of the main indicators, taking into account the risk and uncertainty of the project parameters, primarily taking into account possible deviations of the actual project revenues from the planned ones. Initially, reasonable assumptions are made about possible ranges of changes in receipts and corresponding ranges of net cash flow from the project. These assumptions are transformed in different ways into other assumptions, depending on the used analysis methods, for example, in modified ranges - in the methods of interval mathematics, in fuzzy numbers - in the method of fuzzy sets, in continuous flows - in

the method based on stochastic processes. As a result, the risk section of the investment project is filled in with a table that specifies the method of analysis, initial assumptions, and assessments of indicators for each range of changes in receipts.

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Investment Banking and Its Features in Russia

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Abstract. The banking business is transforming under current economic realities. This is not about increasing the role of financial technology or the Fintech industry in banking practice. The essence of modern transformation of the banking sector is its expansion, the capture of new market segments. A modern bank is an independent ecosystem with its own production potential, characterized both by production assets of pledging clients and by its own IT centers developing new digital financial assets. However, banking expansion also occurs in an extensive way. Banks begin to expand the range of their potential customers abroad, becoming transnational financial institutions, the task of which is to provide their new customers with a full range of investment services. The purpose of this study is to analyze the features of the investment banking development in Russia. For this, the following tasks are solved: a list of operations performed by domestic banks is determined, and the investment position of the domestic economy is analyzed to identify the development potential of investment banking in our country. Key research methods include synthesis, analysis, and expert judgment. The results of the study are reflected in a table representing the international investment position of the Russian Federation.

Keywords: Corporate bonds · Debt financing · Depository services · Direct investments · Investment bank · Stocks

1 Introduction

There is a need for the existence of financial institutions that can accumulate and redistribute investments because business entities that have free cash, in most cases, would like to increase and save it. However, their professional knowledge and skills for competent investment in fixed and current assets are not enough. Based on this, counterparties, to reduce transaction costs of finding financial platforms for issuing financial instruments, should have information about the very possibility of consulting with specially created institutions in carrying out their investment operations. The relevance of this topic is that there is currently a merger of commercial banks and other financial intermediaries. Many large investment banking systems are branches or subsidiaries of large multinational banks [10].

2 Methodology

In researching the key aspects of investment banking, the conceptual basis for the analysis and comparison of the findings became theories that highlight the motives and advantages of banks in their investment operations: from underwriting to acquisition of a share in the authorized capital of other financial institutions. This is the work of a few domestic scientists, for example, Nikulina and Bukreeva [8], Rozinsky [9].

The study of investment banking features is carried out by many modern researchers. Most of them believe that the concepts of investment banking and investment banking system are similar and are based on the provision of services to customers. Other researchers believe that they differ, due to the clear separation of operations for their customers [6]. Often, the studies of investment banking problems represent theoretical justification for investment banking as a mediation between investors (who have money to invest) and corporations (which need capital to grow and run their business), for example, Emelyanov [4] adheres to this point of view.

In Russia, investment banking services are provided systematically not only by large important banks. At present, more than three dozen investment banks carry out their activities in the country, a significant part of which are foreign. The following research methods are used in the study: systematic, to systematize the key factors mediating the current process of attracting and distributing investments; the method of analysis and synthesis; expert assessments of domestic and foreign researchers.

3 Results

One of the main issues in the banking sector is to identify the main trends that are currently taking place in the investment services market and identify the factors that determine their development, since investment banking is an important area of the banking business. In most countries, commercial banks are gradually turning into financial groups of companies that offer customers a wide range of services:

- traditional - common to all commercial banks: bank loans, deposits, cash settlements,
- investment banking - financial services that are based on investment management, sale of securities, issue of new shares, etc. so that companies can raise capital,
- asset management is a process in which a client transfers his assets to an authorized person for use, and he, in turn, increases this capital with the help of his knowledge, professional skills and capabilities,
- insurance is to provide insurance coverage to policyholders and insurance organizations,
- depository services directly related to the storage of securities and carried operations to change their owner.
- Investment banking is based on:
- advising, for example, on issues of mergers and acquisitions of organizations,

- assistance in the placement of securities of companies (IPO, underwriting),
- customer asset management,
- management of funds, portfolios in the interests of third parties,
- customer securities management,
- trading operations with securities and related services.

Investment banking greatly facilitates the issuance of new securities necessary for creating projects, for acquisitions or transforming a company into a public one. Securities are placed by banks through an initial public offering (hereinafter - IPO).

An efficient underwriting procedure is the responsibility of a highly qualified expert who monitors the creation and issue of securities and works in the field of redistribution of valuable documents. An underwriter can be either an investment bank or a large investment company licensed by the Bank of Russia and approved in writing. Another important area in investment banking is the study of the stock market. To analyze the industry, experts and analysts take a lot of time, and therefore researching the stock market by a specialized underwriter bank will greatly facilitate their work and the need for independent analysis of segments will disappear [3].

Investment banks in Russia also offer a wide range of debt financing services: issuing ruble bonds, issuing Eurobonds LPN/ CLN, issuing ruble corporate bonds, issuing ruble bank bonds, issuing ruble bonds for Russian regions and municipalities.

Investment banking has both advantages and disadvantages. The advantages of investment banking include: the ability to significantly increase the client's assets, the minimum risk of default of the client's obligations, a wide variety of investment products, the ability to change and structure investment services and products for the client, the high probability of attracting a large amount of money in the client's project, etc. The low level of interest in the success of the client, risky transactions, the lack of a large amount of own funds at banking institutions (which negatively affects the activities of financial institutions during the crisis), the bank acting as a short-term lender indicate the key shortcomings of investment banking [1].

An organization that has an investment business should monitor the value of financial assets (mainly their growth), as well as examine the geographical penetration and spread of capital markets and the increase in the number of assets in use. The financial depth of the market is one of the main factors in assessing the prospects and opportunities for the development of investment banking in the country.

The Central Bank of the Russian Federation reflects the investment position of the country at the international level in the form of statistical data [2]. This procedure makes it possible to assess the volume of foreign assets and liabilities of the country, as well as to analyze the operations performed and their results to determine changes in the structure of external assets and liabilities. Globally, investment banking plays a large role and occupies an important place in the global economy.

Table 1 summarizes the investment position of the Russian Federation at the international level.

Table 1. Investment position of the Russian Federation (in millions of US dollars)

Indicator	2015	2016	2017	2018	2019
1. A net investment position at the international level	678 338,7	439 332,9	561 057,9	748 025,4	713 007,4
2. Assets	2 355 876,0	2 482 147,0	2 693 494	2 686 296	3 021 133
Direct investments	750 068,6	853 216,6	954 426,8	871 724,1	1 001 166
Portfolio investments	136 237,4	144 120,3	147 891	137 102,2	160 588,8
Derivative financial instruments and stock options for employees	22 291,47	13 713,06	9 706,792	12 813,92	10 724,26
Other investments	710 481,1	715 613,9	715 985,3	727 665,9	739 935,2
Reserve assets	736 797,3	755 482,7	865 484,4	936 990	1 108 719
3. Obligations	1 677 537	2 042 814	2 132 436	1 938 271	2 308 126
Direct investments	695 379,7	955 340	1 059 288	994 732,3	1 171 628
Portfolio investments	283 293,8	431 920,6	460 309,7	413 818,7	605 348,3
Derivative financial instruments and stock options for employees	18 489,76	12 910,08	9 009,461	9 865,995	11 465,09
Other investments	680 374	642 643,1	603 829,5	519 853,6	519 683,8

Source: author based on [2].

Assets increase annually due to the growth in direct (by 334 837.0 million dollars) and portfolio (by 23 486.6 million dollars) investments, as well as due to the growth in reserve assets (by 171 729.0 million dollars). However, liabilities in the same areas are also growing: direct investments and \$191,529.6 million portfolio investments by \$176,895.7 million.

4 Discussion

The Russian investment business both takes capital abroad and actively attracts it in foreign markets to create and acquire assets. Individual investment banking products, the level of the country's stock market development, the level of potential financial intermediaries that provide necessary investment services and mediate the banking institutional environment directly depend on how investment banking is developed. If these factors are correct, harmoniously interact and improve, this will ensure the continuous development of investment banking [7]. Also, for investment banking to continue its successful development in our country, it is necessary to create conditions for the correct and effective functioning and improvement of the subjects of the real economy. Subsequently, these entities should influence the increase in demand for investment services and products. In the medium term and with the lack of sharp and deep financial shocks, this circumstance will have a positive impact on increasing the

volume of securities, improving their quality, as well as on the securities market development as a whole [5]. The development of competition in the financial and banking sectors is also an important factor for improving investment banking, since healthy, fair competition has a positive impact on the quality of investment services provided, and their structure affects the emergence of new investment products.

5 Conclusion

Thus, from the foregoing, it can be concluded that investment banking is a segment that offers services such as raising capital, financial advice, underwriting shares and other securities, facilitating mergers and acquisitions, and much more for individuals and organizations. First, investment banks are engaged in the creation of capital for organizations to plan and manage financial aspects of project activities of business entities. They act as an intermediary between investors and organizations that need capital for their business or new projects. Investment banking has a direct impact on the global economy: the movement of production and financial resources between countries, the development of industry, the improvement of the range of debt financing services, and the improvement of foreign assets and liabilities of national economies.

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Financial Conditions for the Development of Entrepreneurship in a Modernized Economy

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Abstract. The study of the financial aspects of small business development in the context of economic modernization is associated with virtual space due to the fact that information networks connect electronic exchange markets, in which contacts are made between various economic entities. The financial conditions for the development of small organizations have a number of features in comparison with other business entities. The financial conditions for the functioning of small organizations are influenced by positive and negative factors. It is proposed to isolate significant factors of using modern financial technologies using SWOT analysis. A systematic approach is proposed to determine the influence of the identified factors of financial technology on an important result of the activity of a small organization - economic added value. It is noted that modern financial technologies include, by types and scales, a variety of financial services provided to small organizations. In view of the fact that at present the importance of digital capabilities of companies is increasing compared to the availability of financial and production resources, it is concluded that modern financial technologies are key factors in ensuring the effective development of economic processes in small businesses.

Keywords: Financial conditions · Financial technology · Small business

1 Introduction

The financial conditions for the development of small businesses are significantly changing in modern conditions. This process is influenced by both exogenous factors that are independent of the activities of a small organization and endogenous factors determined by the financial functioning policy. In accordance with Russian law, "small businesses include legal entities, farms and individual entrepreneurs." The number of employees in these entities cannot be more than 100 people. The maximum amount of revenue from the sale of goods (works, services) for the previous year for small organizations is 800 million Rubles. The financial conditions for the development of small organizations are specific, including: adaptability to changes; relatively high operational efficiency; use of narrow specialization; a simplified accounting system for individual tax systems. There are no studies on this topic, only certain issues have been considered in the last period. In work [10], a study is conducted of the asymmetric

effect of financial conditions on the sensitivity of investments to cash flow. The study [2] aims to facilitate access to credit for small and medium-sized businesses, reduce the cost of borrowing and reduce default; risk management of banks. In the article [11], the authors reveal a number of fundamental factors (such as personal views, life events and prospects for the future) that determine the goals and perceptions of small business owners and affect their financial decisions, actions and future financing options. In the work [1], it is noted that firms introducing any innovations, and in particular, innovative processes, are still more likely than not innovators to survive crises, even if their financial structure is adopted into account. The authors [3] consider financial services offerings of technology companies with a strong presence in the digital services market. It is noted in the work that BigTech firms often start with payments, and then some expand to the provision of credit, insurance and money management products. In a study [8], the authors note that blockchain technology can affect organizations, their business models, and how they create and generate profit; they consider how various types of blockchains affect business models. In [9], the authors examined the impact of investment in information technology on the long-term value of an organization’s business. The authors found that press releases can affect the market value of the company, possibly providing investors with a better understanding of the current and future operations and strategies of the company. The low level of development of small businesses in our country is due to several reasons: insufficient provision of financial resources and cooperative ties of small businesses with large business companies; insufficiently intensive investment activity, incompleteness of the developed system for supporting small businesses; the significant impact of economic modernization on the conditions for the functioning of small businesses [7].

2 Methodology

An increase in the level of financial management of small businesses leads to an increase in the need for modern financial technologies for effective functioning in the current conditions [4]. The financial conditions of the functioning of small organizations are influenced by various factors, both positive and negative. The selection of significant factors for using modern financial technologies is proposed to be carried out using the SWOT analysis (Table 1).

Table 1. SWOT-analysis of the financial technologies application in small businesses

Intrinsic factors	S – strengths	W – weaknesses
	Decreased payment period	Excessive risks in operations
	Significant turnover of funds used	Significant software acquisition costs
	Elasticity, quick adaptation to change	Cybersecurity costs
	Reducing the cost of manufactured goods, works and services	Difficult device setup and reduced access to financial transactions

(continued)

Table 1. (continued)

External factors	O – opportunities	T – threats
	Creative performance	Economic circumstances at the macro level
	Increase in revenue from the sale of goods, works and services	Lack of regulation of transactions at the legislative level and general conditions for verification of transactions
	Active market behavior	Problems due to the issue of new unsecured electronic currencies
	Ability to use the support of financial institutions	Increase in the number of cyber attacks

Source: authors.

Analysis of various possible combinations of strengths and weaknesses with opportunities and threats, based on the SWOT analysis, allows you to create a problem field for the functioning of the studied small organizations. The problem field includes: risks during operations; expenses associated with the acquisition of software; cybersecurity related costs; reduced access of devices to financial transactions; economic circumstances at the macro level; inadequate regulation of transactions at the legislative level and general conditions for verification of transactions; problems caused by the issue of new unsecured electronic currencies; an increase in the number of cyberattacks that appear. The use of digital technologies in small businesses is influenced by a variety of risks arising from exogenous factors. External economic risks include (Fig. 1):

- unreasonably overvalued assets, entailing the appearance of financial bubbles in the economies of developed countries,
- long-term almost zero inflation in the economies of leading countries, characterizing deflationary processes,
- lack of critical infrastructure, lack of investment to protect networks, which leads to negative system-wide consequences,
- sharp changes in energy prices, which leads to pressure on energy-dependent types of economic activity,
- depreciation of traditional assets that are not subject to digital transformation.

Technological risks that accompany the digitalization process include (Fig. 2):

1. Possible adverse effects of technological progress that could lead to environmental or economic losses.
2. The emergence of cyberdependence, which affects the risk of failure of the information infrastructure.
3. The spread of malware, causing economic losses, geopolitical tensions due to significant cyber-attacks.
4. The misuse of public, corporate and private data that occurs due to massive cases of fraud.

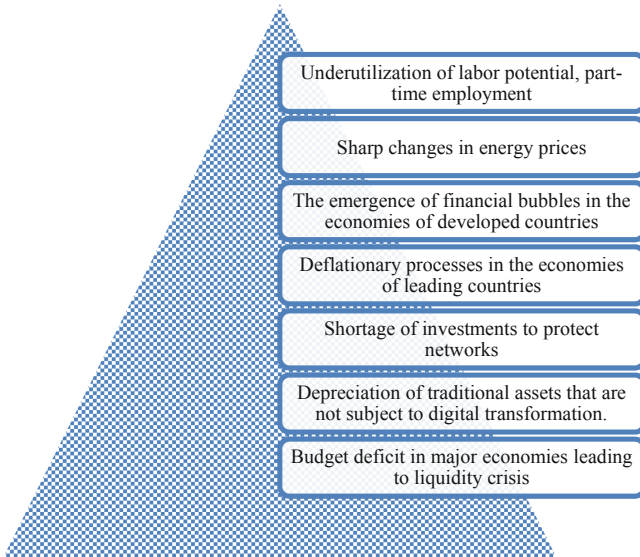


Fig. 1. Economic risks of the digital economy (Source: authors)

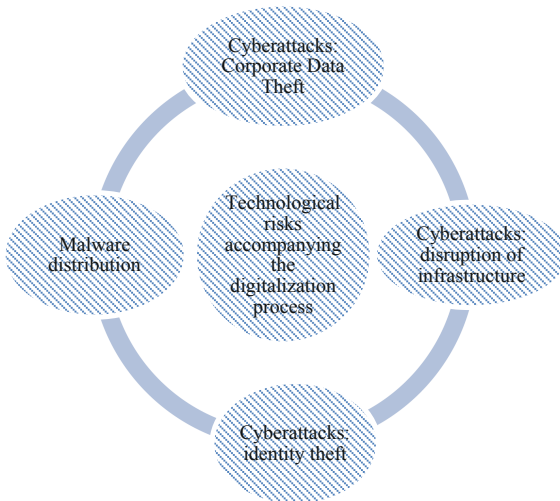


Fig. 2. Technological risks that accompany the digitalization process (Source: authors)

3 Results

The activities of small businesses in the modernization of the economy is accompanied by both economic risks and technological risks. The strategy for solving the problems of development of small business organizations includes a number of strategic steps that determine the sequence of transformations of the state of the object of study:

$$S_0 \rightarrow S_1 \rightarrow S_2 \dots S_m \rightarrow S_c$$

where: - S_0 initial state of the facility; S_c - is the recommended state of the object; $S_i \rightarrow S_i + I$ - is a strategic step at which the problem is revealed and, based on the analysis of factors, the required change is formed.

To analyze the results of applying financial technologies in the financial management of small business organizations, you can use the cognitive structural scheme, on the basis of which the relationship of the influence of positive and negative factors on the main effective indicator - economic value added (EVA) is established [5]:

D - Reduction in the period of payments.

V - The cost of manufactured goods works and services.

E - Costs associated with the acquisition of software. Cybersecurity related costs.

P - Increased risk of emerging cyberattacks.

The EVA variable as a function displays changes under the influence of factor arguments and represents the probability of a certain result, for a set number of factors, the calculation is performed using the logistic regression equation (Logit-model) [6]. In the equation, the regression coefficients reflect the degree of influence of the corresponding argument factor. An independent variable increases the likelihood of an event under investigation with a positive sign in front of the regression coefficient. With a negative value of the regression coefficient, an independent variable reduces the likelihood of the occurrence of the investigated event. A significant value of the regression coefficient indicates a significant effect on the probability of the occurrence of the event, when approaching the zero value of the regression coefficient, the degree of influence on the dependent variable will be insignificant. The range of variation of the values of the logistic function can be from minus infinity to plus infinity, while the calculation result can take values from zero to one.

The variable Z reflects the susceptibility to a certain set of factor arguments, the function F (z) acts as the probability of a specific outcome, for a given set of factors.

For various small business organizations:

$$F(z) = \beta_0 + \beta_1 D + \beta_2 V - \beta_3 E - \beta_4 P$$

F (z) -dependent variable: 1- if positive economic added value, 0 - if negative economic added value.

You can calculate the logistic regression model using professional statistical data analysis programs: SPSS, SAS, R, Statistica and others. In contrast to the linear regression model, the regression coefficients in the logit model produce a multiplicative effect on the dependent variable. In the logit model, changes in the probability of a function value are caused by a change in the argument by one unit, while the remaining

parameters are accepted as constants. The dependence vector is determined depending on the sign in front of the regression coefficient.

On the basis of a logistic regression model constructed accordingly, it is possible to predict the dynamics of obtaining the economic added value of a small company using modern financial technologies. The bulk of management decisions in entrepreneurship is the tailor-made constructor. In finance, virtually all new technologies focus on changes in B2B and B2C payments; smoothing barriers in the transition to digital technology. At the same time, the creation of new standards of electronic payments is being carried out, which allows to carry out business optimization, reduce costs by automating processes, use electronic assistants, and personify goods. In modern conditions, to ensure business efficiency, it is necessary to develop a sound strategy for digital transformation; individual tools and methods should not be unsystematically applied. The use of financial technologies allows accelerating the timeframes for preparing management reports within a small organization and strengthening monitoring in the management of financial resources.

4 Discussion

Modern financial technologies expand the possibilities of attracting financial services for small businesses [5]. Modeling of positive and negative factors in the financial management of small organizations favorably affects the development of these organizations. In the digitalization system, there has been an increase in the financial services provided to small organizations. Modern financial technologies cover, by types and scales, various financial services: electronic payments and transfers, crowdfunding, asset management, financial marketplace, block chain, etc. (Fig. 3).

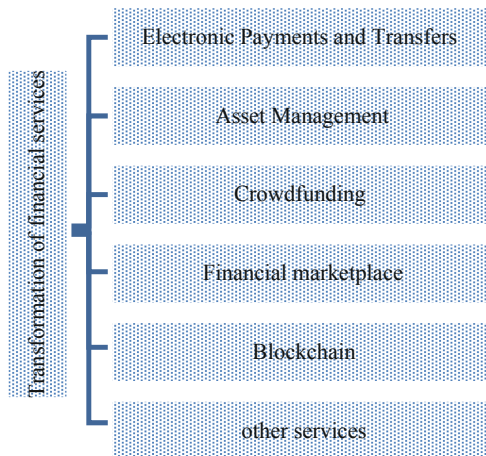


Fig. 3. Transformation of financial services (Source: authors)

The trend towards the organization of fully digital banks continues to be developed in the system of using online banking services. Cloud technologies provide more opportunities for the development of financial technologies and application in various types of economic activities.

5 Conclusion

In modern conditions, the main activity of business entities is associated with the use of digital technologies, functioning in the digital space, which allows to obtain additional opportunities to increase economic efficiency. The use of modern financial technologies allows small businesses to develop, since this does not require significant amounts of financial investment and attracting a large number of employees. Using financial technologies, it is possible to reduce the costs of small organizations, it is advisable to conduct financial management. This will make it possible to increase the market value of a small organization, which positively affects the company's development strategy. Modern financial technologies are one of the significant directions in ensuring the increase in the value of the business of a small organization. The use of financial technologies in the practice of a small organization can improve the financial policy of a small organization, increase management efficiency and competitiveness of manufactured goods, works and services.

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Innovations in the Development of the Individual Investment System in Russia

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Abstract. Today, one of the tasks of the financial market is to ensure the accelerated economic development of the country through a qualitative increase in the competitiveness of the Russian financial market and the formation of the independent financial center on its basis. At the same time, it is necessary to introduce tools to ensure the participation of numerous individual investors in the securities market and protect them. Such tools in the modern financial market of Russia are an integral factor in its development. The main problem when choosing the financial instrument by the individual investor is the desire to receive the largest possible income with minimal risk. When developing financial markets, stock instruments are constantly being improved; new ways of investing free funds are appearing, which are actively being discussed. This determines the relevance and significance of this study, in which the authors analyze the problems and prospects of individual investors in the Russian securities market.

Keywords: Financial instruments · Individual investment · Investment portfolio

1 Introduction

The securities market is one of the main mechanisms for attracting internal and external investments to increase economic growth, as well as to develop the scientific and technological progress and innovation. Financial instruments of the securities market today are one of the most effective ways to protect both savings from inflation and their increase. Nevertheless, the opportunities of the Russian securities market, for one reason or another, do not attract most potential Russian and foreign investors, while the practice of investing in securities in all economically developed countries has long been familiar and completely natural [7]. Therefore, it is necessary to identify the main problems of individual investment in the Russian securities market. Indeed, any citizen is interested in obtaining a constant passive income, but often there is no reliable information on how to make profitable investments of available funds [4].

Many have already tried to open deposits in banks, and a lot of people have lost money in various kinds of financial pyramids. In other words, Russian citizens have enough negative experience associated with the desire to preserve and increase their savings [1, 6, 9, 10]. Often, a person who has free funds and is tempted by the desire to get a quick income, does not understand how the securities market works and how he

can correctly and profitably invest in it. As a result, he invests money in dubious projects with a yield of 30–50% per annum. Accordingly, money disappears almost immediately and there is no question of any profit. Therefore, many citizens believe that investments through a broker are not much different from financial pyramids.

2 Methodology

Currently, there is a list of ways to invest savings in the economy that are available to households in Russia. Investment tools are investment methods. These tools are united by the fact that they carry out the necessary function for the investor, which is to facilitate the diversification of the investment portfolio. Various methods can be used to research these tools [2]. The reliability of the conclusions and recommendations obtained during the study is ensured by the application of general scientific methods and technologies of scientific knowledge, including experimental-theoretical methods (comparison, analysis, generalization, systematization), table and graphical interpretation technologies, econometric analysis methods.

3 Results

Unfortunately, very little is known about passive investments in our country, although this, in part, is the principle of financial literacy. To clearly identify and demonstrate whether there is a problem of the lack of proper informing of the population about all the possibilities of investing their own funds and the lack of financial literacy of citizens, a sociological survey was conducted. 3 age groups participated in the survey:

1. Citizens from 18 to 25 years old.
2. Citizens from 26 to 44 years old.
3. Citizens from 45 to 65 years old.

Participation in the survey of people of various gender and age structures made it possible to ensure representativeness of the survey and reflect the opinion of various segments of the population on issues related to the individual investment system. To begin with, respondents were asked a question regarding their overall awareness of the concept of “individual investor”. Only 60% of respondents were familiar with this concept, another 13.7% of respondents were not previously familiar with this concept. However, they were interested in its presentation.

If you analyze by age, you can draw the following conclusions:

- the most knowledgeable in this matter were citizens aged 18–25, 75% of them are familiar with the concept of “individual investor”, while the awareness of other age groups ranged from 43–45%,
- the greatest interest was shown by citizens aged 45–65 (21%).

In the next question, individual investors were surveyed. Only 16.3% of respondents are individual investors, while the most investors were identified in the age group of 45–65 years old - 36% of respondents; then citizens of 18–25 years old - 15% and

the smallest percentage of the middle age group. The next thing the authors wanted to clarify was whether respondents want to learn in more detail something new about financial instruments of individual investment. Younger respondents showed a great interest in it - 77%. At the same time, only 27.5% of all respondents said that they were not interested in this.

The next question that respondents answered was the question about financial instruments in the securities market that they know. The choice was represented by the most common of them: stocks, bonds, federal bonds with fixed and variable coupon income, ETFs, mutual funds, and it was also proposed to add your own option. The following results were obtained:

- almost all respondents were familiar with a tool such as stocks (91.3%),
- the number of people choosing bonds and federal bonds with fixed and variable coupon income was 75 and 62.5% of the total number of respondents,
- mutual funds were familiar to 47.5% of respondents,
- ETFs were familiar to 25% of respondents,
- 7.5% of respondents said that they were not at all familiar with these tools,
- in addition to the originally named tools in the questionnaire, only 1.3% of respondents added their own option.

The next question asked was whether, in their opinion, sources of information on tools and methods of investing in the securities market are available to a novice investor. The survey results can be seen in Fig. 1.

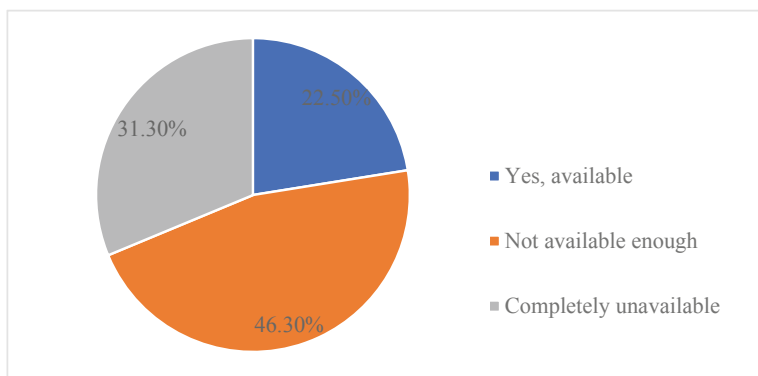


Fig. 1. Satisfaction with the availability of information sources (Source: authors).

Only 22.5% of respondents said that the system of informing citizens is sufficiently developed, the remaining 77.5% are not satisfied or not completely satisfied with this institution. The next question helped to identify the number of citizens with free cash and a willingness to invest, the results can be seen in Fig. 2.

It is worth noting that 22.5% of respondents are willing to invest available funds in the securities market, 77.8% are not investors. Obviously, there are certain reasons for this and they, in some way, are associated with the full informing of the population. At

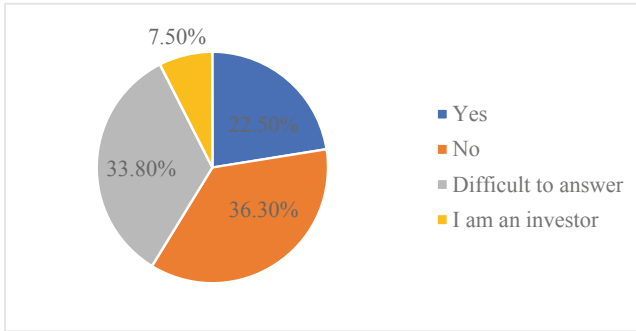


Fig. 2. Availability of free funds among citizens (Source: authors).

the same time, when asked whether respondents would like to receive detailed advice on possible investment methods, 67.5% answered that they were interested. It can be concluded that the population is sufficiently interested in investment activity, but it is insufficiently provided with information about its specifics.

When asked whether you trust the modern system of investing in securities, only 26.3% of respondents answered positively. The rest of respondents either doubt or even consider such a way of generating income a fraud. Moreover, respondents of the younger age group express the most confidence in this system. It was also interesting to find out how our respondents evaluate banks' offers to use an investment product. The results can be seen in Fig. 3.

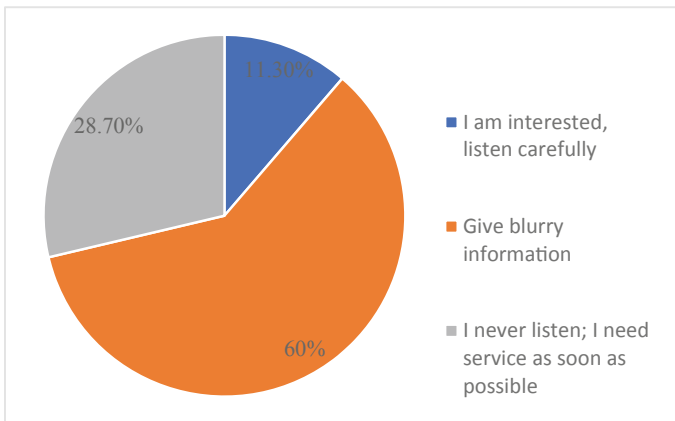


Fig. 3. Assessment of the level of informing citizen (Source: authors).

Only 11.3% of respondents were satisfied with the information provided by banking organizations about new or promising products, which suggests that such a system needs to be improved. Often, credit organizations offer a high-quality and good product, but everything is presented in such a way that a citizen appears mistrusted.

4 Discussion

In Russia, there are some serious difficulties on the way of developing the individual investment system. The first of these is the almost complete lack of information, the lack of support from financial institutions. Meanwhile, the state is trying to attract and stimulate investment activity of the individual investor, for example, through the creation and implementation of Individual Investment Accounts (IIA). It is not worth denying that the share of individual investments in the Russian economy is at a rather low level compared to the United States or Europe, and the creation of investment accounts for citizens, unfortunately, does not solve all the problems. Having gotten an IIAs, a novice investor is faced with the same problems: informational noise and propaganda of trading against the background of the almost complete lack of information about alternative opportunities. Here we again turn to sociological research. Respondents were asked if they knew such an instrument as an individual investment account. The survey results can be seen in Fig. 4.

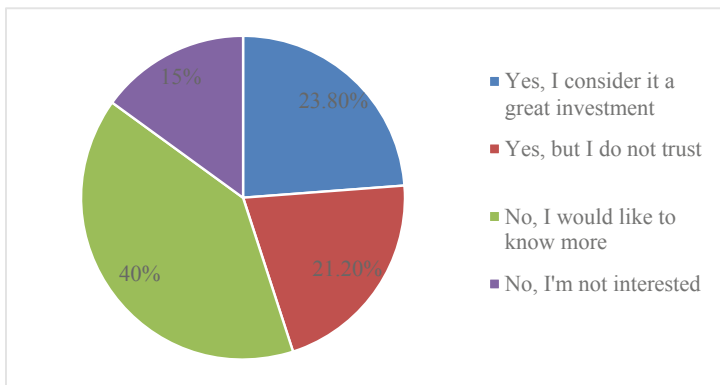


Fig. 4. Citizens Awareness of IIAs (Source: authors).

Thus, only 23.8% of respondents are familiar with IIAs and trust this method of investing. The opinion of another 21.2% of respondents was greatly distorted due to the lack of proper information, and the remaining 55% of respondents did not even hear about such a product. At the same time, one can again notice interest; 40% of respondents were really interested in this tool. In our opinion, it is important not only to inform the population about the positive qualities of a product, but also to explain in general how investing works, where the money comes from, and also to inform about possible risks. Then the potential investor will not have an idealized image of instruments and the process of the appearance of income from investments will not seem suspicious to him [3]. Such programs, webinars and simply information seminars and lectures conducted by direct participants in investment activities can be implemented in higher education institutions [5, 8]. This will help to affect not only theoretical aspects of investment activity, but also practical ones, which in turn will motivate citizens to invest in activities.

5 Conclusion

However, in addition to the identified problems regarding the lack of adequate public information, information noise, low financial literacy and the investment culture of the population, there are some problems that hamper the development of the individual investment system. At present, the Russian securities market should strive to solve these problems and, as a result, to increase development indicators. For this, it is very important to take measures to eliminate existing problems, and to study the experience of foreign securities markets. The development of the favorable investment climate will contribute to improving the economic situation in the country, increasing the well-being of citizens and creating potential for economic growth.

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Digitalization of Tax and Customs Control of Foreign Trade Operations

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Abstract. In the context of digitalization of the world and Russian economy, the digitalization of tax and customs control processes for export and import operations becomes an urgent issue. The article analyzes modern approaches to FTS (Federal Tax Service) and FCS (Federal Customs Service) to electronic products and services using that allow companies involved in foreign trade transactions, to implement electronic document management with regulatory authorities. Digitalization of tax and customs control processes allows the state to increase the transparency of customs operations, track and identify goods in real time, increase the collection of customs payments, and simplify the collection of statistical data. For Russian organizations, this is a way to minimize the time and material costs of abandoning paper document management in favor of electronic, as well as increasing confidence in employees of regulatory authorities by automating processes, reducing technical errors in documentation and calculations.

Keywords: Customs payments · Digitalization · Electronic tax services · Excise taxes · Procedures for customs declaration of goods · VAT

1 Introduction

According to the national program “Digital economy of the Russian Federation” implementation plans, the directions for the development of digital technologies and the formation of information security of society are particularly relevant [8]. The introduction of elements of services provision automation and the use of modern digital technologies in the work is becoming an object of attention in the modern business community, in particular in the field of taxation.

The main purpose of the tax control of the Russian Federation on foreign economic operations is to prevent illegal budget losses from reimbursing domestic indirect taxes to exporters and to timely and fully ensure receipt of taxes and customs payments when moving goods across the customs border of the Russian Federation, as well as when receiving income of foreign organizations and non - resident individuals from sources in the Russian Federation. Another purpose of customs control in import operations is to protect the interests of domestic producers, create conditions for fair competition in the domestic market, for such purposes, non-tariff regulation measures are introduced. Such measures include quotas, licensing, technical quality control of products, and the introduction of additional antidumping, special and protective duties.

The desire to automate taxation processes has become particularly important in recent months due to the current situation in Russia and around the world related to the spread of coronavirus infection. Considering this circumstance, as well as the current level of economic globalization that has developed in recent years, the process of constant systematization of the national tax systems interests of various countries, the complexity and financial cost of tax control, further development of Russia's foreign economic activity requires the development of a set of effective control measures and improvement of digital mechanisms for interaction between the state and business in tax and customs administration.

In 2018 and 2019, the Federal Customs Service has developed, implemented and optimized a number of technologies, including the APS "Personal account of a foreign trade participant", designed for personalized information interaction of foreign trade participants with customs authorities [13]. The website of the Federal Tax Service also provides electronic services for foreign trade participants, such as "Checking the presence of the application for the import of goods and payment of indirect taxes (EAEU)", "Checking the traceability of goods" [14].

2 Methodology

Different methods were used in the research process. These methods include: diagnostic (diagnostic analysis of the state and causes); theoretical (rational knowledge, dialectical logic, etc.); empirical (measurement and generalization of research results, facts description). The need for active implementation of new digital technologies in the control of foreign trade operations is due to the improvement of the accessible process of transferring information from organizations to controlling bodies, which primarily include the Federal Customs Service and the Federal Tax Service. Customs payments: import and export customs duties, customs fees, VAP and excise taxes are not only an actively used tool of state regulation of Russian enterprises' foreign trade, but also a donor to the federal budget of Russia. It is considered a labour-intensive process to collect a set of documents for export operations when exporting goods abroad confirmation. For export operations, Russian companies are exempt from excise taxes and apply the 0% VAT rate provided that the export transaction is documented within 180 days. Automation of declaring goods at customs, introduction of additional federal tax services for indirect taxation makes it much easier for businesses to collect correctly executed documents, which reduces the tax burden on Russian organizations and encourages them to carry out activities at the international level. For the period from January 2020 to April 2020, the largest share in the structure of Russian goods export in monetary terms is crude oil (\$30 US billions), 84 million tons of this crude oil was exported. According to the volume of exported products for this period, vodka with an alcohol concentration of 45.5% is on the first position. 517 million tons of this product was exported to the amount of 35.6 million US dollars. These types of products belong to the excisable products, so the suppliers of these goods in case of failure to confirm the export operation would pay VAT for implementation of these goods in terms of 20% rate and excise duties, the rates of which are determined based on the

type of excisable goods for the measuring unit according to 193 article of the Tax Code of the Russian Federation [12].

The website of the Federal Tax Service provides an electronic service for exporters participating in foreign trade, in particular, “Verification of receipt of information from the Federal Customs Service of Russia on documents required to confirm the 0% VAT rate (excise tax exemption)”. This service allows you to quickly use remote access to find out the latest information from the Federal Customs Service of Russia about the receipt of documents confirming the 0% VAT rate and (or) excise tax exemption.

An important condition for confirming zero VAT is the presence of customs authority notes on the customs declaration. Tax legislation provides for two types of notes: “Release allowed” — on placing goods under the customs procedure of export; “Goods exported “ - on the export of goods from the territory of the Russian Federation. In a letter dated 31.07.2018 no. SD-4-3/14795@ FTS explains that if a company submits a customs declaration in electronic form, it is sufficient to provide the “Release allowed” note in the form of information on the goods release [5]. This note will appear in the document automatically when the customs authority finishes checking the declaration and sends the corresponding message to the service for customs declaring procedure. Further, you do not need to put the original stamp “Release allowed” on printed copies of customs declarations.

The note “Goods exported” must be obtained in the form of an original stamp only if the exporting company will submit documents confirming zero VAT to the tax service on paper. The stamp is placed on the customs declaration and on the transport document by the customs authority at the border crossing point. At the same time, the inspector shares information on the goods export into the database of the Federal Customs Service of the Russian Federation and then this information is transmitted to the Federal Tax Service for control (item 17 of the article 165 of the Tax Code of the Russian Federation) [12].

For indirect taxes on import operations, a separate tax declaration is submitted for the member countries of the Eurasian Economic Union. Indirect taxes paid during the import of goods include VAT and excise taxes. Value added tax is paid by all suppliers whose goods are subject to taxation at the rates of 10% and 20%; excise taxes are paid at customs from excisable goods at the rates specified in 193 article of the Tax Code of the Russian Federation. Organizations under special tax regimes generally pay VAT on import operations, since the tax exemption applies only in the implementation of goods on the domestic market of Russia. At the same time, such organizations cannot accept VAT paid at customs as a deduction, but when choosing the Simplified Tax System “income reduced by the amount of expenses”, they can take into account the VAT paid in expenses for tax purposes.

For import operations, the website of the Federal Tax Service also provides electronic services for foreign trade participants: checking the presence of an application for the import of goods and payment of indirect taxes [12]. (EAEU); verification of applications lists for the import of goods and payment of indirect taxes from the EAEU countries. These services allow their users to quickly get information in electronic format, which greatly simplifies the procedures for interaction between representatives of state structures and payers of duties and taxes. Government agencies are actively developing and improving virtual communications in order to develop the national

program “Digital economy of the Russian Federation” and within the framework of the requirements for foreign economic activity of the OECD for the centralization of digital technologies according to the “Going Digital” project [6].

3 Results

High efficiency of implementation and application of digital technologies is proved by statistics of the electronic products in foreign economic activity use. In particular, in 2018 and 2019, the Federal Customs Service implemented measures aimed at optimizing and expanding the use of new technologies for customs payments.

Remote payment of customs payments by the entities that carry out the declaration of goods in electronic form has become a popular technology. The main point of the technology is to provide an opportunity to make customs payments using an electronic terminal from your workplace, with the ability to create a document confirming the completion of the customs payment operation.

The share of customs and other payments paid by legal entities using remote payment technology based on the technical means of the customs payment operator in 2019 amounted to 93% or 1,226. 16 billion rubles of the payments amount that are paid through the payment system operated by the customs payment operator [13].

In addition, the technology of centralized accounting of customs and other payments using unified personal accounts of customs duty and tax payers opened at the level of the Federal Customs Service of Russia has been optimized. As of December 31, 2019, 164,587 unified personal accounts of Russian legal entities were opened in the ELS resource. The share of funds paid for customs and other payments by legal entities using the ELS resource in 2019 is 100% of the total amount of funds paid by legal entities [13].

The implementation of the ELS technology allowed optimization of most operations with cash:

- time for crediting funds to the payer’s personal account reduced. It is also currently possible to automatically transfer funds to the payer’s personal account even if there are errors in the payment documents in terms of specifying the code of the customs authority,
- the number of requirements for correcting the declaration of goods during the declaration process and refusals to consider applications for refund due to incorrect indication of payment document details reduced. When using ELS payments are made based on the total free balance of funds according to the budget classification code without detailing the payment documents,
- terms for refunds and the number of documents submitted for this purpose reduced. The refund of excessively paid or excessively collected amounts of customs payments, as well as monetary deposit, is carried out in the form of offset against advance payments without the relevant applications and documents from the payer, subject to the submission of an adjustment of the accrual document,
- interaction with the payer on various aspects of controlling the movement of funds on his personal account is concentrated in one customs authority.

To reduce the time and cost of implementing procedures for foreign trade participants, the automated information system “Central register of foreign trade entities” (hereinafter - AIS “CRSVED”) has developed and implemented a mechanism for receiving and processing applications for the provision of state services for maintaining the register of customs representatives, in electronic form on the basis of the federal state information system “Unified portal of state and municipal services (functions)”. Information on this service, as well as the necessary guidelines, is available on the website of the Federal Customs Service of Russia [13].

As of December 31, 2019, 529 organizations were included in the register of customs representatives, which is 5% more than the number of customs representatives included in the specified register as of December 31, 2018. The share of applications for the state service of maintaining the register of customs representatives sent using the Unified Portal for State Services has increased from 5% to 50% of the total number of applications in three years. In 2019, 281 applications for the provision of the state service for maintaining the register of customs representatives were received and processed electronically through the Unified Portal for State Services, which is 59.4% more than in 2018.

Systematic work is underway to optimize the APS “Personal account of a foreign trade participant”. This mechanism was created and operates for the purpose of personalized information interaction of foreign trade participants with customs authorities. Nowadays, it contains 28 services, including the “Personal account” service, which was sent to check the status of the personal account by a foreign trade participant.

In 2019, the APS “Personal account” was improved in terms of the information service “Customs representative»:

- at the beginning of 2019, the service posted a new report form on the activities of the customs representative, approved by the order of the Federal Customs Service of Russia dated December 13, 2018 No. 2036, which changed the composition of information, some sections of information are excluded (fines, specialists and invoices),
- the main page displays a reminder of the reporting periods on the activities of the customs representative,
- since April 2019, notifications, letters and other messages of the Federal Customs Service of Russia have been sent to customs representatives in scanned form, which has accelerated the receipt by the customs representative of information on the results of providing the state service of maintaining the register of customs representatives and other important information,
- you can view the status of processing and directly go to applications sent via the Unified Portal for State Services [7].

Currently, step-by-step work is being carried out to expand the capabilities of the “Personal account of the customs representative” in terms of sending applications for public services, information letters and requests in electronic form by legal entities.

Currently, the Federal Tax Service of Russia, in accordance with the main directions of the digital agenda implementation of the EEU until 2025, plans to introduce a system of digital traceability of imported goods. This system will help control the legality of the turnover of imported products in the unified customs territory of the EEU [1, 14]. Automation of the process will reduce the complexity of the goods registration

procedure and will not increase the burden on market participants. The system will not provide for physical marking of goods; it will be based solely on the documentary principle, when business entities will include the details of traceable goods in the documentation. A result of this development, consumers will be given the opportunity to get all the information on the purchased products, which will allow businesses to reduce their operating costs, and the EEU member states will be able to reduce the level of fraud on the market and control the payment of taxes.

From July 1 to December 31, 2019 The Federal Tax Service of Russia conducted an experiment on the traceability of goods, which was later extended to 30.06.2020 [10]. The experiment involves 10 product groups: refrigeration equipment, industrial vehicles, washing machines, monitors, strollers and safety seats, etc. Taxpayers who make transactions with such goods can participate in the experiment on a voluntary basis. The product traceability system developed by the Federal Tax Service of Russia will allow you to trace the history of the product from the importer to the final consumer.

4 Discussion

The problem of digitalization of taxation in the world is a hotly debated issue among scientists, economists and practitioners. A special role here is played by the Organization for Economic Cooperation (OECD) project “Going Digital”, aimed at digital transformation of the economy and taxation, in particular, at improving the quality of its processes [6]. Turina analyzes the key problems of transition to the digital platform of international taxation, its prospects and difficulties associated with the implementation and integration of processes [15]. Yapar, Bayrakdar, and Yapar in their article analyze the problems of e-commerce and the specifics of their taxation [17]. Many foreign trade operations that are subject to taxes, duties and fees when imported into Russia are purchased by Russian consumers through Internet resources, where questions may arise about declaring goods, paying customs duties, and even double taxation, which makes this article useful for studying in the framework of our research. Gnanon’s work explores the relationship of digitalization of society, promotion of online trade of services and goods via the Internet with tax reform in developing countries, which has had a positive impact on the development of international trade [3].

Digitization of the declaring goods procedure for the purpose of identifying imported goods and taxing them with customs payments has been analyzed in many articles [4, 9, 16]. Yang is researching blockchain technology (BT), which allows sea transportation to optimize paper document flow in electronic format, which significantly saves time and costs, and also allows you to track goods online [16]. In their research, Henningsson and Henriksen analyze the example of European e-customs and its development prospects [4]. Raus, Flügge, and Boutellier analyze the digitization of the customs as an important element of e-government formation in the EU, highlighting the study of the barriers affecting the slowing of a project of customs implementation procedures, they include: slow adjustment, due to the lack of procedural templates, increased complexity in the process of operations standardization and electronization [9]. Bullock, Haddow, and Coppola have analyzed the importance of customs

territories security, protection of national interests, and management of the moving goods process across customs borders [2].

Shirsavar and Shirinpour discuss the impact of electronic products used in customs administration on the efficiency of export companies on the example of Iranian organizations, in particular, the digitalization of customs procedures allows exporters to increase their competitiveness in international markets by reducing transaction costs [11].

5 Conclusion

Digitalization of economic processes is a modern stage of the evolutionary development of economic entities and their controlling structures. Automation of taxation processes for participants in foreign economic activity allows businesses to reduce the cost of providing document flow for foreign trade transactions, make the process remote and, as a result, more accessible. From the point of view of regulatory authorities, automation of taxation, customs declaration and tracking of goods reduces tax risks and the use of schemes for payment of taxes, duties and fees. Electronic document management and the introduction of additional services increases transparency not only in tax accounting, but also in communication between government agencies and business representatives, which allows us to effectively implement the rights and obligations of all participants in foreign economic activity. An important condition in following modern trends for employees of organizations and officials of the Federal Customs Service and the Federal Tax Service of Russia is the formation of additional competencies related to digital technologies. The main skills of the professionals in this context include: the ability to work with databases on datalogic level of skills accumulation, analysis, processing and presentation (datalogy or data science), the ability to create an information base; ability to formulate and present a coherent chain of blocks (linked list) that contains information (block chain), possession of electronic document management on tax and accounting standards in different platforms, knowledge of the electronic services of FTS and FCS, conducting electronic negotiations. The introduction of digital elements of data analysis in tax and customs administration will help to reduce the time of service delivery, which will have a positive impact on the loyalty of Russian and foreign suppliers to the regulatory authorities and will help to reduce mistakes made due to carelessness.

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Special Aspects of Venture Capital Funding of Innovations in Russia

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Abstract. The article is based on the results of the scientific research within the framework of the university-wide comprehensive theme “A new paradigm of social development in the digital economy” carried by the Financial University under the Government of the Russian Federation. The purpose of this study was to analyze the trends in the development of innovative activities of Russian companies and identify the features of attracting venture capital as the main source of financing innovation. The problems of enhancing innovation in both state corporate structures and private business were examined in the course of research. The main directions of the venture market development in Russia and the peculiarities of financing innovation in the context of the Russian economy transition to innovative development have been evaluated.

Keywords: Innovation · Innovative activity · Innovation funding · Investment · Venture capital

1 Introduction

In today’s transformation of integrative processes, one of the most important directions of increasing the competitiveness of Russian companies becomes the need for a deeper and more comprehensive analysis and evaluation of innovation activity of the state as well as corporate business structures. Since the beginning of the 21st century, global changes have taken place in all spheres of human activity, and this is primarily based on completely new approaches of total digitization of all aspects of life. Science and the arts continue to be the driving force behind development, and digital revolution technologies remain the main engine of change. It is very important for Russia to study the issues of integrative cooperation between innovative business and financial institutions; of improving innovation activity in general, and innovative in industry on particular; of developing new forms of funding innovation. This is due to the fact that today Russia is in a new geopolitical and economic environment, and its future will depend on the ability to manage and implement innovations. Russia receives more than 25% of its GDP from exports of gas, oil, metals, timber and other raw materials and semi-finished products. It is possible to change this raw material orientation only with the development of an innovative economy aimed at the rapid development of high-tech industries.

The knowledge economy, or an innovative economy, becomes the key to future progressive development [7]. Influenced by increased competition in the world economy and the orientation of the domestic economy to import substitution, there was an increase in the importance of the Russian producers, in the position and role in the socio-economic development of the country's large business structures and corporations associated with the application of innovative technologies. The model of an innovative economy assumes the dominance of high-tech products and services in the total GDP of the state. Effective innovation development requires the existence of functional innovation system consisting of institutions, policies and tools which create conditions to foster innovation [9]. However, innovative products are for the most part unique and, as a result, highly risky in terms of investment efficiency and its development and promotion to the market [13]. This creates an objective need for an economic category such as venture financing, which acts as a catalyst for the birth and cultivation of innovative projects.

