

Eurasian Studies in Business and Economics 19
Series Editors: Mehmet Huseyin Bilgin · Hakan Danis

Mehmet Huseyin Bilgin

Hakan Danis

Ender Demir

Conrado Diego García-Gómez *Editors*

Eurasian Business and Economics Perspectives

Proceedings of the 32nd Eurasia
Business and Economics Society
Conference



 Springer

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Series Editors

Mehmet Huseyin Bilgin, Istanbul, Turkey

Hakan Danis, San Francisco, CA, USA

Representing

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Mehmet Huseyin Bilgin • Hakan Danis •
Ender Demir • Conrado Diego García-Gómez
Editors

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and Economics Society Conference

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Editors

Mehmet Huseyin Bilgin
Istanbul Medeniyet University
Fatih, Istanbul, Turkey

Hakan Danis
MUFG Union Bank
San Francisco, California, USA

Ender Demir
Department of Business Administration,
School of Social Sciences
Reykjavik University
Reykjavik, Iceland

Conrado Diego García-Gómez
Faculty of Business and Labour - Duques de
Soria Campus
University of Valladolid
Soria, Spain

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Preface

This is the 19th issue of the Springer's series **Eurasian Studies in Business and Economics**, which is the official book series of the Eurasia Business and Economics Society (EBES, www.ebesweb.org). This issue includes selected papers presented at the 32nd EBES Conference that was held on August 5–7, 2020. Due to the COVID-19 pandemic, the conference presentation mode has been switched to “online/virtual presentation only.”

We are honored to have received top-tier papers from distinguished scholars from all over the world. We regret that we were unable to accept more papers. In the conference, 184 papers were presented and 355 colleagues from 49 countries attended the online conference. Distinguished scholar **Jonathan Batten** from RMIT University, Australia; **Klaus F. Zimmermann** from EBES, GLO, UNU-MERIT and Maastricht University, The Netherlands; **Marco Vivarelli** from Università Cattolica del Sacro Cuore in Milano, Italy; and **Dorothea Schäfer** from DIW Berlin, GLO, and Jönköping University, Sweden joined the **KEYNOTE SESSION** entitled “How COVID-19 can help us build a better society.” Moreover, EBES Executive Board selected **Asli Demirguc-Kunt**, Chief Economist, Europe and Central Asia Region, The World Bank, USA as the EBES Fellow Award 2020 recipient for her academic achievements and invaluable contributions to financial development, banking, and financial inclusion.

In addition to publication opportunities in EBES journals (*Eurasian Business Review* and *Eurasian Economic Review*, which are also published by Springer), conference participants were given opportunity to submit their full papers for this Issue. Theoretical and empirical papers in the series cover diverse areas of business, economics, and finance from many different countries, providing a valuable opportunity to researchers, professionals, and students to catch up with the most recent studies in a diverse set of fields across many countries and regions.

The aim of the EBES conferences is to bring together scientists from business, finance, and economics fields, attract original research papers, and provide them publication opportunities. Each issue of *the Eurasian Studies in Business and Economics* covers a wide variety of topics from business and economics and

provides empirical results from many different countries and regions that are less investigated in the existing literature. All accepted papers for the issue went through peer-review process and benefited from the comments made during the conference as well. The current issue is entitled “Eurasian Business and Economics Perspectives” and covers fields such as education, human resources management, management, banking, finance, economics of innovation, and regional studies.

Although the papers in this issue may provide empirical results for a specific county or regions, we believe that the readers would have an opportunity to catch up with the most recent studies in a diverse set of fields across many countries and regions and empirical support for the existing literature. In addition, the findings from these papers could be valid for similar economies or regions.

On behalf of the series editors, volume editors, and EBES officers, I would like to thank all the presenters, participants, board members, and keynote speakers, and we are looking forward to seeing you at the upcoming EBES conferences.

Best regards

Reykjavik, Iceland

Ender Demir

Eurasia Business and Economics Society (EBES)

EBES is a scholarly association for scholars involved in the practice and study of economics, finance, and business worldwide. EBES was founded in 2008 with the purpose of not only promoting academic research in the field of business and economics but also encouraging the intellectual development of scholars. In spite of the term “Eurasia,” the scope should be understood in its broadest term as having a global emphasis.

EBES aims to bring worldwide researchers and professionals together through organizing conferences and publishing academic journals and increase economics, finance, and business knowledge through academic discussions. Any scholar or professional interested in economics, finance, and business is welcome to attend EBES conferences. Since our first conference in 2009, around 13,447 colleagues from 99 countries have joined our conferences and 7587 academic papers have been presented. **EBES has reached 2470 members from 87 countries.**

Since 2011, EBES has been publishing two journals. One of those journals, *Eurasian Business Review—EABR*, is in the fields of industrial organization, innovation, and management science, and the other one, *Eurasian Economic Review—EAER*, is in the fields of applied macroeconomics and finance. Both journals are published quarterly by *Springer* and indexed in *Scopus*. In addition, EAER is indexed in the *Emerging Sources Citation Index (Clarivate Analytics)* and EABR is indexed in the *Social Science Citation Index (SSCI)* with an impact factor of **3.5** as of 2020.

Furthermore, since 2014 Springer has started to publish a new conference proceedings series (**Eurasian Studies in Business and Economics**) which includes selected papers from the EBES conferences. The series has been indexed by **SCOPUS**. In addition, the 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th (Vol. 2), 21st, and 24th EBES Conference Proceedings have already been accepted for inclusion in the *Conference Proceedings Citation Index-Social Science and Humanities (CPCI-SSH)*. Other conference proceedings are in progress.

We look forward to seeing you at our forthcoming conferences. We very much welcome your comments and suggestions in order to improve our future events. Our success is only possible with your valuable feedback and support!

With my very best wishes,

Klaus F. Zimmermann
President

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Contributors

Toure Talnan Aboulaye Graduate School of Economics, Department of Economics, Kobe University, Kobe, Japan

Elisa Arrigo Department of Economics, Management and Statistics, University of Milano-Bicocca, Milan, Italy

Ajtene Avdullahi Faculty of Economics, University Isa Boletini in Mitrovica, Mitrovica, Kosovo

Anda Batraga University of Latvia, Riga, Latvia

Daiga Behmane Riga Stradins University, Riga, Latvia

Zuzana Birknerová Department of Managerial Psychology, Faculty of Management, University of Prešov, Prešov, Slovakia

Gökhan Çaylak Istanbul Bahcesehir University, Istanbul, Turkey

Oscar Mauricio Cruz-Sanchez Universidad Nacional de Colombia, Bogotá, Colombia

Gustavo Di Santo Department of Political and Social Sciences, University of Calabria, Rende, Italy

Michael Dimmer Department of Accounting and Auditing, Friedrich-Alexander University Erlangen-Nuremberg, Nuremberg, Germany

Oscar Fernando Castellanos Dominguez Departamento de Ingeniería de Sistemas e Industrial, Universidad Nacional de Colombia, Bogotá, Colombia

Dariia Doroshkevych International University of Finance, National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”, Kyiv, Ukraine

Adnan Veysel Ertemel International Trade Department, Istanbul Commerce University, Istanbul, Turkey

Diana Geraldine Jimenez Garcia Departamento de Administración de Empresas, Fundación Universitaria Los Libertadores, Bogotá, Colombia

Evelina Gavėnaitė Faculty of Economics and Management, Vytautas Magnus University, Kaunas, Lithuania

Giani Gradinaru The Bucharest University of Economic Studies, Institute of National Economy – Romanian Academy, Bucharest, Romania

Samah Chemli Horchani Management Department, Tunis El-Manar University, Faculty of Economics and Management Sciences of Tunis FSEGT, Tunis, Tunisia

Olha Ilyash International University of Finance, National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”, Kyiv, Ukraine

Alexander M. Karminsky School of Finance, National Research University Higher School of Economics, Moscow, Russia

Ella P. Khromova School of Finance, National Research University Higher School of Economics, Moscow, Russia

Ennata Kivrina Development and Mobility Projects, BA School of Business and Finance, Riga, Latvia

Jana Kovalová Department of Managerial Psychology, Faculty of Management, University of Prešov, Prešov, Slovakia

Roman A. Kudrov School of Finance, National Research University Higher School of Economics, Moscow, Russia

Jekaterina Kuzmina Economics and Finance, BA School of Business and Finance, Riga, Latvia

Andris Natrins Management of the School, BA School of Business and Finance, Riga, Latvia

Iulia Neagoe The Bucharest University of Economic Studies, Institute of National Economy – Romanian Academy, Bucharest, Romania

Salvatore Perri Department of Law, Economics and Sociology, University of Magna Graecia, Catanzaro, Italy

Didzis Rutītis BA School of Business and Finance, Riga, Latvia

Robert Adrian Candoi Savu Economy Department, Bucharest University of Economic Studies, Bucharest, Romania

Liubov Smoliar International University of Finance, National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”, Kyiv, Ukraine

Sonata Staniulienė Faculty of Economics and Management, Vytautas Magnus University, Kaunas, Lithuania

Róbert Štefko Department of Marketing and International Trade, Faculty of Management, University of Prešov, Prešov, Slovakia

Liviu Adrian Stoica Finance Department, Bucharest University of Economic Studies, Bucharest, Romania

Katharina Stolz General Business Administration, esp Innovation & Service Management, University of Stuttgart, Stuttgart, Germany

Ruxandra Trifan Department of Finance, The Bucharest University of Economic Studies, Bucharest, Romania

Tatjana Volkova BA School of Business and Finance, Riga, Latvia

Jacek Witkowski Department of Economy and Economic Management, Faculty of Administration, Lublin University of Technology, Lublin, Poland

Osman Yildirim Engineering Department, Istanbul Arel University, Istanbul, Turkey

Gheorghe Zaman The Bucharest University of Economic Studies, Institute of National Economy – Romanian Academy, Bucharest, Romania

Lucia Zbihlejová Department of Intercultural Communication, Faculty of Management, University of Prešov, Prešov, Slovakia

Anda Ziemele Finances, BA School of Business and Finance, Riga, Latvia

Mahmoud Zouaoui Management Department, Business School of Tunis ESCT, Tunis, Tunisia

Part I
Eurasian Business Perspectives: Education

Validity and Reliability of the Flipped Learning Scale



Osman Yildirim, Liubov Smoliar, Olha Ilyash, and Dariia Doroshkevych

Abstract Digital transformation requires restructuring in all areas of life and getting used to the new normal. Education is also greatly affected by digital transformation. In higher education, while learning and teaching styles change, educational environments also change according to the requirements of digital transformation. Flipped learning is becoming increasingly important from lifelong learning to university education. Therefore, a scale validity and reliability study on flipped learning are aimed at the study. In order to achieve this purpose, linguistic validity, time validity, and pilot application are performed with the survey items. The research survey is conducted on 500 participants by the easy sampling method. Based on research findings, the 4-factor structure of the flipped learning scale is confirmed since the test values and fit index values (GFI, CFI, SRMR, RMSEA) of the research model are within acceptable limits. In higher education, E-Learning applications are increasing in parallel with digitalization. In particular, new applications (robots, internet of things, augmented reality, etc.) that come with Industry 4.0 included not only theoretical courses but also laboratory applications within the scope of E-Learning. This research aimed to draw the interests and attention of educators and education professionals to the ways of evaluating virtual learning environments and styles.

Keywords Flip scale · Flipped learning · Validity · Reliability

O. Yildirim
Istanbul Arel University, Istanbul, Turkey
e-mail: osmanyildirim@arel.edu.tr

L. Smoliar · O. Ilyash (✉) · D. Doroshkevych
International University of Finance, National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”, Kyiv, Ukraine
e-mail: oliyai@meta.ua

1 Introduction

Education is a very important subject that must be emphasized. In the enterprises, especially the development trainings or achievement development of business objectives in a short time are researched. In other words, there is quite a lot of confusion over the realization of the return on investment in education. Again, new learning methods for the education quality in higher education, the effectiveness of education, or transfer of education are being investigated with great interest. Flipped learning finds application in both business education (certification) and higher education.

In higher education, E-Learning applications have started to increase in parallel with digitalization. In particular, new applications (robots, internet of things, augmented reality, etc.) that come with industry 4.0 have included not only theoretical courses but also laboratory applications within the scope of E-Learning. For example, by means of augmented reality, the internal organs of the human body and the detailed internal structure of each of these organs are served to students in a virtual environment.

Digital learning environments, sometimes called “Flipped Classroom” and sometimes “Blended Learning” in the literature, are predicted to become more widespread with the compulsions of Covid-19-like pandemics. Measuring effectiveness in flipped classroom or blended learning patterns has become of paramount importance. In other words, it has become necessary to evaluate these new learning and teaching styles and related learning environments. For this reason, it required the students to watch the course content online, watch the lecture videos at home, and move the learning process to an individual area.

Flipped classroom is defined as a model in which traditional lesson activity is reversed. Before the lesson, students should consider the items related to the lesson (lecture presentation, homework, video, reading passages, exam questions, etc.). In this way, they learn most of the learning event without contacting the instructor of the course (Lage et al., 2000; Anderson & Krathwohl, 2001). Flipped learning model is the key opportunity to increase active learning and provides a large learning space for students. This learning style supports the effectiveness of education and increases the students’ achievement (Prince, 2004). In few studies conducted on students studying in higher education, it is also found that the flipped learning model does not satisfy the students (Strayer, 2012).

There are studies in the literature that reveal the effects of the flipped learning and teaching model on students and students’ learning motivations (McLaughlin et al., 2014; Gilboy et al., 2015; Koo et al., 2016). In the relevant literature, there have been many studies investigating the benefits of the flipped learning method in recent years (Keene, 2013; Davies & West, 2013; Siegle, 2014; Borup et al., 2012). The flipped learning is a teaching method in which students examine course materials before, during, and after class to maximize learning activity. Before the course, each student can access the course materials (text, powerpoint slides, video, test questions, etc.)

on the internet (Bergmann & Sams, 2012; Davies & West, 2013; Frydenberg, 2013; Copley, 2007; Kay & Kletschin, 2012; Vajoczki et al., 2010).

It was suggested that the requirements of Bloom's full learning theory could be met by trying to organize classroom learning environments according to the flipped learning approach (Sams & Bergmann, 2012). Thoms (2013) investigated the effect of the flipped learning approach on students' detailed learning level. The flipped learning approach, which imposes new responsibilities on teachers and students, is closely related to the fulfillment of individual responsibilities by both parties. It has been pointed out that the responsibility of the teacher is more than the traditional approach in order to achieve healthy learning in flipped learning (McLaughlin et al., 2013). Flipped learning classroom training started as a kind of desk work in order to create a database by collecting the conceptual foundations and the terminology used, and the flipped learning approach was analyzed with the collected data. According to the data collected, flipped learning approaches were put forward by dividing them into sections to be opened to individual learning in classroom activities and technological environments (Wolff & Chan, 2015). Computerized education that goes outside the classroom is defined as individual learning and expressed as a personalized form of education (Sams & Bergmann, 2014; Butt, 2014).

The basic elements of the flip method are (1) enabling students to access the course, (2) encouraging students to prepare for the course, (3) establishing a mechanism that evaluates student understanding, and (4) planning activities for active learning (Kay & Kletschin, 2012; Warter-Perez & Dong, 2012; Bates & Galloway, 2012; Brame, 2013; Sarawagi, 2014; Abeysekera & Dawson, 2015; Ilyash & Lupak, 2016). Flipped learning is the use of digital tools that provide enhanced student engagement, where the teacher shows videos to convey content and takes a more active role in lecturing. Based on a social application model, they create a structure that allows integration with technology (Beach et al., 2016; Frolova et al., 2021). The flipped learning approach has had an impact on students' speaking skills, motivation, and learning outcomes (Jones et al., 2019; Zarrinabadi & Ebrahimi, 2019; Haghghi et al., 2019). In the inverted learning model, classroom studies are mostly based on active learning. Out-of-class studies are organized as video watching or computer-based studies. With flipped learning, the traditional learning method has been frequently researched academically (Fraga & Harmon, 2014; AlJaser, 2017). With their meta-analysis study, Hew and Lo (2018) tried to measure the academic success of healthcare students using the flipped learning approach.

2 Methodology

Face-to-face questionnaires were applied to 500 students who received undergraduate education (nursing, physical therapy, health management, child development) in the field of health, who accepted voluntary participation in the survey. For the research, a target audience who is familiar with online courses and who is assumed to be using computers in their classes was chosen. The opinions of healthcare

professionals, who voluntarily accepted to participate in the survey with easy sampling method, about flipped learning were investigated.

The questionnaire was adapted from the original statements on the Flipped Learning Network website (FLN, 2014). Participants were asked to score each 5-point Likert scale ranging from 1 (Strongly Agree) to 5 (Strongly Agree). For the validity and reliability study of the flipped learning scale, language validity, time validity, pilot application, field application, internal consistency and reliability, exploratory factor analysis for validity, confirmatory factor analysis and reliability, composite reliability, convergent validity, decomposition validity, and explained mean variance values were analyzed.

The English expressions of the Flipped Learning scale were translated from English to Turkish by one of two experts in the field of English Language and Literature. Later, the other expert translated this translation text back from Turkish into English. Translation and retranslation are intended to prevent slippage in translations. In order to understand whether the expressions of the scale were understood correctly, a pilot study was conducted with a volunteer person between the ages of 20 and 30. Reliability and internal consistency coefficient were measured with Cronbach's alpha value (Brislin et al., 1973).

3 Results

The difference between the demographic values in both groups can be considered identical because the gender ($p > 0.05$) and age groups ($p > 0.05$) were used in the difference tests. Reliability value obtained from the two groups Cronbach's alpha value is "high reliability". Since the value 0.928 for the first translation is slightly higher than the value for the second translation, it is the first translation to be preferred for the actual application.

The corrected item-total correlation values (>0.912) and reliability (Cronbach's alpha) values (<0.928) were found for all items, under the condition that the item was deleted (Table 1).

Table 1 Results from groups where two different translations were applied

Translation number	Number of items	Number of participants	Gender	Age	Cronbach's alpha
1	11	40	F (19); M (21)	26 ± 1.2	0.928
2	11	40	F (22); M (18)	25 ± 0.9	0.912
<i>p</i>	–	–	$>0.05^a$	$>0.05^b$	–

Source: Authors own study

Note: ^a Independent test p value, ^b Chi-square test p value

3.1 Time Validity

After the pilot application for language validity, the same 40 participants were interviewed and the same translation text was used again 20 days later. At the end of this application, the Cronbach's alpha value (0.924) was determined. Therefore, it was decided that the validity of the test-retest result for the first translation was very close (0.928) in the first application and (0.924) in the second application.

3.2 Piloting

The first translation, whose language validity and time validity was ensured, was piloted with 10 times the number of participants (110 students). With this application, it is aimed to examine the reliability values when the substance is deleted. With the pilot application, it will be tried to ensure that the translations of the substances that increase the reliability of the scale when deleted are more understandable in the actual application. The following reliability values were obtained in the pilot study performed on 49 females and 61 males. The findings related to the pilot application are shown in Table 2.

3.3 Field Application

Following the final arrangements, field application was carried out on 500 participants. Using the easy sampling method, a questionnaire was applied to 525 people

Table 2 Reliability values obtained in pilot application

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's alpha if Item Deleted
f11	36.782	86.814	0.777	0.951
f12	36.700	87.111	0.827	0.949
f13	36.791	86.240	0.841	0.949
f14	36.782	88.025	0.796	0.950
f15	36.755	88.315	0.790	0.950
f16	36.618	89.339	0.753	0.952
f17	36.845	87.545	0.784	0.951
f18	36.618	88.550	0.788	0.951
f19	36.855	89.116	0.734	0.952
f110	36.682	87.980	0.754	0.957
f111	36.755	88.187	0.777	0.951
Total	Cronbach's alpha			0.955

Source: Authors own study

Table 3 Demographic characteristics of the participants

Demography		N	%
Gender	Male	216	43.2%
	Female	283	56.8%
Age	<20	119	23.8%
	20–25	381	76.2%
Academic credits	= < 2	55	11.0%
	2–3	343	68.6%
	3–4	102	20.4%
Field	Nutrition	2	0.4%
	Psychology	2	0.4%
	Child development	6	1.2%
	Psychotherapy	8	1.6%
	Nursing	469	93.8%
	Health management	13	2.6%

Source: Authors own study; N: number of participants

Table 4 Reliability and internal consistency values

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's alpha if Item Deleted
f1	38.867	70.152	0.676	0.933
f2	38.778	70.933	0.726	0.931
f3	38.762	70.557	0.753	0.930
f4	38.853	70.380	0.729	0.931
f5	38.764	69.874	0.769	0.929
f6	38.752	70.833	0.703	0.932
f7	38.813	70.201	0.740	0.930
f8	38.718	70.854	0.714	0.931
f9	38.813	69.991	0.753	0.930
f10	38.716	70.677	0.755	0.930
f11	38.677	70.474	0.725	0.931
Total	Cronbach's alpha			0.937

Source: Authors own study; N: number of participants

face-to-face between September 2020 and October 2020. However, 25 questionnaires were excluded from the evaluation because they were not fully completed. The response rate of the subjects was 95%. Demographic characteristics of the participants in the application are given in Table 3. Internal consistency and reliability values are shown in Table 4.

