CHAPTER 1

Post-industrial Modernization: Problems and Prospects

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In current, turbulent times, futuristic innovations and new technologies have not only entered into our lives rapidly and created new opportunities for developing society and the economy, but also lead to challenges and threats that inevitably cause negative reactions and dilemmas regarding further transformations. In this book, we look at the contradictions, advantages, and problems inherent in post-industrial development as an intensive and continuous process, primarily in the economy, affecting all areas of life.

The modern economy is complex and diverse, and the prolonged recession, touching both developing and developed countries, makes it necessary to adapt economic policy instruments and search for a new model of socio-economic development that will ensure economic growth in the post-crisis period of economic development.

The theoretical foundations for new industrialization as an independent type of social transformation were laid down by the works of Galbraith (1967) and then developed in the ideas from Bell about the

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"post-industrial society" (Bell 1973). Toffler expanded these ideas into "the third wave", which (he argues) will incomparably change the world as did the agricultural and industrial revolutions and many other stages of international development (Toffler 1980).

Bell argues that the post-industrial society inevitably updates itself, as classical production fades into the background and service production predominates, practical knowledge is replaced by theoretical knowledge, and technology is a priority for universal development; at the same time, though, the values and norms of society are similarly changing under the influence of ongoing transformations. The same thing is also happening now, as digitalization provides many technologies for economic and social transformations, ultimately changing not only society but also its mentality (Ayhan 2017).

The time of post-industrial development was the evolutionary result of society's awareness of the consequences of deindustrialization, when developed countries actively transferred production to developing countries and refused to modernize their national industry. On the one hand, this helped to increase the economic growth rates of developing countries and increased employment; it did, on the other hand, not contribute either to producing top-quality products or dealing with unemployment in developed countries. It should be noted that modern scientists consider not only the economic consequences of losses resulting from deindustrialization, but also the social, cultural, and ideological consequences of the mass shutdown of factories in some countries (Nettleingham 2019), and also call deindustrialization a historically disruptive force (Pula 2017).

Furthermore, the active growth of the service sector ("service production") in developed countries did not provide a stable rate of economic growth, which became especially apparent after the global financial crisis of 2008, which revealed the value of industrial development and the opportunities that innovative technologies bring. From a historical point of view, industrialization made the United States, the Soviet Union, Canada, Britain, Germany, France, Italy, and Japan the leaders of the global economy. The most economically developed among developing countries are Brazil, China, and India, where industry has been a major factor in their rapid rise over the last 20 years, and which will allow economists to maintain economic growth; conversely the countries of Africa, South America, the Middle East, and East Asia will develop new forms of production, which will provide the impetus for economic recovery due to

the corresponding changes in the structure and technology of industrial production.

We concur with the position of González from the University of Santiago de Compostela that the term "post-industrial economy" (González 2019) has become synonymous with reformatting the economic structure of countries with a predominance in the tertiary sector, meaning they produce services for a new economy with a predominance of innovation and high-tech enterprises. At the same time, we must also understand that the explanation of the nature and manifestations of processes associated with economic development inevitably lies in the channel of conjugation between economics and sociology. For example, economists view deindustrialization as a natural stage of economic development caused by strong productivity growth in manufacturing (which reduces demand for labour) and rising consumer welfare (which disproportionately increases the demand for services) (Kollmeyer 2020). According to sociologists, deindustrialization involves many social problems, such as growing income inequality, persistently high unemployment, and a serious decay in society.

The most relevant trends concerning the economic dynamics of the development of developed, developing, and transition economies include re-industrialization, new industrialization or "innovative industrialization", neo-industrialization, and super-industrialization. Despite the similarity of possible meanings, these concepts still have significant differences.

Reindustrialization is the restoration, modernization, and innovative renewal of traditional industries based on new industrial technologies, accompanied by the creation of new economic sectors and industries. It should be noted that reindustrialization in no way implies restoring an industry to its former formats—it is industrialization with new principles and technologies, reconstructing the material and technical base for economic development. Reindustrialization focuses on overcoming the consequences of deindustrialization in the changing business environment when it is necessary to restore either production links within technological chains (production cooperation or combination), or even to restore entire industries that have fallen into decline due to lack of competitiveness in the international market, and provides the ability to acquire a finished product on favourable terms in international markets.