2 Methodology

The research methodology is based on a market-based approach to evaluating venture financing for innovation. The research was conducted in three key areas: venture capital, innovation activities of particular companies, and innovative activeness. The research analyzed such indicators as: the share of enterprises developing and implementing a new product; the share of high-tech products and services in the state GDP; the number of active funds; the total amount of investments; segmentation of the Russian venture market; the share of expenditures on research and development; and the amount of funding for innovation.

The research applied a market-based approach to assessing investment activities, which involves analyzing statistics for a certain period, as well as analyzing investments in innovation through venture funds. The research used the existing indicators of the European Association for Direct Investment and Venture Capital (EVCA), Russian Statistical Office, as well as investigated country differences in levels of innovation and venture financing during 1990–2018 among developed economies.

3 Results

Modern civilization was invented and put up by creators: inventors, innovators, entrepreneurs, poets. Innovation, being one of the fundamental principles of society development, define all innovative activities as the growth engine of a company. However, innovations are not a real tool in competitive struggle in Russia. The share of enterprises developing and introducing a new product is 19%, which is much less than the share of enterprises that only adapt and use already known technologies and products, which is 27%. Thus, in Russia the level of expenditure for research and development as a percentage is very small on a global scale, just under 2%, while in other developed countries, for example, in the United States, 476.5 billion dollars is invested in science (Fig. 1).

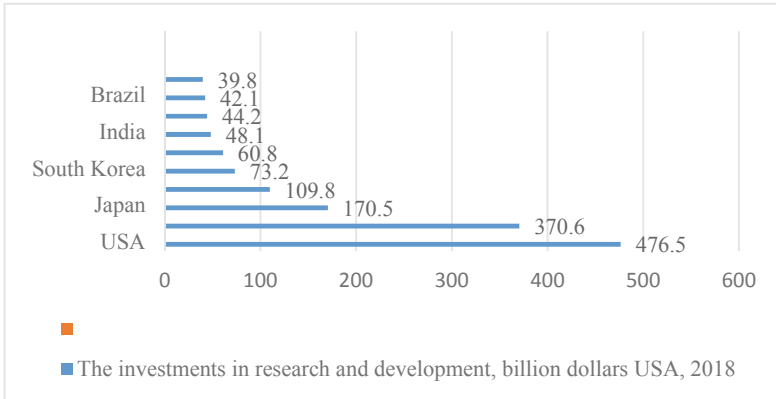


Fig. 1. Investment in research and development in 2018 by country (Source: author based on [8]).

The introduction of innovations most often requires organizational and structural adjustment in the company, which in its turn is associated with additional costs that are long-term in nature. From the point of view of an investor who invests money in a technology, the appearance of a new, more effective, often built on new principles technology, poses a threat to the existing one. Therefore, investors try to hold it back for a while, at least until the previous investments are paid off.

As a rule, venture investors tend to be very selective about the choice of their goal and try to work with technology companies in industries and markets that are more likely to make high returns. In the cutting-edge in terms of innovation countries in Europe, own research and development accounts for 40–50% and above (which is 4–5 times more than in Russia), and the share of purchases of machinery and equipment does not exceed 30–40% of the company’s total costs. Investments in the purchase of machinery and equipment (60–70% of all costs) account for the largest share of the cost structure for technological innovations of Russian companies, while the share of their own research and development is only 10–12%.

To move to innovative economic development in Russia, an effective and working venture financing system with a well-established venture capital financing mechanism is needed, creating a venture ecosystem that integrates with innovation. Businesses supported by venture (risk) and development capital should achieve better results than companies financed by other ways due to the involvement of investor of venture (risk) and/or venture capital. This assumption is confirmed by studies which show that companies that received venture (risk) capital, generally have higher growth rates through funding, advices and experiences of venture capital investor [11].

Innovative ecosystem is a multitude of constituents integrating into the process of commercialization of innovations and their interconnections. Such an ecosystem accumulates human, financial and other recourses for intensification, optimization and providing effectiveness for innovations’ commercialization. Everything in economic life has become faster, inconsistent, and particularly dynamic, resulting in a diminished sense of control over economic variables [11].

An innovative ecosystem is a set of entities that interact in the process of commercialization of innovations and their relationships, accumulating human, financial and other resources to intensify, optimize and ensure the effectiveness of commercialization of innovations.

Venture capital (VC) is an important driver of economic growth and an increasingly important asset class. Of all the companies that have gone public in the US since the late 1970s, a third had venture capital backing [4]. Venture investment in Russia has a very short history, only some years ago this segment was practically absent. A lot has changed nowadays. In March 1997 management companies of existing funds of European Bank for Reconstruction and Development (EBRD) in Russia signed the Constituent Agreement for Russian Association of Venture Investment (RAVI further on). In June 1997 RAVI was accepted into associated members of European Venture Capital Association (EVCA) and entered Council of National Venture Associations of European countries. To the present moment RAVI has established contacts with the majority of foreign venture associations. Only in 2006 Russian Venture Company (RVC further on) was set up for state encouragement of venture investment and financial support of high-tech sector in general. RVC serves as the state institution for venture investment sector development in Russia; it's a project office for realization of National technological initiative, directed for creation of new global markets by 2035.

One of the key aspects of venture investment is its long-term character in combination with procedure of providing funds. Nowadays practically all venture investors prefer investment into high-tech projects. Organization of venture investment on national level largely depends on the degree of development of this industry. Some years ago, according to EVCA, Russian market was in boundary condition, according to the amount of funds aimed at income criteria. However, regarding the results of 2017, their share on Russian market came to 72%, so, it's definite that Russian venture market has practically transited into 'developing state' classified by EVCA. Up to the present moment, integrated efforts of the state, RAVI, RVC and institutions of development for creating national industry of venture investment in Russia has led to the following results:

- regarding the results of 2018, the number of active funds doubled from 55 to 95 in 2017,
- the total amount of investment increased by 13%, 441 deals against 391 in 2017,
- over the first half of 2018 an average sum of a deal increased by 33,6% up to 1,87 million dollars in comparison with the same period over 2017.

The most attractive directions for investors on Russian venture market are the internet and software production, over the first half of 2018 – 212, 9 million dollars. However, in 2018 investors more often preferred such industries as: manufacturing, power, agriculture, transport, education and medicine. Thus, in 2018 Sberbank invested in pay system Plazius, Yandex invested in petrol delivery to a car “Petrol into tank” [5]. At the same time, digitalization and artificial intelligence revolutionize and draw investment focus onto a narrow and knowledge-based market of biotechnologies. In 2017 the amount of investment grew by 55% - up to 14,7 million dollars, and in 2018, within the first half of the year, the amount of investment into biotech overcame the figures of 2016–9,8 million dollars. Positive effect is also observable in bigger

companies. The likelihood of performing process innovation rises proportionally with firm size [5].

Worldwide the process of venture investment is mostly carried out through venture capital funds. Over the past 30 years, venture capital (VC) has been an important source of financing for innovative companies [3]. Competitive companies are committed to 3 core principles in their activities: innovations, effectiveness and responsibility.

“Innovation” principle presupposes early introduction of new scientific projects and their commercialization. In Russia the share of innovative-active companies comprises only 9–10% (in comparison, in Germany it’s nearly 80%, in Finland it’s more than 50%, in Lithuania it’s more than 30%). The share of private financing of research is miniscule; the share of Russian civil products in international science-based export is also miniscule – 0,5%, in the USA this share is 36%, in Japan it’s 30%, in Germany it’s 16%, in China it’s 6%. The amount of financing technological innovations in industry is insufficient and incommensurable with real economic demands within absolutely new economic and political situation. However, since the end of 2014, a large number of homeland companies has been forced to search new partners and new decisions, connected with import substitution. This has had a positive impact on the activation of innovation activities in Russia, namely from the positions of companies supported by the state. In author’s opinion, in modern Russia, the basis for innovative development of industry and technological modernization can be large corporations that currently have large financial, material and human resources, as well as have a serious base for attracting investment.

“Effectiveness” principle means managing business processes on the base of productive and negotiated combination of science-tech innovations and rich experience, accumulated by a company. Speaking about large business in Russia, it’s not an active financier of innovative processes; only 20% of expenditures for research and development activity are financed by corporate sector. In developed countries the amount of expenditures for research and development activity overruns 65%, and on average nationwide scale organization for economic cooperation and development comes near 70%. If we compare total volume of expenditures for RADA in Russian corporate sector, we will see that it’s twice less than the budget for research and development in «Volkswagen group». Total research and development expenditures in Russia in 2018 amounted to \$39.5 billion. This is comparable to the budget of the three world leaders in the automotive industry, Toyota, Volkswagen and Ford.

“Responsibility” principle is based on using and observing the standards within company’s responsibility to a consumer. In 2008 inner expenditures for research and development in Russia were 41 dollars per head of a population, while in the USA they were 794 dollars, in Japan-715 dollars, in Germany – 511 dollars. So, Russia came to be in a group of countries with low scientific potential, according to the level of expenditures on science (Hungary, Greece, Portugal, and Poland).

According to the latest results of the research on countries’ level of innovation development, the Global Innovation Index in Russia took 46th place out of 129 countries worldwide, thus Russia came behind Thailand, Qatar, Chile, Moldova and Estonia in the list (Fig. 2).

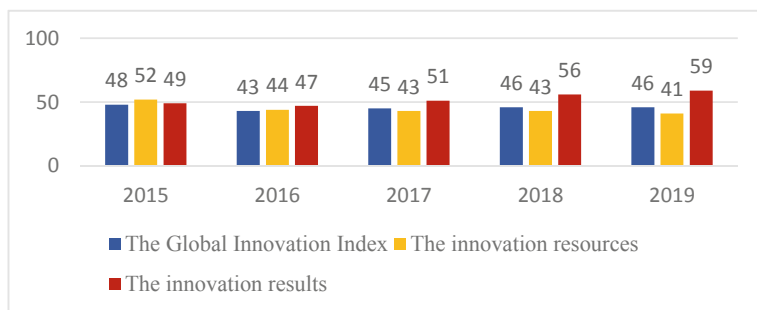


Fig. 2. Dynamics of Russia's positions in the GII rating: 2015–2019 (Source: author based on [2]).

Low place of Russia in this rating is due to such factors as low rates of modernization and innovation changes; the lack of correspondence with the aims of long-term socioeconomic development of the country; extremely low share of private research and development funding. The activities aimed at identification of national SandT priorities and series of Foresight studies have helped to understand which areas are most promising for sustaining existing competitive advantages and building new ones via gradual shift from the resource-based economy towards the technology-oriented one [10]. Regarding questions concerning the effectiveness of scientific research financing, it's worthwhile to draw attention to such criterion as the share of expenditures for research and development activity (RADA further on) in% to GDP, and the share of the country in international science products. In the 21st century, at a rising scale of expenditures for scientific research and RADA, their effectiveness remains different worldwide. Thus, the USA takes the first place (382,6 billion dollars) and produces more than 21% of science products worldwide. In Russia, despite a ten-times rising scale of expenditures for RADA in the last ten years, the share is only 1% in science worldwide market. It is connected with the fact that large business refers to one of the most uninterested participants of innovative processes.

In Russia only 20% of expenditures for RADA are financed by corporate sector. Homeland large business is sufficiently inferior to foreign corporations on both absolute and relative expenditures for RADA. Thus, in 2013 in the list of 1400 largest companies worldwide according to absolute expenditures for RADA, Russia was represented by 3 companies only: OJSC "Gasprom" (83rd place), "AutoVaz" (620th place), "Lukoil" (632nd place); but according to total revenue it was represented by 40 companies. In Russia the leaders, according to the amount of RADA financing, are engineering companies; however, the relation of expenditures for RADA to revenues in them isn't above 2%. Lagging is even more serious in less technological sectors. For example, the relation of expenditures for RADA to revenues in OJSC "Severstal" was 0,06% in 2009. At the same time, this figure in metallurgic corporation "ArcelorMittal" (Luxembourg) was 0,6%, that is 10 times more; NipponSteel (Japan) - 1%; Sumitomo Metal Industries (Japan) - 1,2%; POSCO (South Korea) - 1,3%; KobeSteel (Japan) - 1,4%; OneSteel (Australia) - 2,5%.

The chances of introducing new technologies and new business-processes are higher in big companies. Thus, in companies with the sales more than 1 billion dollars, these chances are 3 times higher a year than in companies with the sales from 100 to 500 million dollars. The chances of introducing new business-processes in companies with the sales more than 1 billion dollars are 46% higher than in companies with the sales from 100 to 500 million dollars.

From our point of view, the solution to the problems of raising the introduction of new technologies and new business-processes in Russian economy can be found activating venture capital (VC). Corporate venture capital (CVC) is a strong component in the startup and innovation ecosystem. With the venture community undergoing substantial changes and many institutional investors having difficulty raising new funds, the role of CVCs will only increase in importance [12]. Thus, in 2017 more than 10500 deals of different stages were carried out in the international venture market. 57% of these deals were on the account of business angel investors, though, median amount of one such deal is 5 times less than the amount of A and B tranches deals and 10,5 times less than the amount of C and D tranches deals. At year-end 2017, the share of venture funds' deals with the state support was 30,8% of the total amount of deals in Russian venture market. Such a high degree of the state presence has a sufficient influence on the aspects of national venture market.

Carrying out an analysis of global market segmentation in investment, a definite similarity with Russian market can be found. Thus, during the last 6 years more than 30% of deals in monetary terms and 40% of deals in quantity terms have been carried out in software and IT sector in the global market; this fact allows us to make a conclusion about the attractiveness of this sector not only for Russian venture investors but for venture investors worldwide. "Power industry" takes the second place in popularity among venture segments worldwide. At year-end 2018, the deals in this segment took 20% of all venture deals. This tendency shows a clue difference of the global market from the Russian one, which causes certain risks for successful goals achievement to take highly competitive positions in EnergyNet market, because leading venture funds has already focused on high-tech energetic companies.

Besides the projects in power industry optimization sphere, revolutionary decisions in spheres of transport, agro and medical technologies have started to attract special attention of venture funds lately. They are interconnected with AutoNet, MariNet, FoodNet and HealthNet NTI markets. The transport and technology market in the sphere of urban mobility enlarged 7 times according to the amount of invested capital over the period of 2014–2018; it can be explained by increasing trends of urbanization and the growing problem of overflow of urban population. The same socio-economic trends and the growth of population make it necessary to find new approaches to the organization of agricultural system worldwide. It explains a rapid rise in the venture market of agritechologies (from 2014 to 2018 the growth was by 275%). In 2018 the leader in the growth among the listed sectors was the sector of medical technologies, in particular, the projects connected with artificial intelligence. In comparison with 2014, the amount of deals grew by 760% in this sector.

Thus, summing up the results of the analysis of the tendencies of the development of Russian and foreign venture capital markets, it's worth making a conclusion that there are a lot of challenges on the way of achieving goals of National Technological

Initiative. They are reflected in growing competitive environment on the part of leading foreign innovative companies, supported by best international venture funds and institutions of development. A corporate VC investment is defined by two characteristics: its objective and the degree to which the operations of the investing company and the start-up are linked. Although companies typically have a range of objectives for their VC investments, this type of funding usually advances one of two fundamental goals [1]. The results of the study indicate insufficient incentives for private venture companies and poor attraction of venture capital by innovative companies. The obtained results can also be used in forecasting the future dynamics of companies' innovative development, which is one of the key indicators of innovative activity, as well as analyzing the effectiveness of venture capital. The presented study empirically contributes to aggregate knowledge about the innovative development of the Russian economy and venture capital impact on it.

4 Discussion

Basically, venture industry in Russia was partly created as a necessary part of state politics in the sphere of innovative development of economy to support competitiveness of Russian technologies in the international market. The same vector of development remains today. The key directions of Russian venture market development for the nearest future are reflected in the Russian Federation government program "Digital economy in the Russian Federation", in the interdepartmental program "National technological initiative", and in the project "Strategies of market development of venture and straight investment in the Russian Federation until 2025 and further prospects up to 2030". The shared purpose of all the stated-above documents is multifaceted support for Russian leading high-tech companies, which are oriented for new global markets via venture financing mechanisms as well. "National technological initiative" (NTI) has a special value among stated above programs. It was defined as one of the state politics' top concerns by the President of the Russian Federation V.V. Putin. NTI is a state interdepartmental program to support the development of upcoming sectors in the RF; these sectors can become the base for the international economy and Russian technological leadership by 2035. This study allows us to summarize the existing potential for innovation development and identify problem areas of venture funding for research and the improvement of the effectiveness of research activities of companies.

5 Conclusion

The ratio of private business to the innovation component, in comparison with other countries of the world, remains low in Russia, since in 2018, only 9.7% of the total number of domestic industry enterprises spent on the development and implementation of technological innovations. By comparison, more than half of the companies in the manufacturing industry of such countries as France, Germany and Finland are innovatively active. The share of innovative products in the total volume of industrial

production, according to the Rosstat, is only 8.9% [9]. In addition to low innovation activity, Russian companies are not focused on creating their own unique technologies and products, or on increasing the competitiveness of their supply either in the domestic or foreign markets, but prefer to purchase ready-made products abroad. The increased attention of Russian companies to the purchase of finished equipment abroad over the last 20–30 years has led to a strong lag in the scientific and technical development of the Russian Federation. Today, Russian companies need not only to increase innovative activity through their own technological innovations, but also to attract venture capital to finance them, as a business supported by venture capital achieves better results than companies financed by other means of attracting an investor. Definitely, state programs' priorities, aimed at creating innovative economy in Russia, will be the key determiner of trends, concerning the development of homeland venture market. However, due to the attractiveness of new technological markets not only for Russian economy, but for other countries as well, it's necessary to accelerate venture market goals' achieving, set in "roadmaps" NTI. Otherwise, all state initiatives will be in vain, and the effect from their realization will be out of proportion with expenditures.

As Socrates wrote, the secret of changes is: "To direct all your energy not for the fight with the old, but for the creation of the new" [6]. In new conditions of changing economic environment, it should become important for Russia to support venture companies, running their business effectively and being able to become an innovative growth engine for homeland companies.

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Analyzing Oil Prices Impact on Russian Foreign Trade

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Abstract. Among the paramount drivers of globalization and the world economy, global oil prices are traditionally named. Most significantly they influence the economy of the countries with export oriented for raw materials. The Russian Federation is among those ones. This study aims at analyzing the impact of global oil prices on the RF's foreign trade statistical indicators. General scientific methodology and statistical and econometric methods are applied in this research. Statistical data demonstrate the coincident changes in global oil prices, foreign trade turnover and the volume of the Russian commodities export. Herein, oil is not affected by the law of demand, since it belongs to the strategical goods with an inert demand. Thus, the indicator of Russian foreign trade turnover, that was forecasted adjusted for oil prices dynamics, demonstrates a further downturn.

Keywords: Econometric modeling · Export · Foreign trade · Globalization · Oil prices

1 Introduction

COVID-19 and the OPEC conflict were the two major events that have affected the situation in the world in 2020. Those events caused a decrease in business activity and a drop in oil prices. The consequences, such as unemployment growth, GDP falling, closed businesses, and broken supply chains are already visible. The entire system of foreign economic relations is entering a crisis that threatens the process of globalization of the world economy. In regard to quantitative indicators, this can be expressed by a decrease in the share of certain countries in trade turnover, in the volume of exports and imports.

The purpose of this study is to assess the ability of the Russian economy to adapt to such crises and the ability of Russia to remain a major player in the world market. At the same time, it is necessary to take into account the specific character of the production specialization of the Russian economy. Its exports are highly commodity-based, which is typical for many developing economies. The main barometer of the state of the Russian economy is the world oil prices. In this regard, it is important to identify the relationship between oil prices and indicators of foreign trade statistics in Russia.

2 Methodology

This study is aimed at analyzing the impact of global oil prices on the Russian foreign trade statistical indicators. It is hypothesized that the situation in the foreign trade of such an export-focused country as Russia is closely interconnected with the state of the global oil market, in general, and oil prices in particular. In the context of globalization, this factor directly affects the level of socio-economic development of the country. The study was based on the data of the Federal State Statistics Service [3] and the World Trade Organization (WTO) [13]. The primary data is represented by a time series from 1998 to 2019.

The combination of general scientific methodology and statistical and econometric methods are applied for the purposes of this study. The historical method was used to justify the regularities of changes in macroeconomic indicators depending on the phase of the economic cycle. The following statistical and econometric methods were used in the study:

- the method of structural and dynamic analysis (calculation of the Ryabtsev index) allowed quantifying changes in the structure of Russian exports,
- the graphical and tabular methods are a convenient form of displaying analytical data,
- absolute, relative and average values determine the quantitative characteristics of an economic phenomenon,
- time series analysis and forecasting allowed characterizing the dynamics of indicators and making assumptions about their changes in the future.

The use of econometric methods in similar studies has recently become widespread, as it provides means for mathematical expression of the identified qualitative patterns for development of foreign trade in countries. Econometric analysis based on cointegrated vector auto regression (VAR) models to describe the influence of various factors on foreign trade indicators was used in the works [2, 11, 12]; econometric methods for constructing a model of simultaneous equations was applied in [1]. The data were processed using the “Gretl” econometric package.

3 Results

The system of statistical indicators, that characterize oil market and foreign trade, was developed within the framework of this study:

1. Average annual oil price, US \$/bbl.
2. Foreign trade turnover, mln. US \$.
3. Export turnover, mln. US \$.

Graphs and charts are the easiest and most visual way to display time series data. Fig. 1 shows time series graphs of world oil prices and Russia’s foreign trade turnover.

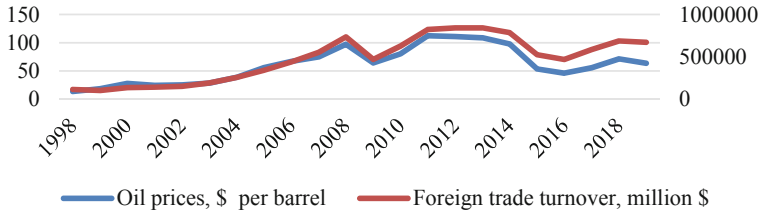


Fig. 1. Global oil prices and Russian foreign trade turnover (1998–2019) (Source: authors).

The line graphs demonstrate the synchronous changes of both indicators. Thus, the period of cheap oil was accompanied by a decline in Russia’s foreign trade activity in 2009 and 2011–2016. To forecast the turnover of Russia’s foreign trade, taking into account the dynamics of oil prices, the econometric modeling of time series was conducted. A linear model is constructed. It is based on the first differences of the indicators under study, which are stationary ones. The forecast for the first differences in foreign trade turnover is shown in Fig. 2.



Fig. 2. Observed and forecast values of the first differences in Russian foreign trade turnover (1998–2022) (Source: authors, Gretl).

As it can be seen from the graph, the increase in the turnover of foreign trade of the Russian Federation is a negative one; therefore, the turnover of foreign trade itself will decrease in the next three years. Due to the unstable economic situation in the world related to COVID-19 and the OPEC conflict, the most reliable numerical forecast of foreign trade turnover will only be as of 2020. It was calculated that, Russia’s foreign

trade turnover in 2020 will amount to 592784 million dollars. Next, the impact of world oil prices on the volume and structure of Russia's commodity exports was considered. It was found that the dynamics of both indicators are generally identical. Table 1 shows statistics on total exports and exports of fuel resources.

Table 1. The RF's export indicators

Year	2013	2014	2015	2016	2017	2018	2019
Total export	521836	496807	341419	281710	353104	443129	418796
Export of fuel resources	372036	346119	216101	134703	211993	237851	...
The share of fuel resources % in export	71,3	69,7	63,3	47,8	60,0	53,7	...

Source: authors

The 2014–2015 crises, combined with the anti-Russian sanctions, led to the loss of foreign markets. Thus, in 2016, the total volume of exports decreased by 46.0% compared to 2013, and the volume of exports of fuel resources fell by 63.8%. In the next two years, these indicators increased by 57.3% and 76.6%, respectively. This is due to the policy of import substitution and the adaptation of the Russian economy to the new reality. Due to the limited data on exports, econometric models has not been built, but the focus instead was set on analyzing changes in the structure of exports during periods of high and low oil prices. We used the Ryabtsev index [10] to analyze the structural shifts for three years: 2013 (high oil prices), 2016 (low oil prices), and 2018 (high oil prices). The results are shown in Table 2.

Table 2. The Ryabtsev index values used to analyze the structural shifts in Russian exports

Years	2016/2013	2018/2016	2018/2013
Value	0,228	0,065	0,164
Explanation	Significant difference	Relatively low difference	Significant difference

Source: authors

Interestingly, the Ryabtsev index values demonstrated that the decline in oil prices led to a significant change in the structure of exports, while the increase in the price had little effect on the change in the structure. The most significant changes were observed in fuel resources. Their share decreased from 71.3% in 2013 to 47.8% in 2018, while the share of food exports almost doubled from 3.1% to 6.0%.

4 Discussion

The hypothesis about the correlation between the state of foreign trade of an export-oriented country and the world oil market, in particular, oil prices, is generally confirmed. Studies of the impact of oil prices on foreign trade and the economy as a whole are quite common. Conventionally each of them is dedicated to a particular aspect. Touitou, Djellit, and Boudeghdegh analyzed the causal relationship between exports, oil prices, terms of trade, and economic growth for a resource-dependent economy [11]. As it is stated by Dreger, Kholodilin, Ulbricht, and Fidrmuc, Russia is a country highly dependent on resource export [2].

Gorokhova argues that since 2014, the structure, geography and volume of foreign trade have changed significantly due to the difficult international situation, the introduction of economic sanctions against Russia, fluctuations in oil prices [4]. It is noted by Obolenskii, that these changes significantly worsen the conditions of Russian foreign economic activity and hinder its development in the upcoming time period [7]. Therefore, often the problem of the dependence of key macroeconomic indicators on the dynamics of energy prices, especially oil prices, relevant to the modern Russian economy is chosen as the subject for a research. The example of such a study is represented by the research of Derunova, Ustinova, Derunov, and Semenov [1].

Polbin, Andreyev, and Zubarev address the task of assessing the impact of commodity prices on the main macroeconomic indicators of the EAEU member states [8]. Khmelevskaya considers the quality of development issues based on mutual trade in the BRICS countries [5]. The dynamics of indicators of foreign trade activity of the Russian Federation for the period 2012–2015 are analyzed by Makhmudova and Koroleva [6].

In her paper Ruzhinskaya studies the current problems of Russian foreign trade, the reasons for the decline in the export revenue, differentiation of the commodity structure of exports in 2014–2016, the impact of changes in oil prices on the export volumes of various commodity items, as well as changes in the commodity structure of imports of the country [9].

Ushkalova and Nikitina econometrically investigate the influence of key external factors on Russian foreign trade indicators. The researchers analyze the nature and extent of the relationship between Russian exports and imports and the dynamics of GDP and individual countries (EU, Germany, and China), world prices for oil and metals. A quantitative assessment of the impact of German and Chinese GDP and world oil prices on Russian exports is given in the paper [12]. Thus, this research was carried out within the framework of the current academic direction and does not contradict the results of similar studies in general.

5 Conclusion

1. The Russian economy, which is focused on the export of hydrocarbon raw materials, depends significantly on its prices. Statistical data confirm the synchronicity of changes in world oil prices, foreign trade turnover and the volume of Russia's commodity exports,

2. The forecast value of Russia's foreign trade turnover in 2020 was obtained. The forecast was based on econometric modeling of time series, taking into account changes in oil prices. The turnover amounted to 592784 million dollars. This marks a decline in this indicator,
3. Although the increase in oil prices had not led to a change in the structure of Russian commodity exports, the decline in prices had a significant impact on its change. Contrary to the law of demand, lower prices for fuel resources lead to a reduction in their share in exports from 71.3% in 2013 to 47.8% in 2016. This is due to the specifics of oil as a commodity that has an inertial demand.

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Main Trends in the Market of Electronic Financial Services in Russia

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Abstract. The modern market of financial services can be characterized as a combination of classic credit and non-credit products with the latest innovative achievements of Fintech companies. Improving the range of financial products is due to the current circumstances in which consumers of financial products must resort to financial institutions as intermediaries in financial transactions between counterparties. The latter circumstance is due to the development of mobile gadgets that can provide access to online banking to customers without a personal visit to the bank's office. The purpose of the study is to identify trends in the Russian market of electronic and banking services and tools, with the help of which the desired transformations occur. For this, the following tasks are posed and solved using methods of comparison, analysis, and synthesis: the key stages of development of electronic payment systems, and the structure of payments in the market of financial services are determined, the main tools for their implementation are identified. The results obtained may well be useful to financial institutions to develop the market of electronic payment services.

Keywords: Bank · Credit cards · Cryptocurrency · Electronic payments · Online trading · Payment orders

1 Introduction

The market of electronic financial services in the national economy is closely connected with such an institution as electronic means of payment, which mediates all electronic financial transactions. Its key components (financial technologies, the implementation of which allows you to conduct financial transactions) are Internet banking and a mobile payment system [2]. Having studied the market conditions for electronic financial services, we can provide a chronology of electronic payment systems (hereinafter - EPS).

The key stages in the development of EPSs are:

- separation from classical banking structures of virtual banks, the functionality of which is aimed at online service,
- emergence of operator organizations whose functionality is associated with the use of online wallets,
- development of their own payment services and Internet banks by mobile operators.

2 Methodology

The basic concept underlying this study is the growing influence of the financial technology sector on transformation of banking. Traditional banks have competitors in the face of electronic payment services, like Amazon, which can conduct financial transactions through their payment servers, excluding the bank as an intermediary [6]. Some theories consider the activities of modern banking through the emergence of new financial instruments and processes, for example, such as initial coin offerings (hereinafter ICO) [8].

We should mention theories developed by a few researchers on the paramount role of financial technology in banking. So, Mikhaylin and Osipovskaya [5] believe that the national structure of the financial technology market, for the most part (about 31% in Russia), is represented by credit and investment services developed by banks, whose main role is to select individual conditions for the most significant clients on existing financial and investment products using remote communication channels.

This study also places great emphasis on the comparison method. The results of studies obtained by other authors are analyzed and conclusions are consolidated. Based on them, a short-term forecast on the provision of banking products is compiled. The author uses the systemic method, as well as analysis and synthesis. In addition, expert assessments of foreign researchers are considered.

3 Results

Over the past decade, there has been a significant increase in payment and credit cards issued and actively used in the domestic economy. From 2008 to 2018, the number of such tools increased by 175 million units (from 95 million units to 270 million units), see Fig. 1.

(Source: author based on [1]).

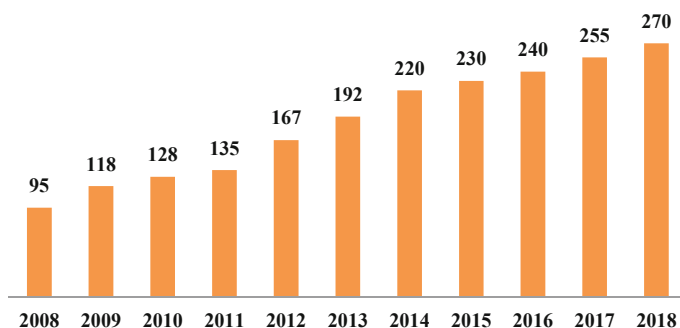


Fig. 1. Dynamics of payment instruments - bank cards, million units

The main reasons for this growth in bank cards were: the rapid growth in Internet commerce and the increase in the quantitative number of salary projects in the Russian economy. In our opinion, the fact of a significant excess of the number of payment cards over credit cards (Fig. 2) is interesting, which may be caused by the recovery of the banking sector of the economy and the revocation of licenses from several credit card issuing banks.

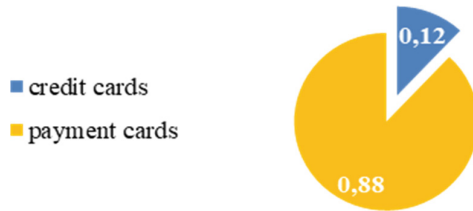


Fig. 2. The structure of payment bank cards, in percent (Source: author based on [1]).

Also, among the main trends of recent years in the field of electronic financial payments is active transition of users to mobile devices for conducting financial transactions from desktop computers, which reflects the global trend of using specialized mobile applications in the market of electronic financial services for transfer and implementation of payment orders by the bank [10].

Most of the payments made until recently in the market of financial services took place in the form of a payment order submitted by a physical person on paper. The reasons are the financial illiteracy of a significant part of the population, and the insufficiently fast penetration of mobile networks and the Internet into all regions of the Russian Federation. However, the share of electronic payments has increased significantly since 2008 by 170% (from 34 million orders for financial transactions to 92 million orders, see Fig. 3 for more details).

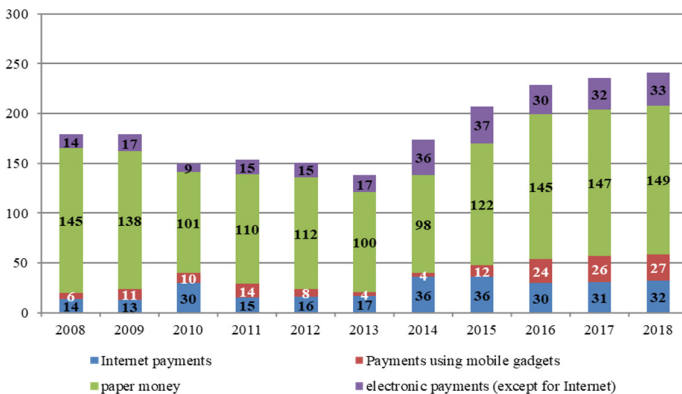


Fig. 3. The structure of payments in the market of financial services, the number of orders in million units (Source: author based on [1]).

4 Discussion

Undoubtedly, the use of electronic payment methods is justified by their convenience, relative cheapness (in some cases there is no need to pay a bank commission), the speed of payment, and the possibility of receiving a certain discount when making payments using electronic financial instruments. The joint study on the use of electronic payment services by TNS Russia and Yandex in 2017 [4] shows the results in Fig. 4. Most often, Russians use bank cards, mobile banking tools and electronic wallets to pay.

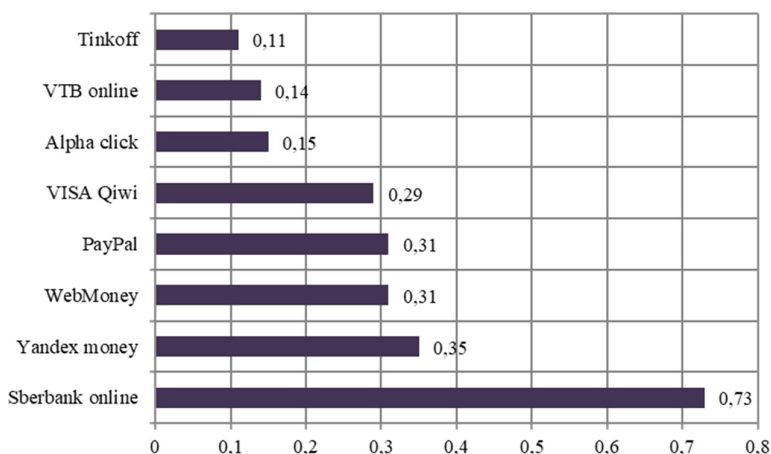


Fig. 4. Use of electronic payment services (in % of the total number of respondents) (Source: author based on [1]).

In the market of electronic financial services, it becomes clear that a significant part of transactions is directed to paying for mobile communications, orders in online stores, making money transfers and paying for utilities [9]. The use of so-called co-branding projects is one of the new trends in the market of electronic financial services in Russia. The essence is the use of banking products with a reward system in various markets, namely the ability to spend the accumulated bonuses on discounts at grocery stores, gas stations, airline reservation systems, travel agencies, etc.

We should also pay attention to such a sphere of electronic financial services as Internet commerce. In 2018, the volume of this market amounted to about 1.1 trillion rubles [3]. An interesting fact was the identification of a significant part of transactions with foreign online stores, primarily with Aliexpress.ru (about 90% of all shipments of ordered goods to the Russian Federation via the Internet channel).

5 Conclusion

The above trends in the field of electronic payments, mediating the functioning of the market of electronic financial services, will be accepted by the population as an inevitable process of financial innovation. This is undoubtedly a positive aspect.

The upward trend in the use of digital financial assets and digital payment instruments is obvious. This is due to both a reduction in transaction and operational costs of using the bank's counterparties as an intermediary in financial transactions and the transition to SMART contracts, as well as accelerated payment transactions [7]. However, the most dangerous in this situation is the increase in the number of cybercrimes committed by fraudsters due to the low financial literacy of the population.

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Intellectual Management of the Budget Process in Municipalities

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Abstract. The article covers the analysis of the problems of budget managing processes in municipalities. Noting the complexity and importance of this process, the author notes that one of the directions for its improvement is the use of intelligent information systems. Currently, these information systems are successfully implemented in various areas of business and management, and therefore it is short-sighted to ignore their capabilities in managing local finances. It is quite obvious that at present, by using artificial intelligence and other information technologies, local authorities can easily and efficiently solve many problems in the field of budget process management, problems that would have previously required significant human resources and significant amount of time to solve.

Keywords: Artificial intelligence · Budget process · Intelligent information systems · Local budget · Local government · Neural networks

1 Introduction

The local budget is one of the most important departments in a municipality, as solving local issues, implementing the tasks and functions of local self-government have to be financed, so the representative and executive bodies of the municipality need certain financial resources that make up the financial and economic basis of their activities [16]. The activities of local governments and other participants in the preparation, review, approval, execution of budgets is a budget process. It also includes budget accounting, drafting, external review, review and approval of budget report. Accordingly, the main stages of the budget process are planning, drafting and execution of the budget. The regulations on the budget process should determine the order and terms of each stage of the budget process, the budgetary powers of all participants in the budget process, the principles of forming and spending budget funds [12].

The budget process in municipalities is implemented independently by local authorities in accordance with the Budget Code of the Russian Federation [5], Federal Law dated 06.10.2003 № 131-FZ (as amended on 23.05.2020) “On the General Principles of the Organization of Local Government in the Russian Federation”

(hereinafter - Federal Law № 131-FZ) [7], the budget legislation of a constituent entity of the Russian Federation and legal acts of the municipal education.

Recently, much attention has been paid to the problem of effective management of budget processes. Despite the adoption of the Budget Code of the Russian Federation, this area is still developing and is undergoing serious legislative transformations, both in the field of revenue generation and expenditure issues [8]. Efficiency of the budgetary system is dependent on how efficiently and competently the budget system is built at the regional level [2]. Thus, the problem of managing the budget process in regions is currently very relevant.

2 Methodology

Methodological basis of this study is formed through philosophical and general scientific principals as objectivity, consistency, comprehensiveness, unity of theory and practice. The study relies on methodology procedures laid out by Russian and foreign scientists in researches of budgetary process issues in Russia. The general scientific dialectic method of cognition was used as the main method. The most important method of analyzing legal problems is the analysis of legal acts on the topic of research. The validity of the conclusions of the article is proven through the integrated application of the method of describing concepts and terms, the method of interpretation. In addition, methods of formal logic, analysis, synthesis, and others were used to complete the paper.

3 Results

Problems of optimizing the management of the budget process in municipalities are subject of interest of many scientists and practitioners. This is largely due to the fact that to identify possible ways to improve municipal finance, the processes of their planning, distribution, execution, etc. only becomes possible during the consideration of controversial issues of managing the budget process [1]. In the current era of rapid development of scientific and technological progress, when information technologies are successfully introduced into various areas of business and management, the use of these technologies in managing the budget process of municipalities seems rather promising. Due to the fact that in the process of compiling, developing, and controlling the budget, serious work is done to process significant amounts of information, intelligent information systems should become an effective tool for local authorities in the implementation of this activity [9]. Intelligent information systems were first developed in the middle of the 20th century. However, domestic scientists dealt with these issues before, in the 19th century. From the very beginning, researchers are trying to create systems that mimic human intelligence. The scientific novelty of the study is reflected in an objective analysis of the problems of managing budget processes in municipalities, as well as the prospects for the intellectual management of these processes.

McCarthy, the author of the term “artificial intelligence,” defined intellectual function as the computational component of the ability to achieve goals [11]. Back in

the middle of the last century, scientists were trying to understand how the human brain works. Then came the theory of computing, the theory of algorithms, and the world's first computers, the computational capabilities of which prompted the luminaries of science to think about whether the machine can compare with the human mind. The solution to this question was a test created by the English mathematician Alan Turing, which determines whether the machine can think. It should be noted that the financial and economic sphere of any state highly developed in terms of information and intellectual technologies is traditionally based not only on vast amounts of data, but also on the possibility of their optimal and high-precision processing; for this reason, for the financial and economic sector, the introduction of artificial intelligence is a quite natural and expected phenomenon [6].

Studies of artificial intelligence (hereinafter referred to as AI) went through several stages, and as technology matured, they became part of our everyday experience. Let us consider some of them that may be useful in managing the budget process of municipalities.

First of all, you can use the capabilities of the machine to learn by improving the computer program. Early researchers struggled with limited computing power and computer storage, but still laid the foundation for AI with programming languages such as LISP and concepts such as decision trees and machine learning. Programs written in LISP can easily display and analyze the movement of municipal finances, choosing the best alternative for them. These programs can also modify their logic of managerial decision-making and learn from previous mistakes, becoming "smarter" over time, climbing the steps of the hierarchy [10].

The introduction of artificial intelligence technologies and automation of budget processes can do a lot to boost the regional economy and increase the prosperity of municipalities. In a period of aging and falling birth rates, productivity growth becomes critical for long-term economic growth. Even in the short term, productivity growth is decreasing by an average of 0.5%. Like previous general-purpose technologies, artificial intelligence can contribute to productivity growth [4]. Artificial intelligence will also create positive external factors, promoting more efficient cross-border trade and expanding the ability to use valuable cross-border data flows. Such an increase in economic activity and income can be reinvested in the economy, contributing to further growth.

Another approach is demonstrated by expert systems technology. While the first wave of AI researchers relied on computational cycles to mimic human reasoning, the next approach was based on facts and data mimicking human experience. Expert systems gather facts and rules into a knowledge base, then use computer inference mechanisms to generate new facts or answer questions. As the technology matured, researchers found ways to automate the development of the knowledge base, and expert systems themselves are increasingly turned into support and decision-making systems [9].

An interesting solution to complex issues in managing budget processes can be found in the use of neural networks. In this regard, a group of researchers tried to replicate the work of the human brain by creating artificial networks of neurons and synapses. Through training, these neural networks could recognize patterns from what looked like random data. Software that relies on this technology can purposefully adapt

a process. Adaptive management systems are designed to achieve management goals in poorly formalized, poorly structured systems [15].

The ability to generalize and highlight hidden dependencies between input and output data of a neural network allows you to create a neural network that represents with some accuracy a mathematical model of the tax base of the region. It should be noted that the neural network should be trained on the statistical data that determine the tax system of the region. Such data may include quantitative indicators of the factors that make up the tax base of the region, and a quantitative indicator of taxes received in the budget for several years. A neural network can identify patterns of changes in the tax base, but it is more reasonable to optimize it for a short-term period, because, despite the inertia, the tax system undergoes many changes over time. This is connected, *inter alia*, with the influence of external and random factors, with the development of the economy, and an increase in the legal culture of citizens.

4 Discussion

At the present, the use of “Big Data” technologies is a promising lead in managing budget processes. Large-scale data analysis, often referred to as “big data,” uses the power of many computers to discover facts and relationships in data that the human mind cannot understand. Trillions of payments in the municipal finance movement system can be scanned and correlated using various statistical methods to find useful information. Big data allows computers to understand the world like we humans could never have done on our own. The growing complexity of budget management processes requires the urgent need to increase the capabilities of information systems used in the management of municipal finances, primarily in relation to forecasting. Sometimes even management effectiveness is evaluated by the accuracy and long-term forecast [13].

The complexity of managing the budget process of the municipality forces local authorities to face the need to increase efficiency and encourages the use of information systems to attract the intellectual abilities of personnel and more efficient use of the technical capabilities of tools. Local governments can measure some of their intangible assets and use non-financial ratios or indicators to measure management effectiveness. For this, it is necessary to allocate resources for measurement and choose adequate indicators [3].

Local authorities must find a stable balance between the effectiveness of budget processes management, the commitment of intelligent agents and technical tools. The appropriate combination of intellectual resources can help local governments anticipate financial problems in the municipality, direct efforts towards innovation and help improve the management of budgetary processes [14]. Based on a set of intelligent information tools, local governments can find a new approach for obtaining higher levels of integrated strategic decisions, the effectiveness of organization and management of budget processes in the municipality.

5 Conclusion

Currently, the budgetary processes of municipalities have not been studied enough, which is largely due to the significant variability of the external environment, as well as the presence of many individual characteristics of each municipality, which make modeling difficult. The relevance of the intelligent management of budget processes in municipalities is associated with new challenges of the implementation of the digital economy. In modern conditions, the ability of local authorities to manage the budget process is becoming critical. As modern practice shows, intelligent information technologies can significantly improve the management of budgetary processes by connecting the knowledge developed through the experience of mankind, thereby providing quick solutions to the most difficult problems and improving the quality of local finance management.

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Financing of Early Entrepreneurship Development: Informal Investments in Modern Economies

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Abstract. The research responds to calls in the literature for a more systematic study of the problem of entrepreneurs' access to the most effective types of financing. The purpose of the study is to evaluate indicators describing the financing of business creation and start-up at the expense of entrepreneurs' own funds and informal investments. We used empirical data obtained from surveys conducted during the implementation of the Global Entrepreneurship Monitoring Project for 2019–2020 for 50 countries. In the course of the work we assessed the indicators describing the existing levels of informal investments in small businesses; investigated the level of participation of the population in investments; proved that the number of early entrepreneurs self-financing the creation of their new business significantly exceeds the number of those using informal investments; set the values of the average amounts of informal investments; demonstrated the differentiation of the indicators by country; identified countries with high and low levels of the considered indicators.

Keywords: Borrowed funds · Early entrepreneurs · Investments · Financial resources · Small and medium enterprises · Sources of financing

1 Introduction

According to the definition proposed in the Global Entrepreneurship Monitor [10], early entrepreneurs are people aged 18–64 who are in the process of creating their own new business or have been owners of a new business for less than 3.5 years. It should be noted that young firms currently account for a high share of overall output growth, especially in developing countries [6]. Many authors, including Caggese [2], Godke Veiga and McCahery [9], note the important role of financing entrepreneurs, especially at the initial stages of their activities. The main problems associated with insufficient financing, as indicated by Kumar and Rao [12], are the level of funds availability, the limited supply of loans, insufficient information about potential financing opportunities, and high requirements for loan recipients. Similar problems are cited in other studies. Thus, according to the authors [3, 4], the main obstacle to providing bank loans for a novice entrepreneur is the lack of assets that could be a collateral. The situation worsens in the context of economic crises, when demand and consumption are reduced,

as well as the size of borrowed funds provided by banks [8]. Even government assistance related to issuing partial credit guarantees to the entrepreneur to repay the debt to the lender [5] cannot always solve this problem.

The research responds to recent calls in the literature for a more systematic study of the important problem of entrepreneurs' access to the most effective types of financing [1, 7, 13]. At the same time, we considered two main options for financing entrepreneurship: using own funds of early entrepreneurs and attracting informal investments along with these funds. It should be noted that in both cases, early entrepreneurs can use bank loans. However, given the above, as well as the fact that the problem of financing entrepreneurs by obtaining bank loans has been widely considered in scientific research, this type of investment is not analyzed in this article. The purpose of the article is to evaluate indicators describing the financing of business creation and start-up at the expense of entrepreneurs' own funds and informal investments.

2 Methodology

Informal investment is a financial transaction carried out without official organizations. The studies [14, 15] indicate various sources of informal investments, with the main investors being family members, friends, acquaintances, and other people interested in creating and developing a specific new business. Accordingly, informal investors are those individuals who provide both loans and credits. To do this, they use their own funds and other assets for unsecured financing. These investors work independently. Mutual trust is crucial in informal investment. At the same time, investors pay less attention to business characteristics, and focus on the personality of the entrepreneur and his credit rating, as well as his knowledge and competencies [11]. As indicated in an article [16], informal investors can receive a share in the authorized capital or shares of a newly created firm.

The study examined the following indicators that characterize private and informal investments in small businesses in 50 countries in 2019–2020:

- the proportion of early entrepreneurs who use informal investments in the overall number of early entrepreneurs,
- the proportion of early entrepreneurs who do not use informal investments in the overall number of early entrepreneurs,
- the ratio of early entrepreneurs who do not use informal investments in their activities to those who use them,
- the proportion of people participating in informal investments in the overall adult population of the country,
- the average amount of informal investment per person involved in such an investment.

In our research we used empirical data obtained from surveys conducted during the implementation of the Global entrepreneurship monitor 2019–2020 [10].

In the process of our study, two hypotheses were tested:

- hypothesis 1 - currently there are significant differences in the values of the five indicators under consideration,
- hypothesis 2 - the values of each indicator are not associated with the countries location.

The above indicators were estimated on the basis of normal distribution density functions. The construction of such functions allowed obtaining unbiased characteristics of the indicators under consideration. The methodology for using normal distribution density functions for specific and relative indicators estimation is given in the article [17]. The obtained functions allowed us to determine the indicators average values for the countries under consideration, the intervals of their changes typical for most countries, as well as lists of countries where these indicators went beyond the upper and lower limits of the intervals. The boundaries of the range of changes in the values of indicators for most countries (about 68%) were determined based on the average values of indicators and the corresponding standard (average square) deviations. The lower bound was calculated as the difference between the average and standard deviation, and the upper bound as their sum. When developing the normal distribution density functions, we used spatial empirical data provided in table A3 of the above-mentioned Global Monitoring Project report for the countries under consideration [10].