Since the reliability value calculated for 11 items is (0.937), the structure has a high degree of reliability. In terms of size, Flexible Environment (0.853), Learning Culture (0.778), Intentional Content (0.823), and Professional Educator (0.853) were found.

3.4 Exploratory Factor Analysis for Validity

By using exploratory factor analysis, factor number and factor structure are defined. Exploratory factor analysis is a variable reduction technique that defines the underlying factor structure and the number of implicit structures of a variable set. This technique is a hypothesis of a variable that cannot be directly measured, predicts the factors that affect the responses on observed variables, allows you to define and describe the number of implicit structures (factors), and includes error and specific factors that result from unreliability in measurement (Suhr, 2006). At the same time, exploratory factor analysis has traditionally been used to investigate the possible factor substructure of the variable set measured without creating any biased structure on the result (Child, 1990).

In exploratory factor analysis shown in Table 5, the researcher may not have any specific expectations regarding factors or factor infrastructure. Even if the researcher has such expectations, exploratory factor analysis does not require the researcher to declare these expectations and the analysis is not affected by these expectations (Thompson, 2004).

Table 5 Factor analysis for FLIP scale

Factors	Items	FL	FA (%)
Flexible environment (F)	fl1. I provide students with different ways to learn content and demonstrate mastery.	0.812	21.34
	fl2. I continually observe and monitor students to make adjustments as appropriate.	0.806	
	fl3. I establish spaces and time frames that permit students to interact and reflect on their learning as needed.	0.518	
Learning culture (L)	fl4. I scaffold these activities and make them accessible to all students through differentiation and feedback.	0.581	12.23
	fl5. I give students opportunities to engage in meaningful activities without the teacher being central.	0.518	
Intentional content (I)	fl6. I differentiate to make content accessible and relevant to all students.	0.817	19.81
	fl7. I create and/or curate relevant content (typically videos) for my students.	0.601	
	fl8. I prioritize concepts used in direct instruction for learners to access on their own.	0.512	
Professional educator (P)	fl9. I collaborate and reflect with other educators and take responsibility for transforming my practice.	0.780	9.65
	fl10. I conduct ongoing formative assessments during class time through observation and by recording data to inform future instruction.	0.699	
	fl11. I collaborate and reflect with other educators and take responsibility for transforming my practice.	0.542	

Note: KMO = 0.941, Bartlett's test $p = 0.000$, FL factor loading, FA factor explanation

Source: Authors own study

In the first stage of the factor analysis, the problem to be investigated is recognized and decided to be suitable. Correlation matrix and factor analysis are investigated with the help of the data. Subsequently, the Kaiser-Meyer-Olkin (KMO) coefficient indicates the suitability of the data structure for factor analysis, while the Barlett Sphericity Test will show the relationship between variables (Jöreskog & Sörbom, 1996; Beavers et al., 2013).

Since the probability value ($p < 0.05$) and KMO were 0.941 for the Bartlett’s test with exploratory factor analysis for the FLIP scale, the data set was “excellent” in factor analysis. The explanatory value for the dimensions of the FLIP scale, which includes a total of 11 statements, was 21.34% for the flexible environment (3 items), 12.23% for the learning culture (2 items), 19.81% for intentional content (3 items), and 9.65% for professional educator (3 items). The total concept explanatory value of the scale was 63.03%. With this ratio, it was accepted that the scope validity of the scale has been achieved.

3.5 Confirmatory Factor Analysis (CFA)

With the help of AMOS 22.0, the good fit indexes of the model were investigated and indicated in Table 6 (Bollen, 1989; Fornell & Larcker, 1981; Bagozzi et al., 1999; Byrne, 2011). Bartlett test is important in confirmatory factor analysis. The statistical significance of the correlation matrix is examined by Bartlett test (Hair et al., 2010). In all of the expressions used in the study, it can be said that if the Skewness and Kurtosis values are within ± 1.5 , the data are normally distributed (Schermelleh-Engel et al., 2003).

In the confirmatory factor analysis for the FLIP scale, which consists of 11 items, factor loadings are in the range of (74; 83). As shown in the literature, the results of the analysis for the 4-factor structure are shown in Fig. 1.

CFA is significant since the model test values are χ^2 (108.299), χ^2/df (2.77). Since the fit index values of the model (GFI (0.947), CFI (0.975), SRMR (0.0285), RMSEA (0.070)) are within acceptable limits, it is understood that the original 4-factor structure of the FLIP scale can be used exactly (Byrne, 2011). As far as concerned the index values modification between fl2 and fl3 items, it is believed to be appropriate to make this modification putting the MI value and exchange value

Table 6 CFA compliance values

Indices	Good fit	Acceptable fit
χ^2 / df	$0 \leq \chi^2/df \leq 2$	$2 < \chi^2/df \leq 5$
GFI	≥ 0.90	0.85–0.89
CFI	≥ 0.95	≥ 0.90
SRMR	≤ 0.05	$0.06 \leq SRMR \leq 0.08$
RMSEA	≤ 0.05	$0.06 \leq RMSEA \leq 0.08$

Source: Based on Schermelleh-Engel et al. (2003)

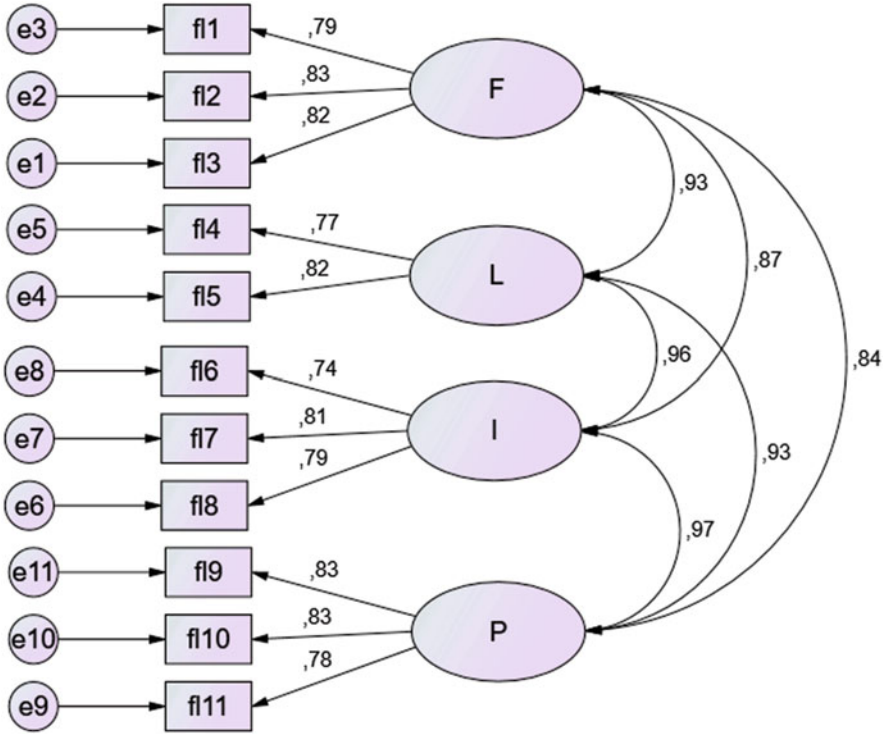


Fig. 1 FLIP scale confirmatory factor analysis first step. Source: authors own study

equal to 15.87 and 0.105. When this modification was made, the following factor analysis results were obtained (Fig. 2).

Since the model test values are χ^2 (84.177), χ^2/df (2.215), the CFA is acceptable. The model's fit index values (GFI (0.960), CFI (0.983), SRMR (0.0242), RMSEA (0.0580)). It is understood that the covariance modification between the fl2 and fl3 items of the 4-factor structure of the FLIP scale yields better model parameters (Byrne, 2011). Detailed information about the last step is given in Table 7.

It is significant since all the regression coefficients of the last second iteration for confirmatory factor analysis are found ($p < 0.001$). The covariance and correlation values calculated between the factors are given in Table 8.

According to the FLIP scale confirmatory factor analysis, the covariance between the factors F and L with the highest covariance value between factors was 0.731. Then, respectively, between L and I (0.721), between I and P (0.690), between L and P (0.675), between F and I (0.660), and between F and P (0.628) values are obtained. The covariance value calculated between fl2 and fl3 items (0.166) was found to be positive and significant.

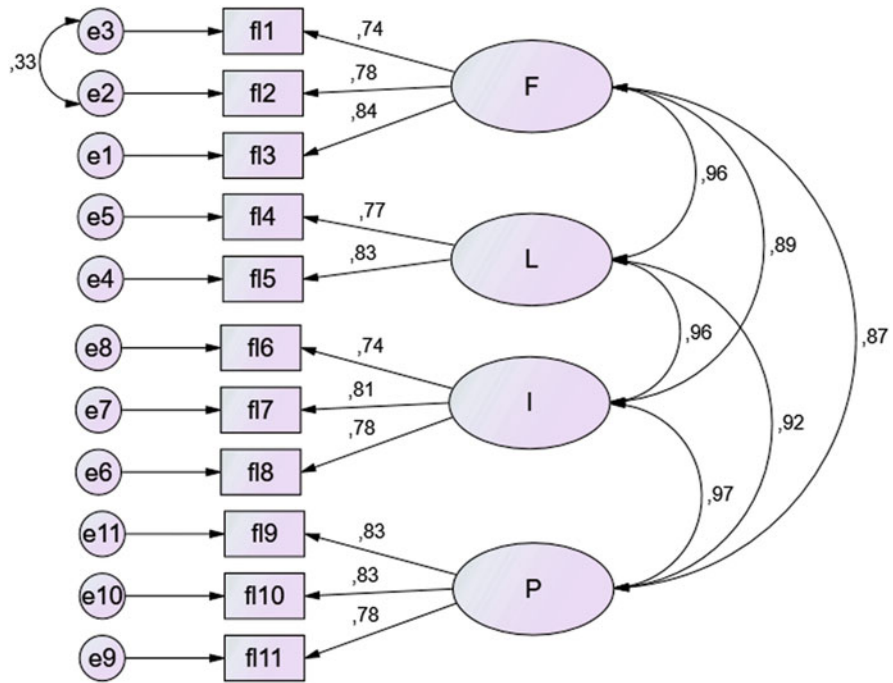


Fig. 2 FLIP scale confirmatory factor analysis second step. Source: authors own study

Table 7 FLIP scale final confirmatory factor analysis results

Ref. (FLN, 2014)			Estimate	Standard Estimate	C.R.	p
fi3	<---	F	1.000	0.837		
fi2	<---	F	0.952	0.783	16.640	***
fi1	<---	F	0.985	0.738	15.301	***
fi5	<---	L	1.000	0.829		
fi4	<---	L	0.942	0.769	16.795	***
fi8	<---	I	0.959	0.785	16.913	***
fi7	<---	I	1.000	0.815		
fi6	<---	I	0.923	0.742	15.668	***
fi11	<---	P	1.000	0.782		
fi10	<---	P	0.943	0.830	15.234	***
fi9	<---	P	1.065	0.827	20.832	***

Source: Authors own study * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. C.R.: critical ratio

Table 8 Covariance and correlation values between FLIP scale factors

			covariance	r	C.R.	p
F	<-->	L	0.731	0.963	10.727	***
F	<-->	I	0.660	0.891	10.228	***
F	<-->	P	0.628	0.873	10.554	***
L	<-->	I	0.721	0.958	10.599	***
L	<-->	P	0.675	0.925	10.874	***
I	<-->	P	0.690	0.967	11.060	***
e2	<-->	e3	0.166	0.326	4.470	***

Source: Authors own study * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. r:relation, C.R.: critical ratio

Table 9 Correlation, reliability, and decomposition validity values of the dimensions obtained from the parameters used in the study

Flipped Learning Scale (Flip Scale)	F	L	I	p
Flexible environment (F)	(0.786)			
Learning culture (L)	0.760**	(0.799)		
Intentional content (I)	0.728**	0.768**	(0.780)	
Professional educator (P)	0.719**	0.759**	0.778**	(0.813)
Reliability constant (Cronbach's alpha)	0.853	0.778	0.823	0.853
Composite reliability (CR)	0.830	0.780	0.824	0.854
Average variance extracted (AVE)	0.619	0.639	0.610	0.661

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Authors own study

Note: The values shown in parentheses are the square root values of the AVE calculated to measure

3.6 Reliability, Composite Reliability, Convergent Validity, Decomposition Validity, and Average Variance Extracted

The reliability (Cronbach alpha), composite reliability (CR), and average variance extracted (AVE) values of the research scale were investigated. Composite reliability (CR) values are calculated from factor loads calculated from confirmatory factor analysis. The composite reliability value should be $CR \geq 0.70$. The indicator of convergent validity is the average variance extracted value (AVE) which should be greater than 0.70. In order to confirm the convergence validity, the mean variance (AVE ≥ 0.50) is required (Fornell & Larcker, 1981; Raykov, 1997).

Since the mean explained variance values (AVE > 0.50) for the research scale were convergent, the necessary condition was provided in the convergent validity. The square root values of the calculated AVE values are given in parentheses in Table 9 for the validity of the decomposition. Since these values are higher than all correlation values in that column, it is assumed that the validity of the decomposition is provided for all variables.

The reliability coefficients calculated for the FLIP scale subscales (Flexible Environment (F), Learning Culture (L), Intentional Content (I), Professional Educator (P)) are “high reliability” since Cronbach’s alpha is 0.80. The composite

reliability values are greater than 0.70, then it can be stated that the composite reliability requirement is met. The values shown in parentheses in Table 9 are the square root values of the AVE calculated to measure. This value must be greater than the correlation coefficient (Fornell & Larcker, 1981; Raykov, 1997). That is because that all the coefficients meet the requirements about structuring the flipped scale. In other words, this scale will be a new and short scale that can be used in research on flipped learning.

4 Conclusion and Discussion

The development of cloud technology and the virtual learning environments that are increasingly accessible provide educational environments that can contribute to conventional classroom education. FLIP learning technique is also becoming more widespread in the field of higher education after certificate trainings or school trainings. For this reason, FLIP scale reliability and validity study is conducted based on FLN (2014) expressions based on the view of higher education students on FLIP technique. As a result of the statistical analysis, the original structure of the FLIP scale is found to be valid. This scale will be a new and short scale that can be used in research on flipped learning.

For the validity and reliability study of the FLIP scale, language validity, time validity, pilot implementation, field application, internal consistency and reliability, exploratory factor analysis for validity, confirmatory factor analysis, reliability, composite reliability, convergent validity, decomposition validity, and explained mean variance values were analyzed. At the end of these analyses, it was revealed that the original structure of the FLIP scale could be used by the researchers.

The Cronbach's alpha value as the reliability and internal consistency coefficient for language validity was measured and the time validity of the scale was obtained after the pilot application. Following the final adjustments, the field application of the scale was carried out on 500 higher education students. Since the Cronbach's alpha >0.80 , CR > 0.70 , and AVE > 0.50 for the four-dimensional FLIP scale, convergent validity was provided. Since the model test values and the fit index values are within acceptable limits, the 4-factor structure of the FLIP scale is acceptable. According to the statistical findings, the subscales of FLIP scale, namely, "Flexible Environment (F)", "Learning Culture (L)", "Intentional Content (I)", and "Professional Educator (P)" have been explained by confirmatory factor analysis. The original structure of the FLIP scale was valid.

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Developing Financial Efficiency Index for Higher Education Institutions



Jekaterina Kuzmina, Andris Natrins, Anda Ziemele, and Ennata Kivrina

Abstract The decision-making process, as well as general management of the higher education institution, is nowadays becoming more and more complex and complicated; therefore, management of the higher education institution requires modern tools and methods to ensure sustainable development of the organization and to meet different shareholders' interests and necessities. The objective of the current paper is to cover the existing gap and to provide the management of the higher education institution in Latvia with an acceptable financial efficiency measurement tool—financial health index—useful in the process of setting the institution's strategic goals, developing and implementing strategies, as well as performance measurement. The authors are using the methodology of ratio analysis in higher education in Latvia. To solve the weight determination problem, the authors apply findings described. The major advantage of the “new” index is its clear weightings based on the simulation and not one's opinion. So that the kind of approach would lead to the usage of the reliable tool, allowing comparison between different organizations and determination of best practice approach.

Keywords Higher education institutions · Financial health · Efficiency measurement · Latvia

J. Kuzmina (✉)

Economics and Finance, BA School of Business and Finance, Riga, Latvia
e-mail: jekaterina.kuzmina@ba.lv

A. Natrins

Management of the School, BA School of Business and Finance, Riga, Latvia
e-mail: andris.natrins@ba.lv

A. Ziemele

Finances, BA School of Business and Finance, Riga, Latvia
e-mail: anda.ziemele@ba.lv

E. Kivrina

Development and Mobility Projects, BA School of Business and Finance, Riga, Latvia
e-mail: ennata.kivrina@ba.lv

1 Introduction

The decision-making process, as well as general management of the higher education institution, is nowadays becoming more and more complex and complicated. Different stakeholders are introducing new requirements (sometimes controversial to each other), information flows are increasing their speeds, and new technologies are getting more power. As a result of these changes management of the higher education institution requires modern tools and methods to ensure sustainable development of the organization and to meet different shareholders' requirements, to find satisfactory answers to changing interests and necessities. Moreover, it is worth considering that since the beginning of the twenty-first century there have been clear modifications in the sector of higher education when the institutions providing educational services have moved near to the economic sector. These changes were primarily introduced by different models applied in the society and as the consecutive response to the transformation processes within the society (more details could be found in the research papers by Gumport (2000); Vaira (2004); Kezar (2004); Gumport (2005); Goastellec and Välimaa (2019) and Franco et al. (2019) and others). The changes and transformation process mentioned above should be embedded in the following construct: in the last decades of the previous century, the higher education sector was seen as one with a lack of power due to the limited market competition (or even absence of competition in particular regions). At the beginning of the twenty-first century, there was a clear move toward a more competitive and market-based system, for example, in the Baltic States and other European countries. This trend was supported by the application of different factors:

- First, one could notice the sufficient move from the higher education mainly evaluable for the exclusive parts of the society to the mass education in the universities and high schools.
- Second, the issue concerning increasing competition in the sector accompanied by the reduction of the governmental support to the higher education institutions.
- Third, one could notice the necessity to demonstrate added-value proposed to the customers (potential students and society as a whole) and application of performance management criteria and approaches.

Discussion of the factors mentioned above and their implication for the management of the higher education institutions could be followed in the works published by Alexander (2000), Huisman and Currie (2004), Burke (2005), Horta and Vaccaro (2008), Hazelkorn et al. (2018), Aithal and Kumar (2019) and others. Furthermore, the studies mentioned above demonstrated a high necessity for performance management techniques in the industry of higher education to be used for setting performance goals, in-depth analysis of the results achieved, evaluation and adjustment to the strategies different requirements of the stakeholders.

The authors believe that the management of the higher education institutions to overcome the challenge of complexity needs modern tools and methods, while performance measurement and management are a significant part of these tools

and methods. It is worth considering that regardless of the existence of research there is no common definition of performance, while different scientists highlight just some of the aspects or factors. The authors would like to agree with Armstrong and Yu et al. as their ideas about performance are similar to the authors' beliefs and findings, that will be shown in the following parts of the research paper. Armstrong (2009) concluded that performance in higher education institutions is not only about achieving or non-achieving the goals previously defined, but also how these goals have been achieved, therefore it is necessary to understand inputs, outputs, and processes. Yu et al. (2009) have shown that the main outcome of performance measurement and management should not be the report, but it is mainly about strategic decisions taken in the changing environment within limited information. The findings of the research works mentioned above increased authors' confidence in the necessity to develop the research topic. Being aware of the importance of performance management in the higher education sector the authors have performed a literature review to identify the research gap. Based on the research the authors can claim that there is extensive research on the field of efficiency measurement and management of higher education institutions, while the topic of financial health within this discussion is less covered. A few authors are seeing the necessity to discuss the issue, while financial health is a critical factor to ensure sustainable development of the organization. Furthermore, the authors are certain of the fact that such a factor as financial efficiency should be considered in different types of high school ratings. The considerations mentioned above allowed to formulate the goal of the research: to cover the current gap and to offer the management of the higher education institution a financial efficiency measurement tool useful in the process of setting the institution's strategic goals, as well as performance measurement.

2 Literature Review

There is extensive research on the field of efficiency measurement and management of higher education institutions, but the topic of financial health within this dialog is less covered. The kind of conclusions was made based on the analysis and applying the following methodology: literature search is based on the systematic methodology concept as described by Tranfield et al. (2003), who was one of the first scientists showing that process of a systematic review previously used in the domain of medicine can be applied to the management to gain consistent data and reliable knowledge on the field. Further details about the approach could be found by Denyer and Tranfield (2009) and by Pfefferkorn et al. (2017). Having analyzed around 300 articles, the authors can conclude that the first publications on the field have been dated from 1980, while the topic got special interest from the side of academic research after 2010. Around 20% of research articles are conceptual papers, while the rest is empirical. While examining the literature, it became obvious that some works focused on the performance of teaching and/or research and others on the performance of administrative or support services. The classification could be done

according to dimensions of efficiency, effectiveness, and quality. The particular point is of greater importance for the current research paper and is going to be discussed in detail below. One of the first authors identifying and discussing the issue of performance in the domain of higher education was Lindsay (1981) claiming that at the time modern methods of institutional assessment differ in their capability to deliver necessary information and there is the necessity to determine and measure both efficiency and effectiveness. In the later years, the mainstream of the researchers on the field connected performance measurement with the issue of efficiency, follow, for example, Agasisti and Dal Bianco (2009); Agasisti and Johnes (2009). While the other group (less numerous according to the results achieved) is talking about a combination of both efficiency and effectiveness, as Buseti and Dente (2014); Rodgers (2007); Taylor (2014). The smallest number of researchers are trying to provide evidence about the combination of performance measurement through quality definition and determination, for example, Thapliyal (2014). The authors have studied also the combination of two factors like the area of research papers and performance dimension chosen by the researchers leading to the following conclusions about the density of the articles analyzed: the mainstream of research papers concentrates on the quality issues within teaching and research (the proportion is almost equal), while only a small quantity of them study the efficiency of supporting services.