Post-industrialization developments through the innovative economic sector—not because of crowding out traditional industries, but because of

initial technical and technological renewal—should give the country's historically specialized industries a high-tech and knowledge-intensive appearance.

Neo-industrialization is the development of fundamentally new industries of the sixth long cycle, following Kondratiev's theory (Kondratiev 2002). To some extent, it is also impacted by the Fourth Industrial Revolution, in accordance with Schwab's concept, when robotics, the Internet of Things, virtual reality, 3D printing, biotechnology, artificial intelligence, and other modernistic concepts become the components of a new economic reality (Schwab 2017) and universities create new science (Torkunov 2019).

Super-industrialization is neo-industrialization from the position of focusing on accelerated development in terms of technological development. Here, great emphasis is placed on significant breakthrough technologies, which are partly the further development of technologies of the fifth long economic cycle: biotechnologies (molecular biology and genetic engineering), nanotechnologies, artificial intelligence systems with the active development of space technologies, global information networks, nuclear energy, and so on.

New industrialization is a radical technological re-equipment of material production (traditional industrial sectors) based on Nano-, Bio-, IT- and Cognitive (NBIC) technologies. It is an integrating concept, including both re-industrialization and neo-industrialization. It is also new industrialization that, in addition to the fundamentally technological renewal of industry, implies significant changes in the institutional environment.

Thus, conceptually, each of these terms has a certain specificity, just as each country has its own unique socio-economic state and its potential for involvement in the world's post-industrial development. For some countries, a reindustrialization strategy based on the growth of industrial production (tradition) is appropriate; others must use a fundamentally innovative strategy, for example, new industrialization (innovation) or a combination of these strategies.

In the essence of the processes and changes occurring in the industry, the new industrialization of the United States, Canada, and Western Europe implies returning production facilities (previously withdrawn to Southeast Asia) to a new robotic base, closer to research centres and consumer markets. US reindustrialization is based both on traditional competitive advantages (leading positions in scientific and innovative spheres) and on new ones (cheaper energy resources, new energy-intensive

industries using cheap gas and electricity), which will ultimately help reduce dependence on industrial imports. Despite the obvious advantages of reindustrialization, some experts note that returning production to the United States is likely to increase labour productivity, but guarantees neither a reduction in the costs of large companies nor the growth of quotations of their valuable securities—it seems it is still companies in either the high-tech or the banking sector that have the highest capitalization rate.

Chinese industrialization was based on the mass copying of foreign technologies and the use of cheap labour; the new Chinese industrialization (in fact, during the third wave after the Second World War) has been focused on building a complete innovation cycle from applied R&D to the development of new industries (environmental and energy-saving equipment, computer science, biotechnology, new materials).

Taking Russia, Latin America, and Africa under consideration, the issues of whether to fundamentally modernize or to traditionally restore potentially competitive economic sectors, the gradual creation of high-tech industries, and the inclusion in global networks as producers of goods and services with high added value are more relevant there.

The concept of new industrialization, based on the list of tasks to be solved within its framework, essentially corresponds to the development paradigm; this, however, is still catching up to the standards of modernity. In Russia, for example, it therefore can only be successfully implemented if it is progressive and accelerated. As international experience shows, at the initial stage of a new long economic cycle, countries lagging behind have a unique opportunity to jerk, get ahead, and become leaders, especially when the corresponding potential is accumulated.

Nevertheless, despite the development of terminology, as well as the state of the economy and industry in specific countries, both theorists and practitioners agree that reindustrialization, as the restoration of traditional industries, should be accompanied not merely by promising technologies, but fundamentally by neo-industrialization: the technological renewal of traditional industry and the development of new industrial production sectors in accordance with new technologies. The introduction of this is already happening. At the same time, we note that economic growth is not based on new technologies, but is creating the potential for technological leadership and the corresponding specialization of production, which will make it possible to implement the classical postulates of the comparative advantages theory by Ricardo: if a country has failed to provide technological development, then it borrows modern technologies from abroad

and further improves them without expecting significant added value. At the same time, those countries involved in creating new products and mastering new technologies at the final stage of their life cycle may already have a larger output volume with a significantly smaller contribution to GDP.