3 Results

In our research, we developed economic and mathematical models (normal distribution density functions) that describe the patterns of regional distribution of the previously mentioned five indicators. These normal distribution density functions (y), which describe 50 countries under consideration, are given below:

- the proportion of early entrepreneurs who use informal investments in the overall number of all early entrepreneurs, %

$$y_1(x_1) = \frac{642.86}{16.76 \times \sqrt{2\pi}} \cdot e^{\frac{-(x_1-37.58)^2}{2 \times 16.76 \times 16.76}} \tag{1}$$

- the proportion of early entrepreneurs who do not use informal investments in the overall number of all early entrepreneurs, %

$$y_2(x_2) = \frac{642.86}{16.78 \times \sqrt{2\pi}} \cdot e^{\frac{-(x_2-62.42)^2}{2 \times 16.76 \times 16.76}} \tag{2}$$

- the ratio of early entrepreneurs who do not use informal investments in their activities to those who use them

$$y_3(x_3) = \frac{53.13}{1.27 \times \sqrt{2\pi}} \cdot e^{\frac{-(x_3-1.97)^2}{2 \times 1.27 \times 1.27}} \tag{3}$$

- the proportion of people participating in informal investments in the overall adult population of the country, %

$$y_4(x_4) = \frac{81.25}{2.20 \times \sqrt{2\pi}} \cdot e^{\frac{-(x_4-4.18)^2}{2 \times 2.20 \times 2.20}} \tag{4}$$

- the average amount of informal investment per person involved in such an investment, thousand dollars

$$y_5(x_5) = \frac{157.14}{4.10 \times \sqrt{2\pi}} \cdot e^{\frac{-(x_5-5.00)^2}{2 \times 4.10 \times 4.10}} \tag{5}$$

Three tests (Kolmogorov-Smirnov, Pearson and Shapiro-Fork tests) were used to evaluate the quality of the developed models. The results of computational experiment demonstrated that the calculated values of statistics for the Kolmogorov-Smirnov test were in the range from 0.04 to 0.09. It was less than the table value, which at significance level of 0.05 was 0.152. The calculated values for the Pearson test extended from 0.88 to 2.44, which was less than the table value of 9.49. All calculated values of statistics for the Shapiro-Fork test were greater than the table value of 0.93 with a significance level of 0.01. In general, we can conclude that all the developed functions are of high quality.

4 Discussion

The normal distribution density functions (1)–(5) make it possible to identify a number of significant patterns characterizing the existing financing of early entrepreneurs in the countries under the review. The average values of considered indicators are presented in column 2 of Table 1. Column 3 of the Table shows the change intervals for considered indicator values typical for most countries under the review.

Table 1. Indicators of early entrepreneurship financing

Indicators	Average values	Values typical for most countries
1	2	3
The proportion of early entrepreneurs who use informal investments in the overall number of early entrepreneurs, %	37.58	20.82–54.34
The proportion of early entrepreneurs who do not use informal investments in the overall number of early entrepreneurs, %	62.42	45.66–79.18
The ratio of early entrepreneurs who do not use informal investments in their activities to those who use them	1.97	0.70–3.24
The proportion of people participating in informal investments in the overall adult population of the country, %	4.18	1.98–6.38
The average amount of informal investment per person involved in such an investment, thousand dollars	5.00	0.90–9.90

Source: authors.

As can be seen from the data in column 2, the average share of early entrepreneurs attracting informal investments across countries was just under 38%. That is, for the 50 countries under consideration, on average, every third early entrepreneur used such investments in their activities. Values greater than 54% were observed in Panama, Croatia, China, Northern Macedonia, Mexico, Japan, Taiwan, Morocco, Egypt and India. These countries are located in Europe (2), Latin America (2), Africa (2), and Asia (4). They belong to different groups in terms of their population income.

The average share of early entrepreneurs who do not use informal investment in their activities in 50 countries reached 62% during the period under review. Values above the upper limit of this range were observed in Ecuador, Spain, Italy, the Netherlands, Cyprus, Norway, Guatemala and Brazil. These countries are located in Europe (5) and Latin America (3). They have a high and medium income level, which allows early entrepreneurs not to attract informal investment.

The number of early entrepreneurs who do not use informal investments in their activities is almost 2 times higher on average than the number of those who use such investments. For most countries, this indicator was between 0.7 and 3.2. Values higher than 3.2 were observed in Guatemala, the Netherlands, Norway, Brazil, Italy, Spain, Ecuador, Slovenia, the United Arab Emirates and Latvia. These countries are located in Europe (6), Asia (1) and Latin America (3). They have high and medium income levels. In North Macedonia, Mexico, Japan, Taiwan, Egypt, Morocco, India and Oman the indicator was lower than 0.7. These countries are located in Africa (2), Europe (1), Asia (4) and Latin America (1). They have high, medium and low income levels. It is interesting to note that the number of entrepreneurs who used informal investments exceeded those who did not use them in 13 countries.

The average share of people participating in informal investments in the overall adult population of the country was just over 4% across 50 countries. Chile, Colombia, Switzerland, Oman, Qatar, Saudi Arabia and Guatemala all had high levels of this indicator, exceeding 7.7%. These countries are located in Latin America (3), Asia (3) and Europe (1). They are characterized by a high and medium income level of the population, which seems logical. Low values (not exceeding 1.9%) were recorded in Italy, Belarus, Mexico, Puerto Rico, South Africa, Japan, Madagascar, Pakistan and Portugal. These countries are located in Europe (3), Asia (2), Africa (2) and Latin America (2). They belong to different income groups: high, medium and low.

The average amount of informal investments per person involved in such investment reached 5 thousand dollars. However, there was a significant (from 0.9 to 9.9 thousand dollars) differentiation of the indicator values for the majority (68%) of the countries. More than 11 thousand dollars were contributed by those wishing to participate in business in countries such as Greece, Luxembourg, Qatar, Taiwan, Italy, Cyprus, Switzerland, and the Republic of Korea. These countries are located in Europe (5) and Asia (3). It seems logical that all these countries are characterized by high incomes of the population. Low levels of informal investment were observed in low-and countries: Madagascar, South Africa, Pakistan, Guatemala, India, Egypt and Iran. They are located in medium-income Asia (3), Africa (3) and Latin America (1).

The data presented in column 3 of the Table showed the significant differences in the values of each of the five indicators by country. Thus, we can come to the conclusion that the hypothesis 1 put forward earlier has been confirmed. The analysis of the lists of countries that are characterized by high and low values for each indicator given above showed the absence of links between these values and the countries location. So hypothesis 2 has also been confirmed.

5 Conclusion

The research results containing scientific novelty are the following:

- indicators describing the current levels of informal investments in early entrepreneurship were evaluated,
- the indicators of population participation in investment of funds directed to the creation of new businesses were studied,
- it was proved that the number of early entrepreneurs who independently finance the creation of their new business significantly exceeds the number of those who use informal investments,
- the values of the proportions of people making informal investments in the overall adult population, as well as the average amount of such investments, were established,
- the average values of each of the 5 considered indicators were determined for 50 countries,
- the presence of differentiation of the considered indicators by countries was demonstrated,
- countries with high and low levels of these indicators were presented.

The obtained results are of some theoretical and practical significance for governments and entrepreneurs. The proposed methodological approach and tools for assessing the financial support of entrepreneurial activity can be used in research on economics and entrepreneurship. The obtained data can be used in the process of training bachelors and masters in universities. Entrepreneurs and government authorities dealing with business regulation can also be interested in the research results. Further research can be conducted to assess gender and industry-specific characteristics of entrepreneurs' finance.

The study provides governments and other authorities with information about the current structure of early entrepreneurship financing in modern national economies. Government agencies and public organizations can use the study results for solving problems of providing support to entrepreneurs. The simulation results can be used to determine the needs for assistance to entrepreneurs in regions where the business sector is not developed. Government bodies can use the results obtained by the authors of this study to decide entrepreneurship development policies. During the study, there were limitations on empirical data due to the fact that only 50 countries were reviewed.

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Internal Control and Internal Auditing Definitions

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Abstract. Internal control has become particularly relevant in the management activities of any enterprise in a competitive environment in order to ensure the efficient operation of the enterprise. The internal control system is aimed at productive and efficient operation of the enterprise. Along with internal control, the concept of “internal auditing” is found in practice as well as in various sources. In some sources these concepts may be identical, in some - it is possible to see their similarities and differences. In the scientific works, there is a lack of consensus on understanding the content of internal control and internal auditing. The article attempts to define the definitions of these concepts, highlights their distinctive features from other management techniques and from each other. The terms analysis, the classification of principles of internal control organization and internal auditing are given in the article and it allows to systematize the system as a whole and to determine the significant difference between the concepts of “internal control” and “internal auditing.”

Keywords: Internal auditor · Internal auditing system · Internal control system · Internal controller

1 Introduction

Internal control has become very important in the management systems of organizations with the development of market relations. The most efficient functioning of the internal control system, as well as qualitative and well-timed organization of inspections, their systematic implementation are aimed at achieving a number of goals: the economic stability formation, transparent financial reporting, the provision of information communication between all levels of the organization management.

Internal control in the company should be considered as an independent function of management, as an activity with a target focus and also as a certain structure and execution rules. Internal control is studied in more detail in the investigation; it is systematized and characteristic features and its features are identified.

It's important to say about restrictions on the effectiveness of any enterprise internal control. In simple, the purpose of each economic entity is to generate profits with the least costs, as well as losses that could be for various reasons, but most often due to the law violations. The internal control system itself is not intended to achieve the organization objective; it acts as an assistant and, as an independent mechanism, has its own objectives, but also limits efficiency in achieving the objectives of other mechanisms

(departments, management). An internal control system functioning can only provide a reasonable (but not absolute) level of assurance for the achievement of the organization objectives. An amendment can be made, and it can be noted that the level can provide guarantees either concerning the achievement of the organization goals, or (if the situation is critical) can speak about the entity survival in the market.

It is possible to conclude based on the available management information how effectively the enterprise works, how quickly it reanes its goals. At the same time, the internal control system only detects errors, but cannot modify them, change them or make corrections. The coherent operation of the internal control system reduces the probability of the enterprise failure in the market (intended to prevent not achieving the goals). In this case, the effectiveness limitations of internal control are that the internal control system may not be sufficiently developed or not updated in accordance with the latest legislative changes.

2 Methodology

It is necessary to define the concept of “internal control” at the very beginning of the study on the organization of an enterprise internal control. As a process, internal control is quite broad. The purpose of internal control is to obtain detailed information on the performance of a number of important tasks: financial reporting reliability, compliance with regulations and laws, efficiency and rationality of the organization activities. Along with internal control, the concept of “internal auditing” is found in practice as well as in various sources. In some sources these concepts can be identical, in some - it is possible to see both similarities and differences.

At present, common views on understanding the content of internal control and internal auditing, their main differences both from each other and from other management techniques are not stated in the national scientific and methodological literature. We will present the scientific and methodological approaches to the definition of internal control and internal auditing in Table 1.

Table 1. Scientific and methodological approaches to internal control determination

Internal control		Internal auditing	
Source	Definition	Source	Definition
Lima declaration of guidelines for control, 1977 [6]	Is part of the company process management system to detect deviations from accepted operating standards	International standards for the professional practice of internal auditing (standards) [4]	Activities based on independent, objective assurance aimed at improving the company performance through a systematic and consistent approach to assessing and improving the effectiveness of risk management, control and corporate governance processes

(continued)

Table 1. (continued)

Internal control		Internal auditing	
Source	Definition	Source	Definition
Committee of Sponsoring Organizations of the Treadway Commission [1]	Process carried out by the company board of directors (management, other personnel), which is aimed at ensuring reasonable confidence in the achievement of the set goals in the operations, accounting and financial statements and compliance	Dontsova and Sharamko, 2015 [2]	It is an independent objective activity of a given department of the organization, including checks and consultations to improve performance through a systematic approach to evaluation and improvement of internal controls
Standards of the Internal Auditors Institute	Includes the following levels: risk owners (risk management at the operational level); supervisors (monitoring, risk analysis and monitoring); auditors (independent evaluation of the functioning of the internal control system as a whole)	Ivanov, 2015 [5]	Assesses control procedures and the reliability of the organization internal control mechanisms
Melnik, 2012 [8]	System of continuous monitoring (management) and inspection of the business entity performance in order to make reasonable management decisions based on identification of risks and adverse situations, etc.	Makarenko, 2014 [7]	Monitoring activities that include monitoring the adequacy and effectiveness of the internal control system
Zambrzhyskaya and Kosheleva, 2016 [13]	Process of determining, evaluating and information about deviations of real values from specified or their matching and analysis results	Ostrenko, 2016 [9]	This is a de facto internal control and/or management tool that provides the enterprise management with information on the results of analysis and monitoring of production and market activities

(continued)

Table 1. (continued)

Internal control		Internal auditing	
Source	Definition	Source	Definition
Zudenkova and Zhuravleva, 2014 [14]	Set of control actions implemented by certain methods and techniques aimed at results evaluation in accordance with established criteria	Turishcheva, 2015 [11]	Verifying compliance with the established accounting procedure and the reliability of the internal control system
Ermishina and Mataeva, 2016 [3]	Organization control system in order to ensure continuous functioning of accounting rules, execution of adopted programs and plans in accordance with the legislation	Sharamko and Garipov, 2016 [10]	Independent monitoring, including tools to improve enterprise performance

Source: authors.

Thus, despite some differences in approaches, it is obvious that many Russian scientists practically identify the concepts of “internal auditing” and “internal control.” It should be noted that this approach is not well founded, and it is confirmed by the other specialists’ works. Thus, despite the fact that in Russian practice the notion of internal control is often equal to that of internal auditing, it is necessary to recognize that these systems are closely interrelated. And if the internal control system can be positioned as a management function, the internal auditing system can be positioned as an internal control mechanism. This position will be taken as the main one in this study. As a guide and basic concepts, we will adopt the definitions of internal control and internal auditing.

Internal auditing, according to the International standards for the professional practice of internal auditing (standards), is an activity based on independent objective guarantees aimed at improving the company performance through a systematic and consistent approach to assessing and improving the efficiency of risk management, control and corporate management [4]. Let’s define internal control as a process carried out by the management and enterprise employees at all levels of management and aimed at productivity and efficiency of financial and economic activity, preservation of assets, reliability of accounting (financial) reporting, compliance with the requirements of the legislation of the Russian Federation and the enterprise internal regulatory documents. In defining the purpose of internal control, we should provide the system of management with up-to-date information, which allows to make effective management decisions on its basis.

3 Results

Next, let's look at the components of the organization internal control system, according to COSO [1]: control environment, control procedures, risk assessment, information and communication, monitoring. It's important to say that the COSO model does not rank internal control components. It should be noted here that a feature of these items is that together as a whole they constitute a common system of comprehensive procedures, which are assigned not only to the inspection person, but also to the enterprise management. These components are the part of the system of internal control measures organized by management to create targeted control over the performance of employees' duties [12]. Let's present the components of the organization internal control system in Fig. 1.

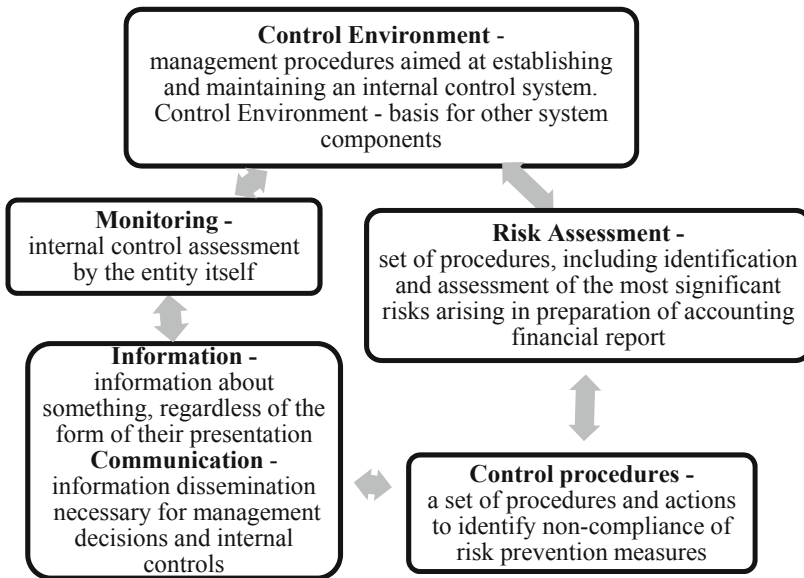


Fig. 1. The organization internal control components (Source: authors)

In its activities the account has such functions as control, information, feedback function, focus on property security and analytical function. Also one of the main accounting functions is the protective function. It consists in ensuring the protection of the organization interests by creating a basis for the operation of the financial control system. This process requires resources, and first of all it is worth speaking about internal control, which is part of all accounting functions. These functions are represented schematically in Fig. 2.

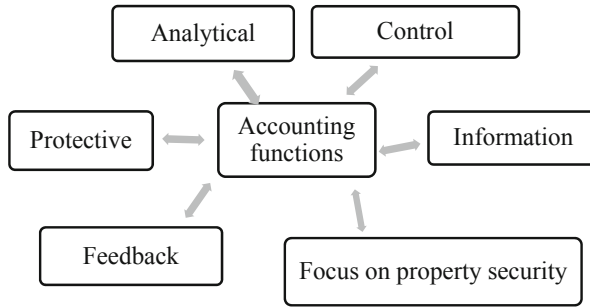


Fig. 2. Accounting functions (Source: authors)

Internal control is a certain system of measures carried out for the most effective performance of official duties by employees, for the purpose of enterprise monitoring the compliance with the law during business transactions. This is, first of all, the creation of a system of the most complete control, where in all work the control itself is a matter of the entire management, not just the control body. Let’s look at internal controls in Table 2.

Table 2. Internal controls

Internal accounting controls	Internal management controls
<ul style="list-style-type: none"> - while taking into account - check of primary accounting documents, documentary confirmation of all accounting records, - responsibilities distribution among responsible people, control over interrelated operations, - ensuring the security and confidentiality of information, making backups, - abuse prevention: separation and rotation of responsibilities 	<ul style="list-style-type: none"> - focus on innovation: production costs minimization, competitiveness improvement, - finance: cash flow planning and modeling, enterprise debt management, - investments: internal and external funds, cash flows monitoring, - staff policy: development of the labor stimulation system, employees skills improvement, employees’ compliance with the requirements of professional standards

Source: authors.

Internal accounting control which acts as a means of internal control, is a control carried out in the process of processing and taking into account documentation of business transactions. This control is carried out by the accounting services. Internal management control, which is also a mean of internal control, is a control carried out in the process of the enterprise management bodies, aimed at creating an effective system of internal reporting, regular exchange of information on the adequacy and completeness of the submitted management information. When organizing a productive system of internal control, the organization sets itself the tasks of ensuring the compliance of accounting financial and tax accounting with the adopted accounting policy,

ensuring the compliance with the rules of accounting financial reporting submission, as well as the enterprise pays special attention to preservation, reliability and protection of information and assets. Internal control essentially consists of the following elements: accounting system, information and communication means, risk assessment, control procedures and control environment. Also an important point in the disclosure of internal control is internal management accounting, the purpose of which is to provide information to internal production planning.

In the process of active economic activity, any enterprise faces the issue of effective risk elimination. The ideal solution to this problem is to develop risk management rules and principles. One of the components of this method is an internal control system development. For the first time, the importance of building a complex control system was stated in the Sarbanes-Oxley Act [1]. In general, this document covered the issues of the internal control system evaluation, corporate governance, the organization financial reporting, as well as ensuring the auditors' independence. For open joint-stock companies, two main management points of the organization were identified: the creation of a new regime for the control and regulation of financial activities, as well as changes in the field of management and disclosure requirements. The system of internal control avoids systematic errors in the practice of management decisions, resource management and cash flows. In today environment, such a system becomes important for large companies with complex organizational structure and geographical fragmentation, as well as for medium and small businesses. In order to understand the similarities and discrepancies between the concepts of "internal control" and "internal auditing," we will draw up a summary Table 3 of the principles of internal control and internal auditing.

Table 3. Internal control and audit principles

Principles of internal control functioning	Internal audit operating principles
Principle of responsibility and timeliness of communication	Principle of professional competence
Principle of constancy	Principle of independence
Principle of complexity	Principle of conscientiousness
Principle of efficiency	
Principle of prioritization	Principle of confidentiality
Principle of single responsibility	
Principle of replacement	Principle of professional conduct

Source: authors.

We tried to relate the available information and construct the table in such a way as to clearly compare the principles of functioning of the two control types in Table 3. By analyzing the data obtained, it can be concluded that the internal audit summarizes the rules and regulations for the audit process, provides specific general recommendations for monitoring, and regulates the profession of the internal auditor.

4 Discussion

In turn, the principles of internal control functioning review the audit and control process in more detail, and set out detailed recommendations for audit implementation. The main purpose of internal control and internal auditing is to increase the organization efficiency, ensure the correctness of decisions taken by the governing bodies, as well as to prevent the law violations. Despite the similarity of these concepts and their mixing while using, internal control and internal auditing differ significantly. These principles are the necessary basis for defining the internal control and auditing action vector in the organization.

Despite the fact that these positions are the foundation of the control system activity, we consider it advisable to add such principles as the principle of reliability of reporting results and the principle of risk orientation to the list of principles. Risk is an integral part of the life of any enterprise. In modern realities, enterprises are obliged to monitor the market constantly, carry out calculations to identify risk. The principle of reporting results reliability will help managers to systematize the available information on the work done, it is easier to guide in the reporting. In order to understand the difference between internal control and internal auditing better, we will draw up Table 4.

Table 4. Comparative table of main functions of internal control and internal auditing

Internal control functions (key tasks)	Internal audit functions (key tasks)
<ul style="list-style-type: none"> - organization: plan, duties division, authority delegation, - separation of duties: the same person cannot control all operations from the beginning to the end. Clear separation of functions of management and execution, as well as inspection and storage of materials, out of here the establishment of authority limits of personnel in accordance with the assigned duties, - personnel control: the manager access restriction to material assets, as well as constant selection of personnel and improvement of their skills, - carrying out accounting and arithmetic control, - monitoring of efficiency and expediency of spending (borrowed, own and attracted), - analysis and comparison of actual results with predicted results, - control over the enterprise finances, - financial assessment of investment results, - internal controls should be organized by all economic actors without exception 	<ul style="list-style-type: none"> - promoting control within the enterprise and performing a protective role related to the assets preservation and the accurate information obtaining, - maintaining independence, impartiality and objectivity while being inspected, - collection and analysis of the maximum information, - implementation of comprehensive activities evaluation, -assessment of the activities development before, during and after the projects execution, - drawing up a useful opinion, taking into account all existing shortcomings and containing recommendations for their elimination, - confirmation or failure to confirm the validity of the data presented in the accounts, - internal auditors' activities for the administration have informational and advisory importance, - internal audit should be organized by those economic entities that are specifically specified in the legislation or that have taken such a decision independently on the basis of their own needs

Source: authors.

5 Conclusion

It can be concluded from the obtained data, that the difference between internal control and internal auditing is that internal control is aimed at identifying errors in business, it is focused on the maintenance of reporting documents and is oriented towards the accounting maintenance. In turn, the internal auditing is aimed at assessing the severity of the detected errors at the level of internal control, at developing and testing measures to eliminate defects, and also includes the quality of control analysis. However, Russian legislation does not establish any restrictions on the procedure and methods of internal control at the enterprise. Each organization has the right to establish rules independently, develop progress and regulations of inspection, add or remove stages, change control measures. Taking into account that the monitoring purpose is to achieve the most effective result, knowing weaknesses and strengths, the organization can thus monitor its activities in a timely manner. Thus, internal auditing and internal control are complementary procedures that enable us to see a complete and comprehensive picture of an organization financial condition.

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Insurance Activities in the Digital Economy of Russia

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Abstract. The article examines the impact of digital technologies on the insurance market in the conditions of internetization, digitalization and individualization of the insurance business. The purpose of the study was to analyze the concept of digital insurance and the process of digitalization of the insurance market based on the practice of Russian and foreign insurers in promoting digital technologies, using general scientific approaches and research methods. Among the results of this research, the problems and prospects of further use of digital technologies in the insurance market were formulated. The authors conclude that the application of new technologies in the digital economy affects the insurance technology without changing its economic essence. In addition, the digitalization of insurance activities is followed by significant innovations that increase the efficiency of the former and the development of a new insurance programs.

Keywords: Digital insurance · Digital technologies · Digitalization · Insurance market

1 Introduction

Digital technologies play an important role in the development of relations in the field of production, in the structure of professional education and the economy, and determine new prospects for the development of communications, computing power, services and systems in the field of information. The digitalization of the economy also affects the insurance industry. However, insurance around the world, including in Russia, is still one of the most inertial sectors, it is quite slow to change, and innovations do not always take root there. But, nevertheless, insurers, taking into account the advantages of innovations, continue to gradually bring modern FinTech solutions into action in the framework of their business processes. This leads to the improvement of insurance products and their effectiveness. With increasing awareness of the potential for innovation provided by digital technologies, insurance companies are increasingly using digital programs in their business activities. In this article, the authors explore the relationship between the expression of the digital agenda in annual reports and the performance of 41 publicly traded European insurance companies for the period from 2007 to 2017. Our results show a positive relationship, which is particularly strong when companies use an integrated approach using digital technologies both in the context of

internal activities within their own organization, and in external activities dealing with customers and business partners.

The insurance business is associated with socio-economic changes in different ways. On the one hand, new trends in society and the economy affect the demand for insurance services. Megatrends such as urbanization, individualization, and aging societies create dynamics in insurance companies' client markets; climate change, economic instability, and political instability require a change in the way risk is calculated. On the other hand, insurance companies themselves are part of larger socio-economic structures that affect their day-to-day operations. They need qualified personnel, use modern information and communication technologies, and depend on financial products to generate savings. Thus, socio-economic changes also affect how insurance companies operate. In this sense, we can talk about external relations and internal relations of the insurance business with socio-economic changes. While the first concerns markets, customers, and offers, the second concerns business operations, management, and control aspects [3].

2 Methodology

In the scientific literature, the study of the insurance market development in the digital economy is still episodic. Foreign analytical literature describes results of regular market research and practical conclusions. Published research prepared by the largest audit companies [5, 6, 8, 10–12] shows some problems and prospects of digitalization of insurance business in developed countries, highlights the main trends, risks and threats to the traditional insurance business, changes in the labor market in the insurance sector. It seems appropriate to conduct similar research for Russia and analyze the data from a market survey of representatives of leading Russian insurance companies. In the works of Russian researchers [1, 14], attempts are taken to rethink the role and development of insurance under conditions of digital economy implementation. The paper considers results of a market research of the insurance industry on the issues of digitalization of the insurance market, aimed at identifying problems and prospects of this process in Russia.

3 Results

Changes in the economic situation caused by the introduction of restrictive measures to combat the spread of coronavirus in Russia and other countries negatively affect the dynamics and development of the insurance market in 2020. The impact of the current decline in economic activity on the insurance market will differ from what was observed in 2014–2015, due to the noticeable change in the structure of the insurance market over the past five years and the unique nature of the economic shock faced by the Russian and global economy. The current financial position of the insurance industry is noticeably better than in 2014. The accumulated margin of safety will help to minimize consequences for insurers from possible deterioration of the financial result. At the same time, the current conditions will probably speed up the process of

digitalization of insurance services (both at the sales stage and when settling losses). In addition, new products may appear on the market. For example, with coverage of pandemic risks and with options to pay for insurance protection in proportion to the time it is used for. At the beginning of 2020, the Russian economy faced a significant change in the economic situation because of the coronavirus pandemic, as well as falling oil prices. Reduced external demand and restrictive measures have led to a significant decline in the economic activity. According to forecasts of the World Bank, by the end of 2020, GDP will decrease by 4–6% [7].

The slowdown in the economic activity will have a negative impact on the Russian insurance market – the dynamics of insurance premiums generally follows the dynamics of GDP as part of a long-term trend to increase the share of the insurance market in GDP. This is due to the dependence of the insurance market on the state of the economy, the activity of enterprises and the income of the population. However, during periods of rapid development of certain segments of the insurance market, the growth rate of the insurance market as a whole significantly deviated from the dynamics of GDP. So, in 2012–2013, during the period of active growth in lending to individuals and related types of insurance (life and health insurance of borrowers, auto insurance), the growth rate of the Russian insurance market was more than one and a half times faster than the growth rate of the economy as a whole. In 2016, the rapid growth of the investment life insurance segment accelerated the growth of the insurance market in the background of a slowdown in the nominal GDP growth.

The active use of digital technologies in sales of insurance products is fully explained by the requirements of the Bank of Russia for mandatory sales of Mandatory Motor Vehicle Liability Insurance (MMVLI) via the Internet, as well as the need to maintain the competitiveness. The introduction of Internet sales was considered as a brand management measure which is necessary for the future development. In addition, it is quite easy to calculate costs of implementing new technologies and evaluate their effect of implementation in the sales process. The introduction of basic standards of insurers' unions and regulatory requirements for the protection of the consumers' rights (consumers of insurance services) made it mandatory to invest in electronic communications with policyholders/insured persons. To more accurately characterize the digitalization of the insurance market, it is proposed to use an indicator of the penetration level of new digital technologies (the digitalization level), which shows the ratio of business processes using new digital technologies to the total number of business processes in the insurance company.

As positive consequences of the current economic shock for the insurance industry (and the financial market as a whole), we can highlight the acceleration of digitalization of processes. Thus, in the conditions of limited operation of offices and movement of citizens, the need for remote services increases. At the same time, in addition to the development of electronic sales (including the expansion of the possibility of pre-insurance inspection of property using mobile applications), the rapid development of remote loss settlement and telemedicine services is also expected. There may be an increase in the popularity of pay-as-you-go policies that involve paying for insurance coverage in proportion to the time it is used for.

The current situation, the development of which was difficult to predict, put organizations around the world in a strict framework – to preserve their activities,

companies needed to transform their processes for the online mode without losing their quality. The insurance industry is consistently implementing new technological tools in its management model and processes, and the industry is therefore prepared for the new realities that the pandemic determines. Product development and adaptation, testing of new scoring models, interaction with internal and external audiences – all these processes are based on the use of digital tools.

4 Discussion

A number of scientific works investigate specific features of applying certain digital technologies in various business processes of insurance companies. For example, Nikulina, Berezina, and Shashkina assess possibilities of using digital technologies in the marketing of insurers [9]. Boldyrev finds application of telemedicine technologies in the process of underwriting when concluding insurance contracts [4]. Separate works are devoted to the analysis of specific cases of using digital technologies: telematics in the segment of voluntary auto insurance [13], specifics of bank risk insurance in the digital economy [2].

The development of digital insurance in terms of insurance of specific risks of the digital economy will be determined by:

- the implementation level of digital technologies in the Russian economy;
- the development and complexity of digital technologies, especially Artificial Intelligence and the Internet of Things, in the industrial production;
- the readiness of Russian legislation to insure cyber risks and other risks of the digital economy;
- the development of digital risk insurance infrastructure aimed primarily at pre-insurance audit and assessment of the causes of an insured event;
- the level of protection systems against the digital risks.

To a large extent, the success and speed of digitalization of insurance business in Russia as an infrastructure institution will be determined by the digitalization pace of the social-economic sphere, while the development of the insurance culture of Russian citizens and the effectiveness of the use of insurance mechanisms in corporate risk and financial management systems will have a significant impact on further development of this sphere. It is obvious that the forced experiment with the transfer to remote work and servicing of Russian residents will strengthen the growth trend of Internet services in many traditional activities, including in the insurance business. Today, this should be considered in insurance companies, where in this regard, the need for office workers and insurance agents will decrease, but the demand for specialists who are ready to combine insurance competencies with digital knowledge and skills will increase. Research in 2018–2019 showed that the main constraints to the introduction of digital insurance in Russia were the high cost of technology and the lack of widespread demand for digital insurance programs and products. However, the technologies necessary for the transition of a significant part of insurance business processes “to digital” were almost ready in the 2010s, and some of them – since the 1990s, so if there is a request for this transition supported by funds, the technologies can be applied quickly and effectively.

5 Conclusion

Insurance is a conservative field that carefully accepts innovations. However, interest in digital technologies is also growing in this sector. The reasons for the lack of penetration of new digital technologies in this sphere should be found outside the insurance market. The lack of demand for digitized insurance programs may be determined not only by the low level of insurance penetration into the economy of our country, but also by the low level of digitalization of the Russian economy, as it increases, we can expect an increase in demand for insurance programs offered on the Internet. The lack of adaptation of digital technologies for insurance services is partly determined by the lack of qualified personnel in the field of new digital technologies and the insurance business. The most important direction of reducing the cost of new digital technologies is the development of universal (boxed) solutions for digital technologies, which will cause a significant demand by insurance companies.

Promising areas of digitalization in the insurance market should be taken into account by IT companies in order to develop specialized programs for insurance companies. The development of the insurance market in Russia is increasingly dependent on the application of new technologies of the digital economy, which affect the technology of insurance, but do not change its economic essence. Results of the use of digital technologies in insurance activities are:

- increase in the efficiency and profitability of insurance activities;
- convergence of mutual and commercial insurance (P2P insurance);
- socialization of insurance relations;
- appearance of new insurance services and products.

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Financial Leasing as a Funding Instrument: Benefits and Opportunities

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Abstract. Limited capacity in usage of the borrowed funding sources, high loan pressure, macroeconomical and geopolitical instability and current reorganization of all banking system – these are the reasons why the development of financial leasing in Russia is now discussed at a practice level, and that is why scientific researches in this field are relevant. Currently, as productive state-owned and private capital stocks are being formed or renewed, the organizations experience an extreme lack of financial resources. Financial leasing in this situation seems an adequate and relevant investment tool with high effectiveness rates, financial difficulties aid and possibilities of raising a capital. The goal of the article is to justify the benefits of financial leasing in comparison to other funding tools, and to review current trends in development of leasing services. To achieve the goal mentioned, the authors used a systematic approach in order to analyze the problem in complex and to propose concrete steps for the solution.

Keywords: Bank loan · Financial leasing · Funding · Leasing · Rental

1 Introduction

Current economic circumstances make the successful development of a business impossible without the usage of complementary funding sources. Along with classic bank loan, there are factoring and forfeiting deals, public budget financing, venture funds etc. [6].

Leasing in general, and in particular - financial leasing, is a new funding instrument in developing financial markets, such as Russian. In comparison to traditional funding sources, it has numeral benefits; the key one is an opportunity to run a business only owning a portion of the required financing: the business is being funded with an actual equipment (not with money like in a bank loan), which can be used in production immediately [2].

For the first time modern financial leasing was implemented in the USA by Henry Schoenefeld. In 1952 he ran a leasing company for one specific deal in rail industry. In 1950–60s, financial leasing has started to develop rapidly in Europe.

There were several prerequisites for this rapidity:

1. Technological revolution claimed the necessity for businesses to renovate their capital stocks, and financial leasing has become a useful tool, more beneficial than a bank loan.
2. Financial services market, along with its' fast growth, has created the newest loan forms; low interest rates and favorable tax system made leasing more attractive for businesses.

In 80s, financial leasing was spread almost everywhere in the world. In the last decades, yearly number of leasing operations has been growing exponentially. According to statistics, of all the leasing operations, more than 80% is financial [10].

However, it is vital to understand that in Western countries the term "leasing" not only involves financial lease, but also the operational one (it refers to the classic rental deal) [4]. In Russia, the term "leasing" involves financial lease only.

Financial leasing is a contract, where a lessor pledges to acquire an asset at a certain supplier, to transfer the asset (as a leasing object) to a lessee for a certain payment, for the certain time and with certain terms of use or ownership. The contract states full (in exceptional cases – partial) refund of all the lessor's costs and following purchasing of the asset by the lessee. The right of a purchase after the end of the contract is the key difference of financial leasing from the other types of leasing.

In total, more than 20% of European investment in productive capital stocks is led with leasing. Around 80% of the leasing industry in Western Europe is concentrated in the Great Britain, Germany, Italy and France. In Eastern European countries, such as Hungary, Czech Republic, Slovakia and post-Soviet countries, the transition to capitalistic markets gave the possibilities for developing the leasing business [10].

2 Methodology

The system approach was used as the main methodological approach in this study. The use of this method allowed us to determine the role of financial leasing in the system of funding sources of the enterprise. The advantages and disadvantages of using leasing not only determine the prospects for its use as a source of funding for an enterprise, but also for the entire leasing services market in Russia.

The key methodological instruments in this research are the principles of functional approach, general academic methods of learning (analysis, syntheses, induction and deduction, abstraction) and statistical analysis tools; this methodological approach helped in enhancing the knowledge about the role of financial leasing in organizational funding.

3 Results

Before reviewing the benefits of financial leasing, it is crucial to keep in mind the existence of mutual interest of the parties in the leasing deal. The main benefits for lessees are:

- fiscal and economic allowances regarding leasing deals,
- reduction of initial financial burden due to balanced and periodical volumes of payments [8],
- for new companies and start-ups, with no initial financing, leasing may be the only source of funding.

The objects of financial leasing in Russia “are any non-consumable goods, such as establishment or other proprietary complexes, buildings, constructions, equipment, vehicles or other movable and immovable property, which can be used in production or business” [4, p.4].

The functions of leasing are similar to the bank loans’ functions, but with slight differences in:

1. Financial function: the possibility of escaping a one-off full payment for the leased asset.
2. Productive function: rapid resolve of the production needs by temporary usage of the expensive equipment (the possibility of escaping a purchase – this is a key function of the leasing as an economic development factor).
3. Sales function: enlarging target groups and entering new markets, using leasing schemes.
4. Fiscal allowances function (the key reason of the usage of leasing):
 - lessee may not mention the leased asset in financial statements: the lessor keeps the ownership rights;
 - the leasing payments are included when computing costs of production; it reduces tax base (in general – corporate tax base),
 - accelerated depreciation (in average, with the depreciation coefficient of 3) helps to fully amortize the asset during the time of the contract, which means lessee will not pay the property tax when repurchasing the asset.

In a number of articles regarded the effectiveness of leasing deals, the necessity of financial leasing in comparison to other funding methods is viewed as the key issue. The main argumentation defending the benefits of the financial leasing involves [3]:

1. Tax optimization; the leasing offers next possibilities:
 - eliminate the property tax (due to depreciation during the leasing contract),
 - corporate tax optimization (leasing payments are stated as costs, thus reduce the tax base),
 - VAT refund.
2. Simplicity in avoidance proceeding: if due to a certain reason the leased asset has become irrelevant, lessee may terminate the lease and return the asset to the lessor. In comparison to the loan, where a borrower has to sell the asset to stop the loan payments, the leasing scheme seems less complicated.
3. Wide range of usage: the leasing offers more variations in assets than loans (for example, specific equipment, production technics etc.).

4. Balanced insurance payment schedule: insurance and necessary technical services are involved in leasing payments, thus costs are evenly distributed by the time of time of the contract.
5. Possibility of exchanging the leased asset to the new one due to the simplicity in avoidance proceeding.
6. Simplicity in receiving the asset: the lessors normally trust the lessees more than banks do, because the ownership for borrowed assets belongs to the lessor until all the payments are made. This is the reason why the leasing scheme may be used by the companies with questionable loan experience.

Along with the above-mentioned benefits, financial leasing has the number of disadvantages:

1. In comparison to a bank loan, the leasing deal is more complicated due to the larger number of parties.
2. Lack of the ownership rights for lessee: however, it is more likely psychological issue.
3. Initial contribution needed: it is necessary for the lessor to trust the lessee; For the new companies and start-ups, or for the companies which have no free cash flow – it is inconvenient to pay 30–40% initially.
4. Dual formalization of the property: the changes in ownership rights when using the leasing scheme should be reported twice.
5. In extreme cases, financial leasing may be more expensive, than the loan: it happens when the leasing company increases rates for a lessee due to specific reasons (financial instability of the lessee, questionable loan/leasing experience, low liquidity of the leased asset, small initial contribution (under 15%) etc.).

Meanwhile, from the economic prospective, financial leasing is the most optimal method of funding the business entities. To prove this, it seems adequate to compare two most used financing sources – bank loan and financial leasing. The key criteria in this case will be the sum of discounted cash flows (loan-regarded and leasing-regarded) of a company.

To choose the funding source, the entities often compute the sum of the leasing payments and compare it to the sum of loan payments; the companies do not take in account the tax avoidance in both computations. However, the above-mentioned tax allowances of financial leasing are its' main benefit, that leads to lower costs in proceeding the leasing deal.

In addition, it is vital to compute every cost that a company may have using any funding method. In particular, when acquiring an asset on credit a company will face extra costs of paying the property tax; when leasing the same asset, it would be formalized by lessor, thus the lessee-company do not pay the property tax. It is vital to keep in mind other additional costs, such as insurance, custom payments, delivery, registration, transportation taxes etc.

Also note that leasing payments involve VAT; that means that in the future a company may credit of these payments to the other taxes. Therefore, if the criteria of the payment flows does not include tax allowances and additional costs of every funding method, the outcome of the comparison will be incorrect [9].

4 Discussion

Russian leasing market, throughout 2019 has been demonstrating lower growth ratio than in the period from 2016 to 2018; nevertheless, this market still takes its' place in TOP-5 biggest European leasing markets [5]. According to 2019 full year statistics, the volume of the “new business” (the price of the transferred within the period leasing assets according to the methodology of Leaseurope: New business is the total value of assets provided during the period, excluding VAT and finance charges) was 1,5 trillion rubles (+15%): it clearly demonstrates the slower growth ratio for 2 years in a row, due to decline in a volume of huge corporate deals in rail and aircraft industries. Other segments, vice versa, grew by 30% in average: the leading drivers were vehicle industry, building and construction works, oil and gas production and recycling.

The main financing source for leasing companies are bank loans: their share in total funds invested in leasing market had not been lower than 60% over the last 4 years [7].

According to Russian Central Bank data, in November 2019 the number of loans disbursed to resident companies increased dramatically – amounting in the equivalent of 63 billion rubles; along with the increase (from 2,5% in 2018 to 10% in 2019) in a share of the currency lending, it led to the growth in a number of corporate deals [1]. The currency lending increase, against the stabilizing rate for ruble and lowering interest rates in 2019, claims for the realization of the catch-up demand for deals with foreign equipment. Over the previous periods, the volume of such deals has been declining; in most cases the deals only occurred either in the short periods when the rate for ruble was stable, or due to extreme necessity equipment with no local analogues. Taking in account the devaluation of ruble in March 2020, such loans now have higher risks for the companies. The issues with paying for currency debts will occur in aircraft industry (because of lower passenger traffic), in coal and oil production industries – the prices and the demand are currently declining [5].

In 2019 the key trends were lowering interest rates and increasing the volume of financing against the stabilizing ruble rate. Currently, COVID-19 pandemic and dis-balanced oil markets changed crucially global geopolitical and macroeconomical conditions; the prognoses are diametrically opposite to 2019: there are two pathways in the development of leasing industry in 2020 – the one and the crisis one.

“Expert RA”, when making a prognosis, based on the moderately-negative scenario: the yearly average cost for barrel of the Brent oil should be around \$40–50, declining rate for ruble against the cheap oil should lead to the increased inflation ratio. As a result, the interest rate should be increased by 1–1,5 points; the growth ratio of Russian economics should slow down at a nearly 0 point. The leasing market, consequently, should demonstrate the decline after 4 years of growing. Meanwhile, “Expert RA” does not exclude the possibility of the crisis scenario [5].

5 Conclusion

Nowadays, more and more researches about the effectiveness of leasing schemes occur in Russia. However, only a small share of them is based on the strong analytics and actual business data: most of the information is provided by leasing companies

themselves in their PR articles. This statement may be proven if we take in account the purposely hidden disadvantages of leasing, such as:

- no time factor (changes in values throughout the certain period) is analyzed,
- shortening duration of leasing payments; the effect of each form of investment throughout the project is being purposely shortened,
- defiance of the industrial features: when comparing leasing to the other financial sources, the specifics of pricing and taxation in each industry are being ignored,
- only computing the costs of charge back schemes: it is assumed that the “tax shield” of every type of financing will be used completely.

In conclusion, we can state that the financial leasing is profitable for every business in general – due to the possibility of tax optimization – and in particular for the companies, that do not benefit from having the equipment on their accounts. Basically, when running a certain project, a company has to analyze and compare every funding pathway before choosing any – including leasing.

When comparing volume and dynamics of the leasing industry with banking loans, it is vital to analyze the “new business” volumes not against total corporate debts disbursed, but against the investment crediting. Typically, investment loans are used to develop and renovate the production – they are more likely to be used instead of leasing. Due to the fact that data on such loans in Russia is not provided, the closest analogue of investment crediting is bank loans, borrowed to invest in capital stocks. Last year the volume of the loans mentioned was 1 874 billion of rubles [1]; the growth dynamics correlates strongly with the volume of the “new business” – which ratios depend crucially on general investment activity. Throughout the last years leasing has been chasing the volume of investment crediting, however never exceeded it, exceptionally in some countries like Poland – the volume of leasing deals is greater than the investment crediting.

Obviously, next several months will be lifechanging for development of leasing industry in Russia. If the arrangement of the OPEC+ will not occur, the oil prices should face the decline period; as a result, the support of the current ruble rate should be economically unprofitable for the Central Bank of Russia – otherwise the reserve funds may be drained dramatically. No exchange controls, against low oil prices, should lead to severe devaluation of the national currency and activate all the conditions of crisis scenario – it will occur with yearly average Brent price \$35/barrel. In such case, the drop in the “new business” volumes in 2020 should reach over 20%, and the amounting equivalent of the market should not exceed 1,2 trillion of rubles [5].

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Company Reform Based on Outsourcing as a Way of Innovative Management

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Abstract. The purpose of this article is to develop a concept of company reform based on outsourcing. The authors consider the problem of implementing the outsourcing process in the activities of modern enterprises. For successful integration of outsourcers into the system of economic relations with customers, it is necessary to ensure a level of organizational and technical development of the enterprise at which the organizational structure, business processes and relationships between departments can be described in detail. The problem also lies in the discrepancy between the customer's expectations and the supplier's capabilities. An additional problem is the lack of a standard scheme for switching to outsourcing. Both the supplier and the customer of outsourcing services must be in constant interaction with each other. In order to find the best way to use outsourcing, the authors developed a step-by-step algorithm for company reform based on outsourcing.

Keywords: Business process · Concept of outsourcing implementation · Outsourcer · Outsourcing · Outsourcing process

1 Introduction

To survive in today's competitive environment, an organization must constantly adapt to its environment, monitor changes in the external environment and change, first of all, in the directions in which it can best realize its capabilities, as well as focus on the business processes that it performs professionally. Organizations that carry out their activities without properly adapting their management system to market requirements, do not withstand competitive conditions and stop their activities. Changes in management and the use of new management methods and tools aimed at improving competitiveness are becoming a key instrument for the strategy of sustainable business development in the conditions of market relations and fierce competition. In the context of globalization, a company can only maintain its position in the market by training its employees and developing new business technologies. If we approach the issue of

outsourcing development from this point of view, suppliers of components and materials can play a key role in developing the customer's competitive advantages. In the conditions of the modern market economy, Russian enterprises are subject to increasingly high requirements from the point of view of management and organization of activities. From the point of view of innovation management, one of the ways is to introduce outsourcing.

In modern society, ideas about the organization of business processes, economic consciousness and the principles of wealth creation are changing. These changes are driven by the use of adaptive manufacturing, cloud technologies, and other technological innovations. This is said by scientists such as Evtodieva, Chernova, Ivanova & Kisteneva [4]. Stephan, Patterson, Kelly & Mair considered innovative management technologies, business models, reserves in management, and the possibility of transferring world technologies to the activities of Russian enterprises [13]. Helfat, Martin analyzed the possibilities of dynamic control in their article. They analyzed and evaluated the management impact on strategic changes, and also reflected the importance of effective management of changes necessary for the company's strategic development [5]. One of the possible strategic directions of the company's development may be the introduction of the outsourcing process in the company's activities in order to improve the quality of provided services and products production of and reduce costs.

2 Methodology

The theoretical and methodological basis of the research is the theses and methods of fundamental and applied sciences in the field of economics, statistics, logistics, commerce, marketing, as well as regulatory documents reflecting the legislative provisions and regulating the activities of transport enterprises. To substantiate the obtained results, the authors used the principles of system and statistical analysis, the basics of logistics modeling, economic and mathematical methods and methods of generalization. The starting point of the theoretical part of the study is the fact that the outsourcing methodology is not something significantly new in economic theory. The core of the modern theory of outsourcing, in the author's opinion, is the general theory of the division of labor. The new economic conditions of development and the penetration of the technological revolution into all spheres of activity, as well as the characteristic provisions of outsourcing, have forced us to take a new look at the well-developed problems of the issue.

The authors interpret outsourcing as a form of economic relations in which the customer concentrates on the main activities and transfers secondary, but functionally necessary business processes and responsibility for their implementation to professional providers on a long-term basis in order to improve the quality, reduce costs and time of these processes, and the performer is engaged in the development and improvement of this type of service. From an economic point of view, it should be noted that the use of outsourcing, according to the authors, is associated with the concept of opportunity costs, or the cost of lost opportunities. In a service economy and a rapidly changing economic environment, it is difficult to choose the best way to use

the available resource. It is necessary to determine the effect of a particular direction of resource use. To make an economic choice, it is necessary to calculate not only future costs, but also the costs of unused opportunities.

The ratio between the volume of own production of resources (works, services) and the volume of resources received from outside is an indicator of the level of development of cooperative relations of this enterprise. It turns out that the relatively new term “outsourcing” is associated with the long-known concepts of “cooperation”, “specialization”, “division of labor”. The concept of “division of labor” in Russian economic science was formed in the paradigm of “labor theory of value”, developed in the works of Karl Marx. This does not prevent us from using this term for explanations of the processes of cooperation and specialization, which, in our opinion, are based on the phenomenon called “outsourcing”. The division of labor is at the heart of the organizational structure of the modern economy, and on a global scale. This phenomenon is really the basis of many economic categories, facts and phenomena.

It is important to note that the concepts of “cooperation”, “specialization”, “outsourcing” go back to the fundamental foundations of the organization of social production. Therefore, it is acceptable to conclude that the study of the essence of outsourcing, the development of organizational design methods on this basis affects the basics of production organization. Consequently, the application of this method in the practice of structural transformations of industrial enterprises can have a significant impact on the efficiency of the country’s economy.

Most Russian companies are potentially ready to disintegrate to a certain extent and transfer their non-core activities to the side. Some of the non-core divisions will become core ones, because they will start earning money, while some will not stand up to competition, and you will be able to buy the same services and products, but of better quality and for less money. Outsourcing is a modern business model that provides additional competitive advantages. The main source of these advantages is the use of reserves (tangible and intangible) of other companies to achieve success in the market. The use of outsourcing in the practice of structural transformations of enterprises can have a significant impact on the efficiency of the country’s economy as a whole.

Despite the rapid development and a number of benefits gained from outsourcing, this relatively new organizational scheme is not yet very common, and many are still cautious about it. Potential customers refer to factors related to trust to the supplier. When outsourcing several important functions at once, there is a real risk of leakage of confidential information and the emergence of a new competitor using the experience and knowledge of the company that ordered the outsourcing.

3 Results

Using outsourcing allows you to focus internal corporate attention on the main goals and objectives of the organization. Secondary functions are delegated to third-party organizations that specialize in performing them. In this case, the customer of outsourcing services can focus its own resources on solving strategic tasks and achieving competitive advantages. In this regard, it is extremely relevant to develop the concept

of company reform based on outsourcing. This approach includes five steps (Fig. 1). The company manager should know which activity is a “candidate” for outsourcing.