The most surprising conclusion out of the literature review was the fact that the financial efficiency of the organization providing higher education services is addressed by a limited number of research papers. Table 1 provides a summary of the latest relevant studies on the field covering the topic of financial efficiency of higher education institutions. Based on the findings described above the authors are seeing the necessity to discuss the issue in greater detail, while financial health and financial performance are critical factors to ensure sustainable development of any organization. In the coming part of the paper, the authors would like to pay attention to the performance management system as an essential part of the financial management framework.

3 Performance Management System as Interaction of Different Elements

Higgins (1989) is one of the first authors who have developed the idea of the performance measurement system for higher education institutions. According to him the two aspects: effectiveness and efficiency, should be considered; while the system should be based on the three elements, including: first, the definition of the mission of the organization, including the levels of teaching, research, and support services; second, development of strategic analysis and planning, where the importance of indicators is underlined; third, management information system. Moreover, it should be considered that Higgins' structure is the first suggestion for the

Table 1 Financial efficiency of the higher education institutions: an overview

Author(s):	Year of Publication:	Questions Addressed in the Study:
Ćwiąkała–Małys and Mościbrodzka	2017	The current paper is the extension of the authors’ previous research on financial efficiency evaluation in higher education. The study is covering the area of didactics in the countries of the European Union.
Tran and Villano	2018	Using the advanced dynamic network data envelopment analysis method, the authors of the current paper examine divisional efficiency (including financial department) in relation to the overall performance of tertiary education institutions in the context of Vietnamese higher education system.
Modugno and di Carlo	2019	The authors are addressing the question from the point of view of the pitfalls and opportunities of cost accounting; specially in fostering universities’ financial sustainability.
Günay and Dulupçu	2019	The authors have used data envelopment analysis to measure the relative financial efficiency of the universities in Turkey (23 public universities founded in 1992 in Turkey over the period between 2004 and 2013).
Mousa and Ghulam	2019	The authors study the efficiency of institutions of higher learning in Saudi Arabia (61 higher education institutions during 2008–2014) with the purpose to evaluate efficiency scores.

Source: Own work

combined performance measurement system including organizational and individual performance. The discussion has been developed by further researchers, for example, Ho et al. (2006) have determined important decision issues within the management of higher education institutions like budgeting and scheduling, allocation of resources, and performance management. The authors propose that the process of the higher education system could be built using a similar approach as within the process in the producing industry, while financial resources should be determined as the main inputs of the performance management framework. The analysis of the mentioned research papers helped the authors to conclude the necessity of a performance management system that could be presented as the following concept as described below: step I—Measurement and evaluation of organizational and individual performance. Introduction of Step I allows to present performance management framework to improve quality of the provided services to the students, public, business, etc. The goal could be achieved by providing information on the performance. Moreover, one should consider that the concept developed should be seen as result-oriented and market-oriented, therefore the accountability of both efficiency and effectiveness is necessary. The concept within Step I could be organized as follows: first, to describe goals/objectives; second, to select the number of crucial indicators; third, to assign goals/objectives and crucial indicators to the financial planning and strategical analysis, ensuring the persistent connection between goals/objectives and allocation of limited resources. Step II—Disclosure of the results

within the performance study. The concept within Step II could be organized as follows: first, to ensure the monitoring/evaluation of the process (including the correction of errors); second, to measure organizational and individual performance promptly; third, to evaluate organizational and individual performance promptly; fourth, to provide consecutive reporting to the shareholders and internal as well as external stakeholders. Step III—Adjustment to the strategic management decisions to the results determined in Step I. Moreover, the current concept ensures the establishment of the link to the strategic management policy within the organization, as it is providing the adjustment possibility to the strategic management decisions due to the existing evaluation of performance. Within the current discussion, particular attention should be paid to Step I, including measurement and evaluation of organizational and individual performance. Moreover, the authors would like to concentrate only on the issue of the financial health and financial efficiency of the higher education institution, while the other aspects within the performance management system should be discussed in the further analysis.

4 Methodology

The authors are using the methodology of ratio analysis in higher education developed by KPMG in cooperation with Tahey et al. (2010), adjusting it to the current situation in Latvia. So that current part is going to be devoted to the description and analysis of the methodology, providing an explanation of the assumptions and adjustments done, as well as showing the new development of the existing approach. It is worth mentioning that the first attempt of the application of the approach developed in Latvia was done by Mavlutova and Ziemele (2012), but the authors would like to renew the discussion and propose further development to the method. It is worth considering that the further discussion is going to be about the Composite Financial Index (CFI) covering the issues of liquidity, operational results, performance of assets, and debt & capital management. The methodology is in line with the approaches used by rating agencies (Moody's and S&P are using them in the quantitative scoring), banks, and financial institutions for credit risk determination and evaluation so that it is based on the rational component proven by the practical experience. The methodology proposed by Tahey et al. (2010) in cooperation with KPMG proposes the usage of four main ratios that would be further summarized within the index. The authors of the current article would like to pay attention to these ratios and share the comments to contribute to the application of the ratios in practice. Below the authors describe the ratios building the CFI.

Primary reserve ratio (PRR) is a measure, showing the level of financial flexibility of the organization; moreover, simultaneously PRR could be seen as a degree of sustainability and indirect measure of liquidity within the organization, as it indicates how long the organization can survive using reserves and without relying on net assets, as well as, it indicates the affordability of strategic plans. The higher the calculated ratio, the higher the level of flexibility of the higher education institution

to organize its operational activities including proposing changes and adapting to the changing environment. A low ratio, for its part, should not be seen as very critical, in the case when significant investments either in fixed assets or in intangible assets have been made. PRR is equal to $\text{Net Current Assets}/\text{Total Costs}$, where Net Current Assets are equal to current assets minus short-term liabilities; and Total Costs—all the costs included in the profit and loss statement minus loss from the elimination of long-term investments (Mavlutova and Ziemele (2012) and Tahey et al. (2010)). Threshold level to indicate the financial health of the organization is 0.4—according to the model the ratio of 0.4 means that the organization to provide financial flexibility should provide around 5 months of expenses. The authors of the current paper are less risk-averse, and after having discussions with the experts in the industry would like to propose the ratio of 0.25—meaning that the organization to provide financial flexibility should provide around 3 months of expenses. The possible explanation is based on the evidence that the tuition fees are usually paid 4 times a year.

The viability ratio (VR) is an indicator of debt management within the organization. VR is equal to $\text{Net Current Assets}/\text{Long-term Debt}$ (Mavlutova and Ziemele (2012) and Tahey et al. (2010)). Threshold level to indicate the financial health of the organization: It is suggested that the ratio of 1.25 could be considered as the average indicator within the industry. However, it is mentioned that each organization should determine the acceptable level based on the analysis of operating liquidity and long-term liquidity and paying attention to the strategic targets of the organization. At this point, the authors of the current paper would like to agree to the explanation provided and are going to keep to the ratio threshold level.

Return on Net Assets (RoNA) could be seen as a measure of economic return, indicating the trend over years and therefore being suitable for analysis. RoNA is equal to $\text{Current period changes in net assets}/\text{Total net assets} * 100$ (Mavlutova and Ziemele (2012) and Tahey et al. (2010)). Threshold level to indicate the financial health of the organization: 3% to 4% above the rate of inflation. The authors of the current paper after having discussions with the experts in the industry would like to propose the ratio of 4% as a healthy level of RoNA also considering the fact the higher education institution does not only fulfill the business function, but also a social one, which limits the return potential.

Net operating revenues (NOR) measures the operating performance of the organization from day-to-day operations. NoR is equal to $\text{Net unrestricted operating revenues}/\text{Total unrestricted operating revenues} * 100$ (Mavlutova and Ziemele (2012) and Tahey et al. (2010)). Threshold level to indicate the financial health of the organization: 2%—4% could be seen as a goal over the extended period. The authors of the current paper have performed the analysis on the European educational sector analyzing public companies traded on the stock exchange within the sector and determined the NOR equal to 2.59%. The authors would like to propose the usage of the ratio for further analysis as setting above-mentioned companies as a benchmark ensures the transparency of the value.

After the four ratios have been calculated it is necessary to establish the strength scale of each ratio. The procedure requires the setting of minimal and optimal limits,

which are embedded in the united value scale from one to ten. It is important to consider that the threshold levels to indicate the financial health of the organization mentioned above are crucial to determine the limits. The sum of the ratios previously adjusted to the strength and the weight provides the calculated CFI, appropriate to be used for further analysis, year-over-year comparison of financial efficiency, and to support strategic decisions of the organization. While determining the CFI one should consider that a single score lets weaknesses in separate ratios be balanced by strengths in other ratios. As the kind of approach allows determining overall financial health, not just separate components of the financial health of the higher education institution, it is necessary to use the weighting factor consistently for each of the ratios. Moreover, if considerable modifications in scores result from year-to-year comparisons, the clarification will be associated with economic factors and managerial decisions, not different weighting plans. Tahey et al. (2010) have determined the following weightings applicable to the higher education institution with long-term debt as demonstrated below (in case the organization has no long term debt the ratios are shown in brackets): PRR—35% [55%]; VR—35% [0%]; RoNA—20% [30%]; NOR—10% [15%]. The authors are concentrating further on the first case—higher education institutions with long-term debt due to the existence and usage of such a financing structure. In a different case, a further adjustment should be made. It is worth considering that no particular in-depth explanation about the basis for the weighting decision was provided. During the number of online webinars, it was stated that the kind of numbers are suggested by the auditing companies according to their best-practice experience, but could be changed in the case of necessity. The authors of the current paper would like to argue that the weighting of the factors in the index represents the crucial issue and further clarification is necessary. Moreover, the issue has not been discussed previously and the authors would like to fill in the gap. As a potential solution, the following approaches could be used: first, usage of equally weighted factors in the index—the approach is less appropriate as Tahey et al. (2010, p. 324) claim that “in a “normalized” institution, the suggested weighting would be more heavily skewed toward measurement of retained wealth and less toward current operations. The principal reason for this is the belief that retained wealth and strategic use of debt are stronger indicators of long-term institutional financial health than measures depending on a single year’s performance”. Second, determination of weightings based on the previous experience or experts’ suggestions—the approach is possible if the index is used for internal purposes only as comparison among different peer-group participants is less possible due to the lack of consistency. Moreover, the kind of approach does not provide the comparison possibilities within an organization, so that the disclosure of the financial situation to the stakeholders is not given. Third, determination of weightings by applying weight-optimization algorithm—the authors of the current research paper would like to underline that kind of solution would provide both the explanatory bases for the weight of each ratio in the composite index as well as ensure transparency and possibilities of comparison.

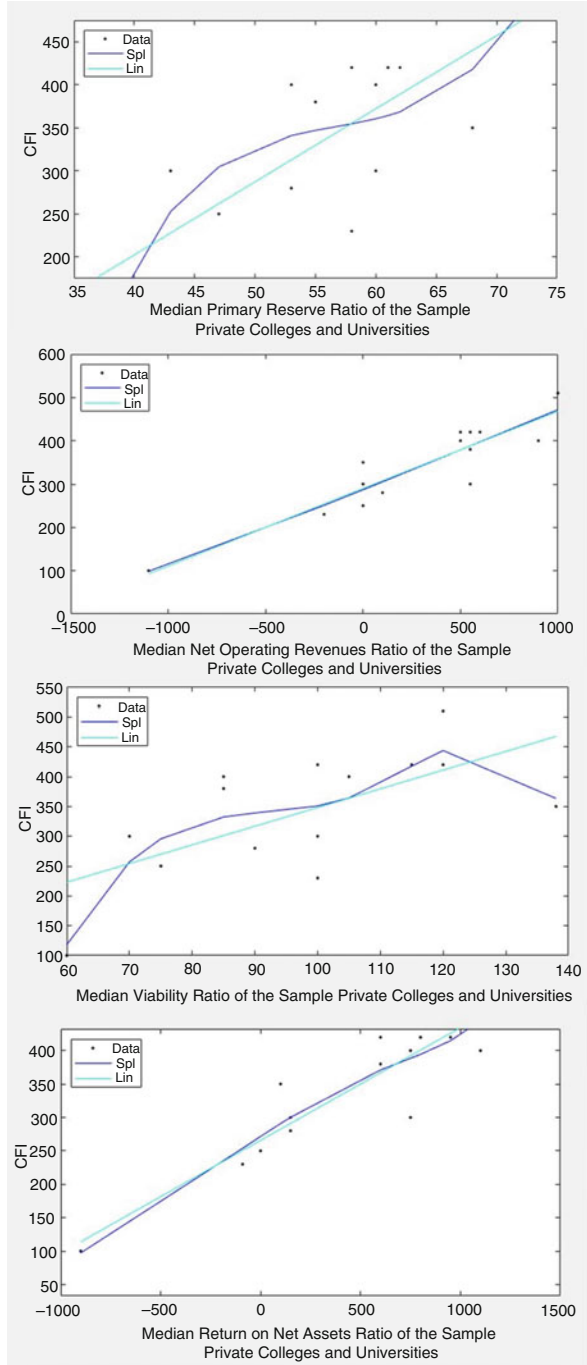
To solve the weight determination problem, we apply findings described in the paper by Becker et al. (2017), who made the study on the composite indexes and

developed several approaches permitting the development of composite indicators to recognize the properties of weights. The proposed approach consists of three steps: in the first step, it is necessary to measure the significance of each indicator to the composite index applying a non-linear Pearson correlation ratio, estimated by Bayesian Gaussian processes. It is worth considering that in composition indexes the aggregation formula has very often linear features, while a non-linearity relationship between different variables could be determined through correlation between these variables. According to Becker and Saltelli (2015), in this case, it is necessary to use a non-linear Pearson correlation ratio that provides the possibility to measure the probably non-linear effect of each variable on the composite index. The second step requires estimating and examining the effect of each variable isolated from others using regression analysis. At this point, it is worth considering that the intention is to determine the degree of input factor uncertainties on the model output. Moreover, the authors would like to overcome the problem of existing negative correlation signaling the conceptual problem concerning the use of the variable within the index. The issue has been studied in the scientific literature and is addressing the problem by the application of a regression-based approach. The authors of the current article are using the process described by Becker et al. (2017), including the following steps as determination of splines for every variable, use of regression analysis for each variable, estimation the residuals out of the regression, and finally evaluation of correlated and uncorrelated sensitivities of the variable within the index. The third step is the optimization process that determines the weights to be fitted within the pre-specified values of the index. The kind of values could be determined either by the experts or by the requirements of the model (as in the case of CFI), while the optimization algorithm is based on the Nelder-Mead simplex search method (Lagarias et al. (1998)).

5 Results from Index Weightings

We share the results applying the weight-optimization algorithm to solve the weighting issue. The authors would like to claim that the kind of approach would increase the explanatory power of the index, also due to the disclosure of the methodology used. The calculations were performed using Matlab tool and the following approach: in the first step it is necessary to provide the calculation of 4 ratios (PRR as X1; VR as X2; RoNA as X3; and NOR as X4) and composite financial index (as Y) for 10 years for the sample including 13 private colleges and universities in Latvia. In the second step the authors determined actual influence of each variable (X1; X2; X3; X4) selected in the previous step and found out that there is some inequality in the influence by gaining the following results: $X1 = 0.6030$; $X2 = 0.5516$; $X3 = 0.7888$; and $X4 = 0.7818$. Therefore, one can arrive at the conclusion that it is necessary to go into details by breaking down the influence from correlations from the influence of the variable on its own. The analysis was performed in the third step and the following result was achieved (graphical

Fig. 1 Determination of influence: testing four variables and CFI. Source: authors own study performed in Matlab



demonstration is presented in Fig. 1): contributions from correlations dominate the influence of each variable; while some nonlinearity exists and should be considered further on.

In the fourth step, it was necessary to start the iterations process to determine the index weights respecting both the linear and non-linear correlation of the variables. After the small number of iterations—33—the process stopped because the size of the current step is less than the value of the step size tolerance and constraints are satisfied to within the value of the constraint tolerance. As a result “new index” weights were determined: $X1 = 20.98\%$ (instead of 35%); $X2 = 58.40\%$ (instead of 35%); $X3 = 4.69\%$ (instead of 20%); and $X4 = 15.93\%$ (instead of 10%). It is worth mentioning that “new” index weights are skewed toward VR, so that debt management is becoming one of the critical factors for the organization’s long-term performance. By comparing the indices one can see the differences in weighting, which would have some impact on the final result—the financial health index. The major advantage of the “new” index is its clear weightings based on the simulation and not one’s opinion as in the original methodology. So that the kind of approach would lead to the usage of the reliable tool, allowing comparison between different organizations and determination of best practice approach. Last but not least it should be mentioned that the determination of the CFI of the organization is the first step inside the performance measurement system within the organization. To make any strategical decisions applying the methodology developed by the authors, it will be necessary to gather information for several years (at least 5 years is advised from the experts) and make the comparison to the peer-group as far as possible. The authors are intending to use the methodology to make a performance evaluation of Latvian private colleges and universities in the coming research papers.

6 Conclusions

Based on the performed research the authors have arrived at the following conclusions: first, management of the higher education institution is nowadays becoming more and more complex and complicated due to the increasing stakeholders’ requirements and necessity of modern tools and methods to ensure sustainable development of the organization. The existing research is addressing the issue only to a limited extend—there is extensive research on the field of efficiency measurement and management of higher education institutions, while the topic of financial health within this discussion is less covered. The well-known truth is that financial health (and therefore also a determination of financial performance) is a critical factor to ensure sustainable development of the organization of any kind, and the authors are addressing the issue by developing and describing the methodological approach.

Second, the performance measurement system of the organization of any kind could be seen as an approach combining the elements on a different level. To ensure the proper application of this management tool the link to the strategic management

policy within the organization should be given. The authors are proposing a three-step concept of the performance management system within the higher education institution that, on the one hand, is addressing the practical necessity mentioned above, but, on the other hand, it is underlining the importance of financial indicators within the management of the higher education institution.

Third, CFI covering the issues of liquidity, operational results, performance of assets, and debt & capital management and proposed by Tahey et al. (2010) in cooperation with KPMG could be considered as one of the possible solutions to address the issue of financial efficiency within the organization. It is worth considering that the approach developed by the American scientists requires further explanations and adjustments, the authors are proposing their view on some of the “weak” points within the existing approach and proposing possible solutions. The concept is developed on the theoretical ground and its implementation will be discussed in the coming publications.

The authors would like to argue that the paper contributes to the fundamental discussion of evaluation tools and methods on the field of higher education institution management and allows to determine further questions for analysis and scientific discussion like the inclusion of financial efficiency measurement in the ranking models for evaluation of higher education institutions on the country level. Moreover, it has got practical implications for the management of higher education institutions not only in Latvia but also in other countries when efficiency and effectiveness of the organization is a primary issue.

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Part II
Eurasian Business Perspectives: Human
Resources Management

Employee Commitment in Relationship to Organizational Culture: The Case of Lithuanian Companies



Sonata Staniulienė and Evelina Gavėnaitė

Abstract The study examines the literature on affective, continuance, and normative forms of employee commitment in relation to clan, adhocracy, market, and hierarchy types of organizational culture, according to Competing Values Framework. The assumptions of how employee commitment develops in different organizational cultures because of their unique characteristics are drawn. The quantitative research was conducted to reveal the level and the prevailing forms of employee commitment to Lithuanian companies, as well as existing and preferred types of organizational culture, employees are willing to be committed. The results show the insufficient level of employees' commitment to Lithuanian companies and high discrepancies among existing and preferred organizational culture types. Organizations seeking to increase employee commitment are offered to move to the preferred clan type of organizational culture, which would lead to enhancing of affective and normative commitment instead of prevailing market and hierarchy types, because market and hierarchy cultural types generate a low level of employees' commitment according to this research results. To implement the change, the model of improving the organizational culture to increase employee commitment is offered to implement in the companies. The form of continuance commitment was found having the weakest relations with all types of organizational culture, therefore the further research of its variables is offered.

Keywords Organizational culture · Employee commitment · Committed employee · Lithuanian organizations

S. Staniulienė (✉) · E. Gavėnaitė

Faculty of Economics and Management, Vytautas Magnus University, Kaunas, Lithuania
e-mail: sonata.staniuliene@vdu.lt; evelina.gavenaite1@stud.vdu.lt

1 Introduction

The rapid development of information technologies, increasing business dynamics and competitive conditions, lead to new challenges for business organizations, which can be overcome by highly qualified specialists with the clause they are committed, dedicated, and motivated staff, and they, in today's business world, should not be treated as a cost, but as one of the company's key strengths in a competitive market.