The study of Hausmann and Hidalgo, who monitored the development of countries over the past 60 years, proved that as soon as a nation begins to expand the knowledge and capabilities necessary for producing goods and providing them to global markets, this nation paves its way to prosperity. Besides, the study determined that the availability of knowledge allows for the production of more complex products, and the development and implementation of more advanced production processes leads to even greater economic prosperity. The authors' study also argues that a combination of knowledge (competencies) and opportunities for the commercialization of new technologies is a major factor in differences in national incomes (Hausmann et al. 2013). Consequently, advanced production is a key factor in creating high added value through job creation and economic prosperity.

Innovation is the engine of development. Any innovative economy should be interested in Schumpeter's theory of "creative destruction" (or "creative destruction"), which, he argued, can renew the economy and society, but this requires destroying the existing order of things to create a new one (Schumpeter 1983). In various classifications, there are various types of innovations that are essential for the identification and implementation of new industrialization, such as:

- Nascent innovations–intensively developing technological areas with a high potential for generating inventions, innovations, and associated significant economic and social consequences (Gokhberg et al. 2013).
- Destructive innovations—technologies with fundamentally new consumer properties that can completely change the structure of markets (Christensen 1997). Such innovations can be defined as innovations that change the "rules of the game".
- Technological applications—technologies in interdisciplinary technological fields that can significantly affect socio-economic development and change people's lives (Silberglitt et al. 2006).

The first type of innovation is identified at the stage of research and development, and the second and third when products based on these technologies can already be partially introduced into the market.

The current situation for reversing economic downturn, implemented across the global economy, requires new theories of economic development. We instead conclude that this structural crisis can be overcome by the introduction of new technologies that open up new production capabilities which provide a breakthrough in improving economic efficiency and instigate the transition to a new stage of height.

It is obvious that each country chooses its own "window of opportunity", and the strategies chosen by world leaders do not apply for the most part to the conditions of the Russian economy. For example, the "transfer" strategy, characteristic of Japan, is based not just on the use of foreign scientific and technological experience, but also on the creation and development of its own scientific, technological, and production potential with full provision of the innovation cycle; however, not only does it require significant financial costs (for acquiring licenses), but it also forms a direct relationship with technologically advanced countries, thereby creating a threat to the country's national security. The strategy of "catching-up development", which is characteristic of China, is based on the creation of its own scientific and technological potential, supported by a combination of state and market forms of innovation. However, the implementation of such a strategy requires attracting foreign capital whilst investing more than a third of GDP; in addition, this strategy cannot create institutions that protect the economy and focus on modernizing all sectors of the economy at once. The "build-up" strategy, which is characteristic of the United States, is based on the use of internal scientific and technical potential with the involvement of foreign scientists and designers, and the integration of the fundamental science of universities and the applied science of firms. Despite the obvious positive results of the implementation of this strategy (the creation of new products, high technologies that are being implemented both in production and in the social sphere, ensuring a constant build-up of innovations), this strategy requires a reasonable choice between a limited number of highly effective areas of scientific and technological development, then providing them with state funding with the obligatory involvement of a private investor.

Moreover, for every evolutionary change—or revolutionary transformation—in the industry, society and people must be the focus. Indeed, new technologies of post-industrialism are changing the business models

of companies, so they should develop strategies to support the employment of workers in conjunction with the development of robotics and artificial intelligence, or organize training on high-tech equipment and employee involvement. This must be done promptly and speedily; whereas the first, second, and third industrial revolutions took a relatively long period of time, the dynamics and speed of the spread of digital technologies make these tasks extremely timely, and public control is necessary.

Therefore, our book is based on an analysis of three main areas of the development of the post-industrial society, alongside the dilemmas associated with its transformation:

(a) the impact of new (including digital) technologies on economic relations, as well as the prospects for the introduction and impact of various innovative technologies on the development of industry and services, business, consumer behaviour, market behaviour, and so on;
(b) the transformation of existing "traditional" institutions in connection with the penetration of new technologies of the post-industrial economy into practice; and
(c) a study of the contradictions between modern productive forces and getting out of date production relations.

The post-industrial society is a diverse series of paradoxical ecosystems; it has predictable and unpredictable manifestations; there are positive and negative aspects; it requires modern values and challenges (to nature, people, and the economy) and relies upon new advanced technologies (for business and society, including megatrends and development), yet requires conservative steps during the period of transformation. To present this complex world as comprehensively as possible, we present our book as a collection of the following chapters.