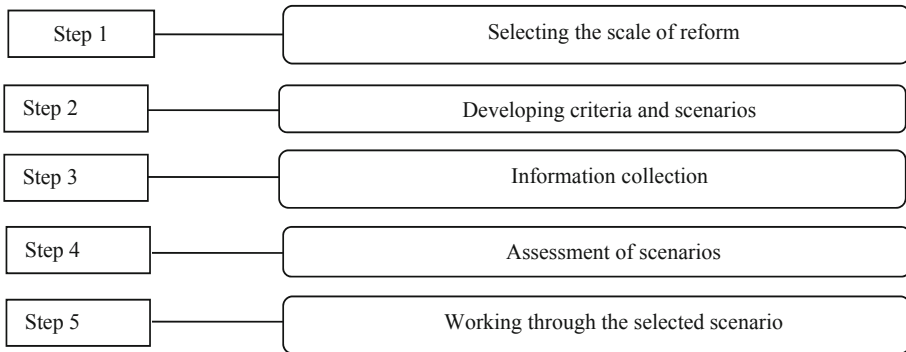


Fig. 1. Reforming the company on the basis of outsourcing as a way of innovation management (Source: authors).

At the first stage, it is necessary to outline the boundaries of the allocated activity, that is, to understand what exactly can be outsourced. Then you need to develop possible scenarios for reforming activities, as well as determine the criteria for evaluating these scenarios. Then information is collected—both within the company and on the external outsourcing market. Based on the assessment of the collected information, management selects the best scenario and develops a business plan for its implementation. It is necessary to consider the indicated stages in more detail.

It should be noted that it is quite difficult to define the boundaries of the reformed activity. For example, the company is faced with the task of improving repair activities for its internal needs. But what is considered such an activity? Does it include, for example, computer repair, or is it considered it software? All such issues should be resolved at the first step.

First of all, it is necessary to find out what works belong to the activity being reformed and what human and material resources are required for this. To determine the object of outsourcing, you must present all the work in detail. In the future this will allow to identify criteria for the evaluation of scenarios. For example, the activity “maintenance and repair of office equipment” includes disassembly, cleaning, adjustment, Troubleshooting, receiving and replacing parts, testing the device, and so on in particular, the “receiving parts” function will reveal such criteria as the waiting time for parts to be repaired.

The definition of resources will be required while evaluating the cost of performing individual functions. For example, knowing the cost of labor for disassembling a faulty printer and the price of consumables, you can determine the cost of disassembly.

At the second stage, it is necessary to determine the criteria by which one or another reform scenario can be evaluated later. There are three main groups of criteria:

- criteria of quality of performance. They show how well the performer does their work. Example: time of arrival of specialists to the customer, total time of repair of one computer,
- the criteria value of the character. Reflect the cash costs of operating or reforming (Example: total cost of business ownership, cost of repairing one piece of equipment),
- performance criteria (social and licensing criteria). Together, they reflect the ability of an external organization to perform its activities (Example: having a license to operate).

At the next stage, information is collected, which then allows you to compare the developed scenarios and choose the best one. For example, questionnaires are mainly used to collect information on the values of criteria included in the quality of performance group. They include information from regulatory documents, expert opinions of users, as well as evaluations of performers. For example, time limits for equipment repairs can be used as regulatory documents.

Values for the right to perform criteria are collected from both performers and managers of the enterprise. Sometimes information related to a block of social criteria is very important. For example, a company that has a repair division may be a city-forming company, so the loss of jobs will cause social tension.

When collecting values based on quality and performance criteria, there are usually no special difficulties. However, it is worth discussing the collection of information for a group of cost criteria in more detail. The main difficulties here are related to inadequate accounting (or lack of it) of the costs of the reformed activity. There are situations when accounting is maintained for the division as a whole, and you need to determine the cost of performing a service provided by the division. In this situation, you have to collect primary data.

In this case, the following algorithm is applied. First, the total labor costs of the division whose staff is involved in providing the service are determined for the period. If employees from different departments are involved in this activity, then the total labor costs are determined.

Secondly, it is determined by the frequency of execution of activities. If services are provided very often, then you can consider the activity continuous and take the labor costs for the period. For example, for round-the-clock security services of an enterprise, the monthly labor costs are taken. If it is possible to calculate the number of implementations for a period (for example, 110 computers were repaired during the quarter), then the labor costs for one-time service provision are taken and its frequency is indicated.

Third, the unit costs are adjusted to match the selected period. For example, initially there is data on the labor costs of production workers for a month, and the number of service implementations for a quarter. In this case, the monthly labor costs are averaged based on available data and are reduced to quarterly, i.e. multiplied by three.

Fourth, the share of labor costs for the provision of services in the total labor costs of the division for the period is calculated. Let's say that the repair department performs other types of work (for example, servicing lathes). Then the labor costs for repairs should be divided into the total labor costs calculated at the first step.

Finally, fifthly, the resulting coefficient is multiplied by the unit's expenditures for the period in monetary terms. This will give an estimate of the cost of continuous service over the period. If you can determine the number of sales over a period, the result is divided by the frequency of service delivery. This way we will get the cost of a single service (for example, the average cost of a single software update).

At the stage of data collection, you need to make a parallel calculation for a situation where the service is provided by a third-party organization. As a rule, this information is collected in the course of a tender for the implementation of the reformed activity or through marketing research.

Next, you need to compare the scenarios based on the values of the criteria calculated in the previous step. Scenarios are evaluated using a specific algorithm. Expert assessments are used as a decision-making tool. To do this, an expert commission is created for each type of activity. For example, it can include: users of equipment, employees of the department that repairs equipment, employees of current and planned repair services.

The expert group should make a decision on how significant each criterion is for evaluating scenarios. The significance of the criterion is indicated in points, for example, from 0 (the criterion should not be taken into account when evaluating the scenario) to 5 (the criterion is very important to take into account). You also need to conduct a local scenario assessment, i.e. an assessment based on the value of a single criterion. It is given in points from 1 (minimum compliance with the criteria) to 5 (maximum compliance).

Despite the fact that the rational scenario has a better estimate, it is useful to analyze the obtained integral estimates of the development of activities for all scenarios. This is done in order to finally make sure that the choice is correct or to eliminate misunderstandings that may have arisen as a result of the "mathematical" approach to decision-making. Based on the results of the analysis, a final decision is made on the scenario for reforming the activity. At the final stage, you need to prepare a business plan for moving to the selected scenario. The scenario is being specified. For example, if the "outsourcing" scenario is selected, the "service level agreement" document is prepared. It will be based on the values of the criteria collected in the third step. The organizational structure and number of employees of the customer's service in the consumer company is also determined.

4 Discussion

There are several sides of the outsourcing process. Customer is a company that is ready to purchase outsourcing services and outsourcer-a company that offers these types of services. One of the most common types of outsourcing is IT outsourcing. Researchers such as Yakhneeva, Agafonova, Fedorenko, Shvetsova & Filatova consider the collaboration between the software manufacturer and the customer as a kind of strategic game for two players [14]. The features of information and communication technology outsourcing are described by Davydova [3].

The client must trust the outsourcing company. I must be sure of her actions. Agafonova, Yakhneeva & Nikitina in their works speak about the importance of

information openness and transparency of companies, as well as about corporate social responsibility, which affects the effectiveness of business development. Agafonova, Yakhneeva & Nikitina in their work pay attention to the importance of transparency of companies, as well as corporate social responsibility, which affects the efficiency of business development [1]. The authors consider the possibility of outsourcing in the field of logistics to be relevant at the moment.

In their article Sosunova, Sivaks, Rakhmatullina, Starun & Iskoskov note that from the point of view of logistics optimization of the service in order to obtain a better product or service, as well as optimization of financial costs, it is advisable to outsource part of the technological process or operations for customer service to specialized companies [12]. Logistics outsourcing or outsourcing in the field of logistics involves the use of a logistics provider in the company's activities. Shalamay and Klochko in their article describe how to choose the best logistics operator [10]. The essence and features of outsourcing of logistics functions and business processes are described in the article by Zayats, Kozlov, and Vakulich [15]. Kornelyuk, Pavlovskaya, and Vakulich, studied and described the reasons for logistics outsourcing related to internal business processes in the company and determining its effectiveness [9].

Sosunova, Astafieva, Yudakova and Petrova considered issues and problems of planning logistics activities in the supply chain. Each participant in the supply chain is responsible for their own volume of work [11]. Kalashnikov, Yudakov, Rakhmatullina, Sivaks, and Permyakova reflected the trends of the logistics services market, the constant growth of competition in this area. The competitiveness of enterprises is associated with improving the quality of services provided [6]. Kirillova, Korzhova, Mukhametzyanova & Banartseva in their work reflect that the assessment of the quality of customer service is one of the indicators of the company's performance [7]. The main tool for improving the quality of transport services Klimova and Semenova called the requirements of the transport strategy of the Russian Federation [8]. The problems of logistics outsourcing and taking into account the industry specifics of the business when making a decision about outsourcing are described in the article by Barkova [2]. Russian companies have significant opportunities to conduct business based on the systematic use of outsourcing. The use of outsourcing serves as a methodological principle for the necessary transformation of the management of Russian companies in the context of increasing competition and the development of the processes of globalization of the world economy.

5 Conclusion

The presented approach allows us to work out in detail the problem of separating non-core activities from the company. This is achieved by applying several criteria for evaluating scenarios at once. In addition, this concept provides a balance of decision-making methods: along with a "hard" mathematical algorithm, "soft" expert evaluation methods are used. The author presented the concept of step-by-step organization reform based on outsourcing as a method of innovative management. This reform includes five main stages, each of which is significant in terms of better transition of the enterprise to the next stage. Properly conducted information collection, interim evaluations,

selection of criteria and other factors are very important for the effective use of outsourcing in the enterprise. This approach is not tied to any particular type of activity, service, or business process. It is universal and can be used in any industry. It should also be noted that this method can be used both for outsourcing a single service, and for reforming the entire direction of the company's activities.

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Management Control of Tax Liabilities of Russian Enterprises in the Automotive Industry

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Abstract. The increase in the volume of information used, the speed of its processing and decision making, external control of the financial and economic activities of organizations, including in the automotive industry, loses its effectiveness. There comes an understanding that effective control of various business processes in automotive companies can be ensured as quickly and efficiently as possible only through in-house administration. This will ensure an adequate level of economic security of the organization, in which it not only consistently carries out its financial and economic activities, but also improves its financial condition. The organization of management control assumes the presence of many objects of control. However, the current conditions of activity of business entities dictate the need for uniform coverage of the absolute majority of objects of control. One of the most important objects, attention to which, in our opinion, in the theory and practice of organizing management control is not enough paid, are the tax liabilities of commercial organizations, including with the automotive industry. One of the current areas of economic security is tax security, which is ensured, first of all, by the effective organization and functioning of the system of management control of tax obligations.

Keywords: Automotive companies · Control procedures · Management control · Tax analysis · Tax passport

1 Introduction

The development of the automotive industry in Russia and its adaptation to rapidly changing economic conditions both in the country and beyond its borders dictates the need for a qualitative transformation of most business processes carried out within such organizations. Dynamics of changes in the volume of exports and imports of cars in Russia is reflected in Fig. 1. When building a strategy for transforming business processes, first of all, the question arises of saving the used resources produced (financial, material, labor, intellectual, etc.) without adversely affecting the quality of the cars. One of the areas of cash outflows earned by the automotive industry is tax and other related payments. We offer to make other payments insurance premiums, as well as penalties and fines arising due to low-quality or untimely non-performance of the taxpayer

function. From this it follows that the owners of the automotive industry are interested in reducing the tax burden for the economy of resources spent on the repayment of tax and other related obligations.



Fig. 1. Strategic planning of the dynamics of the volume of exports and imports of cars in Russia until 2025 (Source: authors).

At the same time, the state whose activities are ensured and supported, including through tax and non-tax payments to the budget, is interested in setting the maximum permissible tax burden to increase budget replenishment and reduce the budget deficit. In this regard, there is a contradiction between the interests of business and the state, which, as a rule, is solved through the implementation of tax administration by state executive bodies, namely the federal tax service of Russia. Such administration allows you to identify errors in the calculation of tax liabilities, the delay in the submission of tax reports, the underestimation of the tax base, the illegality of the use of tax incentives, etc., which ensures the collection of additional taxes from commercial organizations.

In order to avoid such consequences in the implementation of external tax administration, as well as in order to meet the demands of internal users, we propose to pay attention to preventive control, namely the organization and functioning of such a system of management control of tax liabilities of automotive industry organizations, which will ensure a sufficient level of tax security.

The analysis of theoretical positions and practical experience of organizing management control of tax obligations showed that, at automotive enterprises, management control often has a current or a subsequent character. At the same time, today, the most effective is precisely the preliminary control, which allows you to prevent the occurrence of negative financial and other consequences, taking into account the directions of development of state administration of taxation.

2 Methodology

To solve the problem of developing a methodology for organizing management control of tax liabilities of commercial organizations in the automotive industry, were used the following methods:

- systematization - the collection and grouping of information from scientific literature and other sources, which made it possible to come to the conclusion that there is no unified approach to the construction of preliminary and subsequent management control of tax obligations,
- the method of complexity - the study and proposal of the implementation of management control of tax obligations on the basis of an integrated approach by combining all the elements of control into one system, allowing to ensure the tax safety of automotive enterprises,
- dialectical method - the study of the essence of the concept of “management control of tax liabilities” for the development of theoretical positions of this field of study.

Currently, in scientific works the concept of tax control is expanding. It becomes not only an external, but also an internal functional link in the activities of each organization. In the framework of this article, scientific works devoted to the impact of tax obligations and related tax risks on the economy of the country as a whole and the financial and economic condition of a particular enterprise were used [1, 3, 8, 10]. In addition, the basis of the study was the theoretical and methodological issues of the organization of managerial (internal) control, which are disclosed in the writings of scientific economists Azarskaya, Manyeva and others [2, 4, 7].

Also, the methodological base of the research is scientific works in the field of evaluating the effectiveness of internal control [6, 9]. Based on the study of the results of research by economists in relation to the problem of developing a methodology for managing tax liabilities, it has been found that there is no single approach in the economic literature to develop such a methodology. It was also revealed that, as a rule, management (internal) control is investigated as a whole, and not in relation to a specific object. Based on this, the purpose of this study is to develop a methodology for organizing preventive and subsequent management control of the tax liabilities of automotive enterprises.

3 Results

Exploring a specific object of control, it should be noted that by tax liabilities we mean the set of obligations to pay tax payments to the budget, as well as obligations to submit tax reports within a specified period to the regulatory authorities. The study determined the nature of management control of tax liabilities as a system of measures to assess tax liabilities, as well as contribute to their timely and full execution of a commercial organization.

In the framework of ensuring the tax security of automotive industry organizations, it is proposed to classify management control of tax liabilities by the time of its operation as follows: prior (preventive) and subsequent (current and retrospective). The

previous (preventive) control is the most sought-after area of management control of tax liabilities, as it allows to provide interested users with information about the facts of economic life that have not yet been taken into account, from which tax liabilities will arise in the future. Such control also helps to prevent negative consequences during external tax administration. The tools of preliminary control include budgeting tax liabilities, monitoring changes in legislation on taxes and fees, strategic tax analysis, the formation of a tax passport, risk assessment, etc.

Subsequent (current and retrospective) management control of tax liabilities is aimed at monitoring and evaluating tax liabilities in real time or in relation to already accomplished facts of economic life that have led to the emergence of tax liabilities. Such monitoring is aimed at monitoring current errors and identifying deviations of actual indicators from budgetary ones. The tools of such control include the preparation of domestic tax reporting, subsequent tax analysis, monitoring errors in the calculation of tax liabilities, etc.

The organization of management (internal) control in general in Russia is a mandatory action in the management system, but the structure of the management control system in Russia is not legally regulated. However, the information published in 2013 by the Ministry of Finance of Russia, No. PZ-11/2013 "Organization and implementation by an economic entity of internal control of committed facts of economic life, accounting and preparation of accounting (financial) statements" provides recommendations on the organization of internal control including the main elements that form the internal control system [5]. These include:

- control environment,
- risk assessment,
- control procedures,
- information and communication,
- assessment of control.

In view of the fact that these elements of the management (internal) control system are not mandatory, but recommended, we propose to improve the theoretical and practical experience in organizing management control of tax obligations to determine its elements in the following composition:

- control environment,
- internal communication and information infrastructure,
- control procedures,
- evaluation of the system of management control of tax obligations.

The control environment presupposes the existence of an object, subjects of control, as well as regulations that allow regulating the procedure for exercising managerial control of tax obligations. It is proposed to refer to such regulations the developed Regulation on management control of tax obligations, where all elements of control are disclosed in detail. It is proposed to refer the following to the main sections of this Regulation:

1. The control environment of management control of tax calculations and obligations.
2. General concepts and terms.

3. Purpose and objectives general characteristics of management control of tax obligations.
4. Persons responsible for the management control of tax obligations.
5. Information support of management control tax liabilities.
6. Procedures for management control of tax obligations deadlines and documentation.
7. Evaluation of management control of tax obligations

The following element of management control of tax obligations “Internal communication and information infrastructure” is presented by organizational and communication links in the divisions of automotive organizations for the purpose of effective control. This element is regulated by the developed schedule of document flow and approved methods for transmitting information in departments (for example, using the electronic document management service).

Under the procedures of management control of tax liabilities are measures, the purpose of which is to minimize tax risks, increase the efficiency of resource management of an economic entity, balance the tax burden in the interests of entrepreneurs and the state, as well as achieving an acceptable level of tax security.

In accordance with the developed Regulation on the management control of tax liabilities, the following are proposed to control procedures:

- monitoring changes in regulatory and local acts on taxes and fees,
- monitoring the compliance of deadlines for the calculation, payment of taxes and reporting,
- tax analysis and assessment of tax risks for the purpose of ensuring tax security,
- monitoring of errors in accounting (financial and tax), management accounting and reporting, minimization of their consequences,
- the formation of a tax passport.

At the same time, some procedures allow to implement both preventive and subsequent control, and some - only one of the directions of such control. Let us focus on the most difficult from the point of view of disclosure in theory and practical application of management control procedures. In our opinion, such procedures include tax analysis and the formation of a tax passport.

Tax analysis is proposed to carry out in the same areas as management control: strategic and subsequent analysis. Strategic analysis allows to determine in advance the amount of tax liabilities, based on the amounts of such liabilities in previous reporting periods, and to estimate the ratio of budget values associated with tax payments. The results of this analysis are important informational support when making strategic management decisions by internal interested users.

Strategic tax analysis is proposed to carry out by extrapolating data on the tax liabilities of the organization for the period following the budgeted. The information base for extrapolation is the budgets of income, expenses, tax obligations for the future, as well as accounting (financial) and tax reports for previous periods. When using this method, the interested user will receive information about a certain amount of tax liabilities that must be paid to the budget. But, often, the mere amount of tax liability is not enough to make a management decision. There is a need for data on the structure of such liabilities, on the ability of the organization in the future to repay such liabilities in

full, as well as on the balance of income and expenses of the organization in order to optimize taxation when calculating the profit tax and value added tax. Based on this problem, within the framework of strategic tax analysis, it is also proposed to calculate individual coefficients characterizing the tax system in the future: the liquidity ratio of tax liabilities (ratio of budgeted current assets to budgeted tax liabilities), the ratio of tax liabilities (ratio of budgeted equity capital to budgeted tax liabilities), the ratio of the balance of income and expenditure (ratio budgeted to moves to budgeted expenses).

Subsequent tax analysis is proposed to organize by:

- determination of deviations of actual tax obligations from budgetary ones,
- calculation of total (calculation of the tax burden) and individual ratios (security and liquidity of tax liabilities), which allow to characterize the state of the tax system,
- determination and assessment of tax risks.

Identification of tax risks is carried out on the basis of determining the type of such risk (retrospective, current and subsequent), depending on the time of occurrence of the event that caused them. The next step in determining the risk is to correlate the risk with the probability of their occurrence (from 0 to 1) and the magnitude of their negative impact on the tax system (from 0 to 1).

The assessment of tax risk is made by multiplying the probability of occurrence of risk by the magnitude of its impact. Based on this assessment, tax risks are grouped into low (from 0 to 0.49), medium (from 0.5 to 0.99) and high (1). Such a risk assessment makes it possible to apply control procedures appropriate to each risk grouping to ensure the tax safety of automotive organizations.

The next no less important procedure of management control of tax obligations is the formation of a tax passport of a commercial organization in the automotive industry. The purpose of such a control procedure is to generate information about the financial and business activities and the tax system of a commercial organization for the proactive presentation of a tax passport to the FTS in order to ensure control over the accrual and payment of taxes, as well as the accuracy and transparency of the information presented in tax reports. It is proposed to include the following sections as part of this document:

1. General characteristics of a commercial organization.
2. The main socio-economic indicators of the organization.
3. Organization indicators used to calculate taxes and fees to budgets of all levels.
4. Possible tax benefits.
5. Data on accrued and paid taxes and fees. Tax arrears in the budget system of the Russian Federation.
6. Taxpayer audit data.
7. Information about the procedures of management control of tax calculations and liabilities, allowing to identify outstanding amounts of taxes and fees.
8. Information about the tax burden.
9. Documents confirming the accuracy of the information presented in the tax passport and tax reporting of a commercial organization for the reporting period.

It should be noted that such a document is informational support not only for internal interested users, but also for state executive bodies administering taxation. The

document is proposed to submit to the tax inspectorate initiatively to improve the efficiency of tax administration and enhance the preventive role of such administration.

4 Discussion

Nowadays in scientific research, there are problems associated with the development of tax collections and levies at the macro level. At the same time, the development of the internal tax control system is of research interest. The variant of formalization of state control of tax liabilities proposed in the article allows solving this problem. The results of this study allow us to expand the methodology of organizing and conducting in-house tax analysis, as well as using elements of information about the internal control of tax obligations of the organization for presentation to regulatory authorities in the form of a tax passport. This will allow: to increase transparency of information on the tax burden of automobile industry organizations, reduce the number of field tax audits, reduce the requests of regulatory authorities to provide enterprises with explanations about the calculation and payment of taxes. In addition, the use of a tax passport will reduce the processing time of information on tax liabilities of enterprises by creating a single document containing information on all calculated and paid taxes, tax audits, calculated tax burden and internal control measures taken.

5 Conclusions

The final element of the management control of tax obligations is its assessment. Such an assessment is proposed to carry out by determining the reliability and effectiveness of the organization and functioning of the control system. For evaluation, it is proposed to use quantitative and qualitative indicators, which together allow us to form an idea of how effectively control procedures were implemented in the reporting period, whether management control procedures were observed, whether errors related to the calculation of tax liabilities were eliminated, etc. is to inform senior management about the quality of in-house tax administration.

The result obtained in the course of assessing the effectiveness of internal control of tax liabilities can also be included in the tax passport and be included in the criteria for assessing the reliability of a taxpayer for planning tax audits of organizations. Increasing the transparency of information on the effectiveness of the functioning of the internal control of tax liabilities, including to meet the interests of the federal tax service, helps to reduce government spending on desk and field tax audits. This is because part of the data of internal control of tax liabilities of organizations can be used by the federal tax service as an information supplement to the tax monitoring procedure. Thus, in the course of the study, a method of organizing preliminary and subsequent management control of tax liabilities was developed to solve the posed problem. It allows to build a system of internal tax administration consistent with the general directions of state tax administration and to ensure an adequate level of tax safety of commercial organizations in the automotive industry.

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Methodological Aspects of Assessing and Forecasting the Financial Stability of an Enterprise

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Abstract. The article highlights the issues of assessing and forecasting the financial stability of an organization that are relevant for all business entities in an economy prone to crises. The features of the formation and reflection in the reporting of performance indicators of organizations with a long discontinuous production cycle, as well as their impact on the methodology of analyzing liquidity and financial stability, are examined. The calculations of the financial and operating cycle indicators, which have a significant impact on the capital structure and the level of liquidity and financial stability, have been clarified. A method is proposed for calculating the net assets and equity of the organization, taking into account the specifics of the above organizations and the stage of the project, which involves the clarification of balance sheet indicators and the adjustment of liabilities based on the profit margin. This will give a more objective assessment of the financial condition of the organization according to the financial statements and predict the stability of the company at the stage of completion of the project (order).

Keywords: Accounting (financial) reports · Assessment of the liquidity and financial stability · Calculation of duration of financial and operational cycle · Financial analysis · Net wealth

1 Introduction

The most concentrated indicator reflecting the ability of an organization to perform its core functions in an ever-changing internal and external business environment is financial stability. Unlike other characteristics of the organization's activities, financial stability has the attributes of complexity and systemicity, i.e., in fact, includes financial, economic, technical and technological, organizational aspects of the activity. This fact determines the relevance of the research topic, since the analysis and assessment of the financial stability of the organization are a necessary element of the management decision-making process by all interested parties. In a market economy, it is extremely important to have reliable information about the financial stability and stability of organizations. This is important not only to investors, suppliers, customers, but also to the management and owners of the company itself. Works of domestic and foreign scientists Giliarovskaya & Yendovitskaya [5], Kovalev & Volkova [6], Savitskaya [9],

Sheremet [10], Yendovitsky & Sherbakov [12] and others were devoted to the study of financial analysis tools to assess the financial stability of an economic entity.

For a meaningful analysis, on the basis of which scientifically based decisions can be made, the choice of an adequate technique is necessary. Timely diagnosis of the financial condition, as well as the production of balanced and effective decisions, can largely mitigate the negative consequences of the crisis. Therefore, it is necessary not only to assess the level of financial stability at the date of preparation of the financial statements, but also to forecast it for the future. The purpose of the study is to develop theoretical approaches to constructing a methodology for assessing the financial stability of an economic entity in order to monitor and ensure successful economic activity of the company, taking into account industry specifics that determine the duration of the operational and financial cycle.

2 Methodology

The theoretical basis of the study was the work of economists on these issues. The empirical base was the regulations, official data of the Ministry of Finance of Russia, and domestic business practice. The general scientific methods of the author's research were analysis, synthesis, comparison, hermeneutics, and phenomenology. To assess financial stability, we used traditional methods of financial analysis: horizontal, vertical, trend analysis, analysis of absolute and relative indicators (ratios), comparative and factor analysis. Horizontal analysis allows you to identify deviations from basic indicators and based on quantitative changes to give a qualitative interpretation of the situation. Using a vertical analysis, we study the capital structure, determine the share of own and borrowed, and, accordingly, financial risks. Trend analysis allows predicting the results of operations and the level of financial stability, which is extremely important in an economy prone to crises. Trend analysis can be carried out both in absolute and in relative terms. Using a comparative analysis of financial stability, you can determine the level of competitiveness of an economic entity. The results of factor analysis should be used to make managerial decisions to neutralize the negative impact of factors.

3 Results

Traditional methods of analyzing the financial condition and criteria for its assessment are designed, as a rule, for a short production cycle, rhythmic production and continuous activity. However, there are many types of activities characterized by a long production cycle in which a temporal gap arises between the movement of funds, the release and sale of products or the performance of work, the provision of services and the formation of financial results. In the reporting period, the organization may, for example, receive advances from customers to perform work, and the delivery of work, the sale of products will occur in the following reporting periods. Therefore, the structure of the balance sheet and its contents at the stages of financing and delivery of work to customers are significantly different, and, accordingly, are characterized by

different degrees of liquidity and financial stability. For a more objective assessment of financial reporting, it is necessary to detail its individual items and display the necessary data in the notes to the balance sheet. In the structure of assets, special attention should be paid to the composition of receivables, core funds, in the composition of which the capital investments and stocks, which are characterized by a large heterogeneity of the assets included in this item, are shown in the balance sheet. According to these balance sheet items, assets related to both the formation of our own production base and those related to order fulfillment and manufacturing of products, and for different types of activities, can be reflected. The composition and structure of receivables and payables is largely determined by the settlement system used by the organization. Thus, the reporting of the above organizations differs from the balance sheets of enterprises with a short production cycle and continuous rhythmic activity.

First, the liabilities of the organization, as a rule, are presented in the balance sheet by payable accounts. Its main component is traditionally debt to suppliers. As mentioned above, organizations with a long production cycle are forced to raise customer funds, i.e. work on a prepayment basis. Therefore, a significant share in the payable accounts happens to received advances. This type of debt differs from other types of accounts payable in valuation. All other types of accounts payable (debt to suppliers, staff, budget, extra-budgetary funds) are valued at cost. Received advances for products (works, services) include not only the amount of covering costs, but also the planned profit, i.e. are taken into account at selling prices. Therefore, the level of the organization's liabilities is overestimated at the reporting date, since their repayment is supposed to be the delivery of products or the performance of work, the provision of services, and not the return of received funds. Secondly, the asset structure also has distinctive features. Received prepayments can be used to purchase equipment or make other capital investments necessary for the execution of the order, which will lead to an increase in the share of non-current assets and, consequently, a decrease in the level of current assets. Thirdly, as a result of these changes in the structure of assets and liabilities of the balance sheet, a financial analysis using existing methods will show a decrease in the liquidity of the organization, possibly even a loss of solvency at the financing stage, a drop in the value of net assets or even their negative values, respectively, a loss of financial stability. However, at the time of the sale of products, delivery of work to the customer, the obligations to the latter will be repaid, and the profit laid down in the advances received will be reflected in the equity in the balance sheet, which will lead to the strengthening of the financial stability of the organization. Consequently, the process of execution of one transaction is reflected in the reporting of several periods. Moreover, two stages can be distinguished: the stage of financing and the stage of execution of the contract and transfer of work to the customer. Reporting, drawn up at the end of the second stage and full execution of the contract, reflects the real financial condition of the organization. For its analysis, traditional approaches to assessing financial stability can be applied. The reporting of the first stage (order financing) is essentially intermediate, and may distort the real financial situation in the organization. Therefore, the problem arises of applying the methodology for analyzing the financial condition as a whole, and of net assets, in particular, at the stage of financing activities.

Consider the situation in more detail, using the example of an analysis of the balance of the developer involved in the construction of apartment buildings and other real estate, taking into account the features of its activities. Construction is characterized by a long production process that affects the formation of profit for the current period and the financial position of the organization.

The main source of financing the activities of the developer involved in the construction of apartment buildings and other real estate are funds of interest holders. Before the transfer of the construction project, they are reflected in the balance sheet as part of long-term liabilities under the item "Other liabilities" and participate in full in the calculation of the net asset indicator used in accordance with the legislation to assess liquidity and financial stability. However, the nature of these obligations should be clarified. Under an agreement on participation in shared construction, the developer undertakes to build (create) an apartment building and (or) another real estate property on his own and (or) with the involvement of other persons and, after obtaining permission to put these objects into operation, transfer the corresponding shared construction object participant in shared construction. The latter is obliged to pay the price stipulated by the contract and accept the shared construction object. Thus, the developer, in the normal execution of the contract, must transfer the construction object to the interest holder, and not the money. The cost of the object may differ from the contract price. The difference between the price of an object under an equity agreement (the amount of obligations to the interest-holder) and the sum of the costs of building the object and paying for the services of the developer represents the projected (expected) income of the developer. Therefore, when calculating net assets, the amount of expected income should not be included in the composition of liabilities participating in their determination. For a more objective calculation of the net assets indicator, it would be advisable to show the amount of the target financing received from interest holders: the amount for the reimbursement of construction costs, including the services of the builder, under the balance sheet item "Other long-term liabilities", the planned income of the builder under the item "Deferred income". Separately, as part of short-term liabilities under the item "Other liabilities", it is necessary to show liabilities to shareholders under terminated contracts.

In this regard, the calculation of the income of the customer-developer should be considered. The latter's income is recognized as a fee for its services. Until the end of construction and the transfer of facilities to shareholders, the amount of targeted financing of shared construction always includes the amount of estimated (expected) income. In the current practice of accounting in shared construction, we would recommend calculating the net assets to detail the indicator of received target financing of interest holders, reflected in the line "Other long-term liabilities". Then the value of net assets can be determined on the basis of the balance sheet in accordance with the Order of the Ministry of Finance of Russia «On approval of the procedure for determining the value of net assets» [8]. Let us present an algorithm for the calculation of net assets based on an updated calculation of liabilities at the stage of construction financing, limited to the reporting period.

Firstly, it is necessary to calculate the expected (forecasted) profit of the developer as the difference between income and expenses and the estimated income tax. In an external analysis, we equate income with the amount of targeted financing of interest

holders (page “Other Long-Term Liabilities”). Costs can be determined on the basis of the balance sheet and its explanations as the sum of the costs incurred, reflected in the following items: work in progress, inventories, costs of work in progress, other inventories and costs, VAT on acquired values. Costs in work in progress represent essentially the cost of work in progress for which full remuneration has not yet been received. The determination of costs can be difficult in a multidisciplinary organization. In terms of current activities, it is more correct to calculate the expected costs as the sum of the changes in the above items of assets (construction in progress, raw materials and other similar values, costs of work in progress, etc.).

Secondly, the amount of liabilities to shareholders is determined under existing agreements at the date of calculation of net assets. For this, the expected (forecasted) profit is deducted from the amount in the line “Other long-term liabilities”. Thus, the amount of received funding is decomposed into two parts: debt to creditors in terms of meeting obligations to them and the amount of deferred income in the form of forecasted (expected) profit. The calculation is carried out on the basis that the obligations will be fulfilled in accordance with the terms of the contract by transferring the object, and not by refunding as a result of termination of the contract.

Thirdly, the amount of net assets is calculated as the difference between the assets taken into account and the obligations of the organization. The value of net assets, taking into account the adjustment of liabilities by the proposed methodology, may differ significantly from the indicator calculated by the official methodology. This allows, first of all, the owners who are not taking part in the management of the company to more objectively assess its financial condition and risks of loss of financial stability, the real value of equity at the reporting date. However, it should be recognized that in the external analysis it is very difficult to calculate the net assets according to the balance sheet of the company without additional accounting data and design estimates, since the state of capital investments is not taken into account in the calculation (development stage). In addition, the proposed option for calculating net assets is considered from the point of view of the interests of the owners (participants, founders). Based on the interests of interest holders, adhering to the principle of prudence, the proposed option can be considered as an overstatement of the value of net assets, a level of financial stability of the company and an underestimating risk level of investors. For a more objective liquidity assessment, it is advisable to reflect not only the long-term “Other liabilities” line, but also the short-term “Other liabilities” line, depending on the terms of the contract. The adjustment of the structure of the liability balance sheet, equity and borrowed capital, calculated for the calculation of net assets, should certainly be used to determine the financial stability ratios: the coefficient of ownership or autonomy, financial risk, provision with own working capital and other sources characterizing the structure of sources and their use for financing activities of the organization.

4 Discussion

Almost all currently used methods of analysis of financial condition are based on the existing structure of the balance sheet and the content of its items. In individual methods and in carrying out specific analytical studies, attempts are made to differentiate criteria by industry. However, production and trade are usually distinguished, for example, in borrower credit rating methods. But, in turn, production activity differs significantly in terms of industry specificity, which determines the duration of the production cycle, the rhythm of production and services, the execution of work, as well as financing and cash flow. This affects the structure of the balance sheet and the content of individual items, which makes it incorrect to apply uniform criteria to assessing the financial condition of various organizations, including financial stability.

A stable financial condition is achieved with sufficient capital, good quality assets, an acceptable level of profitability, taking into account operational and financial risk, liquidity, stable incomes and broad borrowing opportunities. Thus, the analysis of financial stability on a given date should allow to answer the question: how correctly the company managed financial resources during the period preceding this date. The essence of financial stability is determined by the effective formation, distribution and use of financial resources, and solvency is its external manifestation.

Despite the apparent simplicity of the task of quantifying the financial stability of an organization, as mentioned above, there is no single universally accepted approach to constructing appropriate analysis algorithms. The indicators included in various methods can vary significantly both quantitatively and by calculation methods, and this is characteristic of both domestic and foreign theory and practice. This diversity is explained by the presence of different priorities and preferences for certain indicators among analysts. In turn, this is due to the attitude of analysts to the need and expediency of a joint consideration of the sources of funds and assets of the enterprise and differences in the interpretation of the role of short-term liabilities, including short-term sources of a financial nature.

Traditionally, to assess financial stability, a method is used to determine the type of financial stability, which consists in assessing the adequacy of sources of financing reserves, and coefficient analysis. In accordance with Article 35 of Federal Law No 208-FZ «On Joint-Stock Companies» [3], the indicator of net assets plays a decisive role in assessing the financial stability of companies. Net assets is the carrying amount of property reduced by the amount of the organization's liabilities, i.e. in fact, these are assets free of obligations. Thus, in essence, net assets reflect the financial stability of the organization and its degree of liquidity. Some economists suggest analyzing financial stability at the stages of the organization's life cycle and monitoring it based on an integral indicator. The concept of the product's life cycle is based on the fact that any product, work, service with certain consumer properties will sooner or later be squeezed out of the market by a more perfect product with better consumer properties.

The life cycle of an economic entity depending on the volume of sales is proposed to be divided into six separate stages: the stage of emergence (establishment) of the company; the stage of the beginning of the main (current) activity; stage of active growth in sales; stage of stabilization (maturity); stage of aging (systemic drop in

sales); stage of liquidation of the company as a result of financial insolvency and declaring it bankrupt. In the process of bankruptcy, if financial recovery measures are successfully implemented, a new cycle begins. In our opinion, it is equally important to study the features of financial analysis for different durations of the financial and operational cycles. The duration of the financial cycle reflects the time during which cash is diverted from the organization's turnover. The indicator characterizes the relationship between the inflow and outflow of working capital and cash receipts. It is determined by subtracting the payable period from the operating cycle. In turn, the operating cycle is calculated by summing the periods of inventory turnover and receivables. In the economic literature there are different approaches to calculating the duration of the turnover of stocks. Firstly, it can be calculated as a whole for all stocks or separately for production stocks and finished products. Secondly, there are different opinions on determining the indicator of turnover. More accurate and, therefore, objective is the calculation, detailing the indicators of reserves relating to different stages of the capital cycle.

The circulation period of inventories is the length of time that raw materials are in stock before being transferred to production. As a rule, it is proposed to calculate the ratio of average inventories multiplied by the length of the period to the cost of production. In our opinion, it would be more correct to use the total consumption of inventories in the denominator as an indicator of turnover. The circulation period of finished goods stocks characterizes the time spent on finished goods in stock before sale. The receivables circulation period reflects the length of the customer lending period, or the time between the sale of products and the receipt of funds for these products. The payables circulation period is the time between the purchase of materials and payments to suppliers. The financial cycle, as mentioned above, characterizes the time of diversion of funds from the organization's turnover. Therefore, the lower its value, the higher the turnover of funds, with less financial resources the organization can get more profit with. However, in some cases, the size of the financial cycle takes on a negative value. This can happen due to a long circulation cycle of accounts payable, which may be caused by non-payments or delays in payments to creditors. As a rule, this situation is typical for organizations in financial distress close to bankruptcy. The financial cycle indicators in this case confirm the imbalance of sources and obvious problems of the financial condition.

However, negative financial cycle values are also characteristic of financially successful organizations. This is typical for firms operating on a prepayment basis from buyers and customers. In this case, there is no withdrawal of funds from circulation. But you should pay attention to the change in the composition of debtors and creditors. Buyers who are traditionally part of debtors by transferring advances for goods, work, services, become creditors. Suppliers, having received prepayments for raw materials, transfer from creditors to a group of debtors. Thus, the duration of the financial and operational cycles should be taken into account when developing methods for analyzing the financial stability of an organization. Also, other authors exploring this issue, noted the need to adjust existing methods for analyzing the financial stability of an organization. Thus, it is noted that it is necessary to introduce a number of additional indicators into the model, both quantitative and qualitative [2, 11]. Others attempt to

identify the impact of financial stability of organizations on ensuring the financial stability of an industry, region, state [1, 4, 7].

5 Conclusion

The methodology for assessing the level of financial stability, taking into account the specifics of enterprises, has been improved, in particular, for companies with a long production and short (or even negative) financial cycle in connection with work on a prepayment basis from customers (buyers). When conducting a financial analysis, one should take into account the period of activity reflected in the statements: financing or delivery of works, services, products. When calculating the liquidity ratios, financial stability and the net assets indicator based on the reporting at the financing stage, it is necessary to clarify the indicators of obligations taking into account the incorporated level of profitability in the prices of products, work, services. At the same stage, it is advisable to conduct a predictive analysis on the date of completion and delivery of work to the customer. Semantics and conclusions will be useful to specialists developing methods for assessing the financial stability of specific enterprises, as well as practitioners using these methods, in particular, auditors to determine the business continuity of an economic entity and assess its financial stability.

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Socio-economic Aspects of Intra-regional Distribution of Government Support of Housing Construction Industry

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Abstract. The article discusses interrelationship between government support measures to multi-family housing construction industry (MFC) implemented by the government of Russian Federation during the crisis and potential socio-economic effects of such support as well as the prospects of reaching the goals of the National project “Housing and urban environment”. Our hypothesis regarding the levels of support measures for housing sector for different regions is that it needs to be synchronized with the size of the clusters (defined as Russian regions or subjects of Russian Federation) and their respective forecast of economic development. Based on our analysis, we conclude that this requirement is not fulfilled, which results in skewed support for housing construction companies (and their projects) in only a handful of Russian regions thereby posing risks of reaching goals of National project “Housing and urban environment”. We also expect that the government will continue expanding the measures of housing construction support with a potential of an increased housing sector centralization.

Keywords: Housing construction industry · Government support measures · Systemically significant housing construction companies

1 Introduction

Authors suggest that forecasting of dynamics and socio-economic effect of any sector of the economy during and after the recession and/or crisis is significantly affected by the government support of this sector (both the process itself and the result of such government-sponsored measures). The distribution of government support in the aftermath of the crisis may not only differentiate between winners and losers in each industry as is the case with current support measures taken in the aftermath of COVID-19-induced recession [3], but may also be a factor that determines spatial structure of the economy and have the potential to create “spatially unbalanced” growth of the economy post-crisis [8].

Spatial aspect of economic growth may vary from industry to industry depending on their spatial structure. For example, coal mining and medical services are different in that regard, while coal is mined within localized areas with high concentration in resource-rich regions (as is the case with Kuzbass region [2] in Russia), medical services are provided across all Russia's regions and the size of the medical services clusters are directly tied to population, economic prospects of each region, regulation etc. These two types of industries feature conceptually different feedback loops (and long-term socio-economic effects) for government support measures.

It is therefore necessary, while conducting analysis of government support to multi-family housing construction industry, first to differentiate between sectors that are *spatially concentrated* and *spatially distributed* and recognize that multi-family construction industry represents the case of spatially-distributed industry by its very nature: both supply and demand are tied to local real estate markets and demographic trends [1, 14]. Also, given the size of Russian Federation, there is a considerably uneven development or individual regions [18] and their respective housing markets [5]. It is our understanding that widening the scope of research of government support measures from traditional institutional approaches (for example “too-big-to-fail” institutions logic that drives government support and reinforce existing biases [13]) to spatial analysis may enrich the discussion and provide a more adequate framework for housing policy development as current pandemic-driven downturn may significantly housing markets (as evidenced by historical examples [7]).

In summary, our hypothesis regarding government support of spatially distributed multi-family construction industry is that there must be a *synchronous government support simultaneously* in all Russian regions (proportionately to the size of respective clusters and regions' socio-economic forecast). As an example, we analyze the case of the current government support measures implemented in the aftermath of COVID-19-induced recession in the Russian economy for multi-family construction industry (i.e. MFC), particularly focused on government support for systemically significant multi-family housing builders.

2 Methodology

We build our analysis on our previous findings on government regulation and housing financing strategy [15], banking sector stability as it relates to real estate markets [16] as well as our previous findings on prospects of reaching goals set forth in National project “Housing and urban environment” [17]. However, we widen our scope to include resulting regional distribution of government support measures for housing sector to understand how they correlate with the existing housing sector spatial structure and draw conclusions with regards to reaching goals of National project “Housing and urban environment” [11]. We base our analysis on the following data:

- New multi-family construction volume based on Unified Information System for Housing Construction portal (government-sponsored provider Dom.rf [4]),
- Current distribution of total stock of multi-family housing based on the Russian statistics (Rosstat data [12]),

- List of systemically significant multi-family construction companies [10] is taken in accordance with the most recent available list prepared in accordance with Government Decree dated 10.05.2020 No 651 “On support measures for systemically significant companies” [9], prepared by Ministry of Construction Industry, Housing and Utilities Sector.

3 Results

As of the May 2020, Russian multi-family construction sector can be characterized in terms of the total construction volume, number of developers and projects as follows:

Table 1. Total construction volume, number of developers and projects

Number of multi-family housing builders	3 344
Number of multi-family construction projects	9 543
Number of apartments under construction	2 Million
Area of apartments under construction	99,3 Million sq. m

Source: authors based on [4].

Table 1 and the following Figs. 1 and 2 (Top-25 cities and Top-25 regions by multi-family construction volume) are compiled based on the data provided by the Unified Information System for Housing Construction portal [4], which allows for real-time monitoring of all basic indicators of housing construction in Russian Federation (on the basis of project declarations for multi-family housing construction, not including “troubled” multi-family housing projects). Validity of the data is facilitated by the provisions of Federal Law dated 30.12.2014 No. 214 [6].

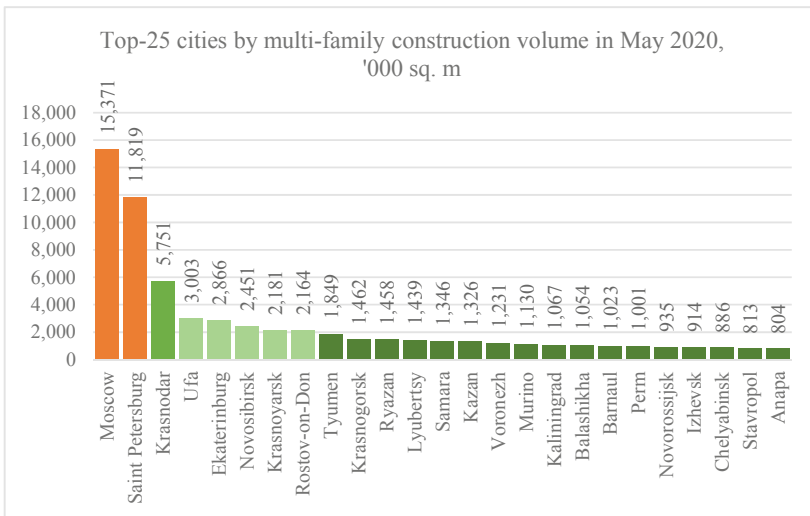


Fig. 1. Top-25 cities by multi-family construction volume in May 2020, '000 sq. m (Source: authors based on [4]).

Multi-family housing construction in 25 cities listed in the diagram above represent 65.6% of the total housing construction volume of Russian Federation. Moscow, Saint Petersburg, Krasnodar, Ufa and Ekaterinburg are individual cities with the highest volumes of multi-family housing construction.

As can be seen from the second diagram, multi-family housing construction in the leading 25 regions of Russian Federation represent around 83% of all multi-family housing construction undertaken by developers in Russian Federation. Also, out of the total – Moscow, Saint Petersburg and their surrounding regions (i.e. Moscow oblast and Leningrad oblast) represent nearly 41% of all Russian housing construction projects by volume.

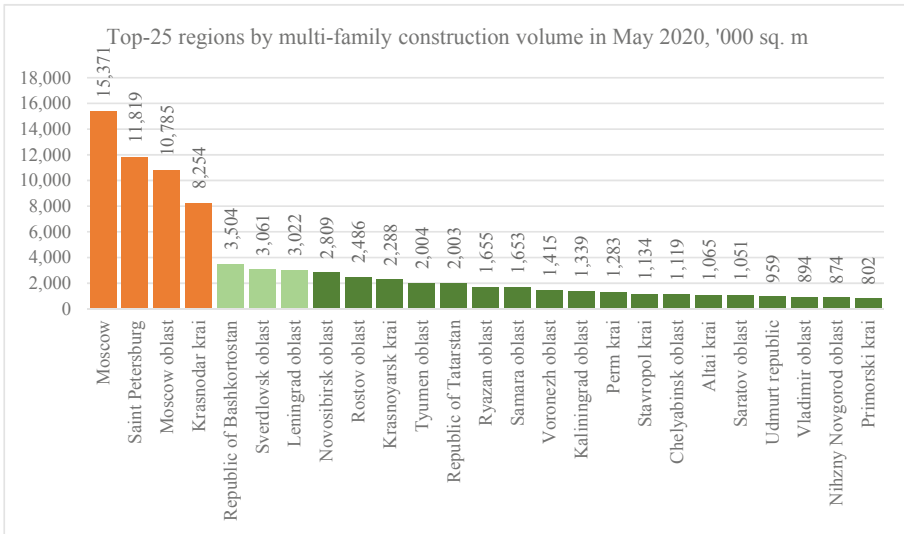


Fig. 2. Top-25 regions by multi-family construction volume in May 2020, '000 sq. m (Source: authors based on [4]).

There are observable inequalities and disproportions in regional distribution of multi-family construction in Russian Federation, which in our opinion are partially explained by the long-standing disproportions in socio-economic development and levels of urbanization in different regions of Russian Federation. To illustrate this, we provide the following map (Fig. 3) detailing current distribution of total stock of multi-family housing based on the Rosstat data [12].



Fig. 3. Spatial distribution of Russian Federation multi-family housing stock (Source: authors based on [12]).

As of 2020, there is around 3.7 billion sq. m of multi-family housing, unlike 100 Million sq. m (of new housing construction annually), however the distribution across different regions is quite similar: same leaders, middle part of the last and “outsiders”.

The entire picture is well supplemented by further analysis of government support distribution provided by the government to systemically significant multi-family housing developers. Until recently, there were only two systemically significant multi-family housing development companies: GK PIK (registered in Moscow, develops housing projects in Moscow and regions of Russia) and GK LSR (registered in Saint Petersburg, has projects in 4 regions of Russia).

Later, in accordance with Government Decree dated 10.05.2020 No 651 “On support measures for systemically significant companies” [9], prepared by Ministry, Housing and Utilities Sector following COVID-19 economic downturn, the list of systemically significant multi-family construction companies was further expanded to 43 companies [16] that meet the following criteria (that in our opinion reflect traditional institutional approach to government support measures issued based on the size of companies and their overall significance):

- total project area under construction based on currently issued construction permits
 - no less than 400 thousand sq. m (total, including affiliated project companies),
- total revenue in 2019 – no less than 10 billion Rubles.