In modern business organizations, increasing attention should be paid to employee commitment, because committed employees are motivated to work more than they are required to, they may work after working hours only to complete the tasks entrusted to them in time, committed employees have a lower propensity to change jobs for a better position or an offer, because they are faithful, dedicated, and satisfied with their organization and the work they do.

Many researchers measure the impact of employee commitment on outcomes such as job performance. The committed employees in organizations can be positive and constructive and to take steps in the fulfilment of organizational goals (Hamidi et al., 2017). Each of the dimensions of commitment can have potential impacts associated with absenteeism and turnover (Dwivedi, Kaushik and Luxmi, 2014). Most of scholars in the organizational commitment literature analyses resulting behaviours such as organizational citizenship behaviour and change acceptance (Iverson & Buttigieg, 1999; Shore & Wayne, 1993). According to Rajput et al. (2016) employee commitment to the organization develops because of increased job satisfaction, and the more an employee is satisfied with the organization, the greater devotion shows to it.

At present human resources, management duty is not to retain individuals in organizations; rather, it should link individuals with organizations as well as creating mutual solidarity between individuals and organizations (Hamidi et al., 2017). Organizational leaders should also take their role in building long-term commitment relationships with employees in order to maintain a competitive advantage, whereas it has become clear that without committed employees in the companies, it is difficult to realize the goals of the company.

Recently, a number of studies analyse employee commitment and its forms (Meyer et al., 2002; Park & Rainey, 2007; Antoncic & Antoncic, 2011; Kim & Kim, 2015; Rajput et al., 2016, etc.). Still, there is a lack of understanding of what forces employees to feel committed to the organization. Although the topic of organizational culture has recently become attractive to researchers (Cameron & Quinn, 2006; Ahmed & Shafiq, 2014; Hartnell et al., 2011; Jones et al., 2005; Teräväinen et al., 2018, etc.) because its researchers' attempts to explain the sources of organizational efficiency and the reasons of attractiveness to employees, the links between organizational commitment and organizational culture still lack researchers' attention. Due to the mentioned reasons, further research in Lithuanian organizations is needed to find out solutions for increasing commitment in the context of organizational culture.

Consequently, the object of the research is employee commitment in relationship to organizational culture in Lithuanian companies. The aim of the research is to examine employee commitment in relationship to organizational culture in the case of Lithuanian companies. Research methods used in this article are analysis of the literature and quantitative method of survey.

2 Literature Review

2.1 *Employee Commitment*

Commitment is the broad concept of analysing an organization's effectiveness and work attitude that is directly related to employee involvement and choice to stay in the company (Hamidi et al., 2017). Employee commitment is measured through the willingness of employees to work effectively to improve developing their companies (Waheed et al., 2012). Meyer and Herscovitch (2001, p. 301) present a definition of commitment as: "a force that binds an individual to a course of action of relevance to one or more aims". According to Antoncic and Antoncic (2011), the employee's commitment can be explained through the feeling that the person belongs to the company and the team of colleagues, behaves in accordance with professional work ethic, stay in the company during crises, have a desire to fulfil their duties, and spread messages about the good reputation of the company. Waheed et al. (2012) state that employee commitment is the best fit between the firm's and the individual's values and due to which the individual is reluctant to leave the organization. Each type of commitment links a person differently to an organization and will affect a person's behaviour in the workplace differently (Iverson & Buttigieg, 1999; Meyer et al., 2002).

The relevant classification of employee commitment is the three-component model proposed by Allen and Meyer (1990), according to the authors, commitment to an organization can be divided into:

- Affective commitment is related to employee's attachment to social relationships. It appears with an employee felt involved in, pursuing the same values with a company. Employees with affective commitment continue to work in the company because they want to remain.
- Continuance commitment, which indicates cost or a sense of loss when leaving an organization. According to Wainwright (2018), an expression of a continuance commitment is when employees understand the need to remain in their companies, because the compensation for their work will not improve if they change the company. Employees with a form of continuous commitment stay in the organization because they need to remain.
- Normative commitment, which is based on the employee's sense of duty to stay in the organization. Employees feel that they should remain in the organization, because they think it is the right decision in their situation, feeling the moral

obligation to remain in the organization. Employees with a normative commitment stay in the organization because they ought to remain.

However, when analysing employee commitment, it is also important to understand that a person does not necessarily have to belong to one specific form of commitment, on the contrary, it may have features characteristic of several of them. Employee commitment does not form by itself, it is determined by a wide range of factors, therefore, it is formed gradually. Depending on the employee's personality, value systems, certain factors can motivate and at the same time increase his commitment, while others, on the contrary, demotivated and at the same time reduce commitment to the organization.

Meyer and Herscovitch (2001) describe commitment as a "multidimensional construct". Iverson and Buttigieg (1999) distinguished three main antecedent groups: (1) organizational variables, related to the job design, policy in human resource management, communication means, leadership, or similar organizational matters; (2) personal variables such as employee age, gender, job expectations, values, needs, motivation, etc.; and (3) environmental variables such as labour market conditions, level of economic development, cultural aspects, etc. Hamidi et al. (2017) propose several more factors that constitute organizational commitment including a sense of psychological well-being and emotional intelligence.

3 Organizational Culture

According to Šimanskienė (2008), employees' ties with organization are not possible without a properly created and nurtured organizational culture. Rasid et al. (2013) suggested the importance of mediating the effect of organizational culture because leadership influenced organizational commitment indirectly through organizational culture. Kljajic-Dervic et al. (2020) state that organizational culture represents company system/set of values, principles, and norms that positively or negatively affects the commitment of employees.

Organizational culture is defined as "a pattern of shared basic assumption that have been invented, discovered or developed by a given group as it learns to cope with its problems of external adaptation and internal integration. . . that has worked well enough to be considered valid and therefore to be taught to new members as the correct way to perceive, think and feel in relationship to those problems" (Schein, 1992, p. 9). Organizational culture consists of ideas, values, attitudes, and software that are shared by individuals in organizations; it also refers to perceptions or notions employees have toward an organization (Hamidi et al., 2017), it is mirrored in its values, behaviour, leadership, language, symbols, procedures, and attitudes used to define success (Cameron & Quinn, 2006). One of the functions of organizational culture is enhancing the commitment, besides providing a sense of identity to members, strengthening organizational values, and shaping behaviour through a control mechanism (Ahmed & Shafiq, 2014).

Cameron and Quinn (2006) suggest a Competing Values Framework to assess organizational culture (Jones et al., 2005). The framework predicts the effectiveness of measured organizations in two dimensions: flexibility and discretion vs. stability and control; and internal focus and integration vs. external focus and differentiation (Cameron & Quinn, 2006). According to this framework, culture types possess flexible or control-based organizational structure and focus more on internal or external environment. Flexibility associated with characteristics of impulsiveness and adaptability, and the focus on control is linked to cohesion and permanence. Externally focussed organizations seek for interaction, growth, and resources, while an internal focus is more concerned with communication and integration (Cameron & Quinn, 1999). The four quadrants are created by these two dimensions, in which the different and competing effectiveness indicators take place, now called the four culture types: hierarchy, market, clan, and adhocracy (Wells & Lower, 2016):

- Clan stresses flexibility, but it is internally focused (Naranjo-Valencia et al., 2016). Clan culture is grounded on teamwork, collaboration, humane work environment, and organization's commitment to employees. In clan cultures, they believe that an employee commitment and trust in employees enables open communication and employee involvement (Hartnell et al., 2011). Accordingly, clan cultures value affiliation, membership, participation, support, and attachment (Wells & Lower, 2016). In clan culture, commitment is caused by a sense of community, family, whereas in this culture workers care about each other, and friendly relations between colleagues and managers are maintained.
- Adhocracy underlines flexibility and transformation, and it is externally oriented. This is usually relevant for organizations operating in a dynamic environment when striving to be a market leader. Adhocracy cultures are reactive and adaptive, decentralizing power and innovating. Hence, adhocracy organizational cultures value novel visions, creativity, variety, adaptability development, autonomy, and risk-taking behaviour (Quinn & Kimberly, 1984; Hartnell et al., 2011). In this type of organizational culture, commitment is promoted by self-realization, the human freedom to create novelty through the application of acquired knowledge, continuous improvement, fostering creativity, and being on a team of individuals working in the same field.
- Market preaches control and stability and is externally oriented. Achievement focused market culture organization operates through economic exchange, striving for competitive advantages exhibiting a strong external orientation. Cameron and Quinn (1999) point out that market cultures develop competitive aggressive employees. Market cultures value goal achievement, consistency, competitiveness, and competence (Hartnell et al., 2011). Within market culture, decision-making and planning are centralized and are task-orientated. According to Teräväinen et al. (2018), market culture is described as result-oriented, focused on profitability and productivity for competitive advantages, thus the commitment here is driven by sporting enthusiasm to excel someone and win. This culture is more acceptable to those whose competitive, volatile, constantly improving, and distinguished environment is a motive to work better, improve,

and achieve higher results and thus contribute to the future success of the company.

- Hierarchy is control-oriented; it focuses on the internal organization. Hierarchy culture is based on formalized and strictly structured workplace where employees perform the task as it is written in procedures. Representatives of hierarchical cultures believe that stability, predictability, and control lead to higher efficiency. Thus, hierarchy culture values are efficiency and close adherence to norms, rules, and regulations, routine, formalization, communication, and consistency (Quinn & Kimberly, 1984). Behaviours in hierarchy cultures show conformity and following the schedules (Denison & Spreitzer, 1991). In a hierarchical culture, commitment is caused by the need for security and functional approach, but he doesn't have to choose the means to perform the task, because all means are described in the rules, employee have to implement only the requirements imposed on him. Those stereotypical bureaucratic organizations are mostly characterized by formal, strict rules and official policies.

3.1 Propositions

Taken together, researchers indicate effects of organizational culture on organizational commitment of employees (Kim & Kim, 2015; Kirkman et al., 2009; Singh & Mohanty, 2011), thus, it can be argued that culture types may influence employee's commitment.

After analysis of the factors that foster employee commitment in different organizational culture types, based on the discussion above, the following research hypotheses, regarding the relationship between organizational culture and commitment, were developed:

H1: Clan culture type is positively related to affective employee commitment.

It is based on assumption that clan culture employee feels emotionally tied to the organization through human-orientated collaborative behaviours.

H2: Adhocracy culture type is not related to any form of employee commitment.

It is grounded by adhocracy's offered autonomy for an employee to decide whether he or she creatively adapts in the organization's environment or fails and then easily can change workplaces for further development.

H3: Market culture type is positively related to continuance employee commitment.

It is assumed that in market cultures for employees it is important to seek for the highest results, and afterwards, it could seem too costly to reject what is achieved, leaving that organization.

H4: Hierarchy culture type is positively related to normative employee commitment.

It is based on obligation developed by hierarchy culture to strictly follow rules and procedures that an employee would not dare to break.

In order to find out how employee commitment is determined by the type of organizational culture, whether representatives of all types of organizational culture are equally committed, or not committed (then it would show that non-cultural factors determine employee commitment), quantitative research is carried out.

4 Methods

Quantitative research was chosen for data collection, which aims to obtain quantitative information about many research objects (in this case, persons working in Lithuanian organizations).

4.1 Instrument and Measure

The research questionnaire consists of an introductory part, which describes who and for what purpose the research is carried out, emphasis on anonymity and two main questionnaire question blocks: the first seeks to find out the form of respondent's commitment (this set of questions is based on the three-component model of commitment of Allen and Meyer (1990), which consist of three types of statements about affective, continuance, and normative forms levels of commitment), and the second question block is for revealing the current and preferred type of organizational culture of the organization in which the respondent works (to prepare this group of questions Cameron and Quinn (2006) proposed organizational competing values framework based culture assessment instrument was used, in order to make the questionnaire easily understandable to the respondent, the organizational culture assessment questionnaire was adapted and instead of 100%, respondents were asked to rate the correctness of the presented aspect by choosing an answer on a Likert scale from 1 to 5, where "1" means "strongly disagree" and "5" means "strongly agree"), demographic questions are placed at the end of the questionnaire. The same scale for measuring employee commitment was used, where the choice of 1–2 stands for not committed, 3—neutral, and 4–5—committed employee. Participants were sent an invitation e-mail with a link to fill the online questionnaire.

4.2 Participants

The research sample was calculated on the basis of Paniotto formula (Kardelis, 2002), which is presented below:

$$n = \frac{1}{\Delta^2 + \frac{1}{N}}, \quad (1)$$

where n —sample size; Δ —sample error size; N —general size of the whole.

According to the data of the Department of Statistics of Lithuania, in the third quarter of 2019, there were 1378.1 thousand persons who were working in any job and receiving remuneration in money. The selected sample error size is 7%. Calculations show that 204 respondents need to be interviewed to ensure the representativeness and reliability of the survey, the survey involved 214 respondents working in various Lithuanian organizations, therefore it can be stated that the results of the survey are reliable.

45.8% of participants were till 25 years old, 37.4%—from 26 to 40, 15.4%—from 41 to 55, and 1.4%—older than 56 years old respectively; 23.8% worked in the same organization from 2 to 5 years, 20.1%—from 5 to 10, 10.7%—from 10 to 20, 2.3% from 20 to 30, and 1.4% more than for 30 years respectively; 41.6% worked as specialists, 28.5%—workers, 19.6%—managers, and 10.3% as executives.

4.3 Data Analysis

The obtained data were analysed through the SPSS 21 software. Descriptive statistics, crosstabulation, and Spearman correlation coefficient (when $p < 0.05$) were used for data analysis. The reliability of the questionnaire was screened using Cronbach's alpha coefficient, which "relies on the correlation between the individual questions that make up the questionnaire and evaluates whether all scale questions adequately reflect the research size, enables to specify the number of questions required on the scale" (Pukėnas, 2009, p. 24). The Cronbach's alpha coefficient average is 0.710 for subscales of the commitment forms, and subscales of the organizational culture type—0.851, such meanings indicate strong subscale compatibility.

5 Results

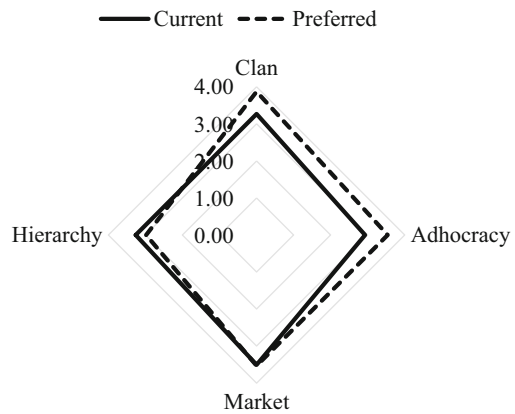
An analysis of the level and form of commitment of the respondents, the results of which are presented in Table 1, reveals that the largest number of respondents are employees, committed to their organizations, but they accounted for only 41.7% of all respondents. According to the form of commitment, the distribution of respondents was quite similar, of all committed respondents the largest part was made up of representatives of affective commitment (15.8%), the lowest number of representatives of normative commitment—12.5%. Neutral remained at 25% of respondents, and not committed respondents accounted for 33.3%. This distribution of results

Table 1 Distribution of respondents (*N* = 214) by commitment to the organization, %

Level of commitment of respondents	Number of respondents, %
Committed respondents:	41.7%
Affective commitment	15.8%
Continuous commitment	13.4%
Normative commitment	12.5%
Neutral respondents	25.0%
Not committed respondents	33.3%

Source: Composed by authors

Fig. 1 Comparison of the current and preferred types of organizational culture by the respondents' opinion. Source: composed by authors using Competing Values Framework (Cameron & Quinn, 2006)



confirms the fact of quite a low employee commitment in Lithuanian organizations and is a signal to business leaders warning of the necessary changes in organizations, to retain talented professionals and encourage their dedication to organizations.

After discussing the results of the respondent's commitment, the paper seeks to clarify the respondent's current and preferred types of organizational culture, that they would like to commit and continue to work. The results are shown in Fig. 1:

The dominant current organizational culture types are market (3.50 from 5) and clan (3.27 from 5), hierarchy follows with 3.26 from 5, and adhocracy points only 2.93, respectively. Comparing with the preferred types by respondents, clan points 3.87, adhocracy—3.54, market—3.53, and hierarchy—2.98 from 5, respectively. The largest discrepancy is observed in the type adhocracy, as the fewest companies were found of that type; however, the research data revealed that adhocracy is the most preferred type. This shows that the respondents are satisfied with the family atmosphere at work, the cooperation and they would like the type of clan culture to be more expressed in their organizations than is the case so far, but, in the opinion of the respondents, less attention should be paid to the dominance of the type of market organizational culture, instead of promoting competitiveness, employees should be given more freedom to reveal their creativity and to create innovations. The research results reveal that employees are willing to take on responsibility, want to be involved in the company's operations and decision-making; however, for fear of

Table 2 Employee commitment level in existing and preferred types of organizational culture, %

Level of commitment	Current organizational culture				Total:
	Clan	Adhocracy	Market	Hierarchy	
Committed respondents, %	38.9%	18.1%	21.9%	21.1%	100%
Neutral respondents, %	32.1%	15.7%	26.9%	25.3%	100%
Not committed respondents, %	28.9%	16.2%	28.2%	26.7%	100%
Level of commitment	Preferred organizational culture				Total:
	Clan	Adhocracy	Market	Hierarchy	
Committed respondents, %	51.7%	17.9%	14.3%	16.1%	100%
Neutral respondents, %	50.9%	20.2%	13.8%	15.1%	100%
Not committed respondents, %	49.7%	19.7%	12.3%	18.3%	100%

Source: Composed by authors

losing their power, the leaders of the organizations are still not ready to change the established order and give more freedom in the performance of tasks to the employees.

After determining the level of employee commitment and the current and preferred type of organizational culture, it is expedient to reveal in which types of organizational culture committed employees work (see Table 2):

Table 2 shows that in the current and preferred clan type there are more committed employees than not committed. Whereas adhocracy is a type of organizational culture that gives a lot of freedom, this culture type is more preferred by neutral employees, possibly because they want to remain neutral in relation to the company, it is also seen that in the preferred culture of adhocracy the percentage of committed employees also increases. In the current market culture, more not committed employees than committed, previous results have shown that the market is the least preferred type of organizational culture, which means that in order to have fewer not committed employees in a company, this organizational culture needs to be eliminated. There are also more not committed employees in the current hierarchical culture, at the request of not committed employees, the introduction of more hierarchy in the organization would reduce the percentage of committed employees. According to the results, the most preferred types of organizational culture for respondents, that they continue to work in the organization, are clan and adhocracy; therefore, based on the results presented in Table 2, it is concluded that a culture of clan and adhocracy needs to be formed in order to increase the percentage of committed employees and to eliminate or at least not significantly diminish the types of market and hierarchy. However, such a choice depends on the individual situation of each organization and the attitude of managers: whether to retain not committed employees or maintain the attitude of committed employees.

Spearman correlation coefficient was calculated by the SPSS program to evaluate the relationships between employee commitment and organizational culture (see Table 3):

The results reveal that the type of clan organizational culture clearly and statistically significantly correlates with affective (0.539) and normative commitment

Table 3 Correlations among forms of employee commitment and types of organizational culture

	Clan culture	Adhocracy culture	Market culture	Hierarchy culture
Affective commitment	0.539 ^a	0.505 ^a	0.344 ^a	0.150 ^b
Continuance commitment	0.273 ^a	0.213 ^a	0.265 ^a	0.265 ^a
Normative commitment	0.538 ^a	0.470 ^a	0.277 ^a	0.306 ^a

Source: Composed by authors

^aCorrelation is significant at the 0.01 level (2-tailed)

^bCorrelation is significant at the 0.05 level (2-tailed)

(0.538); the cultural type of adhocracy also correlates most with affective (0.505) and normative commitment (0.470). Affective commitment rises in the clan's organizational culture mainly due to the fact that the organization is unique in its characteristics, similar to a large family, where people have a lot in common (0.561), and normative commitment in the clan's organizational culture is caused by the education of people, high trust and conditions for participation in the management processes (0.534). Affective commitment as well as normative one (0.456 and 0.467 respectively) correlates with a commitment to work and mutual trust, as well as with the high level of organizational responsibility. In the organizational culture of adhocracy, the emotional and normative commitment of employees (0.492 and 0.469 respectively) is mostly stimulated by the dynamism of the organization, entrepreneurial skills, people's willingness to sacrifice and take risks for the success of the company.

Much weaker correlation observed between affective commitment and market culture, and the weakest—with hierarchy organizational culture. The organizational culture of the hierarchy is most clearly correlated with normative commitment, although hierarchy could be distinguished as the least affecting employee commitment.

It is important to mention that a relatively weak correlation was found between continuance commitment and all types of organizational culture, and this suggests that the emergence of continuance commitment is the least dependent on the type of organizational culture.

Analysing the correlations among the forms of employee commitment and the preferred type of organizational culture, a decrease in the values of the correlation coefficient can be seen, which may have arisen due to the fact that possibly employees do not sufficiently appreciate the significance of organizational culture and influence on the formation of their commitment, whereas employees primarily choose the organization they want to work in, without thinking about commitment to it. Commitment starts to form only later, depending on how the employee managed to adapt to the new organizational environment, and to integrate into the team.

Based on the study results, H1: "Clan culture type is positively related to affective employee commitment" is confirmed. Furthermore, it is related with normative commitment as well, what could be explained as employee unwillingness to disappoint clan members.