Chapter 2, "Development Institutions and Sovereign Wealth Funds as a Tool for Implementing Transformation Processes in the Economy", contains an original approach to researching the role of special organizations created by governments for investing in the implementation of economic development projects (development institutions and foundations) and for solving tasks of conservation and financial stability in times of crisis (sovereign wealth funds). This creates the basis for public administration at a new stage of post-industrial development, when the financial resources accumulated during periods of industrialization or favourable economic

conditions should be used to increase the potential for future development projects, creating opportunities to increase the competitiveness of countries, companies, and their products, and increase welfare citizens.

Chapter 3, "Managing for the Future: Crisis Management Under Post-industrial Modernization", includes an assessment of the factors that influence post-industrial modernization processes and lead to crises. The authors emphasize the adoption of measures to prevent the risks of post-industrial transformations for companies at different stages of their life cycle based on current management tools and a combination of scenario and matrix approaches ("management for the future"), which will reduce the likelihood of bankruptcy and increase sustainability.

Chapter 4, "High Technologies for Smart City Development", will lead the reader into an exclusive manifestation of post-industrialism and digital technologies—smart cities. We are used to the fact that the municipal management system is quite traditional, but a modern city is a special environment for introducing innovations and high-tech solutions aimed at achieving the highest possible quality of resource and infrastructure management, ensuring optimal level of service and security for the population, and maintaining a sustainable environment for living and business activity.

Chapter 5, "Digital State: Creation Through Project-Functional Structure of Public Administration", analyses the public administration system and assesses barriers to innovation, especially in digital technology. The digital state apparatus is already a real future, but for the transition from the existing bureaucracy to the state apparatus of the digital platform, it is important to develop the skill of projective problem solving, where the design and functional structure of the state apparatus will solve conflicts of management systems.

Chapter 6, "Innovative Ecosystems for Attracting Investment in a Post-industrial Society", contains specific tools for taking advantage of international cooperation and public-private partnerships, including attracting foreign capital for joint innovation programmes. The authors assess the potential for interaction between countries (using the example of Serbia and Russia) and cooperation in industry and services, which creates conditions for access to the latest technologies.

Chapter 7, "Transformation of a Traditional Financial Conglomerate into a Financial Ecosystem", considers the evolution of financial convergence in the global financial market and the development of technology as essential prerequisites for creating a new type of financial conglomerate, called the ecosystem financial conglomerate (EFC), and a specific business

model. This contributes to a paradigm shift in the global financial market, highlights the need to take changing customer needs and various risks into account, notes the emergence of new global players operating through the EFC, and requires reviewing prudential measures and crisis management tools.

Chapter 8, "International Investment Law: A Journey from the Past to the Future", analyses the legal aspects of international investments and dispute resolution regimes in the future, taking into account the geographic expansion of interactions in the post-industrial economy. Due to the rapidly changing forms and content of investments across modern international political, economic, and social landscapes, the authors turn to the study of the intermediate evolutionary process from a rich past to a multiverse future.

Chapter 9, "'Who Will Rule?': Institution of State in the Transformation Process of the Twentieth and Twenty-First Centuries", contains a deep multidisciplinary study of transformation processes in public administration and its institutionalization, when, in a post-industrial society, a service state as a new model for solving the vetocracy problem cannot be recognized as the right way for society regardless of its socio-economic development.

Chapter 10, "'New Generation' EU Free Trade Agreements: A Combination of Traditional and Innovative Mechanisms", examines the current provisions and new approaches to the legal regulation of trade relations in various areas: electronic commerce, the resolution of investment disputes, and the relationship between trade, labour, and environmental protection. The development of the post-industrial economy and international cooperation makes it possible to recognize electronic contracts, which itself could completely abolish customs duties in electronic commerce, suggest a new system of investment courts, and require the active participation of civil society in implementing trade agreements.

Chapter 11, "Value Creation by the Sharing Economy in the Post-industrial Society", explores a new form of economic exchange, which, while developing, has always been a source of societal development. The author carries out a value measurement of a shared economy through the prism of certain components (social approval, economic choice [based on benefits], and digital coordination), identifies types of new ways to create and redistribute income, and takes into account the contradictions between saving and consumption. An important conclusion is that the

sharing economy has a key advantage: it relies on real rather than formed demand, which substantially eliminates marketing errors.

Chapter 12, "Change of Tax Policy Model as a Base for Innovation Development While Transferring from the Pre-industrial to the Industrial Society", discusses the inevitable changes in taxation as a stage of development for the modern economic system. An analysis of Vietnam's experience is chosen for historical review, and comparison is conducted of its taxation model at the turn of the nineteenth and twentieth centuries, as well as the transition from pre-industrial to industrial taxation in the twenty-first century, which led to the innovative development of the country.