Companies included in the list of systemically significant construction companies can be subject to receiving:

- government subsidies,
- government subsidies,
- government guarantees for obligations and loans,
- tax and insurance payments deferrals,
- bankruptcy moratoriums,
- the right of construction completion not covered by escrow accounts.

To understand how the above relates to spatial structure of the industry we further analyze how this translates into support for companies in specific regions (subjects of Russian Federation). Table 2 below presents 22 regions where systemically significant construction companies undertake projects and, at the same time, we illustrate that systemically significant construction companies are registered in only 11 of those regions.

Table 2. Systemically significant multifamily developers' presence by regions

No	Region	№ of brands	No	Region	№ of brands
1	Moscow	20	12	Leningrad oblast	0
2	Saint Petersburg	8	13	Rostov oblast	0
3	Krasnodar krai	3	14	Tver oblast	0
4	Republic of Bashkortostan	2	15	Yaroslavl oblast	0
5	Moscow Oblast (Odintsovo)	1	16	Penza oblast	0
6	Sverdlovsk oblast	1	17	Kaluga oblast	0
7	Stavropol oblast	1	18	Tyumen oblast	0
8	Tambov oblast	1	19	Khanty–Mansi Autonomous Okrug – Yugra	0
9	Khabarovsk krai	1	20	Tula oblast	0
10	Ryazan oblast	1	21	Novosibirsk oblast	0
11	Arkhangelsk oblast	1	22	Perm krai	0

Source: authors based on [10].

As can be seen from the table, out of 89 Russian regions (subjects of Russian Federation), only 11 regions domicile systemically significant multi-family housing construction companies. In addition, the aforementioned companies may receive government support measures in all 22 regions where they are represented and develop construction projects (i.e. they may receive subsidies and government guarantees for their debt instruments and loans, have their taxes deferred etc., in total 20 companies out of 43 are registered or have projects in Moscow and 8 – in Saint Petersburg). Still, only a quarter of regions will be the recipients of government support via systemically significant multi-family housing developers, the rest will have to rely on their own resources (which are scarce at the time of crisis) and local developers (which are relatively weak and generally underfunded).

4 Discussion

Overall, 2020 was also characterized by the significant impact of COVID-19 pandemic and continued growth in mortgage origination. In our opinion, crisis of primary housing market (new construction) and overall housing policy already approached a

point of no return. That is why the government (through Ministry of construction and government-sponsored Dom.rf) was predictably taking careful steps towards increased centralization and potential nationalization of the housing construction industry in the medium-term (by 2024), however so far didn't rush them.

In addition, we project that in Q1 2020 due to the housing demand slump resulting from COVID-19 pandemic economic effects, stagnating real disposable incomes because of the oil market collapse and ruble devaluation pressure, the implementation of these strategic plans will only accelerate. Financial "nationalization" in the form of government support measures of both supply and demand of housing industry and the market is already taking place. This is reflected in the increased government subsidies to multi-family housing developers as well as guarantees for project financing and the mortgage market.

According to the data of analytical center of government-sponsored corporation Dom.rf, January through March 2020 in Russian Federation there originated around 308 thousand mortgage transactions with over 760 billion rubles in value [4]. This represents an increase of 10% in quantity over the same period of last year and a 25% increase in terms of portfolio value over the same period last year. At the same time, March 2020 was the most successful year in the history of mortgage market of Russian Federation.

In total, in March 2020 there were over 122 thousand mortgages or 20% increase over March 2019. Growth of the mortgage origination is achieved through the combination of lower interest rates and increased demand due to overall economic uncertainty resulting from COVID-19 pandemic (housing is traditionally recognized as a safe asset during the times of economic uncertainty). However, large cities first saw an increase in prices, which later became much less pronounced. Less developed regional market saw much less activity and were either stagnating or stable. In April 2020 separate experts were already estimating demand drop of nearly 70% for new housing construction. This situation highlights how fragile demand growth without continued government support for the demand side of the housing market and perhaps signals continuation of government policies that support demand for housing going forward.

5 Conclusion

We therefore conclude that our hypothesis that for regionally-distributed sector of multi-family construction there must be a *synchronous government support simultaneously in all Russian regions* (proportionately to the size of respective clusters and regions' socio-economic forecast) is not yet fully implemented by Ministry of Construction Industry, Housing and Utilities Sector criteria. This, in our opinion, may further exacerbate regional differences and pose risks of negative long-term socio-economic effects for Russian Federation, including failure to reach targets of National project "Housing and urban environment" for many Russian regions (subjects of Russian Federation). We also estimate that:

1. Current market conditions do not allow achievement of the goals set forth in National project "Housing and urban environment" [11] (including planned doubling of multi-family construction volume by year 2024 to 80 Million sq. m per

annum) only through independent multi-family housing construction companies due to the deep inequalities of the Russian regions economic development, low socio-economic activity and mobility of the population coupled with stagnating personal disposable incomes.

2. It is fairly obvious to us that the Government of Russian will be further incentivized (due to the extreme socio-economic and political significance of the housing market) to look for ways of achieving goals of national project “Housing and urban environment” by employing more administrative measures with much less emphasis on the free market-driven measures (for example, project financing for multi-family construction may first be nominally guaranteed followed by the more direct financing from the government) [11]. Does that mean a historical defeat for market economy? In our opinion, not necessarily. However, the principles of housing sector development that were in effect over the last quarter of the century will have to be transformed to take into account international best practices and Russian historical preferences (housing as state-owned and global resource, social housing etc.).
3. As a result, given the housing industry conditions at the moment, its further development will depend not just on a straightforward support by the government of the National project goals, but also on whether the government will use this historical opportunity to transform the industry on a “post-Keynesian” basis incorporating overall society goals, market mechanisms while balancing that with the economic growth targets.

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Financial Aspects of Companies Sustainable Growth

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Abstract. The article is devoted to the problems of evaluating the companies growth. The authors study the theory and methodology of approaches to the concept of sustainable growth and variations of factorological dependencies that form the value of decision-making indicators to ensure the necessary growth depending on the companies financial results. The authors justify the choice of indicators and growth models based on criteria, the main of which is the rate of profit reinvestment as the basis of companies financial stability. The level of profit reinvestment primarily depends on the life cycle of companies, and the choice of the optimal growth rate, determined by the growth model, is the basis for sustainable development of companies. The universality of the models is confirmed by the possibility of their application regardless of the availability of companies shares, dividend payments and organization forms, which allowed the authors to reduce the restrictions on the sample. The models were tested on the example of the largest mining companies. The dynamics of average values of growth indicators reflected changes in general market trends, which confirms that the growth of large system-forming companies is the main factor in the growth of the state's economy as a whole.

Keywords: Growth · Profitability · Reinvestment · Sustainability

1 Introduction

The difficult economic situation in most countries of the world in the process of countries' exit from the conditions of self-isolation and struggle with COVID-19 leads to the need to study both theoretical and practical aspects related to the opportunities for sustainable growth. In particular, it is interesting to determine the factors that influence the size of sustainable growth. Sustainable growth is the ensuring the stability of companies' operations. This is the maximum growth in which the company does not exhaust its resources, remains solvent with stable financial results, and many companies restrain growth to ensure financial stability. Every year, interest in the sustainable growth increases, as evidenced by the author's research (Table 1).

Table 1. Number of publications on the topic “sustainable growth”, in the journals of the Russian research citation index basis

Years	Sustainable growth	Sustainable economic growth	Years	Sustainable growth	Sustainable economic growth
2020 (for the 1st quarter)	667	279	2015	1604	623
2019	2615	1048	2014	1206	441
2018	2428	915	2013	804	289
2017	2304	898	2012	672	321
2016	1941	738	2011	517	159

Source: authors.

Due to the pandemic and the significant losses suffered by the economies of many countries, the need for research on this issue is increasing, as evidenced by the dynamics of analytical queries of the index on the research subject. The evaluation of search query analytics suggests that the most frequently used query on the Internet is “sustainable growth”, less often “sustainable economic growth”. On last place is the query “sustainable business growth”. The presented correlation matrix in Table 2 shows that there is a close correlation between the three queries.

Table 2. Correlation matrix of search query analytics by research topic for June 2019–June 2020

The query name	The indicator name	Column	1	2	3	4	5	6
Sustainable growth	Absolute value of demonstrations	1	1					
	Relative value of demonstrations	2	0.974	1				
Sustainable economic growth	Absolute value of demonstrations	3	0.962	0.947	1			
	Relative value of demonstrations	4	0.910	0.941	0.976	1		
Sustainable business growth	Absolute value of demonstrations	5	0.911	0.913	0.898	0.873	1	
	Relative value of demonstrations	6	0.793	0.849	0.791	0.816	0.961	1

Source: authors.

This dependence is also confirmed by data from the Russian research citation index basis. The correlation between the number of publications in the two directions is 0.99. Therefore, we can say that research in this direction is relevant. Objects differ in it. Some researchers study in detail the process of sustainable growth at the macro level, while others study in more detail the dynamics of indicators and factors at the level of

individual companies. Due to the growing relevance of this problem against the background of instability of the financial environment of the economy, as well as the discrepancy between concepts and growth models, the authors conducted a study to determine the most optimal, universal and visual models from the point of view of managerial decision-making.

2 Methodology

The methodology for assessing sustainable business growth is developing quite actively. The origins of the problem are analyzed in the work of Penrose [15]. Williamson continued to develop this topic [20]. In the 1960s, Boston Consulting Group conducted a study that allows us to assess the level of sales growth rates of a company with limited financial resources, taking into account a number of assumptions [21]. Subsequently, Higgins suggested a formula that allowed us to clearly show the variables that determine the company's sustainable growth [7]. The study proved that certain financial policies of the company are not compatible with the growth rate that the business wants to achieve and provided recommendations for its transformation in order to achieve the planned results. Higgins used a steady growth rate to determine the maximum sales growth rate that can be achieved by a business using a specific financial policy. Subsequently, in management, a steady growth rate became one of the tools for long-term financial planning and analysis of the company's growth. Later, Firer came to the conclusion that a stable growth rate is the maximum growth in the conditions of constant financial parameters of its activities [4]. The indicator of the level of sustainable growth allowed us to determine the possibility of maintaining sales growth without additional funding [3]. This enabled Mukherjee, Som to confirm that a steady growth rate is a sales growth rate that a company can maintain without raising additional capital or changing its financial policy [12].

Johnson and Soenen in their research concluded that there is a relationship between a high coefficient of sustainable growth and effective working capital management, as well as the uniqueness of the business in large companies [9]. Amouzes, Moeinfar, Mousavi studied the Iranian financial market in 2006–2009 and found a link between the company's steady growth rate, liquidity, and business performance [1]. Based on the research, the authors argued that the actual growth rate differs from the steady one due to the influence of ROA and P/B ratios.

In India, Pandit and Tejani's research on sales in the textile industry proved that their growth should be supported by a constant level of profitability, asset turnover, financial leverage and retained earnings [14].

A study conducted by Rahim and Saad on the example of 229 public companies in the ASEAN countries in 2001–2012 showed that the profitability of an organization is directly related to its steady growth rate. To prove this fact, the researchers proposed a linear regression model that includes such variables as debt ratios (DTER), capital (TE), total debt (TD), ROA, EPS, and ROC [17].

Continuing with earlier studies, Huang and Zhang identified variables that influence the sustainable growth of companies. They studied 28 exchange-traded companies since 2010 to 2013. The results of their research showed that the company's ability to

sustain growth is determined by its profitability, ability to generate cash, ability to pay for its obligations, productivity, ability to grow (the growth rate of net assets, reinvestment) [8].

Utami and Gunawan in their research on a sample of 25 companies of the Indonesian stock exchange for 2010-2013 showed a positive impact on the steady growth rate of the share price and return on equity of the organization [19]. While dividend payments have a negative impact on sustainable growth.

Studying the activities of the distributor company for 2010–2014. Hafid revealed a significant correlation between the company's sustainable growth indicator (SGR) and the ROL variable reflected in profit margin and total current assets (TATO) [5].

Hartono and Utami studied the sustainable growth of companies in the context of sustainable business development. The sample volume was 10 companies for 2010–2013, 5 companies each from the Kehati Sustainable and Responsible Investment Index (SRI-Kehati) and IDX30 Index [6]. As a result, a positive correlation was found between the steady growth rates of companies in the SRI-Kehati index and their return on assets and liquidity. Companies included in the IDX30 Index showed a positive relationship between stable growth rates and return on assets. It was also found that the growth rates for companies vary significantly depending on the index in which they are included. Companies that are included in different indices have significantly different return on assets. The results of the t-test indicate a slight difference in the average value of the price and profit of organizations included in both indexes.

Mubeen and Hanif studied the growth stability of 27 non-financial companies in Pakistan from the KSE 100 Index for 1988–2011. The companies belonged to 6 industries. The authors developed a Fixed Effect regression model. The study proved that domestic growth is different from the sustained growth of companies in Pakistan due to the impact of leverage. It was also found that companies with liquidity and cash-generating flows had higher internal growth, but these variables did not affect the steady growth of organizations [11].

Rahim used a sample of 226 companies in Malaysia from 2005–2015 to study the relationship between a steady growth rate of companies and efficiency. He found a positive relationship between the debt ratio, equity ratio, total asset turnover, and the size of a firm with a stable growth rate [16].

Indian researchers Mukherjee, Som conducted an empirical analysis to identify the relationship between liquidity (Cash Flow Ratio), profitability and financial leverage with a stable growth rate of the organization. A sample of 115 companies from 2010–2015 was used for this purpose. As a result, there was a significant positive correlation between liquidity, profitability and leverage with the steady growth rates of Indian companies [12].

Steblyanskaya, Wang, Ryabova, and Razmanova analyzed the four largest oil and gas companies in 2005–2016. According to the results of the study, there was a correlation between three indicators: the rate of sustainable growth, share capital ratios and net profit growth [18]. This made it possible to link the concept of sustainable growth with environmental protection, energy conservation and social factors. As a result, non-financial factors were added to the model. It allowed us to determine the dependence of the rate of sustainable growth on environmental ratings and the profitability obtained from social responsibility expenditures.

Nastiti, Atahau, and Supramono studied 136 companies from the Indonesian stock exchange for 2010 to 2017. They proved that working capital has an impact on the profitability of organizations, but its management does not directly affect sustainable growth. At the same time, the authors point out that there is an indirect impact on profitability. Based on it, the authors argue that working capital needs to be managed to increase profitability. This will allow for sustained growth [13].

Junaidi, Sulastrri, Isnurhadi, and Adam in their study focused on sustainable business growth, arguing that increasing profits does not matter. As a result, the authors presented an empirical study on the impact of the finance loan liquidity indicator (LFR), the asset quality indicator for non-performing loan (NPL), and the operating cost-to-operating income efficiency indicator (BOPO) concerning the SGR [10]. In contrast to previous studies, they selected 22 banks, i.e. financial organizations. Their study period was 5 years and included 132 observations. Based on the built regression model, the authors concluded that LFR, NPL, and BOPO had a significant negative impact on SGR. Then, the authors confirmed the conclusions of previous researchers on the importance that SGR acquires due to its relationship with the bank's strategy for further growth and further expansion of the business with maximum preservation of internal and external sources of financing.

It should be noted that the indicator of sustainable growth was also used by scientists to check the degree of companies stability, as evidenced by studies [2]. Thus, various countries are conducting research on the relationship of SGR with a number of financial and non-financial parameters. Most of the studies make it possible to understand the direction and closeness of the connection. Others emphasize the presence of an industry-specific aspect that affects research. For Russia, the issue of sustainable business growth is particularly acute, since the existing terminology and methodology is of a translation nature and is not fully adapted to the existing legal acts. This is also proved by studies of exclusively large businesses in Russian works on this issue.

3 Results

Making a decision about profit distribution depends on the company's life cycle. In particular, a growing business requires large investments, often made at the expense of equity and profit.

According to the authors, the key factor in managing growth is the rate of reinvestment of profits. In this case, the shareholders are the remaining bidders for profit. The authors selected several models that reflect the growth of the company, primarily due to the level of reinvestment of profits.

$$SGR1 = \frac{RR \times ROE}{1 - (RR \times ROE)} \quad (1)$$

where, RR is the rate of profit reinvestment; ROE – return on equity.

From this formula, the following conclusions follow: there is a direct relationship between return on equity (ROE) and SGR, that is, if any factor affects one, then similar

changes will occur for the other, and the maximum rate of sustainable growth occurs at $RR = 1$. It is also worth noticing that an increase in the growth potential of the organization can be achieved with the correct financial policy of the organization's managers. It will be expressed in terms of the ratio of the organization's funds, that is, financial leverage, interest and tax burden, as well as in terms of profit reinvestment rates. This effect can be seen in the following formula:

$$SGR2 = \left(ROIC + \frac{D}{E} * (ROIC - I(r)) \right) * RR * (1 - T) \quad (2)$$

where, $I(r)$ is the average interest rate on loans; D - debt capital; E - net worth; $ROIC$ - return on invested capital; T - tax rate.

To evaluate financial policy, a calculation formula can be applied that takes into account the return on sales and asset turnover, without taking into account the impact of interest and tax burdens. This model uses the profit reinvestment (capitalization) ratio and financial leverage.

$$SGR3 = ROS \times AT \times FL \times RR \quad (3)$$

where, ROS is return on sales; AT is the number of asset turns over the period; FL is financial leverage.

Expanding the organization's activities and increasing business activity is one of the main long-term strategies of the organization, according to which the organization's management faces an important task – to develop and implement cost-effective operational, investment and financial strategies. But it is worth noticing that growth does not always lead to achieving the main goal, namely, increasing the cost of the organization. In addition, excessive growth that is not consistent with real opportunities can lead to bankruptcy of the organization. Effective management of the growth rate that leads to an increase in the value of the enterprise requires a balance and alignment between the key indicators of its investment, financial and operating activities, as well as an effective compromise between profitability, financial stability and the development pace. Otherwise, the chosen development strategy may not only lead to an increase in the cost of the organization, but also destroy it. An effective method for solving this very difficult problem is the Robert Higgins model, which provides a quantitative formula for calculating the optimal growth rates for each organization.

$$SGR = \frac{\left(\frac{NP}{SAL} \right) * \left(1 - \frac{DIV}{NP} \right) * \left(1 + \frac{D}{E} \right)}{\left(\frac{A}{SAL} \right) - \left(\frac{NP}{SAL} \right) * \left(1 - \frac{DIV}{NP} \right) * \left(1 + \frac{D}{E} \right)} \quad (4)$$

where, NP is net profit; SAL - sales volume; DIV - the dividends; D - debt capital; E - net worth; A - assets.

The main problem with applying the Higgins model is the availability of information about company dividends, however, many companies do not pay dividends or information about dividends is closed to analysts. To overcome these problems, the authors suggest that the company's net profit is directed only to the payment of dividends and reinvestment. Then:

$$\left(1 - \frac{DIV}{NP}\right) = RR \quad (5)$$

In the development of the Higgins model, by converting it and accepting an additional condition, the authors propose a new type of formula, the main factor in making a decision in this case will be the rate of reinvestment of profits:

$$SGR4 = \frac{\left(\frac{NP}{SAL}\right) * RR * \left(1 + \frac{D}{E}\right)}{\left(\frac{A}{SAL}\right) - \left(\frac{NP}{SAL}\right) * RR * \left(1 + \frac{D}{E}\right)} \quad (6)$$

Thus, the authors selected 4 indicators for the study, the key factor of which is the rate of reinvestment of profit or the share of profit on the balance sheet (increase in retained earnings for the period) in the company's net profit. The authors tested the growth models using the example of the largest mining companies.

4 Discussion

Correlation analysis of the dependence of models that reflect the company's growth (SGR1, SGR2, SGR3, SGR4) and financial indicators that characterize the financial results of companies in the context of methodological developments of the above authors showed that the strongest direct impact on the company's sustainable growth is the change in the growth of net assets (0.86). At the same time, the net asset growth indicator itself was not used for calculating sustainable growth coefficients, therefore this fact proves the hypothesis put forward by the authors about the feasibility of using the profit reinvestment indicator in the SGR4 model.

Based on the selected coefficients, the average performance of the largest mining companies was evaluated in dynamics.

As can be seen from Fig. 1, the dynamics of SGR1, SGR2, SGR3, SGR4 over 20 years is similar. Meanwhile, the largest amplitude is demonstrated by the SGR4 proposed by the authors, which once again proves the scientific and practical significance of this indicator, as, according to the authors, it covers the largest number of factors. This growth coefficient shows the maximum effect of the actually reinvested profit. In addition, positive correlations were found between sustained growth and return on assets (0.82), debt ratio (0.72), and financial leverage (0.68).

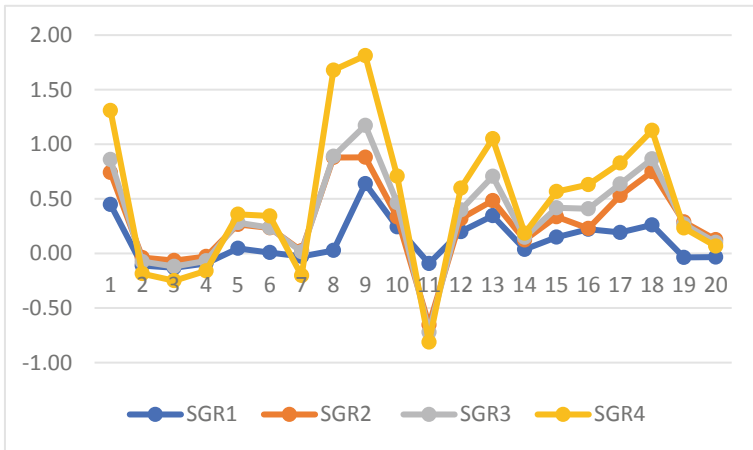


Fig. 1. Dynamics of indicators of sustainable growth (Source: authors).

In general, previous studies confirm the obtained results (Huang and Zhang [8], Utami and Gunawan [19], Rahim [16], Mukherjee and Som [12], Nastiti, Atahau, and Supramono [13]). In addition, the modification of the company growth model proposed by the authors significantly increased the sample, due to the fact that the calculation of SGR4 became possible for companies that do not have dividend payments. The sample for the base under consideration increased by 25% when using the indicator of reinvestment rate proposed by the authors. At the same time, the use of this indicator will allow you to use SGR4 regardless of the company's legal form.

5 Conclusion

The authors' extensive research on the methodological and practical aspects of this problem has led to several conclusions of scientific significance:

- growth and sustainable development of companies have been the subject of research of many scientists since the middle of the last century, however, the evolutionary processes of economic development, changes in the business environment, business organization models, and priority areas of decision - making by company management require further study and development of methods for defining these concepts and adapting them to decision-making models based on the possibilities of universality and availability of incoming information,
- exception in the indicators of dividend payments growth allows you to recognize the indicator SGR4 as universal and appropriate to use for assessing the growth of the company, regardless of the organizational and legal form and the availability of quoted shares on the market,
- when making a decision about financing a company and evaluating its growth, an important parameter is the possibility of self-financing, as the basis for financial stability and independence. One of the company's own sources of financing is the

company's profit, in particular, retained earnings, a portion of net profit that is used for refinancing. The distribution of net profit largely depends on the life cycle of the company, the ability to attract capital from investors, owners and creditors. From this point of view, the indicators chosen by the authors for evaluation are the most clearly reflect the growth, primarily due to reinvestment of profits,

- the mining industry is a system-forming capital-intensive industry, the financial results of which take a significant part in the formation of the country's GDP (gross domestic product), which gives grounds to say that the testing of growth indicators on the example of this industry is acceptable and reasonable, reflecting the true patterns of economic development of companies,
- one of the problems of companies' growth is to meet the potential growth based on the possibility of providing the necessary sources of financing, timely and fully respond to the company's obligations. Risk-free growth can be attributed to the one in which the return on invested capital will be higher than the fee for using the attracted capital. If the company's growth level matches the average market growth of industry and macro economic indicators, we can say that the risk level of investment in a particular company will correspond to the average market risk. If the company's growth is higher than the average market, then restraining regulatory mechanisms should be taken.

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Impact of Russian International Trade on the Global Economy

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Abstract. The paper deals with the issues of international trade as the main indicator of the state open economy. The authors proved that international trade is an integral part of the country in the age of economic globalization and affects the global economy development. International trade characterizes the country's foreign economic activity. The research on international trade is based on the comparison and statistical methods, and mathematical analysis. The main indicators of international trade, such as trade exports and imports, as well as changes in the country's external turnover, were analyzed. The structure of trade exports was studied. Promising areas of Russia's foreign economic activity were identified. The authors of the paper considered the GDP dynamics at purchasing power parity and analyzed the volume of net exports in relation to GDP.

Keywords: Exports · Foreign economic activity · Global economy · Imports · International trade · Trade balance

1 Introduction

Undesirable trends, such as instability of world prices at primary commodity markets, non-observance of agreements on the hydrocarbon production volume, and trade wars between countries (US and China) that lead to a slowdown in the global economy, have emerged in international trade. The international trade problems can be solved by studying the foreign economic activity of a particular country that will allow to find new trade ways and maintain the country's participation in the global economic development. The development of the global economy is linked to scientific and technological progress and the availability of economic resources. Countries have different reserves of natural resources, which can affect their competitiveness. In this regard, it is necessary to identify new areas of international trade for countries to increase their participation in the development of the global economy.

2 Methodology

In the course of the research, the authors used the following methods: comparative, economic and mathematical, statistical, analytical, and logical analysis. These methods made it possible to make a cold evaluation of foreign economic activity and its structural changes, identify trends in the country’s GDP growth, establish the level of country’s participation in international trade, and justify recommendations for expanding international trade to compensate decrease of external demand for fuel and energy products. Materials from the Bank of Russia, the Federal State Statistics Service, and the World Bank are used as an information base. The assessment of the problems of international trade and global economy development is based on the scientific works of Russian and foreign authors. The analysis of the information base allowed us to draw the main conclusions of the study.

3 Results

The degree of country’s participation in the global economy through the production and supply of high-demand products (goods and services) determines international trade. The principle of international division of labor is applicable when countries produce goods and services which have minimal costs in international comparison. Consequently, the global economy is defined by two trends: international trade development and international finance growth. The countries’ activity in commercial and financial turnover leads to global economic growth. The decrease in the trade turnover of one country due to economic, social or political reasons affects the economic performance of other countries. The main indicators of the country’s international trade are exports, imports, external turnover, investment, and external debt. The overall dynamics of the country’s exports and imports is shown in Fig. 1.

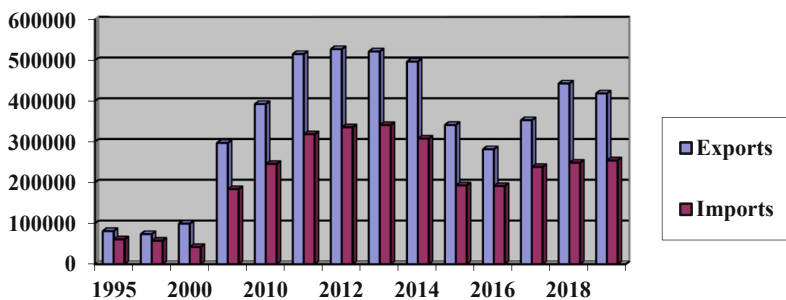


Fig. 1. Dynamics of Russian exports and imports, billion US dollars (Source: authors based on [3]).

Russia’s exports have increased by about five times by 2019 compared to 1995. But there was a 21% reduction in exports in 2019 compared to 2012. In 2019, imports increased four times compared to 1995, but it decreased by 24% compared to 2012. In other words, Russia’s external turnover decreased significantly in 2019 compared to 2012. The decline in foreign trade activity occurred in 2015–2016, which coincides with the introduction of sanctions against Russia. The negative impact of sanctions on international trade was also described by Afesorgbor [1]. It took Russia about three years to adapt to the new conditions of foreign trade and partially restore an external demand. The world economy development also had a decline in exports of goods and services in the same period. The world exports of goods are shown in Fig. 2 [10].

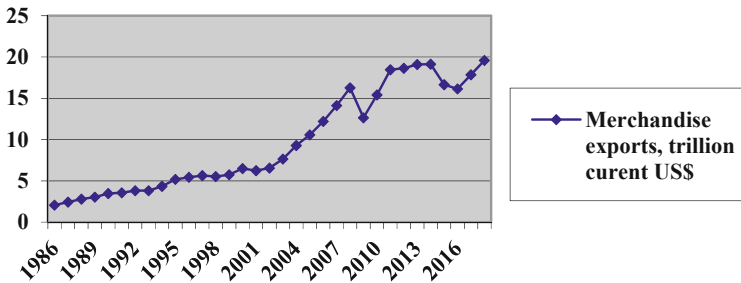


Fig. 2. Dynamics of exports of goods, trillion current US dollars (Source: authors based on [10]).

Figure 2 shows that in recent years, from 2015 to 2017, exports of goods at the world market declined. The decline peak was in 2016 when the global exports amounted to 16.143 trillion US dollars, which is 16% less than in 2014. The global exports recovered in 2018, and the growth was 21% compared to 2016. The decrease in the world exports and the decline in Russian exports coincided in the period of 2015–2016. Therefore, there is a correlation between the trade activity of a particular country and the development level of the global economy. The consequences of a country’s crisis can have a global scale and affect the global economy, causing trade conflicts between countries, a decrease in countries’ investment activity, and an increase in consumer prices. When international trade declines, there is a shortage of money at the world market. In that case, countries choose different financial instruments of the monetary policy. All data of trade operations and financial transactions are reflected in the country’s balance of payments, which consists of current account positions and a financial account. The international trade development of a particular country can be analyzed by studying the structure of the trade balance and the balance of services. The situation when exports exceed imports, which means an inflow of money, is considered the most favorable to the country. On the other hand, the excess of imports over exports is called a “trade deficit” [9]. The structure of the trade balance allows to determine how a country differentiates exports and creates channels in international trade. The structure of Russia’s trade exports is presented in Table 1 [4].

Table 1. Structure of Russia's trade exports, %

Exports	2014	2015	2016	2017
Food products and agricultural raw materials (except for textiles)	3.8	4.7	6	5.8
Mineral commodity	70.4	63.8	59.2	60.4
Chemical industry products, rubber	5.9	7.4	7.3	6.7
Rawhide, fur skins, and articles made therefrom	0.1	0.1	0.1	0.1
Wood and pulp-and-paper	2.3	2.9	3.4	3.3
Textiles, textile products and footwear	0.2	0.3	0.3	0.3
Metals, precious jewels, and articles made therefrom	10.5	11.9	13.1	13.5
Machinery, technical equipment, and means of transport	5.3	7.4	8.6	7.9
Other goods	1.4	1.5	2.0	2.0

Source: authors based on [4].

Table 1 shows that more than 70% of Russia's trade exports were mineral commodity in 2014. Metals, precious jewels, and articles made therefrom came second in terms of export volume (10.5%). Chemical industry products came third (5.9%). Machinery, technical equipment, and means of transport came fourth (5.3%).

The export structure has changed significantly by 2017. It is relevant to consider this fact in the context of a decline in the world and Russian exports. Mineral commodity in the exports structure decreased to 60%, while metals, precious jewels, and articles made therefrom, on the contrary, increased to 13.5%. The share of machinery, technical equipment, and means of transport increased significantly to 7.6%, as well as chemical products (6.7%). The strategic exports orientation of food products and agricultural raw materials in the export structure had only 3.8% in 2014, but they have had a significant increase to 5.8% by 2017 (53% growth).

The share of mineral resources decreased from 2016 to 2017, which indicates a decrease in global demand for these products. The indicator of demand for mineral commodity has a direct correlation with global economy growth. If global economic growth slows down, the demand also decreases. This fact indicates the beginning of the crisis caused by market flooding (increase in production), or by the economic development decrease in particular countries (the demand for crude oil and natural gas decreases), and vice versa. On the other hand, the exports of metals, precious metals, machinery, technical equipment, and food have increased significantly since 2016.

The decline in demand for mineral commodity was compensated through an increase in demand for goods with high added value and a longer production chain. Varnavskii also considered the ways to form added value in international trade and the development of particular industries [11]. The changes of exports in Russian trade structure have a positive impact on the development of upstream manufacturing: engineering, motor industry, aircraft, food industry, and agriculture.

In the economic theory, net exports are a component of gross domestic product (GDP), which also includes government purchases, investment, and consumption. On the one hand, net exports represent the country's participation in international trade, but on the other hand, net exports reveal the profitability of foreign economic activity, as

well as the degree of its independence from imports. The dynamics of GDP and net exports, and the share of net exports in GDP is shown in Table 2 [5].

Table 2. Share of net exports in GDP

Indicator	1995*	2009	2012	2014	2015	2016	2017	2018	2019
GDP in current prices, bln rubles	1,428.5	38,807.2	68,103.4	79,030.0	83,087.4	85,616.1	91,843.2	104,629.6	110,046.1
Net exports in current prices, bln rubles	48.5	2,887.7	4,537.9	5,074.4	6,686.4	4,444.2	4,872.5	10,358.8	8,310.7
Share of net exports in GDP, %	3.4	7.4	6.7	6.4	8.0	5.2	5.3	9.9	7.6

*Before 1998, trillion rubles,
Source: authors based on [5].

The share of net exports in GDP has started to increase since 1995 from 3.4% to 7.6% in 2019. The share of net exports in GDP shows that the most profitable and independent period of Russia's foreign economic activity (cash inflow in international trade) was in 2018, but there was a decrease in the share of net exports in 2019. Table 2 allowed to make the main conclusion: Russia increased its share of net exports and the efficiency of international trade from 1995 to 2019, which means that it affected the growth in the global economy as a whole.

International trade is affected by the laws of supply and demand, which depend on the prices of exported goods. The prices for the same products differ in the international comparison. On the one hand, countries' price formation is related to the volume of costs for the goods production. On the other hand, the prices of goods may be undervalued or overpriced through the exchange rate of national currency. Therefore, international currency is chosen in international trade, and it is a universal measure of the value of export products. The methods for choosing international currency were considered in the researches of the following scientists: Liu, Lu, and Woo [7]. Most countries have their own national currency. When countries enter international trade, there is a question of exchange rates. If the exporter's national currency strengthens against the currency of the purchasing country, the quantity of exported goods decreases at the same value of the exports transaction and the price of goods. If the exporter's national currency weakens, the quantity of exported goods increases at the same value of the exports transaction. Therefore, the exchange rate of the national currency is a financial instrument that can influence the global demand for exported goods. Thus, it can be concluded that countries are able to influence international trade and their competitive positions at the world market, and contribute to the global economy development.

4 Discussion

The research on the impact of international trade on the global economy attracts scientists, as all countries would like to occupy their trade areas at the world market and have a strong revenue stream from external activities. Foo, Lean, and Salim analyzed

the trade and financial flows of particular countries (China and ASEAN countries), and they evaluated trade relations prospects between these countries [6]. International trade contributes to the global economy development, and it is necessary to consider the factors that influence the international trade development. Baley, Veldkamp, and Waugh believe that global uncertainty affects international trade [2]. Other scientists, such as Redmond and Nasir, treat the natural resources abundance, trade accessibility, and institutional quality as the main criteria for international trade effectiveness of selected countries and their economic development [8].

5 Conclusion

The development of the global economy is influenced by international trade. The international trade of particular countries has an impact on world economic development. Countries influence world prices, offer, and demand through the exchange rate regulation of national currency. Russian participation in international trade increased in 1995–2019, which is confirmed by the growth in the country's external turnover and the share of net exports in GDP. The structure of Russian trade exports began to change. Russia is increasing the share of exports among high value added industries. In order to maintain Russia's position in international trade, the following steps are necessary: loyalty on the part of purchasing countries, conclusion of long-term supply contracts, and expansion of the country's international cooperation.

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Deformation of the Federal Center's Fiscal Policy in Relation to the Regions

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Abstract. The article is devoted to the problems of changing fiscal policy in modern society. The reasons for rejecting the liberal concept of fiscal policy in the modern state are to be considered. The article analyzes the main characteristics of fiscal policy in the conditions of crises at the beginning of the century, including the features of the federal center's fiscal policy in relation to public entities forming the state. The conclusion on the dependence of the economic development of Russian regions on the effective fiscal policy of the federal center is substantiated. It is shown that the deformation basis of the fiscal policy center based on the institutions of the constitutional structure of the country, which include: the status of Federation Council members, the order of differentiation of powers in subjects of joint conducting, especially the mechanism for establishing the jurisdiction of the federation. The methodological basis of the research is formed by the research principles developed within the framework of the so-called “New institutional economics” school.

Keywords: Federal center · Federation council · Federal structure · Federal subject · Fiscal policy

1 Introduction

The current fiscal policy is the most important direction of state influence on the development of the market economy. The optimal balance of state budget revenues and expenditures is a key incentive for economic growth. However, the federal center's fiscal policy towards the subjects of Federation often remains without attention. Mistakes or political manipulations in this direction are able to become the serious socio-political consequences, including civil wars, ethnic conflicts and the state dissipation. Therefore, the authors of the article decided to focus their efforts on establishing those institutional conditions that contribute to the transformation of the center's fiscal policy into a mechanism for selective discretionary incentives and a means of political pressure. This aspect of the institutional foundations of economic development has not yet been the subject of special analysis.

2 Methodology

The methodological basis of the research is based on the principles formed by the “New institutional economics” school. The most prominent authors of this school are North, Woollis and Waingast [12]. In the works of these authors, the legal classification of states into countries of restricted and open access is carried out. This division is based on state-political institutions that provide either privileged access to the material resources of society, or access based on legal grounds. Decision-making by privileged institutions is based on broad discretionary powers, personal connections, and judgment. Open access institutions are impersonal and operate on the basis of law and objective criteria. The tools for assessing the institutional framework of the federal center's fiscal policy are the degree of freedom of existing institutions in providing financial assistance to public entities [15]. In addition, the authors used scientific approaches developed within the framework of the Russian concept of “constitutional economy”. Its authors are Mau, Lafitsky, Barenboim, and Gadzhiev [9]. It is aimed at revealing the economic categories contained in the Constitution of the Russian Federation.

3 Literature Review

Fiscal policy is generally defined as the policy of the ratio of income and expenditure of the state, aimed at stimulating the economic development of society. The traditional approach to fiscal policy has always consisted from the need to “live within your means”, expenses should match income, and public debt should not be burdensome for society. Public expenses are public, meaning that the state finances socially important functions, while market participants bear the risks of economic activity independently. Such approach to fiscal policy is an integral part of the so-called liberal concept of economic development. These views became dominant in the late twentieth century and retain its influence in this century [4]. However, economists began to wonder on the real possibility of self-organization of economic agents when conducting a *laissez-faire* liberal approach in the country [8]. The global crisis has more seriously placed the rationality of the previously conducted fiscal policy at issue. This is primarily due to the emergence of separate financial institutions (banks, corporations, etc.) in the states, whose value for society and the state is too great for the latter to allow their bankruptcy.

This was facilitated by several circumstances. In the literature, you can find an answer on the causes of appearance of organizations that are too important to bankrupt. One of the reasons is the rejection of the antitrust regulation principles. For example, in the United States before the beginning of the era of R. Reagan's antitrust legislation was dominated by the so-called “structuralist” approach. It consisted of a formal assessment of mergers and concentrations, when these mergers were considered dangerous for society, without taking into account their economic consequences. “In order to convince the jury, neither the government nor the private plaintiff needed to prove that specific enforcement measures would lead to effectiveness. Instead, they had to prove that the competition process was being harmed” [10, p. 14] However, this approach has changed over time. The criterion for antitrust regulation is not the formal share of

concentration in the market, but the economic efficiency of such concentration. The main assumption in this case is that if, in the absence of regulation, a single seller of a product in a given territory cannot profitably raise prices above current or possible future price levels, then a merger of two sellers of such a product in a given territory cannot significantly increase their market power [10]. This policy opened the way for new mergers. If in 1980 the mergers cost was 33 billion dollars, in 1988 it was 266 billion dollars.

Also at the end of the twentieth century the limit on the separation of commercial and investment banks was canceled, which contributed to the growth of political influence of the financial sector: “the culmination of a process of deregulation and subsequent consolidation has been the adoption in 1999 of the Gramm–Leach–Bliley Act, finally eliminating the separation between commercial and investment banks introduced by Glass–Steagall legislation” [16, p. 94].

4 Results

The financial and credit policy of new market participants has been characterized by risk-taking and irresponsibility. At the same time, expenses for maintaining the managerial apparatus of these participants grew rapidly. Such behavior was based on the understanding that the country's political leadership would not allow the economic situation of the state to be put at risk and would provide assistance to such systemically important financial institutions under any circumstances. Such policy was defined in public opinion as the privatization of profits and the socialization of losses. The new fiscal policy is reflected in the fact that the burden of financial stabilization during the crisis was placed on conscientious taxpayers, or on the state, in cases where the state had such capabilities (the United States, Russia, China). The obvious alternative is to allow lenders to bear some of the costs associated with issuing risky loans. It was dismissed as a threat to the stability of the financial system. The threat of unfairness in such situation should be obvious [7].

With all the rejection of this kind of policy by society, it should be recognized that it has become inevitable in the current conditions. It became clear that without financial assistance from the state, the economic disaster would be so significant that the political institutions of developed democracies would also be affected. The United States and Great Britain were the first to recognize the danger of disaster and in various forms they provided a significant financial injection into the financial sector of its countries. At the same time, this policy was accompanied by strong criticism from supporters of the liberal course. Only quantitative easing, associated with the purchase of shares in troubled banks, helped to get out of the crisis.

In the European Union countries, the crisis intensified due to German resistance to the policy of quantitative easing (allocation of money), which the European Central Bank (ECB) wanted to conduct. Germany assumed that each European country should independently get out of the crisis, using the principles of a liberal market economy [3]. The commitment to the classical market economy of the EU leaders led to the fact that Greece, Ireland, Portugal, Spain, and Italy were in crisis. The result was a deterioration of international relations in Europe.

The crisis has led to increased discretionary powers of the executive authority, primarily in the area of financial control. This created conflicts between the executive authority and the parliamentary majority. The President G. Bush Jr., as a republican, was forced to abandon republican positions on market regulation and to cooperate with the democrats. Only a very fragile coalition of republicans and democrats allowed us to overcome the resistance of the republicans mass and lead the US out of the crisis. The imperatives of maintaining state order required the head of state to abandon the principles of his socio-political base.

German chancellor Merkel was bound by the position of her parliamentary coalition, which did not allow her to support the ECB's (European Central Bank) quantitative easing policy. Dependence on growing nationalists, who demanded expense savings, paralyzed the government's policy aimed at crisis easing. It should also be noted that the policy of overcoming the crisis in the United States, conducted by Obama and the democrats, did not expand their social base. The population considered it as too global, not taking into account the national interests of the United States. This led to the victory in the next election of the US President Trump.

The modern state has to take into account global integration, which is not always accepted by the social base of national political elites. Therefore, an effective fiscal policy focused on the global world can lead to the break of these elites with the parliamentary majority and social basis, which often leads to the power of aggressive nationalist forces.

In these conditions, the question of the impact of the federal center's fiscal policy on the economic situation of the country's constituent public entities is acute. This analysis is relevant for the Russian Federation. The prevailing view of the center's fiscal policy is that the expenses of the federal subjects should correspond to their income. At the same time, it is desirable that the region's share in the total revenue collected on its territory should be as high as possible. The center's assistance in the form of inter-budget transfers should be objective and based on clear criteria. However, the specifics of Russian federalism require certain adjustments.

On December 11, 2019, the Federation Council of the Federal Assembly of the Russian Federation heard the report "Trends in the development of Russian regions" by a well-known expert on regional economic development Zuborevich [17]. The report systematized long-term challenges of the development of the Russian Federation's regions. The speaker attributed to them: demographic "compression"; the stability of regional inequality; over-concentration of the economy, income and budget in Moscow; a strong decline and territorial polarization of investment; a decline in income in the vast majority of regions; non-transparent policy of regions assistance that does not stimulate development; strong institutional barriers of large cities development. In other words, the cornerstone of the current system of challenges is the economic inequality of the Federal subjects. It is caused by a very small set of competitive advantages of regions [17]. It is obvious that in this situation, maintaining the maximum share of collected revenues in the budget of the subject will not bring the proper effect, but will only preserve the existing inequality. Today, this share is already 70–80% of the collected taxes.

There are two main factors that make this situation worse. Firstly, it is a crisis continuation, which has the effect of reducing investment, income and falling

consumption levels. A decrease in investment leads to a reduction in the tax base. The base limits the ability of regions to equalize its economic status. Secondly, it is the center's policy to increase and equalize social spending. It is obvious that strong economic inequality leads to social inequality (inequality of income and regions consumption). This inequality involves socio-political upheavals. This situation pushes the federal center to a policy of equalizing not only the economic situation of the regions and their investment attractiveness, but rather a policy of social equalization. The country's hydrocarbon rent is distributed primarily in the form of inter-budget transfers to equalize social expenditures in the regions. Regional budgets are characterized by the fact that on average social expenditures make up 60–61% of all expenditures, and many – under 70 and over 70%. The share of social expenditures has increased since 2012 due to the need to comply the decrees of the President of the Russian Federation. From the three key elements of the economic crisis of recent years, such as investment falling, income and consumption, the distribution policy of the center is aimed at overcoming, first of all, the fall in income and consumption. This leads to the fact that the subjects of the Federation have almost no funds left to invest in the economy in order to create their own competitive advantages, create a climate of investment attractiveness and raise the level of economic development.

We also need to take into account the fact that spending social obligations of regions are not always fully provided by inter-budget transfers and contribute to regional budgets. In fact, the budget policy of the federal government is currently not aimed at equalizing the economic situation of the regions, but only at reducing the differentiation between them [5]. However, despite this, Russian regions differ not only in size, climate, and population, but also in prices for the same goods and, as a result, in the overall price level. The price differentiation between individual Russian regions exceeds the price differences between the US states, as well as between the countries of the euro zone [13].

In the process of massive budget deficits of the federal subjects and reduced transfers, the issue on searching funds for regional authorities is acute. “If the last crisis was flooded with budget money, we have nothing similar in this crisis. In 2009, transfers to subjects were increased by a third, their share reached 27% of all revenues from regional budgets” [17, p. 25]. If funds for solving social territorial problems are distributed uniformly by the center, then funds for economic development are sometimes distributed quite arbitrarily and non-transparently. For example, there are two ways to borrow money for Russian subjects. This is a bank loan or a public budget loan from the Ministry of Finance at 0.2% per annum. However, it is almost impossible for federal subjects to get budget loans. It is a matter of discretion. It is known that Mordovia and Chukotka have been the leaders in obtaining budget loans for many years, but the motives for such selectivity have not yet been publicly discussed. In addition, there are three groups of federal subjects that have priority in receiving inter-budget transfers: the regions of the Far East, the North Caucasus, the Republic of Crimea and Sevastopol. At the same time, for a long period there have been disputes on the effectiveness of returns from inter-budget transfers allocated to the regions of the North Caucasus.

Effective development of federal relations requires solving a number of key tasks: maximum use of real competitive advantages - they need to be determined; effective

spending on supporting the economy to strengthen competitive advantages and reduce development barriers; adequate budget policy (balance of income and expenditure, debt reduction); reform of the social sphere and competent optimization of spending on “social services” [17].

Thus, we see that the economic behavior of the federal center aimed at forming the economic status of the federal subjects is focused on increasing and equalizing social expenditures of the territories, but, in practice, does not increase the investment attractiveness of the regions. Meanwhile, the scientific literature substantiates the direct relationship between fiscal policy represented by financial investment and the growth of industrial production [1].

In the Russian Federation, the activity of the federal center in relation to the regions reproduces again and again the economic backwardness of the Russian province and the dependence of the majority of subjects of the federation from the discretion of the country's leadership. It is obvious that there are institutional conditions that allow the country's political leadership to pursue a rather arbitrary fiscal policy of a discretionary nature in relation to the economic situation of the regions. The freedom of the federal center to choose its fiscal policy, that is, the policy of forming the material status of the subjects of the federation, is due, to a large extent, to the order of formation and members powers of the Federation Council of the Federal Assembly of the Russian Federation.

The free mandate of the Federation Council members, the absence of strict dependence of their position on the interests of their regions, forms the freedom and discretion of the federal center in choosing its economic behavior. Comparative analysis shows that this legal status of members of the “upper chambers” is not accepted everywhere. For example, an analysis of the legal status of the Bundesrat members suggests that they have an imperative mandate [11]. Article 51 of the Basic Law for the Federal Republic of Germany stipulates that land governments indicate to their representatives how to vote on a specific issue [2]. Land governments have the right to recall members of the Bundesrat appointed by them. In addition, the legal status of members of the Bundesrat is enshrined not only in federal laws, but also in acts of the federal subjects. This is because members of the Bundesrat are themselves the members of land governments. Risse believes that during the voting, members of the Bundesrat are bound by the decision of their land governments and do not have a free mandate. However, this is not a traditional imperative mandate, since these members do not carry out any orders and do not act on behalf of third parties. As members of land governments, they are personally involved in deciding how their lands will vote in the Bundesrat [14]. Such situation significantly distinguishes the Federal Republic of Germany from many other federations – including the Russian Federation, since the German governments actually make decisions at the federal level. All this guarantees an effective fiscal policy for the country's regions.

In addition, the absence in Russian legislation of the category “Federation laws”, that is, laws adopted on issues of joint jurisdiction and affecting the interests of the federation subjects, does not allow to reflect the specifics of the federal structure in the legislative process. It seems that the Federation Council could have greater powers in passing the so-called “Federation laws”. At the same time, the Federation Council does not have the authority to approve certain acts of executive authorities that affect federal

construction. Foreign experience contains examples that limit the discretion of the center in relation to other public entities.

An important condition for the free discretion of the federal center in the formation of fiscal policy at the regional level is the established procedure for dividing law-making powers on issues of joint jurisdiction between the Russian Federation and its subjects. The constitution of the Russian Federation provides for two forms of these powers differentiation [6]. This is a contractual form specified in the article 11 of the Constitution of the Russian Federation and a form of the federal law. In the course of federal construction, the form of the federal law received priority. This form is not associated with the active participation of the authorities of the constituent entities of the Federation in the preparation of rules on the division of powers, which often allows the center to unilaterally impose expanded social obligations on the regions, which increase the existing economic inequality and lag.

Thus, the institutions of the federal structure of Russia are based on the principle of dividing the powers and authority matters between the center and the regions. Federal subjects remain external to the federal center. They contribute to the reproduction of a single state, and it, in turn, assumes the responsibility to guarantee them certain rights and freedoms. The Russian Federation does not act as a mechanism for integration of its parts, in which the policy of the federal center is formed as a result of the interaction practice of public entities that are part of the state. All this creates broad opportunities for the federal center to influence the economic situation of the federal subjects, the negative consequences of which we can observe.