H2: “Adhocracy culture type is not related to any form of employee commitment” is rejected, because it revealed a significant correlation with both affective and normative commitment forms. It could be related to both clan’s and adhocracy’s focus on flexibility and discretion and shows what the new generations of employees’ value in workplaces.

H3: “Market culture type is positively related to continuance employee commitment” is also rejected as the correlation appeared to weak.

Finally, H4: “Hierarchy culture type is positively related to normative employee commitment” is rejected. Low correlation here, in comparison with clan culture, reveals, that normative form of employee commitment rises in conditions of obligation feeling to the colleagues and the pursuit of getting results through collaboration rather than structures, rules, norms, and procedures.

6 Discussion

After this research, it can be argued that organizations can encourage employee commitment by developing flexible work environment and good relationships among colleagues instead of building rigid work structures and strict rules. In human-centred organizations particularly, organizational culture plays an important role in creating organizational commitment and its success (Hamidi et al., 2017). Thus, as Turner et al. (2005) proposed, leaders should promote a culture, specifically clan or adhocracy culture types, fostering employee commitment.

As in the previous study of Wells and Lower (2016) and Harper and Utley (2001) found out, clan and adhocracy cultures are significant variables of affective commitment, when there is a culture of communication, support, and participation that is typically found in clan and adhocracy culture types. Correspondingly, in the research of Lee and Cho (2018), the type of organizational culture that made the strongest contribution to affective commitment was a culture of consensus that emphasizes human relationships and atmosphere, morality, and teamwork in the organization. This result is consistent with the ones presented by Acar (2012) and Shoaib et al. (2013). Kim (2007) argues that a culture of consensus and development, and a rational culture have no significant effect on organizational commitment, but a hierarchical culture had a significant positive effect on organizational commitment. According to Acar (2012), clan and market culture foster affective commitment, but a hierarchical culture and market culture had no significant relation to it. Shoaib et al. (2013) argued that only clan culture positively correlated with affective commitment. In the study by Delgoshai et al. (2009) findings were related to different forms of organizational commitment, where the highest mean score obtained was associated with affective commitment as well, which is consistent with the findings of the present study, but the lowest was related to the continuance commitment, but in the present study the normative commitment is less common.

This study finding agrees with propositions of Cameron and Quinn (2006), that clan cultures promote commitment among co-workers as among family members,

where they share values and attitudes, as well as workplace and remuneration for work. Clan cultures' flexibility and emphasis on people and on teamwork, high standards of morale, inner development, participation, and consensus (Cameron & Quinn, 1999) form an attractive workplace for employees.

Being preferred organizational culture by this study findings in the second row, adhocracy culture type also associated with flexibility, decentralization, and empowerment (Cameron & Quinn, 2006). Employees' commitment here is fostered by empowerment to choose decisions and forms how to work, and creative environment. Based on Acar (2012) findings, adhocracy culture is characterized by flexibility and creativity, loyalty is caused by helping facilitate young and educated, but inexperienced employees to reach their aim, therefore, this organizational culture may be dominated by a normative level of employee loyalty, because employees feel grateful to the company for the trust, the job provided or the resources invested. This totally corresponds to the study findings of normative commitment in relation to adhocracy culture.

Conversely, hierarchy and market culture types were observed in various studies not to be substantial predictors of commitment. Following Wells and Lower (2016) research findings, market and hierarchy culture type organizations create a rigid organizational structure with standardized rules and policies, thus, market and hierarchy culture types develop a lower organizational commitment of employees, especially of affective form, what corresponds to the findings of this research as well. Furthermore, it may be proposed that market cultures devalue employees; therefore, a low level of commitment can be expected for employees whose generation needs to feel significant in their work environment (Gesell, 2010). According to Kim (2007), hierarchical cultures are linked to bureaucracy, thus was expected not to have relation to, especially affective form, of commitment. However, Park and Rainey (2007) found in their study that the hierarchical culture related to affective commitment of employees. It could be a signal that cultural contexts and business environment of Korean companies in that case (Kim et al., 2007) could influence the employee commitment as well; therefore, the researches could be done in cases of companies from different countries in order to reveal those contextual differences.

7 Recommendations

Based on the results of the quantitative research, a model for improving the organizational culture to increase employee commitment was developed, which is presented in Fig. 2. With the help of this model, problems related to the insufficient employee commitment in the relation to organizational culture can be solved.

Discussing the model of improving the organizational culture to increase employee commitment, presented in Fig. 2, it is important to emphasize that the successful application of this model requires the participation all levels of employees. A research of the current organizational culture should be carried out, the type of company culture must be determined, assessing whether employees

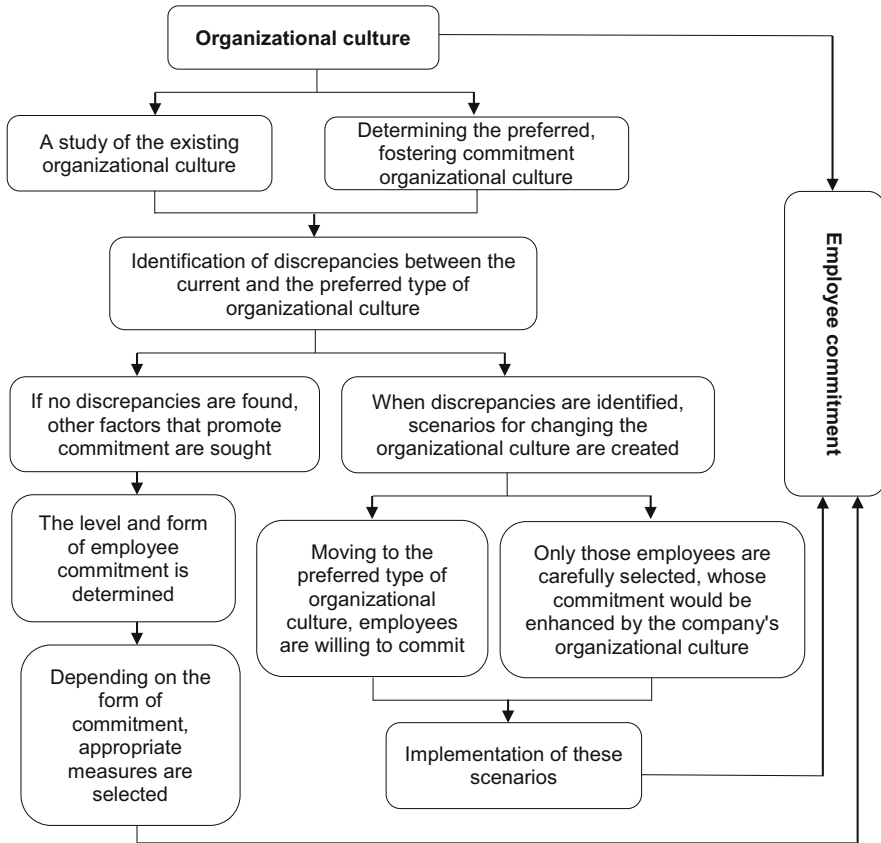


Fig. 2 Model of improving the organizational culture to increase employee commitment. Source: composed by authors

adhere to values. After research, discrepancies between the present culture and preferred and enhancing commitment by the employees are identified. In cases where no discrepancies are identified and the current type of culture coincides with the type of culture preferred by the employees, it is assumed that in such companies the type of organizational culture is not the most important factor fostering commitment, but more important is the basis of commitment and the measures used to promote employee commitment in the organization, for this reason, the level and form of employee commitment is determined by means of a questionnaire, after collecting the data, the results are summarized, depending on the results, other measures to promote employee commitment must be sought (e.g., as the results of the quantitative research, the least organizational culture promotes the continuous commitment of employees, so the measures must be selected according to the needs of these employees). When discrepancies between employees preferred and current organizational culture type are identified, business leaders can decide to change or

improve their culture in order to promote employee commitment, for which there are two main ways:

- transition to the most preferred type of organizational culture, depending on the type preferred by existing employees (it is important to emphasize that in this scenario, new employees must be rigorously selected those, which would be promoted by this culture) or to accept all highly qualified staff and then, in the opinion of the majority, to change the existing type of culture to the preferred one;
- carefully selected only those future employees, whose commitment is enhanced by the company's current organizational culture. In this scenario, special attention must be paid to the staff selection process and the professional performing the selection, whereas those employees should be selected whose values and objectives at least partially coincide with those of the organization and whose preferred type of culture would not conflict with that prevailing in the organization.

Organizations must choose the prevailing scenario that is most appropriate to their situation, considering the needs of employees and the situation in the company, and start to plan its implementation within the organization.

The implementation of the model of improving the organizational culture to increase employee commitment in Lithuanian organizations can help to solve the problem of insufficient employee commitment for the companies.

8 Conclusion

When the employee fails to adapt to the current organizational culture, he does not feel committed to the organization, he is not fully involved in the performance of tasks and does not feel the desire to perform them as best as possible, as well being not interested in contributing to the success of the organization and seeks to meet only his personal needs (e.g., to receive a salary in order to make a living). Without being committed to the culture, the employee begins to feel a strong desire to change the organization, which increases the turnover of employees. Frequent staff turnover also has a negative effect on the organization itself, it loses talented specialists, incurs the costs of finding new employees, decreases commitment, trust in managers and the organization, can form a negative opinion about the organization as an employer in society and thus makes it difficult to attract new employees. Thus, it is essential to form an organizational culture that would retain talented employees committed to organizations.

After analysis of the scientific literature, it was determined that employee commitment is directly related to organizational culture, whereas an organizational culture is properly developed and meeting the needs of employees promotes employee dedication and increases commitment to the company.

Results of quantitative research reveals that managers pay too little attention to promoting employee commitment, which is shown by a quite low part of committed employees surveyed, working in Lithuania companies. The results of the empirical

study showed that the organizational culture types of market and clan prevail in Lithuanian organizations; however, the most preferred types of culture for employees they commit to the organization, are clan and adhocracy. The discrepancy between the current and preferred culture has an impact on the low commitment rates of employees because market and hierarchy cultural types generate a low level of employees' commitment, according to research data, and they are not preferred of employees as a suitable work environment. This study reveals that the highest level of employees' commitment, firstly of affective and then of normative forms, could be reached developing clan type of organizational culture. The form of continuance commitment was found having the weakest relations with the type of organizational culture, therefore further research should be conducted in order to enclose its determinants.

Organizations seeking to increase employee commitment are offered to move to the preferred types of organizational culture, the employees are willing to commit. To implement this, the model of improving the organizational culture to increase employee commitment can be implemented in companies.

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The Mediating Role of Emotional Stability between Regulation of Emotion and Overwork



Ajtene Avdullahi  and Osman Yildirim 

Abstract In today's industrial working environment, too many responsibilities of employees have forced them to extend their working hours and thus affect their individual mood. Having to work overtime may cause individuals to gradually engage in workaholic work. Excessive work obligation or habit can disrupt the emotional balance of the individuals or make it difficult for them to regulate their emotional state. From another point of view, the emotional balance of individuals in industrial life is considered an important skill. This research aims to explore the mediating role of emotional stability between emotion regulation and overwork. The research data were collected by applying a questionnaire with the convenience sampling method with 320 participants from the health sector. All participants work in health institutions in Istanbul and voluntarily agreed to participate in the survey. A research questionnaire was structured by using the expressions of overwork, emotional balance, and regulation of emotions scales from the literature. The results regarding the relationship between emotion regulation and overwork show that the emotional stability of individuals has an important effect. With the findings of the research model established with the research hypotheses, it was aimed to draw the attention of the researchers to overwork as a concerning issue that may affect the emotional state of the individuals.

Keywords Emotional stability · Regulation of emotion · Working excessively · Structural equation modeling

A. Avdullahi (✉)

Faculty of Economics, University Isa Boletini in Mitrovica, Mitrovica, Kosovo
e-mail: ajtene.avdullahi@umib.net

O. Yildirim

Engineering Department, Istanbul Arel University, Istanbul, Turkey
e-mail: osmanyildirim@arel.edu.tr

1 Introduction

The organization will achieve its goals, largely dependent on the employees of the organization. One of the pivotal factors for organizational success is employees' morale (Bakotić, 2016). Top managers make a series of efforts to direct their employees toward organizational goals. Considering the management style suitable for the type of organization, it is known that the managers who will demonstrate an appropriate management style move to the top management of the organizations.

After selecting the appropriate management style and professional managers for the type of organization, the effectiveness of the management style is monitored. It may be necessary to take into account several approaches that will make the manager effective in the management style and their consequences. For example, it can be considered as a good situation in terms of achieving the goals of the organization in case of overwork. According to Kuroda and Yamamoto (2019), overwork is defined as a state in which workers allocate long hours to work, leading to detrimental impacts on their mental health. It should be taken into consideration that emotional stability may change in the employees in case of excessive work or unwanted distress may arise in case of regulating emotions. In the review of the related literature, it can be suggested that there are variables such as emotional stability, regulation of emotion, working excessively, and working compulsively, which are considered important for the employees and are quite a subject of research. With this work, emotional stability, regulation of emotion, overwork, excessive and compulsive work, which are considered important for employees and are highly research subjects, were taken into account. There are a large number of both conceptual analysis and empirical studies in the literature with each of the research variables. With this research, it was planned to reveal the variable that will have a mediator role among the research variables. In this respect, the study has a unique research feature.

2 Literature Review

In this section for our research purpose, the existing literature is reviewed from journal articles as well as from other sources. The reviewed literature is classified according to our variables of interest for the research such as Emotional Stability, Regulation of Emotion, Overwork, Working Excessively, and Compulsively.

2.1 *Emotional Stability*

McCrae and Costa (1989) define individuals' attitudes and behaviors that show continuity according to changing situations and the way they interact. In his study, Goldberg (1990) expresses personality types in five dimensions: openness to

experience, responsibility, extraversion, compatibility, and neuroticism (Andreassen et al., 2010; Barrick & Mount, 1991). According to Saad and Ahmed (2020), emotional stability is the process in which the personality is continuously striving for a greater sense of emotional health, both intra-physically and intra-personally. Arora and Rangnekar (2015) state that low scores of emotional stabilities are labeled as neurotic individuals, who tend to display ineffective coping mechanisms, and they lack the ability to find a constructive solution to a problem.

Burke et al. (2006) search the relationship of personality factors (Neuroticism, Extraversion, Conscientiousness, Agreeableness, Openness to new experience) with workaholism defined by Spence and Robbins (1992) and point out that personality factors are statistically correlated to workaholism. Besides, Aziz and Tronzo (2011) investigate the relationship of the five-factor model of personality with workaholism. According to their research, conscientiousness and agreeableness are positively correlated to work involvement; conscientiousness and openness to experience are positively correlated to work drive. Their research findings show that agreeableness, conscientiousness, and openness to experience are positively correlated to work enjoyment, whereas neuroticism is negatively correlated to work enjoyment. Besides, Imran (2019) finds a positive relation of extraversion, agreeableness, conscientiousness, and openness to experience on individual innovativeness and satisfaction with life perceptions. Whereas, neuroticism which is a core predictive factor of depression and anxiety disorders (Rossberger, 2014) is negatively related to individual innovativeness and satisfaction with life perceptions (Imran, 2019).

Depending on the behaviors, some workaholic individuals may be a benefit to organizations, while others may be an unfit organizational member (Scott et al., 1997). On the other hand, Jackson et al. (2016) formulate the relationships between personality traits (Big Five Models) and workaholics, they find that workaholics are not related to an addictive personality.

2.2 Regulation of Emotion

Regulation of emotion is a process by which people influence their emotions: what and when they feel, and how these emotions are experienced and expressed (Gross, 2015). Aldao and Nolen-Hoeksema (2012) demonstrate that particular regulatory strategies such as suppression and rumination strongly relate to psychopathology, whereas reappraisal and acceptance relate more to psychological health. Thorndike and Stein define the concept of social intelligence in their study in 1937 (Thorndike & Stein, 1937). Wechsler (1939) add the emotional intelligence dimension to this concept in his study. In his research in 1983, Gardner put forward the idea of “multiple intelligence”. In his “multiple intelligence” theory, Gardner (1983) put forward the difference between “knowing one’s inner world” and “social skill”. This research later results in emotional intelligence theories (Gardner, 2011). According to Bhullar and Schutte (2020), emotional intelligence consists of interdependent competencies that relate to perception, understanding, utilizing, and managing

emotions in the self and others. Salovey and Mayer (1990), on the other hand, reveal the connection of emotional intelligence with empathy. Similar to these studies, emotional intelligence can express as the individual's being aware of their own emotions, empathizing, organizing their feelings and behaviors, and managing their emotions (Salovey & Mayer, 1990; Charbonneau & Nicol, 2002). Agnoli (2021) analyzes emotional intelligence as a construct referring to the individual differences in perceiving, regulating, managing, and exploiting emotions. Goleman (1998) in his research makes the concept of emotional intelligence very popular (Kun & Demetrovics, 2010; Schutte et al., 2007). While Schutte et al. (2007) examine the relationship between sensory intelligence and health in their study, Yildirim (2007) reveals the relationship between salespeople and information technology staff's performance with emotional intelligence. Lopes et al. (2003) in their study, indicate the relationships between emotional intelligence and measured personality traits. Goleman (2005) offers new insight into our "two minds"—the rational and the emotional—and how they together shape our destiny. Law et al. (2004) review emotional intelligence and discuss how it differs from the big five personalities. It is possible to empathize, to understand the person opposite, to show the ability to reduce negative emotions and increase positive emotions, and to manage emotions. Therefore, emotional balance directly relates to managing emotions (De Raad et al., 2008). Emotional intelligence in the workplace is the ability of professionals, especially leaders and managers, to recognize their emotions and those of others, and adjust their emotions and reactions to achieve their goals (Udoagwu, 2021). Almazrouei (2017) investigates the effect of dimensions of emotional intelligence on enhancing employees' eustress at work. The findings indicate that there is a significant positive association between others-emotions appraisal, use of emotions, regulation of emotions, and employees' eustress. Whereas, there is no significant effect of the self-emotions appraisal on employees' eustress.

2.3 Working Excessively and Working Compulsively

Overwork means that the individual does business without waiting for a response or works above the level specified in the employment contract. Because of their loyalty to the business, the employees do extra work to avoid giving up half, or they choose to work hard to avoid the stresses and problems of everyday life. Business owners or top managers are satisfied with the attitude of the employees, provided that they do not overdo it. Scott et al. (1997) express workaholics, overwork, as a dedication to working spiritually at all times.

People sometimes overwork by underestimating the negative impact and risk on their physical and/or mental health (Kuroda & Yamamoto, 2019). For instance, in Japan, the government's Ministry of Health, Labour and Welfare interviewed 11,010 regular male employees. The results indicate that more than 55% of employees felt either a high or an extremely high degree of fatigue (Ministry of Health, Labour and Welfare, 2016). Long working hours are among the principal causes of impairing

mental health in Japan (Kuroda & Yamamoto, 2016). The original 25-item self-report inventory, the work addiction test, was developed by Robinson (1999). Besides, many authors endorse a two-subscale solution (Kanai et al., 1996; McMillan et al., 2001) that comprises two scales: Work Enjoyment and Feeling driven to work. Driven to work represents a feeling that one “should” work or an introjected work motivation, or, of compulsion to work (Laurence et al., 2020; Graves et al., 2012). According to Graves et al. (2012), enjoyment of work is an intrinsic motivation that is rooted in finding work itself to be interesting or pleasurable. In addition, employees who both enjoy their work and feel an inner motivation to work will be involved proactively that result in changes in their jobs and will have an impact on their performance (Grant et al., 2009; Laurence et al., 2020). The lack of internal employee’s motivation to work diminishes these behaviors and has an impact on their performance (Laurence et al., 2020).

As a result of the work done on the work addiction test or the workaholism test, a two-dimensional DUWAS scale emerged (Taris & Schaufeli, 2003). Taris et al. (2005) propose the validation of a Dutch version of Robinson’s (1999) scale (Work Addiction Risk Scale). It is called the Dutch Work Addiction Scale which has two dimensions such as working excessively and working compulsively. According to Kowalczyk et al. (2020), working excessively usually take place in four aspects: a perfectionist work style, loss of control over work, general views about work, and the perceived oppressiveness of the organization.

When the literature is examined, workaholism is considered as two dimensions. These dimensions are: (1) overwork (the individual’s overwork or obsession to work), and (2) the tendency to work (the individual perceives work as a necessity) (Schaufeli et al., 2009). However, Ying-Wen and Chen-Ming (2009) investigate the interactions among antecedents of workaholism and determined the antecedents linked to workaholism. The most commonly discussed are the working excessively and working compulsively dimensions of workaholics. Sharma and Sharma (2018) stress that working excessively—the tendency to work hard is a behavioral dimension while working compulsively—an obsession with work is a cognitive dimension. According to Schaufeli et al. (2008), working excessively presents the tendency to allocate remarkably much time to work than to other life activities and to work beyond what is reasonably expected, whereas working compulsively presents a strong inner drive to work hard and to think about work, even when not working. As a rule, submissive people have more of a tendency to enjoy working excessively (Jackson et al., 2016).

In this study, this approach is accepted and while hypotheses are established, emotional balance, personality type, and regulation of emotion were used. Attention has been drawn to the relationships between emotional stability in the five-factor personality model and regulation of emotion, which is the emotional intelligence dimension, and overwork.