Chapter 13, "Civil Liability Concept Transition in Post-industrial Countries", is devoted to the evolution of an important legal institution that takes into account the possibility of monetary compensation for negative property consequences and liability for non-fulfilment of contractual or non-contractual property obligations. It is also important that in the post-industrial economy, in connection with the development of new technologies, the importance of accounting for lost profits as an important component of damage is increasing.

Chapter 14, "Global Competitiveness of High-Tech Companies: Factors, Barriers, Government Support", allows readers to familiarize themselves with what it means to be a high-tech company in the post-industrial economy, the criteria for classifying industries as high-tech industries, and what government support preferences are available. The authors also emphasize the importance of knowledge-intensive and technology-intensive industries in the global economy, as well as the factors and barriers to their international competitiveness.

Chapter 15, "Intellectual Evaluation of the Economic Systems' Performance in Post-industrial Society", is focused on finding solutions to the problems of forecasting the development of companies that are affected by rapid and unforeseeable environmental changes. It is proposed to use a risk analysis and management algorithms using cognitive modelling technologies and neuro-fuzzy networks to provide decision support.

Chapter 16, "Transit Economy in Global Post-industrial Eurasia", assesses innovative development of all types of transport, based on the formation of a single digital transport and logistics environment. The authors note the importance of developing and implementing mechanisms for generating, distributing, and redistributing income from the transit economy on the territory of Global Eurasia in the context of automation,

robotics, digital transformation, the introduction of artificial intelligence, and the transition to paperless and uninhabited technologies.

Chapter 17, "Defining the Readiness for Smart City Concept: Russian Municipalities Study", analyses the practices of Russian municipalities in implementing the concept of "smart cities" as projects supporting the post-industrial economy. The authors applied the expert assessment method and assessed their readiness to implement digital technologies, the availability of budgetary resources, and the coordination of the goals and objectives of the digital agenda.

Chapter 18, "The Evolution of Fashion Consumer Perception in the Post-industrial Era", is atypical on the stated topic, as the authors discuss the influence on the creation and marketing of fashionable clothes of the changed behaviour of new consumer groups—in particular the issues of eco-friendly fashion and sustainable development—as well as the active use of digital technologies. The post-industrial economy not only is focused on marketing achievements, but also takes into account and shapes consumers' perception of fashion.

Chapter 19, "National Innovation System: Formation and Development in the Post-industrial Economy", considers how to modernize the national innovation system in developing and post-Socialist countries through creating a virtual investment community, forming priority development areas, reforming the regional financial system and structural policy, and optimizing budgets.

Chapter 20, "Does a Solution Exist to the Paradox of Trust in Financial Institutions?", considers issues of creating a trusting environment, using the example of financial market institutions, assessing trust, and developing strategies to increase the trust level across various scenarios of economic development. The authors identified the factors that have a positive and a negative impact on the level of trust, and created a set of recommendations for practical use.

In general, this book—written by professors and scientists from Russia, Serbia, Germany, France, Poland, and Tajikistan—deals with public administration, economy, law, and psychology, and is intended to provide a comprehensive overview of the opportunities and challenges associated with modern developments across society, production, and consumption. Combining the work of recognized scientists and specialists in various scientific fields, this book provides a comprehensive understanding of post-industrial development, highlighting the driving forces and limitations,

strategies, funding sources, tools, and technologies for their implementation.

The book includes the practice of countries such as Russia, which is moving from large-scale new industrialization to an undecided but informed choice of its industries' future, including the restoration of traditional industries and the creation of promising new ones. The book is based on specific attitudes to the state management of development finance, the feasibility of interaction between the state and business in the management of scientific and technical breakthroughs with maximum application for viable industries' potential, and the best positioning of newly created industries as part of a new technological cycle.

We sincerely hope that this book will be an informative source of knowledge about the development of the post-industrial society, and also will be useful to scientists, economists, sociologists, and politicians; however, we also hope that it allows each reader to understand a lot of real dilemmas that are inherent in the modern stage of economic modernization, and draw their own conclusions about its values. We are only at the beginning of a revolution (some will call it post-industrial, some will call it digital) that will fundamentally change the way we live, work, and communicate.

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