5 Conclusion

In the course of the study, the authors came to the following conclusions:

- the reason for the well-known crisis of the liberal concept of fiscal policy was the rejection of strict requirements of antitrust regulation, which resulted in the formation of such system-forming financial institutions that are too significant for society to allow them to go bankrupt,
- the essence of the new and inevitable fiscal policy is the policy of “profit privatization and socialization of losses” when the costs for unjustified risks of financial organizations are borne by the entire society, and not by the direct culprits of the crisis, whom the state is forced to rescue,
- in the current conditions, the discretionary powers of the executive authority in the financial and budgetary sphere, subjectivity, non-transparency of decisions, and the rejection of objective criteria for providing state assistance to market entities are being strengthened,
- these characteristics of the new fiscal policy are also reflected in the federal center's policy on low-level public entities,
- economic inequality in the regions requires serious resources to create their own competitive advantages and create an attractive investment climate. However, there are no objective criteria for providing such assistance by the center. It is arbitrary and selective, and often based on non-economic motives,

- the authors conclude that the legal status of members of the Federation Council does not motivate them to protect regional economic interests,
- it is proved that the constitutional mechanism for the division of powers between the Russian Federation and the subjects of the federation on issues of joint jurisdiction allows the federal center to administratively impose social obligations on the regions that are not fully provided for by inter-budget transfers,
- it is concluded that the attempt to overcome social inequality by increasing and equalizing the social spending obligations of regions without a clear policy to equalize the economic situation of the subjects of the federation drives them into a new circle of poverty and dependence on the position of the Central leadership.

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Tax Monitoring as an Instrument of State Support

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Abstract. In the current crisis situation for the economy, the issue of supporting the real sector of the economy with new forms of cooperation from the state is extremely relevant. To maintain the interests of the state and taxpayers, a form of interaction and tax monitoring has been developed and introduced, which is aimed at cooperation and realization of the interests of all participants. The purpose of this work is to study the role of tax monitoring in the system of measures to support business in the Russian Federation, to give its assessment, to make proposals for bringing together the interests of the state and taxpayers. The subject of the article was to study the current form of state control-tax monitoring, and the result will be a conclusion on its improvement and the spread of its implementation. The author, on the basis of the study of the current practice of applying the state tax control form of tax monitoring, identifies the positive and negative sides of this form, conducts a comparative analysis with the current practice in other forms, assesses the prospects and makes assumptions to expand the current practice. Author makes proposals for optimizing the mechanism of tax monitoring.

Keywords: Tax administration · Tax administration efficiency · Tax monitoring

1 Introduction

In the current crisis situation for the economy, the issue of supporting the real sector of the economy with new forms of cooperation from the state is extremely relevant. Under the current conditions, the issue of qualitative interaction between the state and taxpayers comes to the fore. State control and in particular tax administration are the most important spheres of state activity since their effectiveness and the level of development, compliance with the requirements of modern economic realities make it impossible fully formulate the state budget, but it is also impossible develop the real sector of the economy. In modern economic conditions, the role of tax revenues in the formation of the consolidated budget is increasing. At present, the question of the completeness and timeliness of budget formation is even more acute since taxpayers are even more inclined to minimize payments to the budget, it is necessary to develop, implement and improve tools to bring together the interests of business and government representatives, which determines the relevance of the chosen research topic. In this connection, the subject of the article was the study of the current form of state

control and tax monitoring, and the result will be a conclusion on its improvement and dissemination in practice. Tax monitoring is a form of tax control. The issues of improving the forms of tax control arise in front of tax administration bodies at any stage of economic development. Research on this topic was carried out by such scientists as Nazarov, Mikhaleva, Chernousova and Fomin [6, 7], Leontyev and Verovska [5], Plaskova, Prodanova, Leontyev, Ratnikova and Probin [9], Yakovlev and Leguizamon [16], such economists as Arulampalam, Devereux and Liberini [1], Kalaytan, Cherkasova, Drukhov and Yaroshevich [3], Krupka, Lew, Tkachyk, Rubakha and Irshak [4], Semerád and Bartůňkova [11], Shlafman et al. [12], Xu, Li, Liang and Rahman [15] and others. At the same time, there are no fundamental studies on the mechanism of reforming the forms of tax control and recommendations on their optimization and improvement. Based on the study of the current practice of applying the form of tax control, the author identifies the positive and negative aspects of this form of tax control, conducts a comparative analysis of the current practice in other forms, assesses the prospects and makes assumptions to expand the current practice. Based on the analysis, the author makes proposals for optimizing the mechanism of tax monitoring. The aim of the study was to identify the positive and negative sides of this form of tax monitoring, disclosing the problems of implementing this form for all participants in tax relations, making suggestions for their solution and optimizing its usage. Based on the goal, the author sets the following tasks: 1) analysis of the relevant legislation of the Russian Federation; 2) study of the Russian practice of introducing tax monitoring as well as foreign experience on this issue; 3) the formulation of conclusions and recommendations regarding the form of tax control and tax monitoring. The article reveals the theoretical aspects of typical forms of tax control, tax audits and features of such a form of control as tax monitoring. The analysis of the dynamics of the number of field tax audits for the period 2016–2019 and the dynamics of the use of tax monitoring for the period 2016–2019 and its prospects for distribution until 2021 are carried out. The advantages and disadvantages of tax monitoring in relation to other forms, the features of implementation and use by all participants of tax relations are highlighted.

2 Methodology

While studying the selected problem of analyzing tax monitoring as an instrument of state support for the real sector of the economy, methods of observation and collection of facts on the issues of existing forms of tax control were used. By applying analysis and synthesis methods, it was possible to assess the dynamics of the use of the tax control forms in the Russian Federation for the period of 2016–2019, a perspective assessment is given on the distribution of the application of the tax control form in the form of tax monitoring. Currently, the time of the unstable economy of the Russian Federation, the dynamic situation on the world economic arena, more and more attention from the government is paid to support the real sector of the economy, because it is its work that gives maximum revenues to the consolidated budget. The role of taxes in the formation of budget funds is unchanged, therefore, every year the role of tax control increases, and with it the requirements for the quality of its

implementation. Improving the effectiveness of tax control is a priority area of the tax policy of the Russian Federation. In order to further increase the efficiency of the tax authorities and develop tax control, the attention of the state should be focused on creating conditions that ensure the voluntary fulfillment of the obligation to pay taxes and fees by taxpayers reducing the number of facts of tax evasion. The main forms of tax control are tax audits, with their help tax authorities identify the mistakes made in tax calculations and committed tax offenses. The most effective of these is, of course, an on-site audit, but for all its effectiveness, this control tool cannot be applied to all categories of taxpayers and objects of taxation. The Federal Tax Service of the Russian Federation indicates that with a reduction in field tax audits by 35%, the number of complaints based on their results has also decreased. And revenues from the results of analytical work, on the contrary, increased almost 2 times [10]. Due to the limited use of the tool, an on-site tax audit, the tax administration have faced the question of expanding the forms of tax control. Since 2015, a new form of control interaction has been operating in the Russian Federation - tax monitoring, and although this form is not entirely new, many questions remain unsettled regarding its application and real effectiveness. Tax monitoring is an improved form of control, which is aimed at maintaining a balance of interests of participants in tax relations, and at the same time, at increasing the transparency and effectiveness of control procedures. In order to develop and introduce this form of tax control in the Russian Federation, we used the positive experience of economically developed foreign countries such as Austria, Australia, Holland, Denmark, the USA, Singapore and others that actively and successfully apply similar forms and systems of tax control and administration. The central idea of introducing tax monitoring practices is to voluntarily comply with tax and tax legislation by taxpayers. Tax monitoring enables tax authorities and taxpayers to quickly coordinate the size of tax payments and adjust them if necessary, the absence of other forms of tax control. The undoubted advantage of tax monitoring is that it allows you to quickly coordinate the position on tax issues with the inspection and adjust the amount of payments to the budget without additional charges and fines. However, the transition to this form of tax control is very restrained. In the first year the new form was introduced, only 7 companies decided to use it. At the moment, the number of participants has grown to 95. Such insignificant numbers are a greater extent due to the criteria that organizations must meet. They are defined in article 105 of the Tax Code of the Russian Federation [14], namely: restriction on the amount of taxes paid over the past year—this indicator should be higher than 300 million rubles; in addition, the value of assets and the total income of an economic entity should be more than 3 billion rubles for each indicator. The numbers are high enough for the Russian economy, a limited number of companies are suitable for such criteria. To date 1905, such companies in Russia, are as ready as possible to switch to a new system according to the Federal Tax Service, 36% (687). These are mainly organizations involved in oil and gas production, metallurgy, finance and credit, manufacturing, construction and trade. The examples are such companies as Lukoil, Gazprom, Rosneft, Novatek, Severstal, Aeroflot, VTB, Google, NTV, MTS, Rostelecom, Russol and other corporations [13]. To involve more participants in the process of updated tax control, the Federal Tax Service plans to lower the entry threshold for economic indicators. The following are called as the proposed lower numbers of the entry threshold for applying tax

monitoring: the amount of federal taxes paid over the past year over 100 million rubles (including personal income tax and insurance premiums), total income and value of assets of an economic entity more than 1 billion rubles (for each indicator). Thus, we can say that the reduction of the current input threshold is planned to reduce three times. According to experts, such changes should lead to an increase in the number of potential monitoring participants, namely, by 2022 this figure will increase to 3879, and by 2024 to 7000 [2]. Thus, the tax authorities have expectations that in the next two years the practice of the application of this tax monitoring form will more than double. In addition to increasing the effectiveness of existing forms of control and introducing new forms, to expand and improve the quality and effectiveness of control activities based on high-tech decisions, the Government of the Russian Federation approved the concept for the development and functioning of the tax monitoring in the Russian Federation” dated February 21, 2020 [8]. The main objectives of this document are:

- digitalization of tax control, determining ways and means,
- integration of tax control functions by the corporate information system of the taxpayer.

The form of tax control in the way of tax monitoring has several advantages for each of the parties of tax relations. First of all, for taxpayers, this is, the absence of field and desk tax audits, with some exceptions (Article 88 and Article 89 of the Tax Code of the Russian Federation) [14], the possibility of pre-trial settlement of disputes as well as the reduction of tax risks and administrative pressure, the speedy resolution of tax disputes, voluntariness and others. For tax authorities, a clear positive point is: monitoring on an ongoing basis, the opportunity to familiarize yourself with the business processes and industry characteristics of each participant in tax monitoring; electronic document management, reducing the complexity of the work; improving the risk-based approach and reducing the cost of tax administration. Thus, it enables operational monitoring on an ongoing basis. Electronic document management is currently used in cameral control, however, the process of obtaining information is less efficient, respectively, the quality is lower. It is this form that should ensure the voluntary, correct and timely fulfilment of the tax obligation by taxpayers and the wider practice of using the control form of tax monitoring.

3 Discussion

Based on the analysis of the current practice, the author concludes that tax monitoring has many advantages, however, like other forms of control, it also has disadvantages. Although the Ministry of Finance of Russia claims that conducting this type of tax administration does not require additional material costs, however, improving tax control is a laborious and costly process. At the same time, any innovation requires qualified specialists in this field, technical means and other resources. There are not enough professionals in this field in our country, therefore, training or retraining is ahead, which will also require extra time-consumption. As for the technical side of the issue under study, in order to achieve our goals we will need to store large amounts of information, provide quick access to these data as well as establish uninterrupted

operation of the system itself and its security, confidentiality, which is a technically complex process.

Another controversial aspect of tax monitoring is its voluntary nature. On the one hand, this is certainly a plus - interaction is carried out with companies that are ready to cooperate with tax authorities who want to protect the business from constant inspections and penalties. But, on the other hand, companies that are not engaged in such interaction have a chance to subjectively become “unreliable” for tax authorities. Therefore, while eliminating the negative aspects, there is a high probability of improving the quality of tax control and tax administration. Tax audits are aimed at working after a taxpayer fulfils his obligation, whereas tax monitoring is of a preventive nature in itself.

4 Conclusion

Thus, the analysis of the legislation of the Russian Federation and at the study of the Russian practice of introducing tax monitoring as well as foreign experience on this issue allows us to conclude that tax monitoring is a promising form of tax control and an effective form of interaction between the state and business, it has its own strengths and problematic aspects. One of the key ideas for introducing this form is to replace tax audits, both cameral and field ones. Since the introduction of this form of control in the tax administration system of the Russian Federation, the demand for its use has increased, and tax authorities evaluate it as promising. However, the current situation in the economy, deficiencies in tax legislation, and the lack of a solid legal basis make it difficult, in the author’s opinion, perform a massive transition, even if the entry threshold for applying this form of tax control is reduced. Therefore, to increase the number of taxpayers who voluntarily have switched to tax monitoring, further work is required from the legislative and executive branches. And this, in turn, will increase the competitiveness and quality of the Russian tax system, and, accordingly, will create more comfortable conditions for the development of the real sector of the economy in the Russian Federation.

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E-Money as a Financial Instrument in Globalized Economy: Russian Legislation Experience

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Abstract. Modern understanding of the legal category of “electronic money” still does not eliminate discussion on the issues of its difference from non-cash funds and the possibility of considering it as money. The concept of electronic money is given in the article, its main advantages and disadvantages are considered. The article is devoted to the study of electronic money from the point of legal regulation. Due attention is drawn to the possibility of adapting the economic and legal structure of electronic money in the matrix of existing legal structures. Russian and international experience is studied. The difference between the legal nature of electronic money and the legal nature of non-cash funds is studied. The prospects for further legal regulation of the financial instrument presented are outlined.

Keywords: Claim rights · Electronic cash · Non-cash money · Virtual wallet

1 Introduction

Currently, there are many open and closed systems and subsystems on the Internet that do not have special permissions to carry out banking activities and yet provide electronic money circulation. The issues of legality or illegality of such activities are considered not only from the standpoint of the economic component of the market, but also from the standpoint of stability and security of the world as a whole, of a separate state, including counteraction to the legalization of criminally acquired funds and the financing of terrorism. Given the globalization of the economy and the limitless network potential, the problem of legal regulation of electronic money has an international status.

2 Methodology

Legal norms regulating social relations arising in the process of money circulation are the subject of the study, while social relations arising in the process of money circulation are the object of the study. The authors examine features inherent in electronic money, as well as the functions performed by it as money. Reliability and validity of the results are achieved through the integrated application of system-structural, comparative legal,

formal-legal and logical-theoretical methods along with other methods. Authors study the issue of the essence of electronic money and the possibility of classifying cryptocurrencies as such in accordance with foreign legal regulation using the method of comparative law. The study allowed to reveal the features of electronic money that distinguish it from non-cash money, and also, to compare it with non-cash money and cash, analyze the economic money functions of performed by electronic money.

3 Results

XXI century is the century of digitalization and informatization. Science tirelessly leaps forward, proposing new ways to carry out ordinary operations and transactions; ways that simplify the life of every citizen and companies [10]. One of those ways is the transition from cash to the phenomenon of our time - electronic money. The term “electronic money” can undoubtedly be called ambiguous and it is still evolving, as it is used in different context, moreover, it is evolving constantly, expanding its sphere of influence and the range of operations.

It is important to note that in the legislation of the Russian Federation for a long time there was no exact definition of electronic money. Federal Law “On the National Payment System” dated June 27, 2011 № 161-FZ [7] clarified the wording of the term under discussion. The consolidation of the concept at the federal level emphasizes the importance of the term “electronic money” in the modern world, confirms the need for its legal regulation.

For a comprehensive analysis of electronic money, you need to familiarize yourself with their types, distinguish electronic money based on smart cards and network-based. The first operate using the built-in chip on which the equivalent of money is recorded (money file). An example of this type is Visa Cash, Mondex, the Dutch Chipknip system. The work of electronic money based on networks is based on a special system presented in the form of a network resource or program. This type includes such popular and widely used systems today as Yandex.Money, WebMoney, RBK Money, Rapida, PayPal. As of February 28, 2020, there are 85 officially registered electronic money operators in the Russian Federation [2]. What unites these types is that they are all a convenient and quick way of settlement without involving a bank.

We also have to distinguish electronic fiat and non-fiat money. The first is a type of monetary units of payment systems of a state, and the latter are electronic units of non-state payment systems. The issue, redemption and circulation of electronic fiat money occurs according to the rules of national legislation, guaranteed by higher authorities. Smart card Visa Cash refers to electronic fiat money of the United States. Yandex. Money, an electronic payment system, which today is one of the most popular in the Russian Federation, is an example of electronic non-fiat money based on networks. Many systems, which include WebMoney, PayPal [15], Wallet One, Wirex, EasyPay, allow you to exchange non-fiat electronic money for fiat, and systems such as Liberty Reserve carry out this kind of operation through third-party electronic money exchange systems. The degree of control of electronic monetary units in different countries is very different, although the reliability and safety of using this kind of technical progress directly depend on the mechanism of their regulation and legal support.

Electronic funds are a relatively new digital payment instrument, they store practical and currency value, they are an analogue of the usual money, therefore, to identify their advantages and disadvantages, it is appropriate to directly compare them with cash. The main advantages of electronic money include accessibility, speed and ease of use, mobility, divisibility, perfect retention, the availability of their legal regulation.

In the Russian Federation, the very first acts affecting the sphere of cashless payments are: Federal Law dated June 3, 2009 № 103 “On Activities for the Acceptance of Payments by Individuals Made by Payment Agents” [5], Federal Law dated June 3, 2009 № 121 “On amending certain legislative acts of the Russian Federation in connection with the adoption of the Federal Law “On the activity of receiving payments from individuals by payment agents” [6]. In addition to the concept of electronic money, in the Federal Law “On the National Payment System” dated June 27, 2011 № 161-FZ, the term for its transfer operators is fixed, as well as the means and process of its use [7].

Electronic monetary funds, as well as non-cash monetary funds, being the right of claim in a monetary obligation, differ from them both on the basis of the occurrence of a monetary obligation and on the peculiarities of the emergence, disposal and termination of the right of demand in a monetary obligation [11]. So, the basis for the occurrence of non-cash funds is a bank account (deposit) agreement, while the basis for the occurrence of electronic money is an agreement with the electronic money operator. The type of this agreement is not defined in the legislation of the Russian Federation, but it is obvious that it is not a bank account (deposit) agreement, since money is provided by a person without opening a bank account. It seems that it has some similarities with the contract for the provision of services. Differences in the grounds for the occurrence of a monetary obligation give rise to particularities in the emergence, disposal and termination of the right of claim of an authorized party arising on the basis of an agreement with an electronic money operator compared to the right of claim of an authorized party arising on the basis of a bank account agreement.

The rights of claims of an authorized party for a monetary obligation to an electronic money operator are recorded in a manner different from the accounting of rights of claim of an authorized party for a monetary obligation arising from a bank account (deposit) agreement on a special virtual account called an “electronic wallet”. Despite the variety of positive aspects, there are also disadvantages in the use of electronic money. The main disadvantages are operational and technical risks, insufficient security, inability to use without connecting to the Internet, loss of liquidity. The insufficiently stable legal regulation of electronic funds can also be attributed to significant disadvantages of their use.

The Federal Law “On the National Payment System” № 161-FZ, requires refinement regarding the definition of electronic money, the structure of the system and the procedure for its activities [7]. In our opinion, in the text of the law it is important to fix the difference between electronic money and cashless payments, with which they are often considered synonymous. The main difference between these terms is that electronic money is recorded on a virtual account in the transfer system, and not on a bank account. Government bodies do not stop at the achieved result and continue to improve the quality of legal regulation of this sphere of services. It is necessary to consider the possibility of recognizing cryptocurrency as electronic money. What electronic money

and cryptocurrencies have in common are, firstly, the form of their existence, secondly, the obligatory use of electronic means of payment for their circulation, thirdly, the remote nature of settlements, and fourthly, recording information about the amount of funds without opening a bank account. According to their physical parameters, electronic money and cryptocurrency are intangible, incorporeal goods that do not have a physical shell, which is how they differ from things in their classical civilistic sense.

Another common feature of electronic money and cryptocurrency, is that they are both relatively close to non-cash money, as reflected in the presence of written evidence of their existence in the physical world. The existence of both instruments is confirmed by a record in electronic form, which is protected by a system of codes and passwords (which are necessary to enter the electronic trading platform and electronic wallet). Such records are not the object themselves, but rather a proof of existence [4]. There are fundamental differences between electronic money and cryptocurrencies.

1. Legally cryptocurrencies are not rights and do not certify any right; it is difficult to imagine their consideration as property rights. The right of claim implies the existence of an obligation, i.e. the relationship between the creditor and the debtor, according to which the creditor has the right to demand certain actions from the debtor, and the latter has an obligation to carry out those actions. Regarding electronic money, such legal connection undoubtedly exists: the client has the right to demand the transfer of electronic money from the operator, and the latter is obliged to transfer the electronic money to the person indicated by the client. However, regarding cryptocurrency this connection is not traced. Therefore, if the legal nature of electronic money is mandatory then with respect to cryptocurrency, the opposite conclusion about its proprietary nature can be drawn.
2. The possession of electronic money allows its owner to make only one transaction with them - to conclude an agreement on the transfer of electronic money. Other civil law contracts (gift, sale, etc.), the subject of which can only be things, cannot be concluded in regard of electronic money. Cryptocurrency however can be subject of such transactions, where the subject must be a thing. Thus, unlike electronic money, cryptocurrency can be sold, donated, exchanged.
3. To create electronic money, the client must first provide the operator with another type of money (cash or non-cash). That creates the right of claim for the client. Cryptocurrency is created through mining, which requires the costs of human, financial, industrial and other resources.

Thus, cryptocurrency and electronic money are neither similar, nor general and private, but represent completely different categories that have different legal nature and are subject to different legal regulation [18].

A similar view on the coherence of cryptocurrency and electronic money can be traced in foreign law and order. Since there is no issuer during cryptocurrency mining, such “currency” in the European Union is also not recognized as “electronic money”. Cryptocurrency is seen as a regular intangible economic good [13].

Analyzing the practice, it can be noted that criminals quite often use electronic payment systems to carry out crimes and implement malicious intentions [1]. Existing legislation does not limit the actions of offenders in the use of electronic money. Criminals, making operations “bypassing” banks, become more confident in the

impunity of their actions. It is necessary to establish tighter control over the process of cash transactions in electronic payment systems, fix specific penalties for fraud in this area at the legislative level, and develop a regulatory framework to prevent possible leakage of information about users and the state of their accounts [16].

4 Discussion

In Russian legal science, there are several approaches to understanding electronic money [12]. According to the first approach, electronic money is a special legal essence, characterized by the presence of several features of both cash and non-cash funds. Another approach is based on the fact that electronic money is a way of securing claims, that is, the so-called electronic debt document, thus relating them to obligations. The third point of view is that electronic money is an object of ownership, a prepaid financial product. A different interpretation of the term under discussion confirms its ambiguity. Foreign experience during the formation of the legal institution of electronic money is of particular importance. However, in foreign experience today there is no unity of views regarding the concept of legal regulation of electronic money. There are three areas that are sometimes referred to as European, Asian, and American [14]. The distinction is based on the concept of legal regulation adopted as a basis. The first direction is the recognition of electronic money by its status of a new means of payment as a claim. So, in Europe, electronic money refers to money stored in electronic form, on magnetic carrier, which is issued by the issuer (operator) upon receipt of money and accepted by legal entities and individuals who are not issuers of electronic money. In this case, there is a conditional issue of funds, essentially similar to non-cash funds. By transferring money to the issuer (operator) the client receives the right to demand necessary payment transactions from the issuer (Directive 2009/110/EU) [3]. Another area is characterized by the recognition of electronic money as legal tender, allowing the conditional issue of electronic money on the basis of financial institutions of the state, without the participation of the State (central) bank of the country (for example, Singapore, Japan) [8]. This approach can be described as transitional, when the issue of electronic money is allowed, but has limitations in terms of the financial stability of the issuer - a financial institution, as well as in the volume of electronic money. The third area, is the USA, there the regulation of e-money is based on the recognition of electronic money as the status of a new type of monetary service so the issue of using electronic money is shifted to the area of rules on forms of payments.

5 Conclusion

Electronic money in the Russian Federation is a set of subjective legal rights of a binding nature to a credit institution for banknotes in a monetary obligation arising on the basis of an agreement with an electronic money operator. Electronic monetary funds differ from non-cash monetary funds both on the basis of the occurrence of a monetary obligation and on the specifics of the occurrence, disposal and termination of

the right to claim in a monetary obligation. Electronic funds in the Russian Federation acquire the status of money as a result of the application of legal norms that ensure the implementation of the basic economic functions of money and establish the limits for their implementation. The analysis of legal norms that ensure that electronic money functions as money functions suggests that such functions are performed with restrictions in comparison with both cash and non-cash funds [9].

The inclusion of a state in globalized world economy is a complex process, controversial, not yet fully defined and determined by everyone, at least in that way that would harmoniously ally with the sovereignty and originality of all states. And it is because of that it is necessary that Russian civil law be synchronized with at least continental civil law. The use of electronic money in economic circulation can improve the dynamics of settlements, as a result, the volume of transactions, increase the competitiveness of financial services in the context of globalization of economic processes [17]. The concept of legal regulation of the issue and circulation of electronic funds requires a comprehensive and high-quality study considering scientific and technological progress, economic and legal research. In turn, the most pressing issues of legal regulation of electronic money turnover are applicable contractual designs, security, universality of means of payment, an autonomous settlement system without accompanying support using cash or cashless payments.

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Prospects for the Development of ICO as an Alternative Financing Instrument

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Abstract. The article investigates problems of evaluating the economic effect of ICO (initial coin offering) process as an alternative financing instrument in the field of corporate innovation for all stakeholders taking into account their interests and potential benefits. To create an index for ICO's assessment, the correlation and regression analyses were held. A sample of 234 projects was formed, which presented groups of successful and unsuccessful ICO projects. This index allows to evaluate the project by the criteria which are vital for investors and could be implemented in the practice of the companies within financial planning of their innovation activities. Also, the article pays attention to the overview of the ICO's perspectives in Russia and worldwide: modifications of the classic ICO scheme, ways of legislation and technical development in the sphere of cryptocurrency.

Keywords: Alternative financial mechanisms · Cryptocurrency · Initial coin offering · Innovation · Investment

1 Introduction

The initial placement of tokens as a financial mechanism for innovative projects first appeared in 2014, and gained its wide distribution only after 2016 [4]. The climax to development of this financial instrument was in 2018, when the volume of funds raised by ICO projects showed an increase of 230% compared to the previous year. Due to the strengthening of regulatory control by states worldwide, the use of the ICO model significantly decreased in 2019. The same trend can be observed at the beginning of 2020: for example, in January the amount of successfully completed ICO is 100 times less than for the same period in 2018 [9].

The ICO procedure is mostly recognized in the sectors related to finance, trading and infrastructure development. The United States, Singapore and the United Kingdom became the most active users of this financial mechanism [12]. Despite the growing popularity of ICO, still the amount of funds attracted by this financial mechanism is significantly lower, than that companies could cumulate using traditional financial instruments. Thus, the 10 largest IPOs attracted 22 times more investments than the 10 largest ICO projects. A similar situation can be observed with the capitalization of large companies compared to ICO startups. Therefore, the main goal is to increase an attractiveness of ICO projects for potential investors by creation of the assessment

methodology which would take into account interests and expected benefits of all stakeholders and make ICO process transparent and clear for participants.

2 Methodology

To analyze the effectiveness of ICO model, as well as to determine the factors affecting the level of attracted funds, a sample of 234 projects was formed, which presented groups of successful and unsuccessful ICO projects. The projects that collected more than 86% of the planned funding were the most numerous in the first group. In general, the observation data demonstrated the highest average, median, maximum and minimum values for all the main characteristics of the ICO, namely the price and number of issued tokens, as well as the purpose of the collection.

The geographic and industry characteristics of the sample confirmed general market distributions. The largest number of projects was implemented in the field of finance and trading in the countries of Western Europe and Southeast Asia. To attract potential investors, project teams actively use such non-financial drivers as bonus Airdrop and Bounty programs, as well as the KYC procedure: Bonus Airdrop program - free token distribution, which is the part of the advertising campaign; Bounty program - the process is similar to the Bonus Airdrop, but the participants of the program are chosen on the competitive basis; KYC procedure - "Know your customer" which stands for the verification of the identity of the ICO team to prevent asymmetries of information.

These factors were chosen as non-financial variables for the following analysis. As a financial factor, the provision of information on the future distribution of collected funds was chosen, while the services of an escrow agent are unclaimed among the projects presented in the sample. The representation of the document named "White paper" was used as a measure of the provision of information on the ICO project. "White paper" is a document which contains all the information about the future ICO project [16].

A correlation analysis revealed a significant connection between the level of funding received and various characteristics of ICO projects. The variables "Logarithm of difference (Logarithm of the difference between the maximum and minimum planned amount of attracted financing)" and "Logarithm of the number of issued tokens", "White paper", "KYC teams" and "Bounty program" were included in the regression model as independent variables, as they showed a positive correlation with the logarithm of the amount of funds raised by the projects. The final regression model is as follows (1):

$$\begin{aligned} \text{Logarithm of funds raised} = & -0.493 + 0.661 * \text{Logarithm of the difference} + \\ & 0.049 * \text{Logarithm of the number of issued tokens} + 0.113 * \text{Bounty program} + \\ & 0.887 * \text{White paper} + 0.081 * \text{KYC teams} \end{aligned} \quad (1)$$

The results of the model quality assessment confirmed its statistical significance and reliability: the determination coefficient is more than 0.5, there are no multicollinearity, heteroskedasticity of the residues and their autocorrelation. Also, the

hypothesis that the coefficients of the regression model are equal to zero is not confirmed. Since the analysis indicates the inconsistency of the current methods for assessing ICO projects, the variables included in the regression model will become the basis for the development of a new index.

3 Results

The analysis indicates the need to create an index to evaluate ICO projects in terms of significant factors for investors in the decision-making process [15]. The presence of these characteristics contributes to the achievement of the goals set by the project team. First of all, among the parameters, it is necessary to highlight the presence of the White Paper as an aggregator of all information about the project, which is necessary for analysis by interested parties. In addition, the logarithm of the difference between the planned minimum and maximum investment volumes is important: the larger this indicator, the more successful the outcome of the ICO. The implementation of the Bounty program and KYC, the value of the logarithm of the number of issued tokens also have a positive impact on attracting financing. The calculation of the index will occur according to the following algorithm [8]:

1. For each factor, it is necessary to calculate the value of its individual index (In) according to the formula (2):

$$In_i = \frac{x_i}{x_m} \quad (2)$$

where x_i is the value of the i -th indicator of the ICO of the project, x_m is the reference value of the i -th indicator.

The reference value for dichotomous indicators is 1, which means that the ICO project has this characteristic. As for the logarithmic variables, it is possible to use the median values of successful projects that were analyzed in the sample as a reference. This means that the index can be greater than 1.

2. After calculating the individual indexes, it is necessary to calculate the total index (GIn) of the ICO assessment according to the formula:

$$GIn_i = \sum_{i=1}^5 In_i * w_i \quad (3)$$

where In_i is the value of the i -th individual index, w_i is the weight coefficient of the i -th individual index

When calculating the total index, the products of all the values of individual indices by their weight coefficient are summed up. The weight of each index was determined by a qualitative expert method, taking into account the results of the analysis. Using the obtained index value, it is possible to determine which type an ICO project belongs to. As already mentioned, the calculated index can be greater than one, since the median value of successful projects in the sample is taken as the standard for logarithmic indicators. Given this fact, the following categories of projects were identified (Table 1).

Table 1. Interpretation of the index of evaluation of ICO projects

Type of project	Index value
High quality project	$0.85 < GIn \leq 1.2$
Medium quality project	$0.5 < GIn \leq 0.85$
Low quality project	$0 \leq GIn \leq 0.5$

Source: authors.

The maximum threshold value of a high-quality projects was calculated also based on the observation sample. Thus, when obtaining a result exceeding these parameters, it is necessary to conduct additional analysis before including the project in any group. Testing the use of the developed index was carried out on a small array of collected samples (Table 2).

Table 2. Initial characteristics of ICO projects for calculating the index

The name of the project	Logarithm of difference	The logarithm of the number of tokens	KYC	Bounty program	White paper
Cryptune	4.32	7.00	1	1	1
Inlock	4.05	6.52	1	1	1
Snapparazzi	4.00	5.71	1	1	1
Zethereum	1.41	5.70	0	0	1
Agate	3.09	5.50	0	1	1
Dylyver	2.24	3.30	1	0	0
Ultra travel pay	3.11	6.00	1	1	1
Lendsbay	2.28	4.88	1	1	1

Source: authors.

After that, according to formula (2), individual indices for each indicator were calculated (Table 3). For the “Logarithm of difference” factor, the reference value was 4.18, and for the “Logarithm of the number of issued tokens” –5.34.

Table 3. Individual indices of each indicator of ICO projects

The name of the project	IIn1	IIn2	IIn3	IIn4	IIn5
Cryptune	1,04	1.31	1	1	1
Inlock	0.98	1.22	1	1	1
Snapparazzi	1.12	1,07	1	1	1
Zethereum	0.48	1,07	0	1	0
Agate	1,04	1,03	1	1	0
Dylyver	0.79	0.83	0	0	1
Ultra travel pay	1.06	1.12	1	1	1
Lendsbay	0.74	0.91	1	1	1

Source: authors.

Weighting coefficients obtained as a result of correlation and regression analyzes, taking into account expert adjustments, have the following values: $= 0.358$; $= 0.096$, $= 0.153$, $= 0.257$, $= 0.136$.

To calculate the overall assessment index, it is necessary for each project to make calculations according to formula (2), using the individual indices obtained and their weights (Table 4). The calculated GIn values were in the range from 0.50 to 1.04; most of the projects under consideration fell into the high-quality category. This type of project is characterized by the presence of all dichotomous features that were taken into account when calculating the index.

Table 4. Individual indices of each indicator of ICO projects

Name of the project	G in	Interpretation of the result	ICO Results
Cryptune	1.04	High quality project	880.00%
Inlock	1.01	High quality project	75.00%
Snapparazzi	1.05	High quality project	100.00%
Zethereum	0.53	Medium quality project	24.45%
Agate	0.88	High quality project	61.27%
Dylyver	0.50	Low quality project	8.77%
Ultra travel pay	1.03	High quality project	43.33%
Lendsbay	0.90	High quality project	76.33%

Source: authors.

Only two projects showed indicators close to the threshold values of low-quality projects, which was confirmed by the level of effectiveness of these projects in the implementation of ICOs. Projects that fell into the low and medium quality group were not able to attract more than 25% of the initial level of planned funding. Thus, the developed index can be used to assess the quality of ICO projects, as well as their selection for further analysis in the decision-making process by investors on the distribution of funds.

4 Discussion

According to the held analysis it's obvious that the creation of the assessment methodology which would take into account interests and expected benefits of all stakeholders and make ICO process transparent and clear for participants is vital but not totally comprehensive step. It's necessary to make an overview of barriers and perspectives of the ICO market in Russia and worldwide.

The emergence of the cryptocurrency and the ICOs market was the result of a technological revolution caused by the new needs of economic agents, which became the catalyst for the development of cryptographic encryption methods and blockchain technology [10]. These innovations provide an opportunity to solve certain problems of the current monetary system: the duration and high cost of transactions, their low level of transparency, as well as the availability of intermediaries.

Despite such obvious advantages in using cryptocurrency as direct interaction between the parties to a transaction with a high level of transparency, the ways of development of ICO process should be mentioned, such as significant changes and improvements required in the legal field and in the technological sphere. An increase in transparency of both the ICO process itself and the mechanism for the subsequent distribution of the raised funds should be expected. In accordance with current trends, the number of projects entering an ICO with an existing product prototype should increase by an average of 7–10% per year [11].

Already at this stage of development, the following modifications of the primary token placement can be distinguished: Initial Exchange Offering (IEO, Initial Exchange Offering) is a mechanism when the ICO of a project is managed by the exchange, on the platform where the tokens were placed. The project team pays a commission for exchange services in the form of a listing fee, and investors who want to participate in ICO create accounts on the platform and make cash investments using exchange wallets. Comparative characteristics of IEO and ICO are presented in Table 5.

Table 5. The main differences between ICO and IEO procedures

Parameters	IEO	ICO
Fundraising place	Exchange platform	Project site
Control	Stock exchange	The project team
KYC Procedure	Implemented for each project by the exchange	The project team itself determines the need for the procedure
Marketing campaign	The exchange independently engages potential investors	The project team requires significant financial and time investments to advance the project
Project Verification	Each project, before launching on the platform, undergoes a procedure for checking the accuracy of information	There is no need to undergo screening procedures before starting the project

Source: authors.

Thus, the main advantage of the initial public offering for investors is a higher level of security compared to investing in ICO projects. For the project team, the implementation of this procedure can serve as an effective way to attract investment due to the lack of high advertising costs and the presence of a formed customer base at the exchange. However, the IEO model also has certain drawbacks: the project submission procedure is complicated due to the list of requirements for them; the process of attracting financing is becoming longer; there is a risk of personal data leakage, as both investors and project participants go through the identification procedure.

Security Token Offering (STO, Placement of security tokens) is a procedure for attracting investments by issuing tokens that are backed by securities [14]. This feature allows investors to rely on a wide range of rights, including the payment of dividends and the right to vote.

Linking tokens to real securities makes it possible to smooth out the problems of regulation by implementation of laws and acts that control securities. In addition, the obvious benefit for the investor is associated with high regulatory requirements for reporting on securities, which reduces the risks of fraud. Thus, if the ICO mechanism involves the obtaining of income by investors from the growth of the exchange value of tokens, then investing in STO allows them to obtain rights related to the ownership of securities. Also, the sale of security tokens, in contrast to utility tokens, allows to protect investors' rights in case of bankruptcy of an organization [13]. Using the considered financing tools is already quite common among startups and projects that have investment needs. At the same time, new mechanisms are entering the market, which also represent possible forms of ICO development.

One of these is the Decentralized Autonomous Initial Coin Offering (DAICO, Decentralized Autonomous Public Placement of Tokens), which is a synergy of a decentralized autonomous organization, functioning in accordance with a set of agreed, formalized rules, and traditional ICO [7]. Investors gain more control over the distribution of funds that were invested in the project using smart contracts [2].

This tool allows you to regulate payments to the project team since during the implementation of the ICO the team do not have an access to already raised funds, and all the decisions on operations are submitted to the general vote of investors. In case of violation of the project implementation and failure to fulfill their obligations, investors have the right to terminate the smart contract with the return of the remaining investment. Increasing the level of control over the implementation of the project reduces the risk of loss for investors. However, this model assumes the proactive behavior of investors based on professional competencies, as well as the need for a basic level of knowledge of the product development process.

At the moment, a uniform standard for the implementation of a decentralized autonomous ICO has not yet been developed, so the practice of its use is based on the experience of several pilot projects. In general, DAICO in the future is one of the main alternatives to the traditional initial placement of tokens, which will strengthen the reputation of cryptocurrency and blockchain technology in the financial market.

The development of technologies and their integration with the financial services market are becoming catalysts for the need to adapt the regulatory environment to the modern realities of technological entrepreneurship. Due to the analysis of the international experience we could distinguish several options for including ICO in the legal field of economic relation [5]:

Option 1. Regulation of the ICO mechanism through the application of existing legislation. For this, it is necessary to determine the circle of participants in the process of ICO and the relationships between them, mutual rights and obligations. For the first time such an option in practice been used in the United States, while accepting tokens project DAO securities in 2017. Therefore, US token-issuing projects and investors are required to comply with US securities laws. The same concept was supported by Germany, Canada, Singapore [1].

Option 2. Formation of a separate legislative base, which would specialize in digital instruments for attracting financing, taking into account existing regulatory legal acts. When using this approach, special attention should be paid to resolving the issue of distinguishing between the current laws and specially created norms in order to prevent

legal conflicts. In addition, these features should be explained to companies issuing tokens in order to be able to organize their activities within the framework of the norms established by legislature. This option is used in France and Australia, and it is Russia that is leaning towards it, given the project of act “On financial digital assets,” which is being approved in the State Duma in the second reading [6]. Thus, both options allow you to regulate the procedure for issuing a token, as well as protect investors’ rights.

In general, government policy in relation to cryptocurrencies and alternative financing mechanisms should be built on the basis of a permissive nature, which will reduce the level of the shadow economy. These measures, in turn, can become another source of replenishment of the state budget by taxing the activities of the crypto sector, and also become the basis for the further evolution of the digital economy.

5 Conclusion

To assess the quality of the ICO project an index was developed. It includes the main characteristics that affect the investor’s decision. As components of the index, indicators from the regression model were included. The calculation of the general index is carried out in several stages. Firstly, it is necessary to calculate individual indexes by dividing the values of the characteristics of a particular project into reference values. Secondly, multiply the results by the weight coefficients obtained during the synthesis of the analysis and the expert method. The last stage is the interpretation of the result. The developed index was tested on a small sample array and can be used to assess the quality of ICO projects.

As for the further spread of ICO’s usage to attract financing, despite the objective advantages, there are some difficulties in both legal and technological ways [3]. We should expect an increase in the number of projects entering an ICO with an already developed prototype product. This fact would lead to increasing of the transparency of this process and tightening of the regulatory requirements in order to gain more confidence in digital assets among ICO participants. There are some steps already been taken in the modern ICO market such as exchange placement, as well as the placement of security tokens. The advantages of these tools partially allow to solve the problems of high risk of fraud and to protect the rights of investors. At the same time, new mechanisms are entering the market that represent future forms of ICO development. Among them, the most promising is a decentralized autonomous public offering of tokens. Investors gain more control over the distribution of funds, and in case of violation of obligations by the project team they have the right to terminate the smart contract with the return of the remaining investment.

The growing popularity of alternative financing mechanisms among Russian companies leads to the question of legal regulation of digital assets and related financial transactions in the Russian market. To legalize this process, it is necessary to consider the following aspects:

- regulation object (cryptocurrency, utility and security tokens),
- approaches to regulation (application of existing legal acts or development of new legislation),

- an information policy designed to clarify the practice of applying legislation in order to reduce violations of investor rights,
- use of tax and accounting,
- anti-fraud measures.

The adoption of the draft law “On Digital Financial Assets” should be the beginning of the integration of the use of digital assets in the process of attracting financing within the existing Russian financial market. These measures are particularly relevant in connection with current economic problems caused by business disruptions due to the COVID-19 pandemic.

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Automated Assessment of Personnel for Identifying Risk Behaviors

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Abstract. The article analyzes the problem of improving the safety of transport processes on Russian Railways by introducing methods of automated assessment of personnel risk behavior. To provide a high-quality transport service, the company must organize a risk management system and comply with the guaranteed safety of the transportation process, namely, perform such tasks as: identifying potential risk areas and assessing the possibility of preventing or minimizing the occurrence of risks, preventing the occurrence of risks based on their systematic forecasting and assessment, creating management tools and mechanisms to ensure effective risk management. We analyze the regulatory framework for the development of software that provides automated testing using certain methods, systematization and storage of results, as well as the formation of recommendations to minimize the probability of risky behavior. The creation of such a system will improve the safety of transportation, improve the quality of risk management and assessment by creating an environment for the analysis of dangerous risk factors, that is, dangerous sources that affect the safety of the transportation process.

Keywords: Automated behavior testing · Risk management · Risk propensities

1 Introduction

The process of identifying risk behavior of personnel is part of the risk management system in JSCo «RZD» (Russian Railways), which is based on the regulatory framework, conceptual models of risk management of the international standard ISO 31000 “Risk management. Principles and guidelines” and the requirements of the relevant provisions of the corporate governance code [2]. Risk management is the process of making and implementing management decisions aimed at reducing the likelihood of an adverse result and minimizing possible losses caused by their implementation. Optimal risk management schemes should provide maximum protection with minimal costs: time, financial and resource costs [1, 4, 8]. The initial stage of risk management, which aims to obtain the necessary information about the structure, properties of the object and the existing risks, is the risk analysis. It consists of identifying risks and evaluating them. Risk identification and assessment are closely interrelated, and it is not always possible to divide them into separate parts of the overall process. In this

paper, the analysis is carried out from assessment to identification. The formation of a traffic safety culture should be analyzed as an integral part of the risk management system. It is closely connected with corporate standards and rules of official conduct of the officers and other employees of JSCo «RZD» and principles of mutual relations of JSCo «RZD» with shareholders, authorities, legal and physical persons, which are established by the Code of Business Conduct of JSCo «RZD». As a rule, each type of risk allows for two or three traditional ways to reduce it. The purpose of this work is theoretical justification for the development of an automated testing system for detecting risky behavior of personnel. The main functions of the automated system include the following features:

- identify risks associated with violations of labor discipline and working system of railway personnel;
- evaluate the psychological state of the employee;
- suggest measures to reduce the impact of risks on the worker.

2 Methodology

Risk assessment consists of a comprehensive and systematic identification of hazards and risks determination. The overall goal of risk assessment is to increase the level of security. Risk management includes all measures taken to reduce and eliminate risks. To organize professional risk management, it is necessary to identify hazards and assess the levels of professional risks. These processes are carried out in 4 stages.

Step I. Drawing up a risk assessment procedure. We set the frequency and grounds for reevaluation of risks.

Step II. Identification of hazards at regular workplaces. Drawing up a list (register) of the organization's hazards. JSCo «RZD» uses automated systems, and the list of violations committed by employees is already included in them.

Step III. Study of the results of hazard identification and selection of risk assessment methods.

Step IV. Preparation of an action plan to eliminate or reduce the levels of professional risks.

Risk analysis can be divided into two mutually complementary types: qualitative and quantitative. Qualitative analysis aims to identify factors, areas, and types of risks. Quantitative risk analysis should allow to numerically determine the size of both individual risks and the risk as a whole. The final results of a qualitative risk analysis are the initial information for conducting a quantitative analysis. However, when performing a quantitative assessment, there are the greatest difficulties associated with the fact that it requires appropriate background information. When identifying risks (the qualitative component), all the risks inherent in the system under study are determined.

Russian Railways has developed a large number of methodological materials for identification, analysis and assessment of risks in the field of functional traffic safety in infrastructure, traffic management, and others.

The applied methods of normative values control of security levels in various technological processes allow to detect the occurrence of dangerous events, as well as to prevent or minimize the occurrence of risks by statistical processing of these events and developing models for the occurrence of dangerous situations.

The regulatory framework for risk management has been developed and continues to be improved. The main objectives of the risk management system are:

- ensuring the continuity and stability of the production activities of JSCo «RZD» by limiting the degree of impact on it of external and internal negative factors;
- providing a reasonable level of confidence in achieving the target state control parameters stipulated by the regulatory documents of JSCo «RZD», under the influence of external and internal factors;
- complexity – the use of a single methodology and common principles, taking into account the systemic relationship of risks, the nature of their mutual influence and possible consequences;
- integration - risk management is an integral part of management processes, including strategic and operational planning;
- continuity – regular monitoring and updating of information used in the risk management system JSCo «RZD»;

6) coverage of all types of activities - implementation of risk management procedures in all functional areas of JSCo «RZD», including within the framework of the process approach to management;

- balance – an objective balance of criteria when making a decision on how to respond to risk: a choice between possible losses and opportunities, between the costs of risk management and possible damage to risk management.

Risk tracking and forecasting is an integral part of strategic and operational management in JSCo «RZD».

The company has built an effective risk management system that allows you to manage risks and to minimize them. There are the following main risks for JSCo «RZD».

The following structural units are engaged in personnel evaluation in JSCo «RZD»: the railway personnel management service, the center for personnel evaluation, monitoring and youth policy of railways. The main tasks of the HR management service are:

- implementation of a unified corporate policy in the field of personnel management based on the creation of an effective system for managing human resources, providing conditions for the initiative and creative activity of employees, taking into account their individual characteristics and professional skills;
- selection and placement of employees of the railway management body, management personnel of railway structural divisions, taking into account their professional level and practical experience; implementation of state and corporate policy in the field of education, ensuring the needs of employees of JSCo «RZD».

The main objectives of assessment center, personnel monitoring and youth policy of the railways is to facilitate the implementation of the railway structural units of

functional branches, subsidiaries and affiliates of JSCo «RZD» and its territorial subdivisions located within the boundaries of the railway; the assessment of employees for purposes of personnel reserve formation and substitution of appropriate managers and professionals to identify needs in advance of training prospective employees; participate in the implementation of the corporate youth policy of JSCo «RZD» .

The assessment of corporate competencies of the company's employees is carried out to achieve the following goals: making decisions on the appointment and rotation of employees; selecting candidates for the unified personnel reserve; determining priorities for training and development of employees.

Assessment tools are applied to the employees in accordance with the level of the position. The results of the assessment are information that contributes to more accurate personnel decision-making, along with conclusions on professional competencies, personal and professional potential, performance and work experience. The results of evaluation procedures are confidential. Data is stored in electronic form (databases, individual reports), access to which is determined in accordance with the procedure established by JSCo «RZD» .

The assessment center is a specially organized procedure for evaluating corporate competencies of employees (in groups of 6–10 people), which includes various assessment methods (business games, tests and interviews) that complement each other. The assessment center identifies the strengths and risks associated with the personal and managerial effectiveness of the manager (responsibility, skills of working with people, decision-making, leadership, etc.). The assessment center is used: when selecting candidates for appointment to the positions of managers at level 1 and 2; when selecting managers at level 1 and 2 in the unified personnel reserve; when conducting complex evaluation activities as one of the evaluation tools (for example, within the framework of the unified corporate requirements system); when determining the development priorities of managers at level 1 and 2.

The “Business IQ” test assesses the intellectual potential of an employee and their ability to work with various types of information. The test results are one of the sources for predicting the effectiveness of working with information and learning in terms of the potential ability of the employee to learn new knowledge and skills. It is conducted by employees of the Corporate university and other employees of personnel management departments, approved by the Department of personnel management and trained in the application of this test. Test used in the selection of candidates for appointment to the posts of heads of 1, 2 and 3 grade levels; in the selection in the reserve of corporate development, the basic personnel reserve and youth reserve managers and professionals at all grade levels; when conducting a comprehensive evaluation as one of evaluation tools (for example, in the framework of a single enterprise requirements); at the direction of managers and specialists of all grade levels on expensive training/internship.