Sharma and Sharma (2018) explore the impact of different components of workaholism on employee well-being both at the professional and personal front among bank employees in India. They found that family satisfaction and mental, spiritual, and emotional well-being is negatively correlated with combined

workaholism and working excessively workaholism, whereas job and career satisfaction are positively correlated with working compulsively workaholism (Sharma & Sharma, 2018). Employees need to find a balance between work and leisure, i.e., entertainment. Further research (Onstad, 2017) showed that a well-lived weekend is a gateway to a well-lived life and that by saving the weekend from overbooked schedules, we can save ourselves.

3 Methodology

The research methodology, data collection tools, research model, the research sample (participants), and statistical techniques used for our research purpose are presented below. The collected data in the study are analyzed and interpreted using SPSS for Windows 22.00 and AMOS 22.0 program. Confirmatory factor analyses related to the scales used in the study are made in the AMOS program, and Cronbach's alpha, average variance extracted (AVE), and composite reliability (CR) values were also calculated. Besides, the mediating effects of structural equation modeling were analyzed in the AMOS program using the bootstrap method.

3.1 Data Collection Tools

To gather information about the emotional balances of the participants, De Raad et al. (2008), the emotional stability dimension of the personality types was included in the research questionnaire. However, as a result of the statistical analysis, the statements such as "Is dependent in taking decisions" and "Is affectionate towards family and friends" in the original scale dimension were excluded from the evaluation.

Unlike the studies in the literature, hypotheses have been established regarding the mediating effects between the emotional intelligence component, the personality type expressed by emotional balance, and the dimensions of overwork. The hypotheses detailed in the methodology section are established with the variables emotional stability, the regulation of emotion, working excessively, working compulsively, the relationship between others-emotions appraisal and working excessively. For the hypotheses, the scale in the study of Schaufeli et al. (2006), sub-dimensions of the emotional intelligence scale from Law et al. (2004), and the emotional balance dimension is taken from De Raad et al. (2008).

3.2 Research Model and Hypothesis

The research conceptual framework is shown in Fig. 1.

The research hypotheses are restated below using the sub-dimensions of the scales mentioned above.

Hypothesis 1: Emotional stability has a mediating role in the relationship between others-emotions appraisal and working excessively.

Hypothesis 2: Emotional stability has a mediating role in the relationship between others-emotions appraisal and working compulsively.

Hypothesis 3: Emotional stability has a mediating role in the relationship between the regulation of emotion and working compulsively.

Hypothesis 4: Emotional stability has a mediating role in the relationship between the regulation of emotion and working excessively.

3.3 Participants

Surveys were conducted with 329 people for face-to-face survey work. However, the completion rate of 9 questionnaires was very low and it was excluded. Thus, the number of participants was determined as 320. Research data were collected from employees in health institutions in Istanbul between September 2019 and November 2020. The ethics committee report was received before the survey application. The questionnaire was applied face-to-face to healthcare professionals who accepted to fill out the questionnaire voluntarily using the easy sampling method. Based on the requirement of at least 200, at most 500 survey data for statistical analysis, 320 survey data were deemed sufficient.

A categorical evaluation was not made according to demographic data, but a percentage distribution was given for the sample. To collect research data, 320 healthcare workers in Istanbul were conducted voluntary surveys using an easy sampling method. Since there are mostly female employees in health services

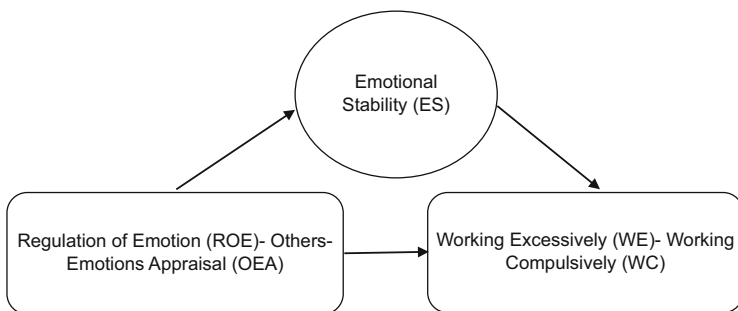


Fig. 1 Research conceptual framework

in Istanbul, the percentage of the female who filled out the questionnaire was high. According to the percentage distribution, the gender distribution of the participants is 76.7% female and 23.3%, male. The highest age group among our participants is 30–34 years old with 59.7%. Then, the 25–29 age group is included with a rate of 35.3%. In the educational status of our participants, there are 54.3% of primary school graduates, 25.7% high school graduates, and 10.7% university graduates. In the occupational groups, the administrator was at the rate of 33.7%, while the ratio of doctor-nurse was in the ratio of 17.7%. The rate of other participants is determined as 16.3%.

3.4 Methodology

The collected data in the study were analyzed and interpreted using SPSS for Windows 22.00 and AMOS 22.0 program. Confirmatory factor analyses related to the scales used in the study were made in the AMOS program, and Cronbach's alpha, AVE, and CR values were also calculated. Besides, the mediating effects of structural equation modeling were analyzed in the AMOS program using the bootstrap method.

4 Findings

Confirmatory factor analysis (CFA) investigated the significance of the measurement models for each scale and the good fit criteria required for both confirmatory factor analysis and the suitability of the measurement model with the AMOS 22.0 package program (Table 1). As it is known, as the sample grows, the chi-square (χ^2) value also increases and the statistical significance level of the chi-square (χ^2) test decreases (Bollen, 1989; Fornell & Larcker, 1981; Bagozzi & Yi, 2012). Both the confirmatory factor analysis and the suitability of the tested model are determined by taking into account the values in the chi-square (χ^2) value, the degree of freedom, goodness-of-fit indices, and the standardized residual covariance matrix (Schermelleh-Engel et al., 2003).

Table 1 Goodness-of-fit indices and conformity values used in confirmatory factor analysis

Indexes	Good fit	Acceptable fit
χ^2 / df	$0 \leq \chi^2/df \leq 2$	$2 < \chi^2/df \leq 3$
GFI	≥ 0.90	0.85–0.89
CFI	≥ 0.97	≥ 0.95
SRMR	≤ 0.05	$0.06 \leq SRMR \leq 0.08$
RMSEA	≤ 0.05	$0.06 \leq RMSEA \leq 0.08$

Source: Kline, 2005; Schermelleh-Engel et al., 2003

From the 16-item Big four (bf) scale, the 4-item emotional stability (ES) dimension was eliminated from the analysis because the factor load was low (FL <0.50). From the 17-item DUWAS scale, the 6-item factor load was low (FL <0.50). There are 4 items in the regulation of emotion (ROE) and others-emotions appraisal (OEA) sub-dimensions, which are sub-dimensions of the emotional intelligence (EI) scale. In all of the scale items, factor load values are in the range (0.543; 0.895) (Kline, 2005; Schermelleh-Engel et al., 2003).

As can be seen in Table 2, confirmatory factor analysis is significant for the measurement model since model test values ($P < 0.05$) $\times 2$ (318.078) $\times 2/df$ (1.797) are found in confirmatory factor analysis. It is understood that the confirmatory factor analysis of the measurement model is valid since the fit index values of the model are within the acceptable limits of GFI (0.911), CFI (0.941), SRMR (0.0631), RMSEA (0.060).

4.1 Reliability, Combined Reliability, Convergence Validity, Decomposition Validity, and Average Variance Values

To collect data, a research questionnaire was designed using the scales in the literature. The reliability of the scales used for the analysis (Cronbach's alpha ≥ 0.7), composite reliability (CR ≥ 0.7), and the average variance extracted (AVE ≥ 0.7) values for the convergence validity were tested. Decomposition validity values are compared with the correlation value for each dimension and are expected to be greater than it (Raykov, 1997; Fornell & Larcker, 1981).

The square root values of the calculated AVE values given in brackets in Table 3 should be higher than all correlation values in that column. The separation validity is provided for all variables.

According to the research findings in Table 3 all sub-dimensions of research scales are very reliable. The Cronbach's alpha, CR, and AVE values are enough high for all sub-dimensions of research scales such as the others-emotions appraisal (OEA), the regulation of emotion (ROE), the working excessively (WE), the working compulsively (WC), and the emotional stability (ES). It can be stated that the unified reliability condition is fulfilled since the unified reliability values are in all CR values (CR > 0.70). As the mean-variance values (AVE > 0.50) for all variables are found, it is seen that the necessary condition is met in the convergence validity. The square root values of the calculated AVE values are given in brackets in the table to see the validity of decomposition. Since these values are higher than all correlation values in that column, the separation validity is assumed to be provided for all variables.

Table 2 Confirmatory factor analysis for measurement model

Items from references	Dimension	Estimated values	Standard estimated values	C.R.	P
bf13 (Is controlled. . .emotional situations)	ES	1.000	0.895		
bf15 (Remains. . .chaotic situations)	ES	0.745	0.649	6.056	***
dws4 (I find myself . . .called it quits)	WE	1.000	0.778		
dws8 (I stay busy . . . irons in the fire)	WE	1.085	0.706	10.67	***
dws10 (I seem to be . . .against the clock)	WE	1.310	0.757	11.12	***
dws12 (I spend . . .on leisure activities)	WE	0.874	0.77	11.45	***
dws13 (I feel guilty . . .on something)	WE	1.294	0.67	6.995	***
dws15 (I find myself . . .on the telephone)	WE	1.075	0.643	6.164	***
dws17 (It is hard . . .I am not working)	WE	1.425	0.611	6.637	***
dws7 (I overly commit. . . than I can chew)	WC	1.000	0.686		
dws11 (I feel . . . drives me to work hard)	WC	1.296	0.708	8.210	***
dws14 (I feel . . .when it is not enjoyable)	WC	1.249	0.651	7.750	***
dws16 (I feel guilty. . . time off work)	WC	1.573	0.781	8.712	***
ei5 (I always know. . .from their behavior)	OEA	1.000	0.631		
ei6 (I am a good . . . others' emotions)	OEA	1.138	0.751	10.367	***
ei7 (I am sensitive. . .emotions of others)	OEA	1.114	0.783	8.878	***
ei8 (I have good. . .people around me)	OEA	1.379	0.859	9.106	***
ei13 (I am able. . .difficulties rationally)	ROE	1.000	0.818		
ei14 (I am quite. . . my own emotions)	ROE	0.968	0.795	11.406	***
ei15 (I can always calm. . .I am very angry)	ROE	0.853	0.660	9.369	***
ei16 (I have good. . .own emotions)	ROE	0.799	0.700	10.030	***

*** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$; Bigfive (bf); Emotional Stability (ES); Dutch Work Addiction Scale (dws); Working Excessively (WE); Working Compulsively (WC); Emotional Intelligence (ei); Others-Emotions Appraisal (OEA); Regulation of Emotion (ROE)

Source: Authors own calculations based on De Raad et al., 2008; Taris et al., 2005; Law et al., 2004

Table 3 Correlation, reliability, and dissociation validity values of the scales used in the research

<i>Sub-dimensions of the research scales</i>	MEAN	SD	ES	WE	WC	OEA	ROE
Emotional stability (ES)	3.65	1.113	(0.781)				
Working excessively (WE)	3.54	0.891	0.287**	(0.707)			
Working compulsively (WC)	3.47	1.031	0.286**	0.795**	(0.715)		
Others-emotions appraisal (OEA)	4.27	0.739	0.145*	0.215**	0.153*	(0.760)	
Regulation of emotion (ROE)	3.93	0.930	0.400**	0.239**	0.211**	0.311**	(0.746)
Reliability coefficient Cronbach’s alpha	–	–	0.719	0.848	0.789	0.823	0.821
Composite reliability (CR)	–	–	0.754	0.875	0.800	0.844	0.833
Average variance extracted (AVE)	–	–	0.611	0.501	0.512	0.578	0.557

*** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$. WE Working Excessively, WC Working Compulsively, ES Emotional Stability, OEA Others-Emotions Appraisal, ROE Regulation of Emotion
 Source: Authors own calculations

4.2 Structural Equation Modeling

The research model given in Fig. 1 was tested using the path analysis with the observed variables with the help of the AMOS program version 20.0 (Kline, 2005). As seen in Fig. 2, the statistical significance of the indirect effects present in the model was tested by the bootstrapping method used instead of the Sobel test (Preacher & Hayes, 2008).

It is understood that the model is significant since the model test values $\times 2$ (397.166), $\times 2/df$ (2.206), and ($p < 0.05$) in the path analysis model with the observed variables for all data ($n = 320$). It is understood that the model is valid because the fit index values of the model are within the acceptable fit limits of GFI (0.911), CFI (0.961), SRMR (0.0702), and RMSEA (0.071). The presence of meaningless ($p > 0.05$) path values in the model are predicted to slightly weaken the model fit index values. Direct and indirect relationships tested with bootstrap to determine mediator variables in the model are given in Table 4.

The findings were obtained in the analysis made by the bootstrap ($n = 2000$) method. In the research conducted with 320 people, the following hypotheses were investigated. These hypotheses are as follows:

1. The mediating role of the emotional stability (ES) between the others-emotions appraisal (OEA) and the working excessively (WE) (Not Mediator: Hypothesis1).
2. The mediator role of emotional stability (ES) between others-emotions appraisal (OEA) and working compulsively (WC) (Not Mediator: Hypothesis 2).
3. The mediating role of emotional stability (ES) between the regulation of emotion (ROE) and working compulsively (WC) (Partial Mediator: Hypothesis 3).

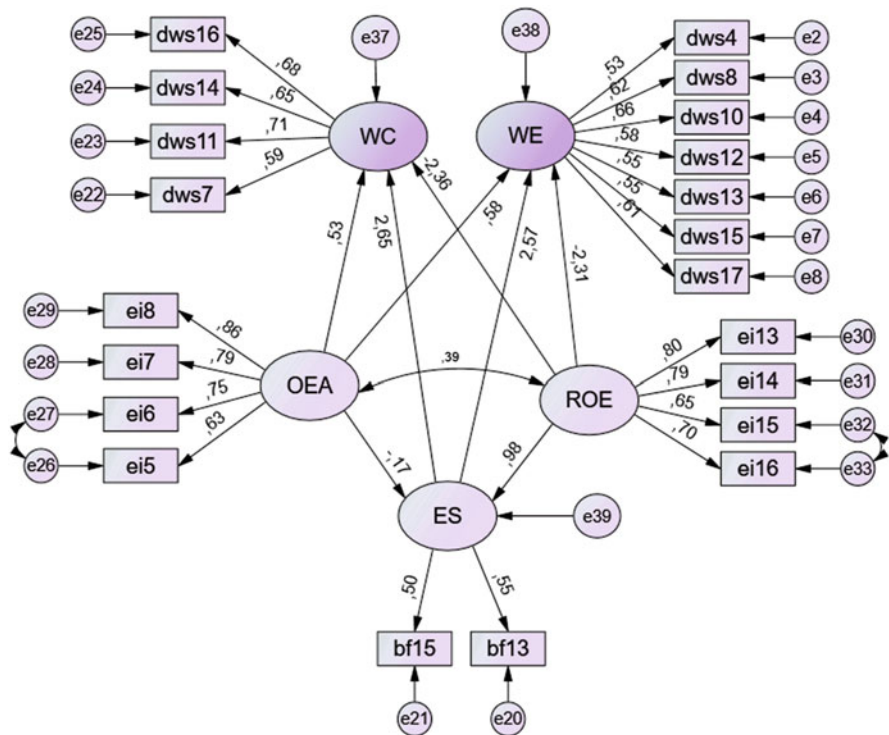


Fig. 2 Testing the mediator model with path analysis by latent variables. Source: Authors own study

Table 4 Direct and indirect effect values between independent, dependent, and mediator variables

Hypotheses	Direct effect	Direct effect <i>p</i>	Indirect effect	Indirect effect <i>p</i>	Result
OEA→ES→WC	0.645	0.204	-0.560	0.250	Not mediator
OEA→ES→we	0.667	0.174	-0.517	0.243	Not mediator
Roe→ES→WC	-1.835	0.001**	2.022	0.001**	Partial mediator
Roe→ES→we	-1.704	0.001**	1.867	0.001**	Partial mediator

****p* < 0.001 ***p* < 0.01 **p* < 0.05. WE Working Excessively, WC Working Compulsively, ES Emotional Stability, OEA Others-Emotions Appraisal, ROE Regulation of Emotion
Source: Authors own study

4. The mediating role of the emotional stability (ES) between the regulation of emotion (ROE) and the working excessively (WE) (Partial Mediator: Hypothesis 4).

The direct and indirect effects of the OEA on the WC are not significant. Then ES has no mediating effect on the relation between OEA and WE (Hypothesis 1:

Rejected). By using a similar approach, ES is not a mediator on the relation between OEA and WC (Hypothesis 2: Rejected). The direct and indirect effects of the ES on the relation between ROE and WC are significant (Table 4). Therefore, it can be said that the emotional stability (ES) variable plays a partial mediator role in the relation between ROE and WC (Hypothesis 3: Accepted). It is possible to talk about the mediator effect for hypothesis 3 and hypothesis 4. When the analysis results in Table 4 are examined, the mediator effects are given. It can be said that a similar evaluation is valid for hypothesis 4. That is, the direct and indirect effects of the ES on the relation between ROE and WE are significant (Table 4). Therefore, it means that emotional stability plays a partial mediator role in the relation between ROE and WC (Hypothesis 4: Accepted).

Although we found numerous studies (conceptual analysis and empirical studies) in the literature for each research variable of our research, still there is a gap in the literature regarding the mediating role of emotional stability between the regulation of emotion and overwork. Thus, comparing the results of this study with other research results has been almost impossible and has not been performed. This is mainly due to the difference that the established hypotheses and variables in this paper with those we encountered during the literature review.

5 Conclusion

Lack of nursing staff affects the quality of medical services worldwide (Haegdorens et al., 2019). The emotional balance of individuals in both daily and business life is a very important feature and requirement. The mental state of individuals is an important factor in their happiness in their private lives. Similarly, the individual with good emotional balance will work with greater pleasure in the workplace and work in good harmony with their colleagues. For this reason, top managers try to achieve the organizational goals while trying to achieve the desired performance of their employees by using organizational behavior theories.

While the emotional balance of the individual is suppressed by his emotional intelligence, on the other hand, his good mood deteriorates and even affects his job performance. When the relevant literature is examined, it is possible to find many qualitative and quantitative studies in this context. There is little or no research that had been done on the mediating role of emotional stability between the regulation of emotion and overwork. From our literature review, we found research that has examined the mediating role of Emotional Stability and Self-esteem between Mindfulness and Psychological Well-being (Ayesha et al., 2020). The research findings indicate that self-esteem mediates the relationship between Mindfulness and Psychological Well-being but Emotional Stability does not mediate between Mindfulness and Psychological Well-being (Ayesha et al., 2020). The mediational role of emotion regulation in the relationship between personality and subjective well-being was explored by Kobylińska et al. (2020). Results indicated reappraisal mediated associations of emotional stability with life satisfaction and positive affect. This

research admits the role of emotion regulation for extraversion and emotional stability and their association with well-being (Kobylińska et al., 2020).

A new questionnaire was not studied for this research, but a research questionnaire was created using the scales in the literature. Reliability and validity (Cronbach's alpha, AVE, CR) for the scales in the research questionnaire were analyzed statistically. Besides, confirmatory factor analysis was performed for the original scales. Structural equation modeling was used to test the hypotheses created according to the research model. According to the findings, emotional stability has no mediating role in the relationship between both regulation of emotion working excessively and regulation of emotion-working compulsively (Hypotheses 1 and 2: Rejected). On the other hand, research findings say that emotional stability has a mediating role in the relationship between both others-emotions appraisal-working excessively and others-emotions appraisal-working compulsively (Hypotheses 3 and 4: Accepted).

This research has aimed to reveal the effects of overworking on the emotional balance of employees or the ability of employees to manage their emotions through overwork. On the one hand, employees who strive to achieve the goals of the organization by working excessively, on the other hand, this excessive work has effects on the mental state of individuals. The mediating effects between the variables revealed by this research present important findings for the management styles of top managers.

Although this study provides valuable contributions to employees, managers, and enterprises, still it has some limitations. First, the data collection tool was the research questionnaire addressed by the easy sampling method to 320 healthcare workers only in Istanbul. The results of our research may differ from the results of other countries, but also within Turkey when it comes to other smaller cities which have other traditions and customs, less crowded, stressful, and dynamic life compared to a large city such as Istanbul. Therefore, we can say that this research may have some cultural limitations. Moreover, the ratio among female respondents is significantly higher than for male staff. So, research can also be conducted in other sectors, to have more inclusive research results of both genders. Third, our research includes data only for approximately one year and is not longitudinal research; therefore, it lacks the time dimension to observe and investigate a phenomenon. Therefore, further research with a holistic approach in this area is desirable to explore the mediating role of emotional stability between emotion regulation and overwork.

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Part III
Eurasian Business Perspectives:
Management

Offshore Outsourcing in Fast Fashion Companies: A Dual Strategy of Global and Local Sourcing?