The Russian Railways Business Profile test is a method of complex diagnostics of psychological and personal-business qualities of an employee in the projection on corporate competencies. The test results determine the level of development of the employee's corporate competencies and predict the success of their management activities. Direct identification of test results with the results of other methods may lead to incorrect conclusions. The test is based on an ipsative model of testing construction, when the respondent has to make a “forced choice” between the most and least characteristic

aspects of behavior among the listed ones. This approach is considered more effective in preventing falsifications or attitudes to the social desirability of the response. Test used in the selection of candidates for appointment as heads of 2 and 3 level positions; in the selection of the base reserve of heads 2 and level 3 positions and employees in the youth reserve; when conducting a comprehensive evaluation as one of evaluation tools (for example, in the framework of a single enterprise requirements); in the selection of young talent and planning of their further development; the employment of young professionals; under the direction of managers and specialists of 2, 3, and 4 grade levels for education, training; in the evaluation of personnel for the solution of actual tasks.

The 360° method is a form of assessment based on a survey of opinions of reference (significant) persons from a person's working environment about the level of development of corporate competencies. The test results reflect the opinion of a significant environment about the degree of development of corporate competencies of an employee and have higher values than when evaluated by independent experts or automated tools. The method is used when conducting complex assessment activities as one of the assessment tools (for example, within the framework of a system of unified corporate requirements) for all levels of positions; when planning activities for employee development (forming individual development plans, planning the development of corporate competencies, preparing for certification).

For the analysis of risk factors in the field of functional security of trains movement of the branch in accordance with the approved methods of risk assessment, in the functional area of traffic safety statistics from information systems is used. Statistics such as the system of automated accounting and control of investigation of violations of traffic safety; complex automated system of accounting, control of elimination of failures of technical means and analysis of their reliability; the complex automated system of accounting, investigation and analysis of cases of technological failures.

3 Results

The accumulated database on violations of the transportation process technology and the reasons for their occurrence is the basis for solving the problems of improving the reliability of the transportation process, developing measures to strengthen the infrastructure based on analysis, adjusting the technologies for organizing operational work in order to reduce unproductive losses caused by train delays at the stations of the dispatcher section.

One of the areas of security culture is working with railway personnel. A full assessment of employees allows to identify a person's propensity to choose safe or, conversely, risky behavior at work. Examples of violations of labor discipline that employees can commit: violation of the work permit regime, violation of the work regime, violation of labor discipline, lack of preparation for work, etc.

Preliminary diagnostics measures not only a person's tendency to follow the rules, but also those "weaknesses" of the person (impulsivity, exposure to stress, inattention, lack of development of skills for planning their own activities) that can "push" a person to conscious or unconscious dangerous actions. The assessment is carried out in an automated mode, where the evaluator is asked to answer questions on three tests:

Shmelev's "Research on risk propensity" [7], Rean's "Methodology for diagnosing motivation for success and fear of failure" [6], and Zuckerman's "Self-assessment of propensity for extreme risk behavior" [9].

The evaluator chooses how much he or she agrees with the statement in each question on a 3-point scale, where 1 means "Yes", 2 means "No" and 3 means "Not sure". The results are analyzed automatically by calculating the scores for each test, for accurate interpretation of diagnostic results, it is important to know not only the average score for each evaluation criterion, but also the features of the combination of ratings. 2 reports are made for each evaluated person - for the manager, the evaluated person, and an individual report for the evaluated person. The reports provide interpretation of the results and recommendations: both for the manager (for competent interaction with the employee), and for the most evaluated (for the development of self-organization abilities and self-control of their own actions).

Tasks are to identify the 3 components of the "human factor" that cause the risk of "human error": 1) individual factors, 2) organizational factors, and 3) factors related to a specific work assignment; diagnose the propensity to risky behavior, diagnose stress conditions of employees in working conditions, identify and eliminate organizational factors and factors of the work assignment that push the employee to making error, take actions to overcome "human risks" in the workplace. The tests described below are also evaluation modules.

"Methods for diagnosing motivation for success and fear of failure" by Rean [6]. The questionnaire test contains 20 questions that must be answered either "Yes" or "No". It is suggested to answer questions quickly, without hesitation. The answer that first comes to mind is usually the most accurate. The questions in this test suggest evaluating your ability to take actions that involve a risk to your life, as well as certain prohibited actions. Some situations are rare in everyday life, so the answers to them are assumed. The author does not share the risk situation depending on the degree of unfavorability of possible consequences, the risk motivated by material or moral values is not shared, so the test results may not be objective. Also, no information was found to establish meaningful validity and reliability.

To assess the risk propensity, the questionnaire "Risk propensity research" was used by Shmelev, a Russian psychologist, a specialist in experimental psychosemantics, psychodiagnosics and psychometrics, which allowed us to accept this method as standardized, reliable and valid [7]. This technique allows us to study such a trait as a risk-taking tendency, and is important when it is necessary to make a psychological forecast of the decision-making process in a situation of uncertainty. Subjects are offered a set of 50 statements. It is necessary to decide whether each statement is true or false in relation to a person. When analyzing the results, you should focus on indicators that vary on a scale from 0 to 40. The results were evaluated and interpreted according to the points set in the instructions to the questionnaire. The higher the value of the indicator, the greater the risk propensity. Also in this questionnaire, there is an additional scale – "sincerity", which helps to take into account the element of honesty when answering questions. The test results depend entirely on the sincerity of the responses.

When studying the propensity to risk and assessing the level of personal need for new sensations of various kinds, the method "Self-assessment of propensity to extreme risk behavior" is used by Zuckerman [9].

He is one of the first authors to propose a method for measuring the needs to search for impressions that encourage a person to this type of activity. He described the behavior model associated with the tendency to search for impressions, this factor was defined as “the need for various new impressions and experiences and the desire for physical social risk for the sake of these impressions.” The technique is associated with a tendency to emotional risk, reflecting active physical actions and asocial behavior. The questionnaire contains 40 statements that relate to various behavioral orientations. The task of the subject is to choose the appropriate for him answer. Data is processed using the key to the questionnaire scales. The assessment of results is formed on 4 scales: the scale of search for thrills; intolerance of monotony; search for new impressions; maladaptive desire for difficulties. Each scale has a score range from 0 to 10. Levels of the studied scales: low; medium; high.

The automated system allows you to systematize and store information about test results, track dynamics, and detect deviations. After passing each test, the results are saved, evaluated, and compared with recommendations. Recommendations can be prepared in advance and selected from a set of ready-made recommendations, or they can be formed by a specialist after getting acquainted with the results and history of the user’s assessment. Reports for the manager on the test results formed by the program are processed and evaluated, and then transmitted to the database for storage. The reports show an assessment of the propensity for a particular type of violation and recommendations for reducing the impact on the work process.

4 Discussion

Modern psychology offers several approaches for determining the level of readiness of a person to accept a risk situation, identifying the most frequently chosen alternative: achieve success at any cost, or avoid failure at any cost. Surveys are the most widely used research methods that allow you to collect, analyze and evaluate a person’s subjective perceptions of risk, to get enough complete information about various aspects and properties of the individual [3, 5]. Automation of the data processing process, supplemented with data from related information systems, can become the foundation for the intellectual analysis of data on inherent risks to personnel or the basis for analyzing the causes of technological violations.

5 Conclusion

As a result, automation allows you to get an analysis of the employee’s condition and identify a tendency to certain violations of labor discipline on an arbitrary scale. The Manager receives a list of recommendations for each type of violation. The ability of the manager to get more complete information about the employees of his or her division contributes to the improvement of the management system and the development of a safety culture in JSCo «RZD» .

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Informatization Impact on Social and Economic Development of the Region

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Abstract. The article analyzes the effects of digital technologies on the socio-economic development of Russian society. As a part of the study, we analyzed the degree of development of information infrastructure in the Russian Federation regions, as well as general economic indicators of regional development. The influence of educational development indicators on socio-economic development is studied. As indicators of the development of regional higher education, the following indicators were analyzed: the number of universities, the number of teachers and the number of students per 10,000 people of the population. The obtained results of the regression model indicate the need to invest in higher education and attract highly qualified personnel to higher education institutions, since these indicators have an impact on the accumulation of intellectual capital in the region and, as a result, on the potential of its future development.

Keywords: Digitalization · Differentiation · Intellectual capital · Regional development

1 Introduction

Informatization is the initial stage on the way to digitalization and its structural components. Digitalization involves systemic changes. Digitalization is a dual process that has both a positive and negative impact on the intangible capital and the social institutions involved in its formation [1, 8]. The relevance of the problem is caused by the fact that digitalization conflicts with established management systems.

The main hypothesis of the study is that digitalization has a positive impact on regional economic development [3]. The research hypothesis is tested by evaluating panel models with fixed and random effects on data for 2010–2018. The models include variables that characterize the level of digitalization of households and businesses, economic development, and education. The analysis showed that digitalization indicators influence regional development. The influence of specific indicators of digital transformation on regional socio-economic development is still not fully

studied. The differentiation of regions in terms of digitalization indicators, which affects the potential for regional development, requires additional analysis.

2 Methodology

The purpose of this study is to assess the impact of digitalization of Russian society on the social and economic development of Russian regions. The work is based on state statistics data for 2014–2018. To study the relationships, we used the following indicators, shown in Table 1.

Table 1. List of indicators for research on the relationship between digitalization and social and economic regions development

stud	Students who are studying under the bachelor’s, specialist’s, and master’s programs for 10,000 people
uni	Number of universities
vrpd	Gross regional product per capita
prep	Number of faculty members in higher education institutions
srdoh	The average per capita income
eldok	Percentage of electronic document management use in organizations (from the total number of organizations)
intnasd	Percentage of Internet usage by the population
sot	Number of mobile radiotelephone (cellular) subscriber devices in the subjects of the Russian Federation per 1000 population
wagePrep	Salary of higher education teachers
niokr	Internal research and development (R&D) expenditures

Source: authors.

The main evaluation method is to build panel models with fixed effects using bootstrap technology.

$$\text{Invrpd} = \beta_1 \text{IT} + \beta_2 \text{Control} + \beta_0, \text{ where}$$

IT are variables responsible for digitalization;
Control - control variables.

In the results of the estimated model, we will be interested in regression coefficients. If a positive coefficient is obtained, we can say that an increase in digitalization variables or control variables has a positive impact on the economic development of the region. The model will be built for the general selection.

3 Results

We believe that digitalization has a direct impact on regional development. As part of the study, we analyzed the degree of development of information infrastructure in the regions of the Russian Federation. In terms of the number of cell phones per 1000 people, Moscow and the Moscow region are the leaders with 2890.9 people in the

period from 2014 to 2018. The lowest rate in the North Caucasus Federal district is 1331.3 people. High rates of mobile coverage in Saint Petersburg and the Leningrad region, Krasnodar territory, Nizhny Novgorod and Tyumen regions. The second analyzed indicator was the percentage of the population using the Internet every day. The highest rate of daily Internet use by the population is observed in the Ural Federal district and is 73%. At the same time, among the regions, the coverage of Internet use by the population is higher in the Chechen Republic (84.8%), the Chukotka Autonomous district (84.7%), the Republic of North Ossetia - Alania (84.3%) and the Tyumen region (82%) [2].

The use of electronic document management in organizations is also an important indicator of the digitalization development. The development of electronic document management systems in the Russian Federation exceeded 60% of the total number of organizations in 2015, and reaches 68.6% in 2018. It is the leader on this indicator in 2018. The Republic of Ingushetia is 97%, the Republic of Tatarstan is 76.9%, the Smolensk region is 76.7%, the Novgorod region is 76.1 [2].

In addition to indicators that reflect the process of digitalization and informatization, we analyzed the impact of general economic indicators. We also study the impact of educational indicators on socio-economic development. As indicators of the development of higher education in the regions, the following indicators were studied: the number of students, the number of universities, the number of teachers. The results of the built model are shown in Table 2.

Table 2. Dynamic model of factors' influence on intangible capital

Observed Bootstrap				
InGRP	Coef.	Coef. Std. Err.	[95% Conf. Interval]	
eldok	0.005***	(0.002)	0.002	0.009
intnaskd	0.005**	(0.002)	0.0001	0.001
Sot	0.001***	(0.000)	0.0001	0.001
niokr	0,063***	(0.012)	0.005	0.014
wagePrep	0,405***	(0.024)	0.111	0.540
srdoh	0.00001**	(0.001)	0.000	0.000
stud	-0.003***	(0.002)	-0.010	-0.002
Uni	-0.001**	(0.007)	-0.017	0.003
Prep	0.0003*	(0.000)	-0.000	0.000
R ²	0.71			
N	385			
Rep	1000			

0,01 - ***; 0.05 - **, 0.1 - *

Source: authors.

The model showed a strong impact of research expenditures and higher education teachers' salaries on GRP per capita in the region, with the level of wages having a greater impact. Research expenditures indicate the development of intellectual capital

in the region, which allows it to achieve competitive advantages in the conditions of the fourth industrial revolution. The wage index indicates the quality and specificity of human capital. Teachers form students' knowledge, which allows them to institutionalize higher education and spread it in the region. The quality of a teacher's intellectual capital directly affects the formation of intellectual capital in the region. The number of students has the opposite effect on GRP, which is explained by low incomes during the study period.

All the digitalization indicators included in the model have a significant positive impact on regional development. The coverage of electronic document management systems has a positive impact on the regional GRP, which in our opinion is due to time savings and reduced transaction costs, for example, for filing a patent application. The use of the Internet and cellular communication by the population is also positively significant.

4 Discussion

According to the World Digital Competitiveness Ranking, the Russian Federation ranks 38th in terms of digital competitiveness out of 63 (Fig. 1) [4].

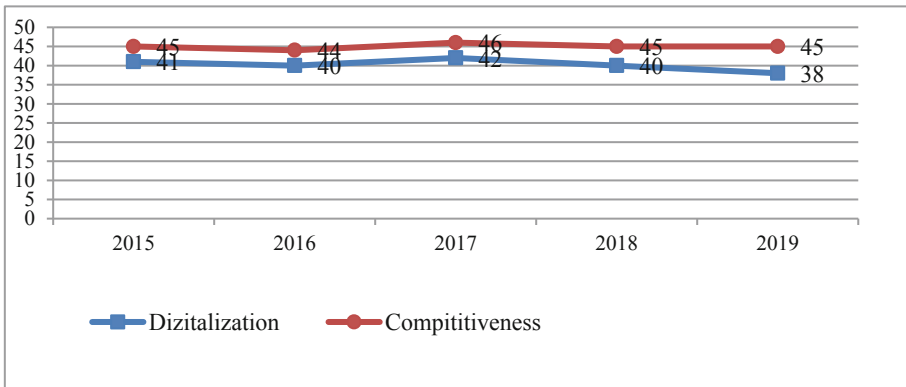


Fig. 1. Place of the Russian Federation in the World Digital Competitiveness Ranking (Source: authors based on [4]).

The development of digital technologies leads to systemic shifts in all spheres of life, and has a significant impact on the mechanisms of translation, assimilation and transmission of information. However, according to consulting companies, the process of digitalization of the economy in the Russian Federation has an impact on GDP and produces from 4.1 to 8.9 trillion rubles, i.e. about 19–34% of the total GDP growth by 2025 [9].

In the current conditions, an empirical analysis of the risks and challenges of the digitalization process in the Russian Federation is necessary by building new models for assessing this impact on the development of regional socio-economic systems. The

objective of this work is to assess the impact of regional informatization on the socio-economic development of regions of the Russian Federation.

Regions of the Russian Federation are included in digitalization heterogeneously, so according to 2019 data, digitalization programs exist or are being developed in 34 regions, 45 of them either do not exist or are included in informatization projects [6]. Digitalization projects are being implemented in the Samara, Chelyabinsk and Kirov regions, the Republics of Tatarstan and Bashkortostan.

According to Skolkovo, Moscow, the Republic of Tatarstan and Bashkortostan, Saint Petersburg, Khanty-Mansiysk Autonomous Okrug - Yugra, YANAO, Tyumen, Moscow, Leningrad and Chelyabinsk regions are among the top ten (Table 3) [5, 7].

Table 3. Indicators of the “Digital Russia” index

Place in the 2018 ranking	Region	Score in 2018	Score in 2017	Change
1	Moscow	77.03	70.01	10,02%
2	Republic of Tatarstan	76.48	67.95	12,56%
3	Saint-Petersburg	76.44	67.54	13,18%
4	Moscow region	76.25	65.61	16,22%
5	Tyumen region	76.19	65.44	16,43%
6	KMAO-Yugra	75.81	67.88	11,69%
7	YaNAO	74.48	66.03	12,79%
8	Republic of Bashkortostan	74.43	65.08	14,36%
9	Leningrad region	73.15	62.45	17,13%
10	Novosibirsk region	73.10	52.48	39,29%

Source: authors based on [7].

In addition, the rating of regions digitalization was also developed by the Ministry of communications. In any case, the methodology for constructing these indices uses expert assessment and a system of points, in addition, this assessment dates back to 2017, which does not currently allow us to establish the presence of time dependencies. The process of digitalization is based on informatization and develops it, but it is a larger process. Nevertheless, Informatization and digitalization are related and mutually dependent processes, so in the study we assume that the depth of the processes of digitalization and informatization in the regions of the Russian Federation is proportional.

5 Conclusion

Thus, the obtained results of the regression model indicate the need to invest in research and developments and attract highly qualified personnel to higher education institutions, since these indicators have an impact on the socio-economic development of the region. Indicators of digitalization and informatization have an impact on the development of the region. In further research on a given topic, it is advisable to

investigate the purpose of using information resources (Internet, computer, cell phones, etc.). The determining factor in this case is the change in free time that can be potentially spent on research, which is indirectly evidenced by the results on the workload of teachers in the educational process, i.e. the load with students. The comparative assessment of the digitalization development in regions and Federal districts of the Russian Federation allowed us to determine the impact of informatization on the development of regional socio-economic systems, which can be taken into account when building strategies for socio-economic development of regions.

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Potential of the Small Enterprise Value Assessment Using the Discounted FCF Method

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Abstract. The issue of enterprise value assessment ranks among fairly new economic disciplines. The aim of the article is to evaluate the potential for a small enterprise value assessment using the method of discounted FCF on the basis of a case study. In the theoretical part, the paper is concerned with the justification and description of the process continuity of the chosen calculation procedures and, moreover, it specifies the way of identifying the quantities primarily influencing the discount rate. The practical application of the research method is demonstrated on a case study concentrating on a particular but randomly chosen enterprise. In order to maintain a complete objectivity, the financial data was gained exclusively from sources open the general public, or alternatively from audited sources. The potential of the method for the value assessment of a small enterprise was eventually proven and the aim of the paper was therefore fulfilled. On top of that, the study managed to thoroughly map and characterize the impact of factors influencing the accuracy of the method worthy of taking into account by the assessor in pursuance of the decision-making process.

Keywords: Cash flow · EBIT · Enterprise value · Future revenues · Yield method

1 Introduction

To begin with, one should focus their attention to a few questions determining the whole issue. What in particular is hiding under the term enterprise value? To what extent can it really be assessed? Is there a market environment specific to such an extent that it reflects the corresponding demand and offer?

The expression of value in a quantitative form, generally known under the term price, suggests itself as a simplifying solution. Market value then presents and characterizes an enterprise in the form of a tradeable or an exchangeable commodity [18].

Practically all owners aim for permanent growth of their company's so-called market value. In the ideal case a growing market value mirroring itself into concrete financial indicators suggests a success rate or financial health of a particular company [9]. From a different, broader perspective, the enterprise value reflects its future potential to generate desired revenues. Such potential is undoubtedly of great importance not only for the

owner. It also contributes to a deliberate behaviour of current creditors and draws attention of new potential investors or purchasers [14].

That is the crucial factor for the core of the issue. The introductory, primarily most essential, starting point is to determine a material reason and purpose for an enterprise value assessment [17]. A similar degree of importance must be assigned to the choice and the subsequent application of a suitable method as well. It is therefore necessary to include many aspects to the decision-making process. The assessor should be endowed not only with the knowledge of finance mathematics, but also with the awareness of both the local and the global market, frequently linked with the art of predication of the micro and macroeconomic development [16]. Prognostication gains significant importance mainly in the current, economically connected world. The ideal principle of a general, objectively correct and universal procedure is practically non-existent [13]. The paradox in the form of mutual dependence of the desired objectivity of the result and the subjective attitude of the assessor pervade the whole issue. The paper's aim is to evaluate the potential of a small enterprise value assessment using the method of discounted FCF based on a case study.

2 Literature Review

Certain doubt expressed by Ballwieser and Löffler about the objective effectuality and unambiguity of the current rules proceeding from International Valuation Standards (IVS) is interesting not only from the viewpoint related to this paper [3]. The existing methods and rules of enterprise valuation using market multipliers are relatively complex. However, they provide the possibility to obtain only a more or less qualified price estimate. The issue is intensified by different and not always transparent conditions in various countries in the world. The author addresses a question whether it is even possible to find and apply a simple and universal solution.

Behera characterizes two basic branches of the most currently applied methods of valuation [5]. According to him, the crucial historical contribution consisting mainly in connection with the share price lies in the method based on the economic value added (EVA). Nevertheless, Behera admits the impossibility of the future constant revenue supposition that forms the fundament of the method. Therefore, in the current globally interconnected market environment under a constant mutual influence, the methods based on discounted cash flow (DCF) gain their importance [4].

The high rate of a practical application of methods and models taking free or discounted cash flow into account all over the world is also confirmed [2]. He documents their objective popularity by means of a descriptive and comparative analysis of investment analytics' opinions endowed with appropriate expert qualification.

Cash flow can come either from operation, investment or financial activities [1]. Nevertheless, according to Huang, Chiang & Liao, each of the factors is differently involved in the potential enterprise value strengthening [10]. With the use of data files, he demonstrates the positive effect of the financial means gained from financial activities, or alternatively put into investments. On the other hand, financial means gained from operation activities do not explicitly raise an enterprise value, mainly if the decrease in profit margin occurred at the same time [7].

Significant involvement in the relative inaccuracy of the current methods can be attributed to goodwill. Paradoxically, it is exactly this hardly quantifiable factor that can have a substantial influence on assessing the overall enterprise value and play an important role in decisions of purchasers or strategic investors. Goodwill, integrating the values of many abstract units such as brand, reputation, image etc., stands out of a plain list of accounting terminology. Podhorska et al. interprets the meaning and the way of evaluating the goodwill based on examples of companies in the Czech Republic and Slovakia [15]. Moreover, by means of applying various models of using financial data, she proves the variability of the result.

The technological difficulty of a sector is another aspect influencing the enterprise value. Borah introduces an interesting paradox [6]. An industrially developed sector demanding in terms of technologies and the need of capital for research and development, has a negative influence on the enterprise value. On the other hand, a positive value effect is created in sectors with a lower need for implementing modern technologies and a higher proportion of fixed assets.

An unconventional insight into factors that are hard to quantify yet influence the matter of assessing the market value of an enterprise is provided [19]. The macroeconomic conditions impacting the enterprise are often not taken into consideration, although they can even have a determining function mainly the future of the enterprise. An analysis of macroeconomic factors should therefore be a specifying component of the enterprise value calculation methods. Furthermore, their incorporation into analyses and predications of long-term development, or alternatively into comparative methods, should be desirable as well.

Although there are internationally acknowledged standards for valuation, they are, according to the vast majority of experts, only of an indicative character. This is caused by the amount of relatively difficultly quantifiable factors that can have either a significantly positive or negative impact on the value. Even though the methods using discounted cash flow are often described as more accurate, without a broader knowledge of the micro and macroeconomic environment of the business, their application does not guarantee an objective correctness of the result [12].

3 Methodology

In order to apply the valuation method based on the discounted FCFF, a company from the category of SMEs was selected where a sufficient amount of financial data could be collected. The objective criterion of the selection is the publication of accounting statements in the publicly accessible information system of the Business Register for at least three accounting periods in sequence, namely for the years 2016, 2017 and 2018.

The FCFF method is designed for assessing the enterprise value as a whole; it takes into consideration the free cash flows intended for both owners and creditors. Regarding all possible options, the calculation process based on a two-phase model will be applied [8].

The first phase will serve for determining the current enterprise value based on the estimated free cash flow (CF) for the observed accounting periods and their discounting interest rate corresponding with the weighted average cost of capital (WACC) [11]. The

second phase will be used for ascertaining the continuing enterprise value based on a prediction of constant cash flow from the year following the first phase and its analogous discounting. The resulting value will be assessed by the means of summarizing the result from both calculating phases.

First Phase

The basis for the following calculations is created by the determination of earnings before interests and tax payment:

$$EBIT = EBT + I$$

where *EBIT* are earnings before interest and taxes, *EBT* – earnings before taxes and *I* are interests.

In order to determine the amount of FCFF, it is necessary to make some numeric changes to the EBIT figures.

The first step is their decrease according to the tax rate valid in the observed periods. The subsequent correction consists in including two different books or financial entries. In pursuance of acquiring fixed assets, the summary expense was already entered into the accounts at once. For the elimination of repeated entering of a practically identical entry, EBIT will be increased by the amount of amortization.

On the other hand, the amount of cash flow directed away from owners or creditors will be deducted. This concerns the investments (capital expenditures) and the change of the working capital necessary for operating.

The amount of investments is expressed by the difference between the amount of working capital in the current and the last year. The amount of working capital is determined by the sum of current assets necessary for operating and the active accrual and by the subtraction of the values of non-interest-bearing short-term liabilities including the passive accrual.

Based on the operations, the final value of FCFF will be gained according to this formula:

$$FCFF = EBIT * (1 - t) + A - INV$$

where *t* is tax rate, *A* is amortization and *INV* – investments + working capital.

The weighted average cost of capital (WACC) reflects the price for which the enterprise uses both its own and foreign capital. Objectively, exclusively from publicly available sources, their individual amount cannot be ascertained, particularly as far as the foreign capital is concerned. WACC will therefore be established with the use of a build-up or rating model. It is based on the sum of surcharges for risks burdening the company's capital in individual fields. It uses statistical data published in financial analyses of the company sphere prepared by the Ministry of Industry and Trade of the Czech Republic (2017, 2018).

$$WACC = r_f + r_{LA} + r_{POD} + r_{FS}$$

where *r_f* is risk free rate of return, interest rate of the state bonds of the Czech Republic, *r_{LA}* is surcharge for the size of the company derived from the amount of

chargeable capital (*C*) provided that: $rLA = 0\%$, if $C > 3 \text{ B CZK}$; $rLA = 5\%$ if $C < 100 \text{ M CZK}$, $rPOD$ is surcharge for business risk, or lower business stability, dependent on the amount of return on assets (ROA); $ROA = EBIT/assets$; $rPOD = 10\%$ if $ROA < 0$; $rPOD =$ the minimal value of $rPOD$ in the sector if $ROA < rd * C/A$ ($rd =$ interest rate of charged foreign capital), rFS is surcharge for financial stability based on the current ratio, or current liquidity ($L3$) (current assets/short-term liabilities) provided that: $RFS = 0\%$ if $L3 \geq XL2$ ($XL2 = 2,5$); $RFS = 10\%$ if $L3 < XL1$ ($XL1 = 1,0$); $RFS = 0,1 * [(XL2-L3)^2 / (XL2-XL1)]$ if $XL1 < L3 < XL2$.

In the first phase, the enterprise value will be determined by discounting of cash flow according to the following formula:

$$EV1 = \sum_{t=1}^{t=n} \frac{FCFF_t}{(1 + WACC)^t}$$

where *EV1* is enterprise value in the first phase, *t* is observed time period and *n* is number of time periods.

Second Phase

In the second phase, the continuing enterprise value will be established. First, the amount of *FCFF* will be predicted and then discounted to the current value in the first year of the second phase. Provided that the observed enterprise keeps constant and sustainable development, the expected rate of growth will be estimated based on the Gordon Growth Model using the estimated growth of GDP and inflation.

$$FCFF_{n+1} = FCFF_t * (1 + g)$$

where *g* is estimated rate of constant growth based on GDP and inflation.

The amount of discounting rate derived from the future costs of the *WACC* capital will correspond with their value in the preceding time period provided that a constant behaviour is kept.

The going enterprise value will be calculated by applying the following formula:

$$GV = \frac{FCFF_{n+1}}{WACC - g} * (1 + WACC)^{-n}$$

where *GV* is going value.

Overall Enterprise Value

The overall enterprise value will be established on the basis of a summarization of partial calculations in both phases:

$$EV = \sum_{t=1}^{t=n} \frac{FCFF_t}{(1 + WACC)^t} + \frac{FCFF_{n+1}}{WACC - g} * (1 + WACC)^{-n}$$

Where *EV* is overall enterprise value, *t* is observed time period; the last year of the first phase, *n* is number of time periods in the first phase and *g* is growth rate.

4 Results

In order to apply the enterprise valuation method based on the approach of the FCFF discounting a company named Cleaning machines Ltd. with the registration number 04741668 and its main office in Zliv 28, 507 23 Liban was selected. The core business involves regular maintenance, repair and sale of floor cleaning machines intended for sitting and walking operators. The company has one employee.

Assessment of Values based on the First Phase of the Method

Based on the data from publicly accessible accounting statements, the amount of earnings before interests and taxes (EBIT) was determined.

Table 1 shows the inconstant development of the company's earnings before taxes (EBT) as well as before interests and taxes (EBIT). The fluctuation, or more precisely, decrease of the net operating income in 2017 is given by the combination of the simultaneous increase in expenses and decrease in sales. Such trend manifests itself in the consequent determination of the amount of free cash flow in Table 2 as well. The tax rate in the amount of 19% is identical in all observed time periods. Nevertheless, an abrupt increase of short-term liabilities can be observed in 2017, subsequently influencing the amount of the working capital.

Table 1. Quantification of earnings before interests and taxes (EBIT) for the period 2016–2018 (in thousands of CZK)

Item	2016	2017	2018
Net operating income (+)	662	528	1 070
Financial result (+)	-38	-105	-148
Extraordinary profit/loss (-)	0	0	0
EBT	624	453	922
Cost interest (+)	27	36	60
EBIT	651	459	982

Source: authors.

Table 2. Quantification of free cash flow (FCFF) for the period 2016–2018 (in thousands of CZK)

Item	2016	2017	2018
EBIT	651	459	982
Taxes (-)	124	87	187
Amortization (+)	74	250	369
Change of working capital (-)	n/a	468	230
Change of investments into fixed assets (-)	n/a	535	583
FCFF	n/a	-381	351

Source: authors.

Table 3 reflects the statistical, or alternatively, by the Ministry of Industry and Trade of the Czech Republic in their annual analyses recommended, financial indicators. By their gradual addition, the amount of weighted average costs of capital (WACC) used by the company for its activity was determined.

Table 3. Quantification of weighted average costs of capital (WACC) for the period 2016–2018

Item	2016	2017	2018
Risk free rate of return (r_f)	0.46%	2.77%	2.74%
Surcharge for the size of the company (r_{LA})	5.00%	5.00%	5.00%
Surcharge for business risk (r_{POD})	1.77%	1.71%	1.66%
Surcharge for financial stability (r_{FS})	8.08%	9.07%	2.89%
WACC	15.31%	18.55%	12.29%

Source: authors.

The enterprise value in the first phase is demonstrated in Table 4. With the use of a discounting rate, free cash flows (FCFF) are discounted to their current amount and subsequently summarized.

Table 4. Quantification of the enterprise value (EV) in the first phase (in thousands of CZK)

Item	2016	2017	2018
FCFF	n/a	-381	351
WACC	15.31%	18.55%	12.29%
EV 1. first phase	n/a	-322	279
EV 1. phase in total	-43		

Source: authors.

Assessment of the value based on the second phase of the method

The rate of growth and the resulting value of free cash flow for the following time period ($FCFF_{n+1}$) are derived from the estimated interannual growth of the GDP and the inflation. With the use of statistical data, their amount is predicted to be 2.4% and 2.6%, and 5.2% in total.

$$FCFF_{2019} = 351 * (1 + 0.052) = 370 \text{ thousand CZK}$$

The assessment of cash flow for the following year enables the calculation of the continuing enterprise value according to the relation described in the methodology section.

$$GV = 4,710 \text{ thousand CZK}$$

Overall enterprise value

The overall enterprise value is established by the process of summarization of partial results from both calculation phases:

$$EV = -43 + 4,710 = 4,027 \text{ thousand CZK}$$

5 Discussion

The methods of discounting free cash flow were applied to valuating a randomly chosen small enterprise. During the process of calculation, however, some aspects with a conditioning effect on the process and, most importantly, the accuracy of calculation were identified. A non-negligible degree of variability influencing the process of calculation and, consequently, the final result are reflected primarily in the need of quantifying the changeable quantities influencing the determination of discounting rate which is crucial to the whole calculation. The degree of knowledge of the micro and macroeconomic environment of the company or its absence undoubtedly condition the accuracy of their establishment and subsequently the final current enterprise value. Such finding corresponds with the opinion [19]. Explicitly, it showed in the case study of valuating a completely anonymous company without the possibility of obtaining information about the amount of costs connected with the use of foreign capital. An analogous potential inaccuracy can be expected in the case of estimating the value of a company active in an unknown or economically turbulent market environment.

Another factor that presented its significant influence during the application of the method is the number of time periods included in the first phase of calculation. Their lower amount, reflecting the non-continuous development of the company, has an evident negative effect influencing the final enterprise value. It is obvious that an opposite, positive effect could be observable in case of the possibility to include more observed time periods characteristic of their stable growth of the enterprise.

The randomly chosen company, whose accounting data provided a starting platform for the subsequent calculations, objectively fulfils most parameters conditioning the degree of accuracy or inaccuracy of the method. It is evident that the application of the method in this case attacks its limits to a certain extent and balances on the borderline of its applicability. Nevertheless, it is not an automatic argument for a possible strict rejection of its usage in similar cases. The accuracy of the result, however, undoubtedly depends on the amount of information about a particular company that the assessor has at their disposal and on the possibility of predictable and stable development of market economics.

6 Conclusion

The aim of the paper was fulfilled. The method of determining the enterprise value by means of discounted free cash flow can be applied and in its general principle, it has potential for assessing value not only of large or medium-sized enterprises but also

small enterprises. That was demonstrated by a case study of assessing the value of a randomly chosen small enterprise. However, the previously announced indicative character of the valuating standards was confirmed, the established enterprise value corresponding with a qualified estimate. In the process of the method employment, the influence of several factors potentially impacting and distorting the accuracy of the calculation could be observed. It is therefore recommended that the factors should be taken into account by the assessors in practice, or alternatively already in the phase of selecting the right method. The objective correctness of the result depends on the amount of information available for the assessor concerning a particular enterprise and on the possibility of predictable and stable development of market economics. That is closely related to the subjective attitude and, most importantly, the expertise of the assessor.

The randomly chosen company, whose accounting data provided a starting platform for the subsequent calculations, objectively fulfils most parameters conditioning the degree of accuracy or inaccuracy of the method. It is evident that the application of the method in this case attacks its limits to a certain extent and balances on the borderline of its applicability. Nevertheless, it is not an automatic argument for a possible strict rejection of its usage in similar cases.

The findings concerning the applicability of the method for establishing the value of small enterprises could play a role of a supplementary criterion in terms of the assessors' decisions, or alternatively of a guideline for collecting data and information for the evaluated enterprise. Furthermore, the method can have greater potential for owners who want to be familiar with the current value of their company and have actual and exact information and data at their disposal.

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Enterprise Value Assessment as an Evaluation Criterion of a Merger

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Abstract. The aim of this paper is to express the enterprise value for the purpose of a future comparison of the investment revenue in form of a business merger. To fulfil this aim, the model of discounted cash flow (DCF) is employed that is, according to reference literature, considered to be the key method of enterprise valuation, namely in the form of free cash flow to firm (FCFF). The predicted values of free cash flow to creditors and shareholders are discounted using the weighted average cost of capital to their current value for the respective years in the time period from 2018 to 2032 and for the period of perpetuity. Apart from the final enterprise value, it was pointed to not only the limits of the future cash flow prediction but also to vast opportunities for using the predicted values for financial planning of the company in the future.

Keywords: Discounted cash flow · Enterprise value · Financial plan · Prediction · Valuation

1 Introduction

Valuation is an art susceptible to some degree of uncertainty, not a science [5]. As true as this observation might be, a concrete situation in which it is necessary to establish an enterprise value and to choose a particular valuation method that is the most suitable for the requirements of both the owners and the creditors cannot be disregarded [19]. The need of knowing the enterprise value comes hand in hand with the development of the global market and the necessity to react better and faster to its changes. Mainly the European legislative changes and the connected necessary investments into old production machinery force the owners and the creditors to contemplate the further development of their enterprises [17]. In this moment, the need to assess the value of the enterprise as such is of relevance and, consequently, the right direction for the company's future development has to be chosen. This can result in sale, liquidation, merger or loan application. In case of an enterprise that does not face existential problems, the results of the value assessment can be used as a tool for evaluating the performance of management or as an indicator of market value increase for its owners [14].

In case of a merger of two companies, the familiarity with the enterprise value is essential not only for the final decision about the expediency of the merger but also as key information for the subsequent value comparison before and after the merger. The

merger of two companies should necessarily lead to one-off investment savings, an increase in production efficiency and an economical effect on material purchases and other activities. This results in an increase of the enterprise value as such.

The aim of the enterprise value assessment is to determine the enterprise value before the merger as the reference value for subsequent comparisons after the merger using the model of discounted cash flow (DCF) in the FCFF option, i.e. free cash flow to firm both for the owners and the creditors.

2 Literary Research

The aim of every investment is to reach satisfactory profit. However, the decision is always burdened by a significant degree of uncertainty [8]. In order for the risk to be as low as possible, it is necessary to assess all information available with regard to the both internal and external conditions of the company and mainly to quantify the basic criterion in form of the enterprise value [18]. Based on this key value, a strategy can be adopted that leads to maximizing the enterprise value [7]. To assess the enterprise value, it is convenient to use a formula to calculate the current enterprise value using the discounted cash flow [4], which is a method that derives the current value of cash flow possibly generated by an asset in the future on the basis of a proportionate discount rate [12]. This approach can be justified by the fact that investors striving to acquire the company need to be familiarized by the amount of profit that can be expected in the future [6]. The results of studies focusing on comparisons of the DCF method with other models in practice show the rigidity of the DCF model in connection with the expansion or termination of a project [2] or with a very dynamic environment [9] and point out the fact that this method considers risk to be a useless aspect that should be eliminated or at least mitigated in the initial phases of a project. [1] Other analyses, on the other hand, consider the DCF method to be suitable primarily for business environment of a dynamic nature. However, they warn about the difficulty of predicting the future cash flow and the determination of the appropriate discount rate [5]. Despite the numerous discrepancies and uncertainties, the DCF became a very popular method of enterprise valuation in the last years [16] mainly as far as long-term investments are concerned [3]. Unlike other approaches based on historical data about the market, the DCF method tries to predict the future cash flow and its timing as realistically as possible [13]. The proof of its popularity is its explicit favouring on international markets [15]. It is considered to be the key model for enterprises in the Czech Republic [7] and it is popular among experts and academics as well as it relies on the cash flow in and out of the company rather than on the accounting profit [10]. In the business practice, the technique free cash flow to firm (FCFF) is the most used, enabling to conduct an analysis from the point of view of all parties financing the project. Furthermore, it represents a lower risk of threatening the owner's interests compared to the calculation based on the free cash flow to equity principle (FCFE) reflecting the return rate only for the owners [11].

The valuation method based on DCF is not the only yield method used for valuation but it seems to be the most suitable one in sense of its use to determining the market value of the business as a whole. Using the discounted FCFF, the final value of

predicted future cash flow calculated to the current value represents the quantification of the property and liabilities of an enterprise and, therefore, the best characterizes the enterprise value.

3 Methodology

The data used to calculate the enterprise value are collected from annual reports on the website Justice.cz and the official website of the company Plzeňská teplárenská, a.s. in the time period 2012–2017 and from the plan of economic parameters of the company in 2018–2032 in accordance with the outlook of the economic sector indicators and the expected development on the particular market obtained from the financial database AMADEUS.

Table 1 shows the key items of the company's economic activities in 2012–2017. Table 2 provides an overview of the indicators of rentability, debt, liquidity and activity in the same time period.

Table 1. Key items of the company's economic activities

Time period	2012	2013	2014	2015	2016	2017
Sales (in thousand CZK)	2,671,393	2,730,41	2,339,223	2,437,714	2,178,384	2,366,296
Rate of growth (in %)	-5	2	-14	4	-11	9
EBITDA (in thousand CZK)	878,483	953,593	657,477	710,796	593,869	817,378
EBITDA margin (in %)	33	35	28	29	27	35

Source: authors.

Where EBITDA equals the net income + amortization and sales = turnover from goods sales + turnover from own products and services + turnover from property and material sales + other operational turnover.

Table 2. Indicators of rentability, debt, liquidity and activity

Time period	2012	2013	2014	2015	2016	2017
Own capital rentability	8.9%	9.9%	5.1%	4.2%	2.9%	4.5%
Overall capital rentability	7.2%	8.0%	3.7%	3.2%	2.5%	3.8%
Assets rentability	6.9%	7.9%	3.6%	2.8%	1.9%	3.3%
Sales rentability	19.2%	21.7%	14.3%	12.7%	10.2%	13.6%
Rate of foreign capital	46.7%	43.0%	68.2%	69.9%	68.1%	58.2%
Financial liquidity	1.6	1.7	0.6	0.8	0.7	1.0
Quick ratio	2.0	2.3	1.3	1.3	1.4	1.8
Current ratio	2.2	2.5	1.4	1.5	1.5	1.9
Assets turnover time (in days)	789.1	766.0	1,035.3	1,031.9	1,144.5	1,000.7
Financial claims turnover time (in days)	22.1	31.6	31.7	26.1	50.0	46.8
Supplies turnover time (in days)	11.6	7.1	8.2	8.2	10.7	8.2
Liability turnover time (in days)	35.6	50.6	42.1	35.2	59.8	49.7

Source: authors.

The process of determining the free cash flow based on free cash created by operational and investment activities reduced by the taxation is illustrated in Table 3.

Table 3. Determining the free cash flow

Earnings before interest and tax
– Earnings taxation
+ Change in deferred tax
= Net profit
+ Amortization
+ Other cashless items included in earnings before interest and tax
= Gross income
– Fixed assets investments
± Change of working capital
– Other net assets investments
= Free cash flow to firm

Source: authors.

The calculation of the enterprise value using the DCF method has two phases. Phase 1 includes the time period 2018–2032 when it is possible to elaborate a prognosis of the free cash flow for the individual years from the financial plan. Phase 2 concentrates on the subsequent values, i.e. after 2032. The enterprise value is represented by the sum of both partial results.

Phase 1:

$$HP_1 = \sum_{i=1}^n \frac{FCFF_i}{(1 + WACC)^i}$$

Phase 2:

$$HP_2 = \frac{FCFF_{n+1}}{WACC - g}$$

where HP represents the enterprise value; $FCFF_i$ is the expected value of the future free cash flow in the time period i ; $WACC$ is weighted average cost of capital; i is the time period index and g is the growth tempo.

In order to set the current value of the future free cash flow, it is necessary to establish the discounting factor using the weighted average cost of capital (WACC):

$$WACC = r_d * (1 - t) * \frac{D}{C} + r_e * \frac{E}{C}$$

where r_d are costs of foreign capital; t is the income tax rate; D are interest-bearing foreign resources; r_e is the required percentual rate of return of own capital; E is own capital and C is the overall capital.

The costs of foreign capital are determined on the basis of information about the values of arranged interest rates for the time period 2018–2027, for the following period then, subsequently, according to the financial plan. Then, the costs of own capital are applied in the following formula:

$$CAPM = R_f + Beta * (R_m - R_f)$$

where *CAPM* is the lowest required rate of return; *R_f* is risk-free rate and *Beta* * (*R_m* - *R_f*) is the risk bonus including the surcharge for the respective country’s risk.

Furthermore, the surcharge for the size and market capitalization of the company and also a surcharge for specific risks if this type of data is available.

The risk-free rate is determined based on the rate of return of long-term bonds in the Czech Republic with a ten-year maturity. The Beta coefficient is then set using the anthology method according to relevant companies active in the same field in the respective European region. Eventually, it is adjusted according to the debt rate.

$$Beta = non - indebted Beta * \left(1 + (1 - d) * \frac{D}{E} \right)$$

where *d* is tax rate; *D/E* is the ratio of own and foreign capital.

The risk bonus is calculated using the middle value between the arithmetic and geometric average for the time period 1928–2017. The risk surcharge proceeds from the rating of the respective country and the volatility of the stock and bond market profitability. The surcharge for specific risks resulting from possible future threats is very hard to quantify and is, therefore, not reflected in the valuation process.

4 Results

Table 4 presents the free cash flow based on the free cash created by operational and investment activities reduced by the company’s taxation.

Table 4. The process of determining the free cash flow (in thousand CZK)

Time period	2018	2019	2020	2021	2022	2023
= Free cash flow to firm (FCFF)	576837	423671	351898	378598	20607	-68584
Time period	2024	2025	2026	2027	2028	2029
= Free cash flow to firm (FCFF)	359038	393771	402752	355340	299102	236487
Time period	2030	2031	2032	Perpetuity		
= Free cash flow to firm (FCFF)	203286	206661	273331	230166		

Source: authors.

Table 5 provides an overview of the discounting factor using the weighted capital costs. The coefficient Non-Indebted Beta has the value 0.65 in all time periods, the coefficient Beta then 1.12.

Table 5. Discounting factor of the time period of the plan and perpetuity

Time period	2018	2019	2020	2021	2022	2023	2024	2025
WACC	7.68%	7.71%	7.74%	7.75%	7.76%	7.76%	7.76%	7.76%
Time period	2026	2027	2028	2029	2030	2031	2032	Perpetuity
WACC	7.76%	7.76%	9.47%	9.47%	9.47%	9.47%	9.47%	9.47%

Source: authors.

Table 6 shows the final calculation of the enterprise value based on yield valuation of the DCF.

Table 6. Calculation of the enterprise value (in thousand CZK)

Time period	2018	2019	2020	2021	2022	2023	2024	2025
Enterprise value	535695	365188	281375	280872	14181	-43800	212783	216562
Time period	2026	2027	2028	2029	2030	2031	2032	Perp.
Enterprise value	205550	168293	110553	79848	62700	58227	70349	724433

Source: authors.

The enterprise value for the time period 2018–2032 sums up to 2,618,376 thousand CZK, for the perpetuity period then 724,433 thousand CZK. The overall value of deductible foreign resources is 1,053,025 thousand CZK. Assets of the company that are not reflected in the operational cash flow represent the amount of 525,377 thousand CZK. After the deduction of the debt value and adding the assets, the overall enterprise value is 2,815,161 thousand CZK.

5 Discussion

To assess the enterprise value using the yield method and discounted future free cash flow to firm, the economic state of the enterprise to 31st December 2017 was deciding. By quantifying the values having a direct connection with the operational cash flow of the company, the free cash flow to firm was determined. With regard to the expected growing difference of the future free cash flow from the planned ones, the time period was divided into two sections. For the first time period to the end of the year 2032, the predictions of economic results were gained based on the financial plan; for the following time period then based on simplified assumptions. In order to establish the current value of the future cash flow, the discounting rate WACC was calculated. Furthermore, the CAPM model was employed to determine the costs for own capital.

The costs for foreign resources were predicted in accordance with available data about the arranged interest rates. The final calculation of the overall value was deducted by the amount of debt and increased by property not included in the operational cash flow. The final value of the company Plzeňská teplárenská, a.s. determined by means of the yield method is 2,815,161 thousand CZK.

Eventually, it has to be remarked that valuation using the yield method is one of the most used method. Its result, however, depends strongly on the correct collection of the input data where it is necessary to predict the cash flow and the discounting factor for a long period of time. With a more extended time period, the expected deviation of the predicted values from the actual values grows. For this particular reason, it is highly important to devote enough effort to the financial plan taking into consideration also the values of key indicators of the respective sector and, last but not least, to reflect the current and expected development on the respective market.

6 Conclusion

The aim of this paper was to assess the value of the company Plzeňská plynárenská, a.s. using the DCF model in its FCFF subtype, and to acquire the data necessary for a value comparison before and after a merger. This goal was fulfilled. The future free cash flow to firm was predicted and subsequently, on the basis of discounting, converted to the current value. The prediction of the company's future development and economy is a very difficult task. Simultaneously with the extension of the observed time period, the deviation of the predicted values from the actual values increases. The DCF model is, therefore, limited by the risk of not reaching the predictions serving as a base for its application. In practice, it is suitable to compare the values determined by this yield method to the valuation results based on other methods as well.

In order for the research to be complete and the enterprise value to be appropriate for a comparison, it is necessary to value not only the successor company before the merger but also the second company before its decline. In future, it would be possible to not only observe the growth of the enterprise value as an effect of a merger but primarily, to provide a comparison of the financial plan quality with the actual state and, subsequently, to contrast the actual development in the respective sector and on the market with the development that was originally expected.

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Risk Premium and Comparison with Damodaran Methodology

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Abstract. This paper discusses the essential aspects of the methodology of creating a risk premium. It is expressed by the level of systematic risk in the economy and part of the expected return on investment. It only exists because it is impossible to estimate the future values of a selected investment and it expresses a certain degree of uncertainty. The aim of the paper is to compare the calculation methods used for the risk premium of the Czech Republic. The methodology provides an analysis of calculation methods, in particular the basic CAPM method and modified Tax-CAPM, or the relative standard deviation method, government bond default spreads and the risk-adjusted discount rates according to Damodaran. The modified concept of the CAPM model according to Damodaran seems to be most appropriate for the Czech Republic. The model includes a country risk premium. However, the size of a company must be taken into account and the recommended market volatility coefficient of 1.5 may have to be adjusted to a higher value. However, no exact rules of procedure are available to clearly determine which models would be most appropriate for use. These are only speculations and approximate estimates in the calculation.

Keywords: CAPM model · Financial management · Investment · Systematic risk

1 Introduction

The topic of the risk premium is the most important aspect in finances as it is the investors, managers and academics who are very interested in proper evaluation of this important measure to assess the success of their investment projects to obtain this long-term premium. It is expressed by the level of systematic risk in the economy [11]. Damodaran looks very closely at the topic and development of risk premium, mainly in the US stock market, in his research [4]. He modified the CAPM model and included a country's risk premium in the calculation. This model is considered to be the most accurate picture of reality. The Damodaran's approach is not appropriate for the Czech Republic as some calculations and indicators need to be adjusted and this model does not consider a company's risk profile in regard to its size. It is based on the difference in the government bond yields of the given country and countries with AAA rating. The US capital market data are primarily used to calculate the beta coefficient and the market risk premium. Each investment and the related capital cost reflect the

environment where they are located and this premium obtained in the best global markets must be adjusted for the given country [9].