Elisa Arrigo

Abstract Previous academic research highlighted that cost and time represent key factors to consider in fast fashion manufacturing outsourcing decisions. In fact, fast fashion companies were proven to combine local and global sourcing to reduce their manufacturing cost and be able to rapidly meet customer needs. However, in the last years, fast fashion companies have often been criticized for adopting irresponsible behaviors in their offshore sourcing activities. Therefore, the purpose of this study is to explore the sourcing strategies of fast fashion companies in order to understand whether a dual strategy of global and local sourcing is still followed and whether new additional factors may have recently influenced their outsourcing strategies. By adopting a qualitative research methodology, a multiple case study of fast fashion companies was carried out. The findings revealed that fast fashion companies do not perform constantly a dual sourcing strategy and, despite cost and time still represent key factors characterizing their manufacturing outsourcing, also social and environmental sustainability aspects appear to be currently assessed by companies to achieve a strategic sourcing orientation.

Keywords Offshoring · Global sourcing · Fast fashion · Global markets · Fashion industry

1 Introduction

Manufacturing outsourcing has emerged as a valuable strategy to survive in the global market where the process of globalization and the consequent growth of competitive rivalry have forced companies to maximize their productivity and profitability (Kotabe et al., 2009). For decades, European and US clothing

E. Arrigo (✉)

Department of Economics, Management and Statistics, University of Milano-Bicocca, Milan, Italy

e-mail: elisa.arrigo@unimib.it

companies have profited from moving manufacturing to low-cost countries and this has caused the advent of global sourcing (Kotabe & Murray, 2004). However, companies have currently understood the need to consider additional factors beyond cost and are reevaluating their supply chain design (Bohnenkamp et al., 2020).

Fast fashion represents a fascinating area of research in which to investigate manufacturing outsourcing decisions (Moon et al., 2017; Li et al., 2014; Barnes & Lea-Greenwood, 2006; Hayes & Jones, 2006; Sheridan et al., 2006). Fast fashion companies have organized their supply chains at a global level with the objective of exploiting the best competitive conditions arising worldwide. In fact, companies such as Gap Inc. and Inditex rely on complex supply chains to facilitate garment production by using offshore suppliers on a contract basis (Moon et al., 2017; Arrigo, 2016). At the same time, the need both to respond quickly to market requests and to monitor all stages of apparel manufacturing has sometimes discouraged fashion companies from choosing suppliers too distantly located, even if they offer labor and service costs lower than those of the home country (Mihm, 2010; Li et al., 2014). Consequently, fashion companies have revisited their manufacturing location decisions by performing also near sourcing strategies (Tate et al., 2014; Tate, 2014). Furthermore, through a dual strategy (Allon & Van Mieghem, 2010), fast fashion companies rely both on global and local sourcing networks (Moon et al., 2017; Li et al., 2014; Bruce et al., 2004). Bruce and Daly (2006) have meanwhile suggested that they frequently select their offshore suppliers on the basis of two criteria: cost and time. However, tragic events which have occurred in the garment industry such as the incident in Bangladesh in 2013 (Siddiqui et al., 2020) have focused the world's attention on the sourcing strategies of large apparel players and on the role of the ready-made garments sector in generating a sustainable and economic growth for developing countries (Berg et al., 2019; Jiang et al., 2019).

In spite of the growing significance of global sourcing in modern corporations, there is still limited knowledge about current outsourcing decisions in the fast fashion industry. This research attempts to fill the gap by investigating the sourcing strategies of fast fashion companies in order to verify if they currently still embrace a dual strategy of local and global sourcing. To reach this purpose, the paper has adopted a qualitative methodology based on illustrative case studies (Yin, 2017; Gummesson, 2000) of two leading global fast fashion companies, namely Inditex and Hennes and Mauritz AB (H&M).

The paper is arranged as follows: after the introduction, section 2 provides the theoretical background on offshore outsourcing and global sourcing strategies in the fast fashion market. Section 3 contains the methodology with case descriptions, Section 4 presents the collected data, Section 5 discusses the findings and, finally, Section 6 draws together the conclusions.

2 Theoretical Background

2.1 *Offshore Outsourcing*

Offshoring has been defined as an international relocation of disaggregated firm value chain activities (Jahns et al., 2006). Three main organizational processes characterize offshoring: the company value chains disaggregated into offshore activities; the relocation of these latter to foreign locations; and the integration of all these activities into a unique entity (Bals et al., 2013). By analyzing offshoring through a 2×2 matrix, although often discussed in the academic literature (Mudambi & Tallman, 2010), with the geographical spread (domestic vs foreign) and the type of ownership (internal or external) on the axis, offshore outsourcing pertains to a foreign-external quadrant since it consists in delegating an internal activity or process to a third party. Usually, offshore outsourcing is based on generating value through low cost and investing the spared financial resources in other critical activities (Mudambi & Tallman, 2010; Williams & Durst, 2019). Many companies find this latter as one of the best options to follow as it allows managers to focus on core competencies; however, sometimes, offshore outsourcing can cover “hidden costs” derived from the problems managers face in forecasting all the consequences of offshoring (Smite et al., 2019; Christopher et al., 2004; Christopher, 2016).

Offshoring outsourcing strategies require practice to be successful since companies need to understand how to select the best offshore suppliers and to manage the new relationships with them; however, these strategies can allow companies reaching relevant cost efficiencies (Javalgi et al., 2009). In fact, often, pressured by potential offshoring opportunities, companies break down their value chain processes into many sub-processes and each one is relocated overseas where it is more convenient in meeting corporate objectives. Thus, manufacturing becomes characterized by a spatial fragmentation of activities and the creation of global production and distribution networks (Gereffi, 2019).

The search for low cost has led to the development of global sourcing strategies and pushed many companies to outsource manufacturing to low-income countries (Kotabe et al., 2009; Trent & Monczka, 2003). In this way, the generated global production networks (Coe et al., 2008, 274; Tian & Guo, 2019) have amplified the offshoring complexity in both structural and operational terms (Bals et al., 2013). In fact, global supply chains are more complex and riskier than domestic ones since money and knowledge flows are more difficult across countries (Pournader et al., 2020). In attempting to manage this complexity, companies can try to develop a “strategic sourcing” process to address sourcing activities toward opportunities in terms of long-term operational and organizational performance objectives (Chiang et al., 2012). Global sourcing strategies involve the development of businesses’ partnerships that require careful planning and close monitoring over time (Williams & Durst, 2019; Tokatli, 2008), and a “strategic sourcing orientation” (SSO) can lead to relevant benefits for companies such as the improvement of their reputation and financial performance (Eltantawy et al., 2014).

Finally, one recent interesting trend in US manufacturing outsourcing decision-making is reflected in the emergence of “reshoring”, namely the relocation of manufacturing from traditional offshore locations to more attractive offshore locations or relocation to the home country (Tate et al., 2014; Tate, 2014). In fact, the increasing competition in global markets has caused a shift of manufacturing away from low-cost countries toward newer low-cost countries (reshoring) or closer to the customers (near shoring) where there is an available workforce and well-developed infrastructures (Ellram et al., 2013).

2.2 *Fast Fashion Sourcing Strategies*

Fast fashion represents a disruptive innovative business model within the fashion industry, by being characterized by short time to market, luxury fashion catwalks’ imitation, and cheap prices (Arrigo, 2016; Arrigo, 2018; Li et al., 2014; Barnes & Lea-Greenwood, 2006; Sheridan et al., 2006). In fact, fast fashion companies frequently launch small batches of trendy garments into their stores by attracting many customers intrigued by the opportunity to find new fashion items (Sull & Turconi, 2008; Hayes & Jones, 2006). In this way, fast fashion companies are able to govern the uncertainty of the fashion demand and to stimulate increased amounts of fashion consumption (Stringer et al., 2020).

Fast fashion manufacturing constitutes a key aspect of the fast fashion business model and can vary from a full vertical integration to a total outsourcing (Mihm, 2010). Through the first, fast fashion companies carry out all the activities from design, to manufacturing, retailing, and sale. They own manufacturing facilities and logistics centers and procure externally the raw materials or fabrics necessary for in-house manufacturing (unless fibers and/or fabric suppliers are not in fact the company’s subsidiaries). In contrast, manufacturing outsourcing involves the interaction with external partners in order to design, produce, and deliver garments that will then be sold through the fast fashion companies’ retail chains (Arrigo, 2016). Frequently, between these two extremes, fast fashion companies adopt a midway strategy characterized by internal design, total or partial manufacturing outsourcing to an external production network, and retailing through their retail chains (Moon et al., 2017; Li et al., 2014; Sheridan et al., 2006). Moreover, fast fashion companies realize a multiple sourcing where all suppliers are linked to one another in order to provide flexibility to the supply chain and, inside their “supplier portfolio”, often distinguish between “key” or “top suppliers” that play a critical role, and secondary suppliers that perform less relevant activities and, consequently, can be easily substituted (Doyle et al., 2006).

Low labor cost represents a key element to consider during the choice of suppliers as, in this way, fast fashion companies can maintain low selling prices (Bruce et al., 2004; Bruce & Daly, 2006). However, in some cases, the need to inspect manufacturing activities pushes fast fashion companies to choose suppliers near to their home country, even if they are more expensive (Mihm, 2010). Furthermore, a

closer geographical partner can be selected also to reduce the transportation costs, which influence the final price, beyond to speed up the lead times (Li et al., 2014). Therefore, fast fashion companies implement also near-sourcing strategies in order to have both local and global sub-contractors to reach a good level of efficiency, performance, and cost (Tokatli, 2008). When the manufactured products are basic or predictable and restocked only once a season, the fast fashion supply chain spreads across the global market looking for minimum manufacturing cost, while, for products characterized by unpredictable demand and high fashion content, companies need to be able to quickly respond to the market by sourcing from countries in close proximity, even where product costs are higher (Moon et al., 2017; Bruce & Daly, 2006; Christopher, 2016).

However, the fast fashion industry is facing growing global scrutiny of its environmentally polluting supply chain operations (Niinimäki et al., 2020) and a recent survey on apparel sourcing strategy, carried out by McKinsey, has shown that two-thirds of CPOs think that sustainable sourcing costs (Jia & Jiang, 2018) will increase between 1 and 5% in next years. However, most agree that this investment will be necessary to reach a competitive advantage (Berg et al., 2019).

3 Methodology

To analyze manufacturing outsourcing in fast fashion companies, a qualitative research design based on the case study methodology (Yin, 2017; Gummesson, 2000) was carried out. The case study represents one of the most commonly used qualitative methods for undertaking research in management studies. As suggested by Yin (2017), case studies are particularly helpful in dealing with “how” and “why” a phenomenon occurs and usually they are based on secondary data, direct observations, and interviews with experts of the sector under investigation. In addition, the case study is used to explore phenomena little known and/or when several gaps exist in explaining the topic under study. The widespread use of case studies in management studies lies in enabling the researcher to study a phenomenon in a real-life setting, where often it would be otherwise difficult to grasp the key-dimensions (Gibbert & Ruigrok, 2010).

Following a literature review (Gummesson, 2000) on the validity of case study research, this approach seemed to be a worthy method to explore and examine offshore outsourcing in the fast fashion context. In particular, the choice of two case studies has enabled a detailed description of the phenomenon under investigation by comparing different business models in the fast fashion sector. Moreover, the use of a longitudinal approach is justified by its ability to provide a detailed view of a phenomenon as it evolves over time (Eisenhardt & Graebner, 2007).

The fast fashion companies selected as illustrative case studies are the Spanish Inditex and the Swedish Hennes & Mauritz AB (H&M) and were selected for two main reasons:

- They are two leading fast fashion companies worldwide (in 2019 Inditex realized 28.2 billion euros of revenues, +12% on 2018, and H&M 232,755 billion SEK, equal to 22.4 billion euros, +11% on 2018) (Inditex Annual Report, 2019; H&M Annual Report, 2019).
- They are multinational companies operating in the global market (Inditex in 202 countries and H&M in 74).

Both companies represent an important prototype of the fast fashion industry, being well-established players in the global fashion retail scenario with both ranked in the Top 50 Global Retailers 2019 List (Deloitte, 2020), 35th position for Inditex while H&M is in 43rd position.

The data collection process derived predominantly from the analysis of secondary sources including literature reviews, annual reports, sustainability, and environmental reports, press releases, and company websites. Both Inditex and H&M have adopted a transparent attitude toward disclosing information about sustainability and codes of conduct making it possible to gather information from their websites and corporate reports. Additionally, both companies have a section on their websites dedicated to sourcing and supplier management with H&M publishing online a list of suppliers including details on factories and sub-contractors.

3.1 Case Description

3.1.1 Inditex

The origins of Inditex date back to 1963 when Amancio Ortega Gaona opened a small workshop making women's clothing and in 1975 also the first Zara store. At the end of the 1980s, Zara's international expansion had begun and today the company owns a multibrand portfolio composed of 8 brands and over 7412 stores. Inditex employs approximately 176,611 staff covering more than 170 nationalities (Inditex Annual Report, 2019).

The business model of Inditex is founded on a vertical integration model where the company carries out many activities in the supply chain from design, to manufacturing, logistics, and retailing (Arrigo, 2018). It owns textile design and manufacturing facilities in Spain; however, in part, also outsources manufacturing from external suppliers. An internal design team projects several fashion items which are then sent to stores twice a week as flash collection launches. Its great flexibility is based on an efficient logistics structured around supply chain agility, just in time, and inventory reduction in order to reach short lead times. Logistics is thus central for the company's success by allowing a synchronized and incessant replenishment of stores, within only 48 h.

3.1.2 H&M

H&M operates with more than 5000 stores and 179,000 employees in 74 countries, offering clothing, cosmetics, accessories, and footwear for men, women, teenagers, and children (H&M Annual Report, 2019). In 1947, Erling Persson opened the first store in Västerås (Sweden) and today the company has through its retail chain brands including H&M, COS, Monki, Weekday, & OtherStories, Arket, Afound along with home interiors at H&M Home.

H&M's business model aims at offering fashion garments at the best price by contributing to a Sustainable Development. It is founded on in-house design, no intermediaries, large purchasing volumes, efficient logistics, and cost-consciousness across the entire organization. Collections are created at H&M headquarters in Stockholm by an internal design team made up of designers, pattern makers, and buyers that project new collections with the main emphasis on good value, newest trends at low price. H&M does not own any factories but outsources its manufacturing to external suppliers that are continually reviewed in order to preserve a growth. In 2007, H&M indicated that lead times of products vary from a few weeks up to six months, by placing orders in advance for high-volume fashion basics while trendier items are produced in smaller volumes to reach the stores quicker (H&M Annual Report, 2007). Logistics represents a core activity for the company and, by being in the position of buyer and seller, efficient logistics and ecological transport systems form the basis for the company to ensure the availability of products in store, offered at the lowest prices for customers with the least impact on the environment.

4 Results

In Tables 1 and 2, data are displayed about the global sourcing of the case studies (data were collected from the annual reports and websites of the case studies). Table 1 indicates the sourcing countries and the suppliers' base in 2014 and 2018, while Table 2 illustrates the suppliers' country of origin by geographical areas between 2011 and 2018 showing their evolution over time with the percentage of each area.

Table 1 Fast fashion sourcing strategies

Company	Manufacturing	Sourcing countries		% Local sourcing		% Global sourcing		Number of suppliers	
		2014	2018	2014	2018	2014	2018	2014	2018
Inditex	50% in-house, 50% outsourced	50	43	55%	57%	45%	43%	1625	1866
H&M	Totally outsourced	27	42	Less than 1%	2%	99%	98%	850	840

Source: Author's own work

Table 2 Suppliers by geographical area

	2011	2012	2013	2014	2015	2016	2017	2018
Inditex								
EMEA ^a	50%	49%	49%	48%	48%	45%	43%	43%
Asia	46%	47%	46%	47%	48%	52%	54%	56%
America	4%	5%	5%	5%	4%	4%	3%	1%
Tot suppliers	1490	1434	1592	1625	1725	1805	1824	1866
H&M								
EMEA ^a	29%	26%	23%	25%	25%	n.a. ^b	n.a.	26%
South Asia	29%	31%	32%	31%	32%	n.a.	n.a.	30%
Far East	42%	43%	45%	44%	43%	n.a.	n.a.	44%
Tot suppliers	747	785	872	850	820			842

Source: Author's own work

^aEMEA: Europe, Middle East, Africa

^bnot available

4.1 Inditex Sourcing Strategies

As described earlier, Inditex owns manufacturing and textile plants located in La Coruña in Spain where are carried out the capital-intensive and value-added intensive stages of production (raw material purchasing, designing, cutting, dyeing, quality control, ironing, packaging), while more labor-intensive and less-value added processes are outsourced (Escalona & Ramos, 2014).

Inditex produces in-house approximately 50% of the total goods sold in its retail chains; the remaining 50% is outsourced from an external network composed of suppliers located in Europe, Africa, America, and Asia (Inditex website). The company has opted for proximity production since 55% of the total clothing assortment is made in Spain, Portugal, and Morocco and, and the remaining 45% of production is outsourced to offshore suppliers in various foreign countries. This diversity provides the company with a variety of textile manufacturing specialties.

Inditex has grouped sourcing countries into twelve clusters, which are localized in the geographical areas where the company has a large and significant sourcing presence. These clusters are conceived as spaces of multilateral cooperation that involve suppliers, manufacturers, trade unions, business associations, and international buyers with the objective of promoting a sustainable productive environment in strategic geographical areas in order to adhere to International Labour Regulations. Suppliers are obliged to disclose all factories used for manufacturing by including all processes and tiers of the manufacturing process. Inditex considers these factories as part of its supply chain and consequently all are subjected to the labor and social principles set out in Inditex's Code of Conduct for Manufacturers and Suppliers.

4.2 *H&M Sourcing Strategies*

H&M totally outsources manufacturing to external suppliers that are continually reviewed and supported by 19 locally based production offices in Europe, Asia, and Africa working directly on site. In addition to production offices, in order to ensure that goods are manufactured under good working conditions and with minimum impact on the environment, 240 sustainability experts work in the sourcing markets. In this way, they can ensure that suppliers live up to H&M's requirements of good social and environmental conditions (H&M Annual Report, 2019).

H&M's production network is split into macro-areas: EMEA (Bulgaria, Czech Republic, Egypt, Ethiopia, Greece, Italy, Kenya, Latvia, Netherlands, Portugal, Romania, Spain, Sweden, Tunisia, and Turkey), South Asia (Bangladesh, India, Pakistan, and Sri Lanka), and Far East (Cambodia, China included Hong Kong, Indonesia, Myanmar, South Korea, Taiwan, Thailand, and Vietnam). Through a network of 800 independent suppliers, H&M is connected to around 1400 factories in Europe, Asia, and Africa and approximately 1.6 million people ensuring that only suppliers and factories that sign the H&M's Code of Conduct and commit to its values can work with the company. H&M has a high level of transparency and publishes online the list of its suppliers, factories, and sub-contractors.

5 Discussion

Firstly, the study has shown how H&M and Inditex have developed a global production network (Gereffi, 2019) since their manufacturing is spatially fragmented across many countries. For Inditex, Asia emerges as the geographical area with the highest density in terms of suppliers' number (56%) and constitutes the main region for apparel global sourcing. However, in terms of whole manufacturing, the company has a higher percentage of near sourcing since 57% of its products are made in Spain or Portugal and Morocco. Although manufacturing in those areas is two and a half times more expensive than in Eastern Europe because of higher salaries, the company is compensated by achieving higher productivity levels, better quality, and faster lead times (Escalona & Ramos, 2014). In fact, local sourcing enables Inditex to safeguard very short lead times; on average, it takes only 24 h to process an order and deliver it to European stores and a maximum of 48 h for foreign stores, confirming that short lead times (Bruce & Daly, 2006) are a key factor in local sourcing.

Through dividing up manufacturing between locally based and global suppliers, Inditex can achieve two objectives: firstly, to respond quickly to customer requests, by sourcing from near suppliers and, secondly, to safeguard the items' low price, by sourcing at global level. However, as explained by Bonin (2002), Inditex exploits a local supplier base since the Galician textile sector demonstrates exceptional competitiveness due to prominent designers and optimal distribution networks. Policy intervention in Galicia in the 1970s allowed developing a beneficial co-existence of

large companies in touch with global markets and small firms operating in local supply chains. This has surely contributed to Inditex's growth as an outstanding global retail fashion company in one of the world's most competitive industries. In the H&M's case, most suppliers are in the Far East (about 44%) and key sourcing markets are also in South Asia (30%). H&M has very few suppliers in Sweden or other near European countries (e.g., Latvia and Netherlands), which represent only 2% of its total production network, differently from Inditex. Consequently, probably H&M has lead-times longer than those of Inditex due to bigger geographical distances between its manufacturing sites and points of sale.

Findings show that fast fashion companies do not appear to always perform a combined strategy of global and local sourcing, as stated in previous studies (Bruce et al., 2004; Tokatli, 2008). Low income and emerging countries resulted to be relevant global sourcing countries for both fast fashion companies: 74% of H&M's suppliers are located in the Far East and South Asia and 54% of Inditex's suppliers are in Asia. By analyzing Tables 1 and 2, the supplier portfolio of Inditex marked a linear growing trend while the H&M's supplier portfolio marked an increase however with some little annual fluctuations. However, both the companies preserved a stable composition in terms of country of origin of their contractors; in fact, in Inditex and H&M, the percentage of the different geographical areas from 2011 to 2018 had minor annual fluctuations.