The financial sector in the Czech Republic has more than doubled in the last decade [13]. The key for the evaluation of the risk premium is to properly evaluate historical results which allows to implement higher profits in the future. The monitoring of the risk premium provides an important input into the estimation of the magnitude of the capital cost. It is the essential return and risk component of any model [31]. The aim of the paper is to compare the calculation methods for the risk premium in the Czech Republic. Specifically, the basic CAPM method and its modification will be compared. Damodaran primarily applies the values of the Moody's rating company and the second largest S&P. In her book, Kislingerova refers to the value sizes of the risk premium for the Czech Republic [18]. The Moody's rating is 5.85% while the S&P rating value is 7.2%.

2 Literary Research

The country risk has become a sensitive issue for the financial markets, therefore being discussed by many authors. For example, Bouchet et al. not only examined the economic, political but also the financial risk of a country [3]. Howell developed a methodology together with the PRS group to measure a country risk based on the score obtained from the category of these three risks [14]. In contrast, Busse and Hefeker only focused on the issue of political risk, especially in developing countries [2]. Haugh et al. studied the development of government bonds with regard to the countries in the Euro zone during the financial crisis 2008–2009 [12]. The problem of high spreads was identified to have been caused by economic inefficiency and deficit of some countries. Similarly, higher risk aversion of investors during this crisis.

The monitoring of ratings is very important for potential investors to be able to make decision on the purchase or sale of securities [17]. This evaluation is provided by independent credit rating agencies. They determine the level of risk of non-compliance arising from the issue of bonds or other fixed-income investments. The country's risk premium increases as the country risk increases. These agencies help to improve the efficiency of financial markets because the information failure and costs are reduced. The creditworthiness and credit quality of the issuer are also assessed. Following the analyses, the entity will be assigned a rating from the specified rating scale. Nevertheless, this rating is only considered an independent risk assessment [27]. The bond quality classification is divided into two grades: investment grade (AAA-BBB ratings) and speculative grade (BB rating and beyond). Credit rating agencies do not have a lot of ability to predict developments. It was confirmed in the global crisis 2007 and it was obvious that credit rating agencies only responded to market developments [1]. Standard & Poor's, Moody's and Fitch are amongst the largest credit rating agencies on the market. The country rating helps to, for example, attract foreign investors or issue securities on foreign markets. It also allows better access of the country to the international capital market. The agencies can assess a country risk, for example, on request of a government, central bank or provide this service to their investors [7].

The discount rate consists of the risk premium and the risk-free rate. The risk-free rate is the theoretical rate of return of an investment with zero risk. Zero risk cannot be achieved for any asset, it can only be reduced as much as possible. Treasury bills are the least risky and most liquid investment [22]. The investment in government bonds issued for 10 or more years of repayment would be longer-term and more appropriate. The risk-free interest rate on return of these government bonds is even called for in practice. The risk premium consists of the return above the risk-free rate level. It is primarily the profit for the risk taken by the investor [21]. The Chkili's et al. study supports the appropriate use of the FIAPARCH model to predict the portfolio market risk exposure and the existence of the diversification advantages between the equity and foreign exchange markets [15].

For the sake of simplification, Damodaran recommends to replace the stock and bond volatility coefficient with the value of 1.5 because it is not easy to collect this data [6]. Beta coefficient is another important aspect. Here the level of risk and sensitivity of the return rate is derived from the difference between the risk-free rate and the return rate of investment. This market risk called beta is estimated based on the individual market risk factors, each of which has its own price. In the calculation of the risk premium, Damodaran uses 5 essential estimation methods by Othieno and Biekpe [25]. These mainly include the estimated demand, the method of supply, the historical estimate, the implied ERP estimate and the approach-based survey. For the calculation of the risk premium, the level of risk of the asset against other assets must be determined. The CAPM model based on the capital market will be most appropriate. Qin suggests to build a conceptual framework to understand the aggregate risk effects [26]. It also means that risk aversion is a potential reason for settlement of the securities market and a high risk premium. The standard CAPM model does not consider the risk premium. Modifications and adjustments are required to include the risk premium in the calculation [1].

The financial market is sensitive to the country risk. It is important to examine the score obtained from the review of the economic, political and financial risks of the country. These evaluations are reviewed by the credit rating agencies. It increases the efficiency of the financial market by reducing the information failure and transaction costs. They can also help some countries to attract foreign investors. Nevertheless, credit ratings are only considered and recommended as an independent risk assessment. The CAPM model based on the capital market is the most appropriate model for the calculation and Damodaran applies its modified version. Invasive globalization and turbulent financial changes foster the competitiveness across the areas of business, placing considerable emphasis and pressure on business profitability. The investment will only be successful for investors if the rate of return on the contribution contains the reasonable remuneration or risk premium.

3 Methodology

The risk premium in evaluating the success of investment projects is expressed by the level of systematic risk in the economy. According to Damodaran, his modification of the CAPM model is the most accurate picture of reality. In his modification,

Damodaran also included the country's sovereign risk premium in the calculation. However, his approach is not suitable for use in the Czech Republic due to the required adjustments of calculations and indicators. However, it is to be noted that the model does not consider the level of risk of the company in relation to its size. It is based on the difference in the government bond yields of the given country and countries with an AAA credit rating.

3.1 Rating

The rating allows to assess the investment level of risk. Credit ratings are divided into two grades, namely investment and speculative. The highest sovereign ratings are obtained by the most developed countries in the world that offer the investors a stable and growing economy with low inflation and unemployment rates, and good quality infrastructure and an educated population [10]. At the other end, there are countries with high debt ratios and an overall insolvency. In the history, for example, the sovereign rating downgrade of Greece temporarily weakened the euro due to concerns about the spread of the crisis across the euro zone. In the calculation of a rating, the credit rating agency works together with the national institutions such as the central bank, the ministry, and government agencies, or trade unions. The country is then assigned a rating A to D corresponding to the country's sovereign credit risk. The investment grade includes ratings from A to Baa3. The speculative grade ranges from Ba1 to D according to the Moody's rating. As shown in Appendix 1, the Czech Republic is assigned the same investment grade rating – Aa3 according to Moody's and AA-according to Fitch and S&P – from all the three credit rating agencies. The Czech Republic achieved this rating in 2019 after 17 years when the rating was upgraded from A1. This value warrants the high credit reliability of the Czech Republic and advantageous financing on the domestic and foreign markets even with regard to the current situation affected by the corona virus pandemic [20]. According to Moody's, this pandemic will have an adverse impact on the Czech economy, causing an increase in public debt to 36.9% of GDP [31].

Table in appendix 1 shows the ratings from the big three agencies. The S&P and Fitch ratings have the same values different from Moody's. In the determination of a country's standing in credit ratings, S&P and Fitch will compare the current problems of a country and its public finances [29]. In contrast, Moody's rather focuses on the expected country's future development. Thus it will be up to each investor to choose a specific credit rating agency because their ratings of countries can be different. Damodaran applies the Moody's ratings for his calculations and the same will be used in this paper.

3.2 Risk Premium

The risk premium is the price for risk and is part of the expected return on the investment. This remuneration corresponds in value to the risk premium of the company's equity costs. Along with the cost of liability, it is possible to set the discount rate using WACC. Expected return is a determinant of the cost of capital. There are several financial risk models that share some views on risk. They all define the risk in terms of

variance from expected return and the investment is not safe if the actual return equals the expected return. Risk should also be measured from the perspective of a marginal investor who is diversified [5]. This premium exists only due to the impossibility of estimating the future values of the selected investment and expresses a certain degree of uncertainty. This risk is already included in the discount rate, so its quantification is secret and no such attention is paid to it. There are a number of calculation methods and some selected ones will be examined in other parts of the methodology.

3.2.1 Relative Standard Deviation Method

The usual measure of risk is deviation, the higher it is, the higher the risk is. If the scale of the deviation of one market from another changes, the relative degree of risk will be obtained. The formula for the relative standard deviation for the selected country to the United States is:

$$\text{Relative standard deviation} = \text{standard deviation of country } x / \text{standard deviation of U.S.}$$

The risk premium for the selected country is calculated using historical data and relative standard deviation. The problem for the determination is only if the selected country does not have a sufficiently developed capital market. The U.S. market is most often compared to other countries. Marikova therefore recommends the use of the German risk premium calculation, as there are large differences between the U.S. economy and Europe [22]. The differences are mainly in the stability of the economy, the structure of the capital market and political risk. The formula for calculating country risk premium according to Damodaran is:

$$\text{Country risk premium} = \text{U.S. risk premium} * \text{relative standard deviation of country } x$$

3.2.2 Model Tax-CAPM

German practice is based on a modified Tax-CAPM model, which explicitly takes into account taxes from the owners of income on a designated asset [16]. This model is widely used and is anchored as a German standard for determining objective value. Damodaran's models are criticized by theorists because they are not theoretically grounded, but this model has a theoretical basis that is generally accepted. The formula for the calculation is:

$$NVK_{netto} = rf * (1 - d) + RPT_{netto} * \beta$$

where: NVK_{netto} = cost of equity reduced by owner tax, rf = risk-free return, d = owner's income tax, RPT_{netto} = capital market risk premium reduced by owner income tax, β = beta coefficient.

3.2.3 Default Spread of Government Bonds

The default spread is the difference between the yields of two bonds with different ratings. It is the simplest and most common method of calculating the risk premium. It is based on the fact that investors charge for a spread when buying government bonds. Government bonds must be issued only in Euro, Dollar and Yen. This guarantees a risk-free interest rate. The spread is determined by the current or average value in the market.

3.2.4 CAPM Model

The model is based on future values and represents an equilibrium state of the market, therefore the results from past data lead to not entirely accurate results [21]. This model is based on the initial WACC model. With the CAPM model, it is a problem to define the market portfolio of the company, as it includes all available assets. Many are not even traded and some cannot be accurately measured, such as human capital. Another problem is that the model deals only with expected returns and not the actual return on investment and assesses only systematic risk. Graphically, this model is expressed using the SML securities straight line equation, which determines a combination of stock yields and beta coefficients. The beta coefficient plays an important role here. It expresses the degree of systematic risk to the market and draws data from the past [19]. According to Sharpe, the essence of the model is that the expected return on an asset is related to the degree of risk of the examined asset [28]. This is indicated by the beta coefficient. Fernández [8] claims that the beta coefficient causes difficulties and problems when calculated in this model. The way in which the CAPM model is derived is far from reality and needs to be modified.

There are two ways to calculate the CAPM. One way is with the beta calculation from historical data, the other way is with the beta calculation by the analogy method. The beta coefficient should be 1. If it exceeds 1, there is a higher level of systematic risk and vice versa. Formula for calculating the CAPM model:

$$E(ri) = rf + \beta * (E(rm) - rf)$$

where: $E(ri)$ = average expected return on the security, rf = risk-free interest rate, β = beta coefficient, $E(rm)$ = the average expected return on the capital market.

3.2.5 Discount Rate Adjustment and Damodaran's Approach

It is the most accurate and realistic model, which is a combination of spread models and market volatility. It is based on the difference between the yields on government bonds of the designated state and the state that has an AAA rating, i.e. risk-free. The result is general regardless of the situation and conditions in the country. Thanks to this model, a risk premium can be calculated for any country if it is rated by a credit rating agency. For a more accurate result, it is appropriate to include the volatility of individual countries. From these US capital market data, the beta coefficient and the market risk premium are determined in particular. Each investment and its cost of capital reflects the environment in which they are located and it is necessary to adjust this premium obtained in the best markets in the world for its country. However, it is first necessary

to calculate and determine the country risk premium, which is determined according to the following formula:

$$RPC_c = \text{Country default risk} * (\text{stock market volatility} / \text{bond market volatility})$$

The difference between shareholder and creditor risk is incorporated in the model as a correction of creditor risk by the ratio of stock market volatility to government bonds. To simplify, Damodaran recommends replacing the stock and bond volatility coefficient with a coefficient of 1.5, as it is not easy to obtain this data [6]. Damodaran further modified the CAPM model with a country risk premium as follows:

$$E(ri) = rf + \beta * RPCM + RPC$$

where: $E(ri)$ = average expected return on the security, rf = risk-free interest rate, β = beta coefficient, $RPCM$ = capital market risk premium, RPC = country risk premium.

4 Results

The most appropriate parameter to assess the level of investment risk is the globally used and recognized rating of agencies. However, it is not mandatory, but is indispensable for investors in bond issues [24]. This rating takes into account the risk that investors would take if they invested in a riskier country than countries rated by Moody's Aaa. The first rating agency, CRA rating agency, a. s., was established in the Czech Republic in 1988. In 2006, Moody's agency became the owner [29]. Rating performance is a complex and lengthy process, where a credit rating agency cooperates with state institutions. From the information obtained, the state is awarded an appropriate mark from A to D indicating the riskiness of the country. These analyses are performed mostly once a year, so it is not possible to react so quickly to turbulent changes in the financial market. Agencies also do not have much ability to anticipate developments and rather only react to them. It is necessary for each investor to choose the credit rating agency at his discretion, as each agency uses a different methodology for risk assessment. Moody's focuses on the country's anticipated future development. S&P and Fitch compare the current problems of the state and its public finances [30]. The rating divides individual countries of the world into marks that determine investment-grade and speculative grade of investment. Rating of the Czech Republic falls into the rating of the investment grade according to Moody's on Aa3, it was stated in the rating from April this year [23]. The outlook for long-term liabilities is stable despite the current development of the corona virus pandemic and the expected economic slowdown. Countries such as Taiwan, Saudi Arabia, Chile and Hong Kong are also included in this rating level. In comparison with these advanced capital markets, the market of the Czech Republic has a shorter history and therefore does not reach such qualities as other world markets. However, it is worth considering whether it would be more appropriate to break down these country rating marks into further rating levels so as not to distort the results when calculating the country risk premium and also to take into account the company's riskiness in relation to its size.

The relative standard deviation method is the usual measure of risk. In the specified formula, the U.S. market is most often compared to other countries. There are large differences between the Czech and U.S. economy, especially in the stability of the economy, political risk and the structure of the capital market, therefore it would be appropriate to use the German calculation of the risk premium. Damodaran uses the ratings of the rating agency Moody's in its calculations. The higher the deviation, the higher the risk is. If the scale of the deviation of one market from another one changes, the relative degree of risk is obtained. The default spread of government bonds is the simplest and most common method of calculating the risk premium. Investors charge a spread when buying government bonds. A risk-free interest rate is guaranteed and spreads represent a risk premium. During the first quarter of this year, a record high value of the issue of government bonds with a nominal value of CZK 179.7 billion was issued compared to previous years [23].

The CAPM model is based on future values, draws on past data and leads to not entirely accurate results. It also represents the equilibrium state of the market. It is based on the initial WACC model. The problem is that the model does not deal with the real return on investment but only deals with the expected returns and systematic risk assessment. The beta coefficient is important here, which expresses the degree of systematic risk to the market and uses data from the past. Critics say that this coefficient causes difficulties and problems in the calculation [8]. It is also necessary to make calculation corrections for this model. In the Czech Republic, this model is used less, as some small and medium-sized enterprises do not have listed shares on the stock exchange and cannot use this model.

Another modification of the CAPM model is a German standard for determining the value called Tax-CAPM. It is widely used in this country and explicitly takes into account the taxes of those who receive income from the asset. However, it has never been possible to prove whether this model clearly works. Damodaran's discount rate adjustment is the most accurate and realistic model that combines a model of spreads and market volatility. It is based on the difference between the yields on government bonds of the designated state and the state that has an Aaa rating. The situation and conditions in a given country are not taken into account, so the result is general. For a more accurate result, it is necessary to include the volatility of individual countries. To simplify, Damodaran recommends replacing the stock and bond volatility coefficient in the calculation of the country risk premium with a coefficient of 1.5 [6]. It is not easy to obtain this data. Then the CAPM model is modified by the country risk premium. However, the use of the recommended coefficient distorts the results of the risk premium. Damodaran's procedure is not suitable for use in the Czech Republic, as some calculations and indicators need to be adjusted and this model does not take into account the riskiness of the company in relation to its size. For the relative standard deviation, it would be appropriate to use a higher ratio of standard deviations drawn from the actual statistical data of the Czech Republic.

5 Discussion

Damodaran's calculations are applied in a number of countries but they are also criticized by theoreticians. Critics consider the approaches pragmatic; it is not clear which of the models is more suitable to use. Damodaran is also criticized for the fact that his approaches and models are not embedded and supported by a relevant theory; therefore he is also considered to be a practitioner. His websites, which are not accessible for the public, include data for various calculations of a company as a whole or for shares. However, it shall be taken into account that the data on Damodaran's web are intended mainly for USA markets. Therefore, it is necessary to adjust the input data for each specific situation in the calculation. Furthermore, it was also found that there is no direct and clear definition for a country's risk premium. Only the calculation procedure for the capital market risk premium is defined.

The most common risk assessment method is to take over the rating from a rating agency according to own specific requirements. According to the Moody's agency, the Czech Republic achieved in 2019 (after 17 years) the investment grade Aa3. This confirms the country's high creditworthiness and advantageous financing on both the domestic and foreign markets. Damodaran also uses the ratings from the Moody's agency. Their ratings are based on the assumed future development of the country. Rating summarizes the insolvency risk of a given country.

In Damodaran's model of calculating the discount rate adjustment related to the market volatility, it is not clearly said how the volatility can be measured. This can have impact on the results, as the standard deviation can be mistaken for variance. Volatility estimate is provided by local capital markets; however, Damodaran does not consider them credible. The obstacle to volatility is the difference in determination over time and between the individual countries. It is therefore difficult to estimate the volatility of bonds, as government bonds are assumed to be issued and traded. For simplification, recommended volatility ratio is 1.5. In his work from 2011, Damodaran uses 4.6 for the Czech Republic. However, in the tables on his blog from 2014, he states the deviation value of 2.0. Based on this information, the ratio for the CR should be definitely higher than 1.5.

The CAPM model, for example, is not evaluated as positively in Germany as in the USA, and experts are still trying to find a more suitable modification. German practice is based on the modified Tax-CAPM model, which explicitly takes into account the taxes from owners of the designated asset income [29]. In terms of the basic CAPM model, critics claim that it is based on several unrealistic assumptions. For example, it does not include tax and transaction costs. It is also impossible to influence the share prices from the side of the investors, to include their individual rational behaviour, risk aversion or the ability to sell and buy at a risk-free rate. This model is based on future values and represents the equilibrium in the market; therefore, the results of the data from the past years are skewed. When carrying out the calculations in this model, there are problems with beta coefficient, even when determining beta. The determination is based on the volatility of the share prices, which, as already mentioned, are not easy to be determined.

6 Conclusion

The aim of this paper was to compare the methodologies for calculating the risk premium for the Czech Republic and the differences between them. Above all, the basis was Damodaran's models and the evaluation of credit rating agencies to determine the appropriate process of calculating the risk premium for the Czech Republic. It was established from a literature search that credit rating agencies and their ratings improve the efficiency of the financial market by reducing the information failure and transaction costs. They also help countries to attract foreign investors and ratings also provide better access to the capital market. The assigned country's sovereign rating summarizes the risk of insolvency. Adopting a rating from a pre-selected credit rating agency becomes the simplest and most widespread way how the risk premium is determined. The differences between the ratings of the global agencies are very similar, with a few exceptions. It depends on the investor which credit rating agency they will choose. The current rating of the Czech Republic falls within the investment grade according to Moody's Aa3 rating. The countries such as Taiwan, Saudi Arabia, Chile and Hong Kong are also included in this investment grade. In comparison to these advanced capital markets, the market of the Czech Republic has a shorter history and the capital market is still under development, so it does not achieve the quality of the other world's markets. However, it is worth considering whether it should not be more appropriate to break down these country's sovereign ratings into multiple rating levels not to distort the results when calculating the country's risk premium.

The method used included descriptions of the selected methods and approaches, mostly from Damodaran. In the discussion of the results, these methods are described and compared in more detail. The basic CAPM model only reviews the systematic risk. The model is criticized for not truly reflecting on reality and is being abandoned because it builds on historical data and it does not seem applicable for the future development of investment. It must be modified for further use of the calculations. For example, Germany has modified this model as Tax-CAPM where the taxes of those who receive income from a given asset are explicitly considered. It would be useful to produce a customized and tailored design that would fit the conditions of the Czech Republic.

The modified concept of CAPM according to Damodaran seems to be the most accurate picture of reality and the most appropriate for the Czech Republic. This model is also the most commonly used. The country's sovereign risk premium is also included in the calculation. However, note that this model does not consider the level of risk of a company in relation to its size. The result of this model is general without regard to the situation and conditions in given country. The challenge of the calculation is to determine a beta coefficient value which is related to stock price volatility. Another challenge is to determine volatility, therefore a universal coefficient of 1.5 is recommended. The drawback of the model is that it does not consider the individual companies in the country and their characteristics, but only the country as a whole. It would be adequate to use a higher than a coefficient of 1.5. Results will then be distorted and based on the review of historical data, the values for the Czech Republic were higher

than the specified coefficient of 1.5. In the calculation you also have to make sure the standard deviation is not confused with the variance.

There are no exact rules available that would clearly determine which of the models is most appropriate. However, these are only speculative and approximate estimates in the calculation. It can be concluded that the aim of the paper was fulfilled. The most adequate model for the Czech Republic is a modified version of the CAPM model according to Damodaran which also considers the country risk premium. However, the stock volatility ratio must be increased from 1.5 to a higher value.

Appendix 1

(See Table 1).

Table 1. Summary long-term rating scale from S&P, Moody's and Fitch

	Extremely strong capacity to meet financial obligations	Very strong capacity to meet obligations			High capacity to meet financial obligations			Sufficient capacity to meet financial obligations			Slightly threatened short-term capacity to meet financial obligations			More threatened short-term capacity to meet financial obligations			Highly threatened short-term capacity to meet financial obligations			One or multiple obligations not met
S&P	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
Fitch	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B2	B-	CCC	CC	C	D
Moody's	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa	Ca	C	-
	INVESTMENT GRADE									SPECULATIVE GRADE										

Source: The own production from: *The credit rating of the Czech Republic*. Available from: <https://www.cnb.cz/en/monetary-policy/inflation-reports/boxes-and-annexes-contained-in-inflation-reports/The-credit-rating-of-the-Czech-Republic>.

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The Results of Dividend Policy Tools Can Be Surprising

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Abstract. The goal is to analyse the dividend policy of a particular company (ČEZ a. s.), determine a dividend payout ratio and evaluate how far it is impacted by chosen factors. As a basis for the analysis, data from the company's final accounts were used. Furthermore, correlation tools, the proportional indicators of ROA, ROCE and liquidity, the Lintner Model and the Gordon Growth Model were employed. Based on the results of correlation, it can be stated that retained earnings increase the value for shareholders, the given company makes rational decisions and the payout ratio is reasonable from the viewpoint of its management. Results of the Lintner Model and Gordon Growth Model show that the company does not employ any of these two models. According to the result of the payout ratio, it was determined that retained earnings generated benefits for the shareholders. The impact of the proportional indicators of ROA and ROCE on the payout ratio is negative. It is to be recommended to make more dividend models a subject for further research, namely across different types and sizes of enterprises, and provide a comprehensive overview of recommendations for enterprises in the field of dividend policy.

Keywords: Company value · Correlation · Dividend models · Dividend payout ratio

1 Introduction

Every company, regardless of its size, establishes a certain ratio between the dividend payout to its shareholders and retaining earnings as an in-house source of financing differently. Therefore, the companies use various methods and tools and each of them inspects different factors influencing the specification of the dividend payout ratio. Such individual decisions should be considered to form a part of the financial strategy of a company [19]. It is generally applicable that the set amount of the dividend payout ratio influences the ratio of the earnings used by the company for its future growth at the same time [18]. In practice, the explored topic of the determination of a company's payout ratio can run into problems with a conflict of interests. The main decision about the dividend ratio is generally made by the board of directors and the company management. Naturally, they consider keeping the highest ratio of earnings as possible. On the other hand, the stockholders strive for a higher ratio of dividend payout. In bigger enterprises, the final decision is often made by making a difficult compromise.

Authors concerned with the above issue permanently compare the use of tools and the influence of factors playing an important role in the process of determining the payout ratio and, furthermore, the conditions of enterprises that differ every time. Even though the determinants of the dividend policy have been researched for many years, the authors engaged in the issue have not yet unanimously agreed on a united set of factors influencing the payout ratio of dividends and earnings. Due to a turbulent and global environment that we live in today, the conditions of enterprises and the factors influencing them face a constant change [9]. It is therefore to be remarked that the examined topic evolves permanently and provides new knowledge. The aim of this paper is to analyze the dividend policy of a particular company, establish its payout ratio and evaluate how far it is impacted by chosen factors.

2 Literature Review

According to Sattar et al. [14], the dividend policy is one of the most important finance policies not only for investors but also for companies, employees and the government. The payout of higher dividend amounts gives information on the prosperity of an enterprise. Based on this fact, the investors have expectations for the same development even for the future, which results in the increasing price of shares. Thus, dividends serve as a kind of signal ensuring the loyalty of investors to companies. It is sometimes the case that even though enterprises do not have free cash flow, they still pay out dividends in order to gain trust from their investors. A higher dividend payout ratio means less resources for the business growth whereas a lower dividend payout ratio provides more resources for business expansion and growth [11]. Li states that companies that do not pay out dividends have a better dynamics of profit [10]. The decision about the future dividend payout is influenced by various factors such as the company's investments, cash flow, risk and share return.

Hayati, Astuti, and Murdy [7] claim that the dividend policy includes two involved parties in the relation of mutual contradiction. The interests of shareholders preferring a higher dividend on the one side collide with the interests of the company retaining its earnings on the other side. The optimal dividend policy and, simultaneously, the dividend payout ratio hence create a balance between the future growth and the dividends maximizing the share price. The amount of earnings on a share in the form of a dividend is stated in the payout ratio of dividends. In order to establish a suitable dividend policy, it is necessary to focus one's attention toward the exploration of factors influencing the dividend payout ratio such as liquidity, profitability, assessments, capital earnings and access to capital markets [20]. Dragota, Pele, and Yaseen propose to count the size, growth of sales, return on assets and leverage among such factors, also known as financial factors [4]. Moreover, there are also the so-called legal factors such as the legal system, tax benefits and the obligation to pay out the dividends. Susanti et al. focused on the factors of market risk, leverage and investment opportunity [16]. It was discovered that leverage and investment opportunity have a partial impact on the dividend payout ratio. The market risk, on the other hand, does not affect it in any way. Farooq and Elbannan, on the contrary, explored the influence of the share price synchronicity factor on the payout of dividends that both directly and

indirectly relate to the informational environment of a company [6]. It was discovered that a higher informational asymmetry connected with a high synchronicity have a negative impact on the dividend payout ratio. Tahir, Masri and Rahman categorize the attributes of the board of directors among the examined factors of dividend policy [17]. While measuring the dividend payout ratio, they observed a negative impact of leverage on the dividend payout. Sumail comments on the high difference of the influence of various factors according to different authors [15]. He was concerned with numerous factors such as the board of directors' size, impact of the institutional property, influence of concentrated ownership and leverage. The same conclusion also appears in the work of Dewasiri et al. who claim that although the dividend policies have been examined for whole decades, so far there has been no united opinion on the factors influencing the dividend payout [3].

Badruzaman and Kusmayadia state that most investors decide based on the analysis of the dividend payout [1]. Looking at the dividend payout ratio, the investors can predict the future development of an enterprise. For the analysis of the payout ratio and its influence on the share price of joint-stock companies, they used the means of a correlation estimate that led them to the conclusion that a raise in the dividend payout results in a raise in the share price and, analogically, a decrease in the dividend payout has a decreased share price as a consequence. Thus, the dividend payout ratio significantly impacts the share price. On the contrary, Sarumpeata and Suhardi concentrated on the influence of profitability, liquidity, leverage and MBV on the dividend payout ratio [13]. Using the multiple regression analysis, they discovered that the indicators of profitability and liquidity had a positive impact on the payout ratio whereas leverage and MBV proved to have a rather negative influence. The higher the profit, the easier it is for a company to fulfil its liabilities towards the shareholders. The impact of profit is therefore linear. The same also applies to the influence of liquidity. As for leverage and the MBV indicator, the dividend policy has an opposite effect as opposed to the indicators of profitability and liquidity. The bigger the leverage of a company, the lower the dividend payout ratio. The same results were also proven in the case of the MBV indicator. The use of retained earnings for funding the company's investments results in less dividends paid out to the shareholders. Hu, Huang, and Chen explored the indicator of liquidity in relation to the dividend payout ratio [8]. By means of the agency theory, they came to the conclusion that an increase in the liquidity of shares leads to a bigger dividend payout. Ernayani, Sari and Robiyanto employed the multiple regression analysis to analyse the relationship of the return of investment and the ratio of cash and debt to the overall amount of asset [5]. According to their findings, the return of investment has a partially positive impact on the dividend payout ratio. The ratio of debt to the overall assets has a significant negative impact on the dividend payout ratio. Last but not least, the ratio of cash to the overall assets did not prove to have any impact on the dividend payout. Purwanto and Elen further explored the relation of the debt ratio to the overall assets as far as the payout ratio is concerned [12]. In this case, however, the factor did not show any important effect on the dividend payout ratio. Bae employed the bi-variate time series model for dividend and dividend-tax preference to examine the influence of share repurchase on the relation between the dividend payout ratio and the relative tax rate on dividends [2]. To establish the dividend dynamics, Bae chose the Lintner Partial Adjustment Model. The outcomes

proved a significant influence of the legalization of share repurchase on the relation between the dividend payout and the dividend tax preference.

3 Methodology

Input data for a company analysis were gained from its accounting statements in the Collection of Instruments on the justice.cz website. In order to present a statistical description of the data, basic statistical characteristics of dispersion, standard deviation, coefficient of variation and expected value were employed. In Table 1, particular values of the statistical characteristics for the used variables are indicated for the period 2007-2018. The high values of dispersion, standard deviation and coefficient of variation imply a high degree of input data variability. The values are stated in millions of CZK.

Table 1. Statistical description of the input data

	Dispersion	Standard Deviation	Coefficient of Variation	Expected value
EBIT	323,634,575.61	17,223.97	37.27%	49,450.00
EAT	206,875,093.48	13,770.82	42.15%	37,680.00
Assets	8,139,286,124.45	86,377.15	14.83%	615,296.00
Current Assets	1,571,910,772.55	37,959.43	29.07%	130,441.00
Equity	946,959,509.84	29,462.62	12.43%	246,750.00
Reserves	236,992,905.66	14,739.18	49.46%	37,000.00
Long-term Credits	75,437,134.06	8,315.69	57.92%	13,861.00
Short-term Liabilities	1,236,428,769.84	33,665.90	31.33%	119,253.50
Long-term Liabilities	2,382,661,054.15	46,734.42	22.33%	235,451.50
Dividend per share (CZK)	80.97	8.62	21.36%	40.00
Number of Shares (thousands of CZK)	445,441,945.61	20,206.97	3.69%	537,990.00
Share Price (CZK)	67,210.94	248.21	36.00%	635.50

Source: authors.

All calculations intended for evaluating the dividend policy of the company ČEZ a. s. will be made for the period from 2007 to 2018 which is considered to be stable. The observed period is determined from the viewpoint of development of the company's operating profit. In order to evaluate the dividend policy of the company ČEZ a.s., a relation between the values of retained earnings and the indicator of rentability of return on equity (ROE) will be examined. To calculate the overall amount of retained earnings, the variables of earnings after taxes (EAT) as well as liabilities towards shareholders are required to be known as well. The amount of liabilities towards shareholders will be calculated by multiplying the value of dividend per share by the number of shares.

$$\text{Liabilities towards shareholders} = \text{dividend per share} * \text{number of shares}$$

Subsequently, the amount of retained earnings will be obtained after the subtraction of liabilities towards shareholders from the earnings after taxes. The calculation is illustrated by the following formula:

$$\text{Retained earnings} = \text{EAT} - \text{liabilities towards shareholders}$$

In the next step, the indicator of return on equity will be calculated as a ratio of net profit to equity.

$$\text{ROE} = \text{EAT} / \text{equity}$$

By means of the correlation method, a rate of dependence between the values of ROE and the values of retained earnings will be determined. The final values of retained earnings and the indicator of ROE will be noted in the table.

Furthermore, to assess the dividend policy of the company, the indicators of ROA, ROCE and common liquidity will be used. The indicator of ROA will be calculated according to formula for every year of the period under review.

$$\text{ROA} = \text{EBIT} / \text{assets}$$

The indicator of ROCE will be calculated as a ratio of EBIT to the sum of equity, reserves, long-term liabilities and long-term credits for every year of the period under review.

$$\text{ROCE} = \text{EBIT} / (\text{equity} + \text{reserves} + \text{long-term liabilities} + \text{long-term credits})$$

To determine the indicator of common liquidity, it is necessary to establish a ratio of current assets to short-term liabilities for every year of the period under review.

$$\text{Common liquidity} = \text{current assets} / \text{short-term liabilities}$$

Results of the proportional indicators for the period 2007–2018 will be represented by a chart. Additional tools enabling to assess the dividend policy of the company ČEZ a.s. include the Lintner Model and the Gordon Growth Model. The formula of the Lintner Model illustrates the relation below where the variable a represents average interannual growth of dividends. The quantity T stands for a final payout ratio. EPS_t symbolizes earnings per share in the period t and the quantity DIV_{t-1} represents a dividend per share paid out in the previous year.

$$DIV_t = a * T * EPS_t + (1 - a) * DIV_{t-1}$$

To calculate the quantity a , formula is used. The sum a dividend per share of the year $t + 1$ a dividend per share of the year t is divided by the overall number of the observed period.

$$a = (DIV_{n+1}/DIV_n + \dots + DIV_{n+1}/DIV_n)/n$$

The quantity of net earnings per share EPS_t will be calculated for every year of the observed period using formula.

$$EPS = EAT/\text{number of shares}$$

The quantity of the final payout ratio will be calculated as a ratio the dividend per share the net earnings per share. In that respect, a partial aim of the paper, i.e. to calculate the company's payout ratio, will be fulfilled.

$$T = DPS/EPS$$

All values obtained by individual calculations and the final value of the Lintner Model will be illustrated in a table. The Gordon Growth Model determines the value of a share. The formula for the calculation of the Gordon Growth Model is represented by the following relation.

$$\text{Share Value} = DPS/(r - a)$$

The value of an expected dividend in the next year will be calculated using next formula. The quantity DIV_t represents the dividend per share. The quantity a symbolizes the average interannual growth of dividends.

$$DPS = DIV_t * (1 + a)$$

The rate of return of dividends will be calculated based on formula using the following relation:

$$r = (DIV_t/\text{price of share}) + a$$

All values obtained by individual calculations and the final value of Gordon Growth Model will be illustrated in a table.

Initially, given the long-term successful history of the company and its size, it can be presupposed that its dividend policy is created based on long-term research and theories. The company can be expected to behave in a rational way in case of retained earnings. Due to frequent and financially highly demanding investments, the amount of retained earnings is certainly higher. In connection with the assumption, the observed indicators of asset rentability, return of capital employed and liquidity are most likely to increase as well. The company ČEZ a.s. definitely uses a dividend model to establish the optimal dividend policy.

4 Results

In Table 2, the amount of retained earnings and the indicator of ROE for the period 2007–2018 are stated. With each following year, the amounts of both retained earnings and the indicator of ROE decrease.

Table 2. Amount of retained earnings and the indicator of ROE during the period under review

Year	Retained Earnings (in millions of CZK)	ROE
2007	30,919,780	23.21%
2008	23,662,560	25.54%
2009	24,955,500	25.09%
2010	18,427,530	20.67%
2011	13,853,500	17.56%
2012	15,943,450	15.79%
2013	13,687,400	13.40%
2014	912,400	8.44%
2015	-972,600	7.55%
2016	-6,944,600	5.58%
2017	1,205,330	7.45%
2018	-7,253,670	4.39%

Source: authors.

The mutual relation between the variable of retained earnings and the indicator of ROE was determined by means of the correlation method using the CORREL function in the Excel computer program. The final value is 0.964955756. Further tools used to assess the company’s dividend policy involved the ratio proportion indicators of ROA, ROCE and common liquidity. Their development over the course of time is illustrated in Fig. 1.

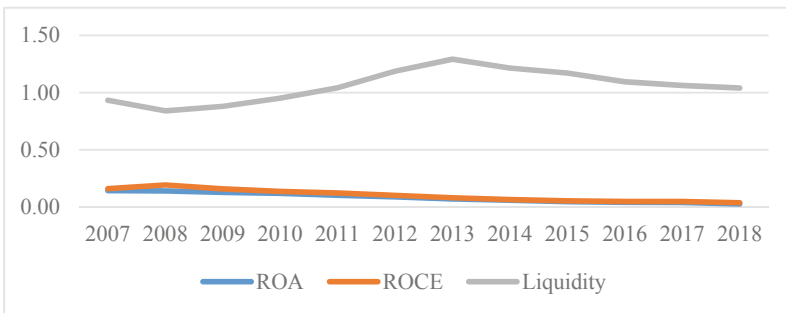


Fig. 1. Development of the proportion indicators of ROA, ROCE and liquidity over the period under review (Source: authors).

The dividend policy of the company ČEZ a.s. was also a subject to the examination related to the Lintner Model. In Table 3, individual variables of the Lintner Model developing over the course of time along with its results are presented. The variable T symbolizes the amount of the payout ratio.

Table 3. Variables of the Lintner Model and its results

Year	a	T	EPS _t	DIV _{t-1} (in CZK)	Lintner Model (in CZK)
2007	0.08	0.28	72.21	–	–
2008	0.08	0.50	79.96	11,844,220,000	10,910,373,121
2009	0.08	0.52	96.39	23,688,440,000	21,820,746,239
2010	0.08	0.61	87.25	26,899,500,000	24,778,633,099
2011	0.08	0.66	75.75	28,513,470,000	26,265,351,084
2012	0.08	0.60	74.64	26,899,500,000	24,778,633,098
2013	0.08	0.61	65.44	24,209,550,000	22,300,769,788
2014	0.08	0.96	41.70	21,519,600,000	19,822,906,479
2015	0.08	1.05	38.19	21,519,600,000	19,822,906,479
2016	0.08	1.48	27.09	21,519,600,000	19,822,906,479
2017	0.08	0.94	35.24	21,519,600,000	19,822,906,478
2018	0.08	1.69	19.52	17,753,670,000	16,353,897,845

Source: authors.

Table 4 illustrates the development of variables and results of the Gordon Growth Model.

Table 4. Variables of the Gordon Growth Model and its results

Year	DPS (in CZK)	r	a	Share Value (in CZK)
2007	–	–	–	–
2008	43.15	0.13	0.08	846.68
2009	53.94	0.14	0.08	932.12
2010	57.18	0.15	0.08	844.73
2011	53.94	0.14	0.08	847.97
2012	48.55	0.15	0.08	733.61
2013	43.15	0.16	0.08	557.76
2014	43.15	0.15	0.08	637.60
2015	43.15	0.17	0.08	479.33
2016	43.15	0.17	0.08	463.90
2017	35.60	0.15	0.08	535.65
2018	35.60	0.14	0.08	577.18

Source: authors.

5 Discussion

Having applied the correlation method, the mutual relation of retained earnings and the indicator of ROE for the period under review (2007–2018) was evaluated. As may be seen from Table 2, the amount of retained earnings decreases over the course of time and so do the values of the ratio indicator. The final correlation value neared number 1, which means that there is a relationship of mutual dependence between the observed variables. Based on the findings, it is possible to claim that the retained earnings increase the value for shareholders, the company makes rational decisions and the payout ratio is reasonable from the viewpoint of its management.

Figure 1 illustrates the almost steadily decreasing indicators of ROA and ROCE representing the relation to the retained earnings. The indicator of common liquidity only increases from 2008 to 2013, while previously showing a decrease up to the year 2008, and the same applies to the period from 2013. The growth of this indicator was caused by a higher value of assets and short-term liabilities in comparison with the other years. The relation of the indicator of liquidity and the retained earnings can be excluded. When comparing the values of dividends on share and the results of the Lintner Model, it may be noted that the company ČEZ a.s. does not use the dividend model to set its dividend policy. The cause for the values related to the Lintner Model may be observed in liabilities to shareholders stated in billions of CZK.

Furthermore, the Lintner Model provides the calculation of the company's payout ratio whose values are higher in the majority of cases. In 2015, 2016 and 2018, the payout ratio exceeded 100% and the discussed company therefore paid out more money to the shareholders than it had earned. The proportional increase or decrease of the payout ratio between individual years correspond with the increase or decrease of the amount of retained earnings. As a result, the payout ratio calculation confirmed that the payout ratio of the company is reasonable. The retained earnings generated additional sales in the company and consequently benefits for the shareholders. The impact of the proportion indicators of ROA and ROCE on the payout ratio can be evaluated as negative because the values of the respective indicators decreased even if the payout ratio increased. The comparison of the final values of liquidity and the payout ratio did not show any influence of the factor on the payout ratio.

Nor the results of the Gordon Growth Model did not prove the company ČEZ a.s. to use this dividend model. Thus, it may be stated that, according to the chosen dividend models, the company ČEZ a.s. does not employ a stable dividend policy. The company determines its dividends based on the needs of the state budget of the Czech Republic. When setting the payout ratio, strategic intentions of the company should be taken into account. The value of dividends should stabilize and ČEZ a.s. should employ the Lintner Model describing the dividend policy in greater details in relation to its variables. The difference of the results obtained from the dividend models and the number of dividends on share indicates that all companies should implement at least some of the dividend models when determining their dividend policy and, simultaneously, take into account strategic company intentions as well.

6 Conclusion

The aim of this paper was to analyze the dividend policy of a particular company, to establish the payout ratio and to evaluate the impact of chosen indicators on the dividend payout ratio. In order to perform the dividend policy analysis, the methods of correlation, the proportional indicators of ROA and ROCE and liquidity, the Lintner Model and the Gordon Growth Model and, last but not least, the payout ratio were employed. First, the payout ratio of the company was determined and individual proportional indicators were assessed in terms of their impact. Based on earlier findings that the company ČEZ a.s. did not employ the chosen dividend models, a general recommendation for companies being in the process of setting their own dividend policy is to use dividend models and to consider their strategic intentions as well. Unfortunately, the recommendation is limited by the amount of dividend models explored in this paper, which could serve as a reference drawing one's attention to exploring more dividend models across different company types and sizes, and, consequently, provide a comprehensive overview of recommendations for other companies in the field of their dividend policy.

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Author Index

A

Agaeva, L. K., 3
Agafonova, A. N., 10
Agafonova, N. S., 366
Akopyan, D. A., 657
Aksinina, O. S., 510
Aleshkova, D. V., 590
Andrianova, J. V., 358
Arkhipova, N. A., 25
Ashmarina, S. I., 33
Azarkhin, A. V., 18

B

Bakanova, I. G., 467
Balanovskaya, A. V., 520
Barakina, E. Y., 40
Barchukov, V. K., 713
Bataeva, B. S., 48
Belayeva, I. Yu., 84
Belikevich, A. S., 637
Belyaeva, G. I., 275
Berbasova, L. V., 632
Borisova, O. V., 784
Bortnikov, S. P., 529
Brazhnikov, M. A., 794
Bulavko, O. A., 54

C

Channov, S. E., 800
Chaplygin, S. S., 189
Charikov, V. S., 296
Chasovskikh, E. A., 832
Chernousova, K. S., 809
Chibisov, A. E., 435

Churakov, A. N., 18
Churakova, E. N., 815

D

Danilova, O. V., 84
Davletshina, L. M., 61
Didenko, Valentina, 669
Dorofeeva, Yu. A., 108
Doronina, N. G., 99
Dozhdeva, E. E., 736
Dzardanov, A. Yu., 93

E

Egorova, D. A., 822
Egorova, E. N., 116
Ermolaev, K. N., 677

F

Fedorenko, R. V., 267
Fomin, V. P., 390
Frantasov, D. N., 832, 840
Frolova, I. V., 333, 758
Frolova, V. B., 784
Fursov, A. L., 749

G

Gafarov, M. R., 657
Gagarina, M. A., 553
Gilfanov, R. R., 450
Glisin, A. F., 67
Gorbunova, O. A., 749
Gorgodze, T. E., 560
Gorshkova, L. A., 417
Goryachev, M. D., 219

Gráf, P., 846
 Guliev, I. A., 503
 Guryanov, N. Yu., 567
 Guryanova, A. V., 567
 Gusakova, E. P., 76

H

Horák, J., 876

I

Igoshina, N. A., 390
 Ismailov, I. S., 40
 Ivanova, N. V., 157
 Izmailova, M. A., 164

K

Kalmykov, V. V., 580
 Kamaletdinov, A. S., 267
 Kandrashina, E. A., 590
 Kapitonov, A. A., 460
 Kapustina, L. V., 467
 Karasev, V. A., 282
 Karev, D. A., 800
 Karlina, A. A., 380
 Khafiyatullina, E. R., 366
 Khayrullina, A. D., 233
 Khisamova, Z. I., 479
 Khuzhamov, L. T., 398
 Kirillova, L. K., 596
 Kiseleva, T. Yu., 603
 Kolesnikova, Yu. S., 840
 Konovalova, M. E., 623
 Korobetskaya, A. A., 311
 Korobova, A. P., 713
 Korunova, V. O., 197
 Kovaleva, T. M., 613
 Kozhevina, O. V., 48
 Kozhevnikova, E. I., 398
 Kozhukhova, V. V., 25
 Kozlov, V. V., 226
 Krulický, T., 864
 Kshniakin, P. A., 189
 Kubantsev, S. P., 479
 Kudinova, G. E., 327
 Kudinova, Yu. V., 174
 Kulakhmetov, T. R., 503
 Kulikov, E. I., 643
 Kurganova, M. V., 179
 Kuzmina, O. Y., 623
 Květová, H., 856

L

Lang, P. P., 815
 Larionova, N. I., 840

Lazarev, M. P., 784
 Lazareva, N. V., 197
 Lebedeva, E. M., 742
 Levchenko, A. V., 632
 Likhacheva, O. N., 637
 Lipatov, E. G., 800
 Litvinova, A. G., 202
 Loginova, O. A., 174
 Lukyanov, S. A., 133
 Lykov, A. A., 496

M

Machová, V., 864
 Makhovikov, A. E., 226
 Malikova, A. Kh., 643
 Malina, A. B., 794
 Malysheva, E., 648
 Mamleeva, E. R., 210
 Mantulenko, A. V., 657
 Mantulenko, V. V., 219
 Mazur, N. Z., 373
 Merinov, M. V., 233
 Miasnikov, D. A., 197
 Mikhaylov, A. M., 664
 Mitropolskaya-Rodionova, N. V., 417
 Mokeev, A. D., 189
 Morozko, Natalia, 669
 Morozko, Nina, 669
 Mukhametshina, G. R., 10
 Murzagalina, G. M., 33

N

Nedorezova, E. S., 677
 Nevruiev, A. N., 553
 Nikitina, I. N., 719
 Nikolaev, P. P., 632
 Noskov, S. V., 249

O

Ordov, K. V., 84

P

Palmov, S. V., 226
 Panikarova, S., 258
 Papirovskaia, L. I., 832
 Pashtova, L. G., 692
 Pavlova, A. V., 233
 Pavlova, K. S., 684
 Perstenyova, N. P., 702
 Petinova, M. A., 567
 Petrogradskaya, A. A., 713
 Petrov, N. A., 708
 Pinkovetskaia, I. S., 719
 Piskunov, V. A., 333, 726

Pokrovskaya, O. D., 267
 Polischuk, O. A., 93
 Polyanskova, N. V., 275
 Pomulev, A. A., 580
 Ponamorenko, V. E., 489
 Popov, E. V., 148
 Popova, E. S., 61
 Pracko, G. S., 529
 Prokopenko, I. S., 76
 Prosvetova, A. A., 736
 Provotorova, T. A., 822
 Prygunova, M. I., 373

R

Rakov, A. W., 282
 Ralyk, D. V., 290
 Rowland, Z., 846
 Rozenberg, A. G., 327

S

Salamov, F. F., 677
 Salkina, A. R., 296
 Salomatina, S. Y., 742
 Sanginova, L. D., 603
 Sazykina, M. Yu., 210
 Semenychev, V. K., 311
 Semilutina, N. G., 99
 Setchenkova, L. A., 637
 Sevastyanova, S. A., 303
 Shalneva, M. S., 822
 Sharikova, J., 648
 Shcherbachenko, P. S., 435
 Shchutskaya, A. V., 441
 Sheremetyeva, E. N., 417
 Shevchenko, L. I., 503
 Sheveleva, S. V., 496
 Shiryayeva, L. K., 424
 Sidorenko, E. L., 320, 479, 496
 Sidorov, A. A., 327
 Sivaks, A. N., 749
 Slepneva, T. A., 116
 Smagina, A. Yu., 333, 758
 Smolina, E. S., 684
 Solentsova, E. A., 460
 Solovova, N. A., 553
 Solunina, T. I., 547
 Sotskova, S. I., 766
 Spanagel, F. F., 430
 Štefanová, N., 864
 Stepanov, A. A., 164
 Sternik, S. G., 775

Šuleř, P., 856
 Streltsov, A. V., 343
 Sumburova, E. I., 352
 Sycheva, E. A., 67

T

Tarasova, T. M., 726
 Tazikhina, T. V., 358
 Teleshev, G. V., 775
 Temir-Bulatov, K. A., 643
 Timofeev, A. V., 366
 Tokarev, Y. A., 202
 Tretiakova, V. V., 116
 Trofimova, N. V., 210
 Troshina, E. P., 373
 Tsibareva, M. E., 794
 Tsirin, A. M., 320
 Tsirina, M. A., 99
 Tsirulev, D. E., 76
 Tsybatov, V. A., 408
 Tuktarova, L. R., 54

U

Ustina, N. A., 380

V

Vágnerová, E., 876
 Valeev, E. R., 840
 Valishin, E. N., 539
 Valishina, M. E., 539
 Velezhev, S. I., 18
 Velinov, E., 258
 Veselovsky, M. Y., 164
 Vishnyakova, A. B., 61
 Vlasov, M., 258
 Voitkevich, N. I., 547
 Volkodaeva, A. V., 520
 Volkodavova, E. V., 123
 Voyko, A. V., 67
 Vrbka, J., 856
 Vshivkov, A. V., 520

Y

Yakhneeva, I. V., 10
 Yakovlev, G. I., 343
 Yelizarova, E. A., 467

Z

Zaelskaya, S. A., 352
 Zaitseva, K. A., 398
 Zaychikova, N. A., 702

Zhabin, A. P., [123](#), [450](#)
Zhivaeva, V. V., [133](#)
Zhukov, P. E., [140](#)
Zhukova, O. V., [174](#)

Zhuravleva, D. N., [93](#)
Zimakov, A. V., [148](#)
Zinin, A. A., [358](#)
Zubkova, M. N., [574](#)