The geographical area of provenance of Inditex and H&M, namely EMEA, had a downward trend therefore indicating a reshoring home phenomenon (Tate et al., 2014) is not recognizable in these two European fast fashion companies. This may be due to the fact that Inditex owns manufacturing facilities and already has a local production network founded on close and long-term relationships with its suppliers and it does not need other local contractors. In contrast, H&M cannot benefit from a local supplier base as in its country of origin, Sweden, the development of the apparel industry (Åkesson et al., 2007) is very different from the case of Inditex in Galicia, by lacking the country-based conditions necessary to carry out fast fashion local sourcing.

With regard to the criteria considered in offshore supplier selection, it is possible to propose that labor cost seems to represent a key factor in fast fashion global sourcing strategies since the top sourcing countries chosen by Inditex and H&M are all emerging countries, such as Asia and Far East. However, these latter countries are sadly well known for their "questionable" local conditions such as lax environmental legislation, discrimination, corruption of public authorities, child labor, etc. (Niinimäki et al., 2020). In response to this, both fast fashion companies invest heavily in these regions to monitor factories, offer training and capacity-building programs targeted at promoting continual self-assessment and pay great attention to promoting and to safeguarding a sustainable productive environment among their suppliers. Furthermore, according to Doyle et al. (2006), once key suppliers have been selected, fast fashion companies aim at creating stable and long-term relationships with them that then constitute a steady base of suppliers.

Lastly, it seems possible to assert that an efficient management of sourcing strategies has enabled H&M and Inditex to achieve an efficient strategic sourcing

orientation (Eltantawy et al., 2014) with many benefits in terms of reputation and performance. In fact, both companies are listed among the 2019 Best Global Retailers (Deloitte, 2020) and both have exhibited strong economic performance in recent years.

6 Conclusion

Previous research has highlighted offshore outsourcing as a significant strategy for growth in the global market by moving production to low-cost countries (Kotabe & Murray, 2004; Kotabe et al., 2009). Fast fashion companies provide a good example of manufacturing outsourcing since they have dispersed their manufacturing worldwide by developing global production networks composed of numerous offshore suppliers. Previous scholars (Bruce et al., 2004; Tokatli, 2008; Bruce & Daly, 2006) suggested that fast fashion companies rely both on global and local sourcing networks in order to achieve efficient manufacturing costs and short lead times for customers. This paper has investigated the current sourcing strategies performed by two key fast fashion companies in order to understand if they still embrace a dual strategy of global and local sourcing by creating both a local and a global production network.

The results have shown that not all fast fashion companies perform a dual sourcing strategy (Mihm, 2010). To be more precise, “*where it is feasible*”, fast fashion companies adopt a dual strategy by splitting up manufacturing among both local and global multiple suppliers and, in this way, they benefit both in terms of cost efficiency and market responsiveness. The words “*where it is feasible*” have been underlined since, in order to split manufacturing among local and global suppliers, a local network of suppliers must exist and, in contrary case such as in the H&M’s case, global sourcing becomes a forced choice. Recognition of the new role of sustainability (Jiang et al., 2019; Jia & Jiang, 2018) in sourcing strategies can provide important managerial implications for all apparel managers who outsource manufacturing in emerging countries. In fact, they should carefully choose the geographical areas in locating their manufacturing facilities by analyzing not only country-based factors but also by evaluating all sustainability strategies in order to assess outsourcing risks (Tian & Guo, 2019; Pournader et al., 2020).

The academic contribution of the present study is twofold. Firstly, the research contributes to the outsourcing management literature (Javalgi et al., 2009; Jahns et al., 2006; Jiang et al., 2019; Jia & Jiang, 2018) by providing an examination of global fast fashion sourcing strategies. Moreover, the study focuses on investigating the sourcing strategies of two European fast fashion companies while the majority of earlier academic studies on global sourcing examined US companies (Tate et al., 2014; Smite et al., 2019). This shift in perspective provides new insights on previous academic literature about outsourcing.

In conclusion, the study has some limitations. Even if the analyzed fast fashion companies represent two leading global companies, while offering interpretative

advantages, findings cannot be generalized. The paper's overall purpose was to enable a better understanding of the match between current practice and existing theory in the fast fashion outsourcing field. Additional case studies may contribute to strengthen the conclusions outlined above and make them more valid and generalizable.

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Possibilities of Trading Behavior Assessment by TBQ-T Methodology



Róbert Štefko, Zuzana Birknerová, Lucia Zbihlejšová, and Jana Kovaľová

Abstract The methodological concept of trading behavior, as an important part of business effectiveness, is based on an assumption that assessment of its construct has a multidimensional structure. The objective of the presented research, which included the participation of 110 traders, was to identify and specify the trading behavior assessment factors. The paper presents the results of the factor analysis of the self-report methodology labeled as TBQ-T (Trading Behavior Questionnaire—Traders). Principal Component Analysis with Varimax Rotation enabled the extraction of three factors: Proactive Behavior of Trader, Manipulative Behavior of Trader, and Distressed Behavior of Trader. Meaningfulness of the extracted factors was supported by the Cronbach's alpha values. Assessment of the extracted TBQ-T factors by traders did not confirm the existence of statistically significant correlations, but confirmed the existence of statistically significant differences, with the highest degree of agreement expressed by the respondents in the factor of Proactive Behavior of Trader, the lowest one in the factor of Distressed Behavior of Trader. Based on the acquired analysis results it is possible to consider the use of the TBQ-T methodology as meaningful. Limiting factors of this research include the issue of generalization level of the acquired knowledge, its trans-situationality, the context of cultural and transcultural conditions in terms of how the cultural schemas affect the

R. Štefko

Department of Marketing and International Trade, Faculty of Management, University of Prešov, Prešov, Slovakia
e-mail: robert.stefko@unipo.sk

Z. Birknerová · J. Kovaľová

Department of Managerial Psychology, Faculty of Management, University of Prešov, Prešov, Slovakia
e-mail: zuzana.birknerova@unipo.sk; jana.kovalova@smail.unipo.sk

L. Zbihlejšová (✉)

Department of Intercultural Communication, Faculty of Management, University of Prešov, Prešov, Slovakia
e-mail: lucia.zbihlejova@unipo.sk

assessment of the trading behavior forms, and using the self-report methodologies to study this particular phenomenon.

Keywords Trader · Trading behavior · Manipulative behavior · Distressed behavior · Proactive behavior · TBQ-T methodology

1 Introduction

Trading is one of the oldest professions (Kotler et al., 2007). It is motivating customers to buy, a transaction in which money is exchanged for a good or service where the trader tries to convince the buyer of the benefits of the offer during the negotiation (Forbes Ley, 1995). It represents the full spectrum of activities, but much of it consists of the art of persuading the customer (Inks et al., 2019). Professional trading behavior, personality, attitudes, values of the trader, and their ability to communicate are the basis of business success. The basic equipment of traders includes engagement and assertive communication (Křížek & Crha, 2008), ethical and professional approach (Bojei et al., 2013), initiative and responsibility, as well as honesty and reliability (Adler, 1992). Traders have the task of learning to control stress so as not to reduce the number of potential customers. It is essential to avoid the manipulative, unethical behavior of traders and their pressure (Todd, 2013).

In this context, in the proposed paper the attention is paid to three attributes of Trading behavior, which were defined as Proactive Behavior of Trader, Manipulative Behavior of Trader, and Distressed Behavior of Trader. There is a number of existing studies which describe and examine these attributes individually, e.g., research on distress in the work of traders by, e.g., Kemp et al. (2013), Agyapong et al. (2016), Oksanen and Ståhle (2013), and Malik et al. (2011), manipulative techniques of traders by, e.g., Sunstein (2016), Martínez-Miranda et al. (2016), and Aaron (2016), and assertive or proactive communication of traders by, e.g., Medhurst and Albrecht (2016), Terho et al. (2015), Brown et al. (2011), Joy (2016), and Sood (2015), but this paper presents a coherent view of the aforementioned attributes and further supports it by a research study the result of which is a methodological tool for assessment of trading behavior based on the examined attributes. Concerning the theoretical background of the issue at hand, the proposed study is unique in the elaboration of the given concept as there is no evidence of any other similar methodology available in the literature. The paper further contributes with a finding of statistically significant differences in the assessment of the extracted TBQ-T factors by traders, with the highest degree of agreement expressed in the factor of Proactive Behavior of Trader, the lowest one in the factor of Distressed Behavior of Trader.

In the light of the above, the paper is structured in a traditional research article manner. The theoretical background on proactive, manipulative, and distressed behavior of traders is followed by the research containing the factor analysis of the proposed TBQ-T methodology (Trading Behavior Questionnaire—Traders).

Meaningfulness of the extracted factors or trading behavior attributes is supported by the provided Cronbach's alpha values, eigenvalues, and the percentage of variance explained. The main findings are presented and discussed in the concluding section of the paper.

2 Proactive Behavior of Trader

Proactive trade involves several aspects, such as assertive and committed approach of traders, effective and courteous communication, respect, and attention to customers. Trading and trust go hand in hand, and if a trader wants to be successful and efficient, they should engage in conversation, proactively seek, and not be discouraged by rejection. In this context, consideration should be given to traders' commitment and assertiveness.

Trader commitment or engagement is interpreted as an effort to address customer demand situations and tasks, such as energy flow characterized by passion, absorption, eudaimonia, and automatic self-regulation (Medhurst & Albrecht, 2016). It brings many benefits such as better service and product quality, customer satisfaction, repeated purchases and references, and a higher level of profit (Terho et al., 2015). Brown et al. (2011) add that commitment is connected to passion and loyalty to work, and Joy (2016) adds higher productivity, well-being at work, better customer approach, and results.

Traders' assertiveness brings efficiency, productivity, happiness, well-functioning teams, a sense of satisfaction and enjoyment at work, self-confidence, and convincing performance (Jolson, 1984). Sood (2015) considers the assertive communication style to be effective because it offers the acquisition of self-esteem, respect, self-confidence, understanding, and recognition of one's own feelings. Praško and Praškova (2007) emphasize improved communication, ability to solve problems, establish and maintain good and honest relationships, and Garner (2012) adds creative ideas, quality customer service, less tension and stress levels, as well as greater confidence. Lelková and Gburová (2015) complement this definition with open and honest expression, accepting the opinions of others, compromising, eliminating guilt and responsibility. Assertive traders manifest themselves with customer care and respect. When facing dissatisfied customers, they work to find a suitable solution (Garner, 2012). Assertive, passionate, sincere, and humble traders usually gain customer loyalty and trust. One of the best ways to become more assertive is awareness, readiness, empathy, respect, self-confidence, calmness, and credible and pleasant behavior.

3 Manipulative Behavior of Trader

Sunstein (2016) points out that manipulation is most often encountered in marketing. The business environment uses a variety of tools, principles, and approaches to influence and manipulate customers. In this context, we speak of manipulation as an unfair tactic (Martínez-Miranda et al., 2016), where traders try to unethically influence customers to achieve their own goals and profits (Aaron, 2016). Braiker (2004) perceives manipulation as a social impact that aims to change the perception and behavior of customers through misleading, deceptive, or abusive tactics. Edmüller and Wilhelm (2010) talk about withholding and distorting the information about products and services, unclear and evasive arguments, insincere compliments, or unwillingness to help. According to Linder (2018), customer relationships based on manipulative processes only last until customers realize that they are not treated with care. These unethical practices will be shared by the dissatisfied customers and cause more damage to the traders than any short-term benefits (Dooley, 2011).

4 Distressed Behavior of Trader

Research has confirmed that trading is considered a stressful job and ranks among the top stressful professions. Stress that emerges in the profession of traders can be beneficial on the one hand, and harmful on the other, depending on its control and management (Kemp et al., 2013). A positive aspect of stress is the need to develop, grow, and push the trader's limits, which motivates them to perform better at work (Agyapong et al., 2016). However, its excessive level can be paralyzing and cause health problems (Oksanen & Ståhle, 2013). The impact of stress on traders was addressed by Allen (2013), who claims that everyone perceives a different situation as a source of stress. Traders encounter new, demanding, aggressive, dissatisfied, and complaining customers, which is stressful. Demanding situations should be seen as a challenge and an opportunity for development (Tapia et al., 2019). In the research of Standford (2008), a significant relationship between trader and customer satisfaction was pointed out, and in the research by Daniel et al. (2012), the importance of satisfaction, which also contributes to the growth of the organization, was accentuated. Research by Malik et al. (2011) records a negative impact of stress on customer satisfaction and suggests introducing stress management for traders to cope with stress. The best are positive traders who are able to respond flexibly and do not invest much time and energy in just one customer (Ford, 1998).

5 Research

From a methodological point of view, the aim of the research was to verify the original methodology labeled as TBQ-T (Trading Behavior Questionnaire—Traders) for assessing the trading behavior by traders. The methodology consists of 30 statements related to the assessment of trading behavior. Each statement contains 6 possible ways of responding to the degree of agreement with this measure (1 = definitely no; 2 = no; 3 = rather no than yes; 4 = rather yes than no; 5 = yes; 6 = definitely yes). Some of the item examples are: “Customers appreciate the high commitment of traders”; “I perceive manipulative behavior as part of the trading process”; “Customers can tell when I am exposed to stress”. The research sample consisted of 110 traders, of which 54 (49.1%) were men and 56 (50.9%) were women aged from 19 to 61 years (average age was 33 years, standard deviation was 11.154 years).

5.1 Trading Behavior Assessment Factors

Based on the results of the KMO test (0.855) and the Bartlett’s test (2108.977), Sig. (0.000), using the Principal Component method with the Varimax rotation, three factors of trading behavior assessment by traders were extracted and subsequently labeled and described as follows:

- F1: *Proactive Behavior of Trader*. This factor is saturated with 16 items and is aimed at assessing the engaged, committed, and assertive behavior of traders. The content context is related to the awareness of the relationship between the trader’s proactive approach and the positive customer response in the form of product selection.
- F2: *Manipulative Behavior of Trader*. This factor is saturated with 5 items and focuses on the use of manipulative trading techniques. It focuses on whether traders feel that they manipulate customers, or accept manipulative behavior as part of the trading process.
- F3: *Distressed Behavior of Trader*. This factor is saturated with 8 items. These items specify the factor content in terms of the traders’ willingness to have the stress of selling under control. It describes whether customers can recognize situations when the trader is exposed to stress.

The extracted factors explain 44.578% of the variance (Table 1). This percentage of the variance explained is acceptable, thus the inclusion of other factors that would increase the percentage was not appropriate, as other factors would not be meaningfully specified in terms of their content.

It was possible to clearly specify the extracted factors in terms of their content. This structure of factors is also confirmed by the result of the Scree plot method used (Fig. 1). This is also evidenced by the high values of the Cronbach’s alpha

Table 1 Saturation of the extracted factors by individual TBQ-T methodology items

Questionnaire items	Factors		
	F1	F2	F3
I feel like I'm manipulating customers.		0.843	
I use manipulative techniques when selling.		0.841	
I perceive manipulative behavior as part of the trading process.		0.820	
When I behave manipulatively, customers feel negative emotions.		-0.714	
When customers feel manipulated by me, they won't come back next time.		-0.545	
If I provide the customer with quality product information, the value of the product also increases for him/her.	0.624		
With my positive attitude I can change customer's choice of product.	0.520		
When choosing a product, customers let a dedicated trader give them advice.	0.656		
A committed trader is an added value to the store.	0.684		
Customers appreciate the high commitment of traders.	0.642		
When shopping, I provide customers with sufficient information about the products.	0.549		
The customer feels better during shopping when I have a committed approach.	0.664		
Customers appreciate if I tell them an honest opinion about the product.	0.576		
Customers appreciate if I listen carefully to their request.	0.606		
Customers appreciate if I make sure I understand the customer's request correctly.	0.468		
When a customer is critical of a product offering, I can accept their criticism.	0.600		
When a customer is dissatisfied when shopping, I ask them how I would meet their requirements.	0.772		
Customers appreciate when I can politely defend unjustified criticism.	0.608		
Customers appreciate if I address them first.	0.667		
Customers feel good when I sincerely flatter their purchases.	0.502		
Customers appreciate if I respect their opinion on the product.	0.531		
Customers often observe signs of my stress.			0.705
Customers do not like me to pass my own stress on them.			0.471
Customers do not like when I talk to them about my problems.			0.428
The customer does not feel comfortable in a shop where he/she feels stress.			0.537
Customers are nervous when I serve them under stress.			0.638
When shopping, customers notice when I am stressed.			0.595
Customers can tell when I am exposed to stress.			0.773
Stress during shopping upsets customers.			0.582
Customers appreciate if I don't apologize for things I can't control.			0.326
Eigenvalue	6.303	3.793	3.277
Variance (%)	21.009	12.645	10.924
Cumulative percentage	21.009	33.654	44.578

Source: Authors' own study

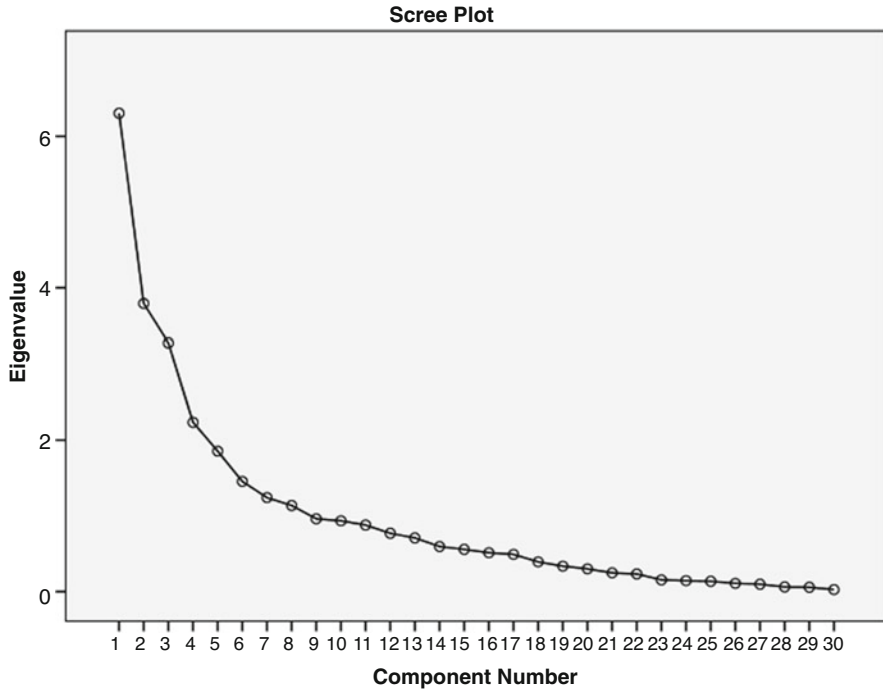


Fig. 1 Illustration of the identified factors based on the Scree plot method. Source: authors’ own study

coefficient, which indicate that the internal composition of the items saturating the specified factor is within the acceptance range (Tables 2, 3, and 4).

Extraction of these factors—Proactive Behavior of Trader, Manipulative Behavior of Trader, and Distressed Behavior of Trader—proves the possibility of classification of the trading behavior assessment factors by traders. The different assessments of trading behavior factors by traders were recorded by means of a non-parametric Friedman test for dependent samples, the results of which were statistically significant (0.000). In the assessment of the three factors—Proactive Behavior of Trader, Manipulative Behavior of Trader, and Distressed Behavior of Trader—perception, low values represent a low agreement (identifying oneself with) rate, high values a high agreement rate. Assessment of the extracted TBQ-T factors by traders confirmed the existence of statistically significant differences, with the highest degree of respondents’ agreement expressed in the Proactive Behavior of Trader, the lowest in the Distressed Behavior of Trader. By means of the Friedman test, we were able to find out that traders perceive the engagement/commitment and assertiveness attributes most prominently (Table 5).

The analysis of the links between the extracted trading behavior factors confirmed that these factors describe separate areas of perception of this behavior (Table 6).

Table 2 Cronbach's alpha values for the Proactive Behavior of Trader factor

Items	α
If I provide the customer with quality product information, the value of the product also increases for him/her.	0.870
With my positive attitude I can change customer's choice of product.	0.874
When choosing a product, customers let a dedicated trader give them advice.	0.868
A committed trader is an added value to the store.	0.867
Customers appreciate the high commitment of traders.	0.869
When shopping, I provide customers with sufficient information about the products.	0.873
The customer feels better during shopping when I have a committed approach.	0.868
Customers appreciate if I tell them an honest opinion about the product.	0.870
Customers appreciate if I listen carefully to their request.	0.868
Customers appreciate if I make sure I understand the customer's request correctly.	0.874
When a customer is critical of a product offering, I can accept their criticism.	0.871
When a customer is dissatisfied when shopping, I ask them how I would meet their requirements.	0.861
Customers appreciate when I can politely defend unjustified criticism.	0.872
Customers appreciate if I address them first.	0.867
Customers feel good when I sincerely flatter their purchases.	0.875
Customers appreciate if I respect their opinion on the product.	0.875
Cronbach's alpha for proactive behavior of trade is 0.877	

Source: Authors' own study

Table 3 Cronbach's alpha values for the Manipulative Behavior of Trader factor

Items	α
I feel like I'm manipulating customers.	0.757
I use manipulative techniques when selling.	0.763
I perceive manipulative behavior as part of the trading process.	0.795
When I behave manipulatively, customers feel negative emotions.	0.803
When customers feel manipulated by me, they won't come back next time.	0.856
Cronbach's alpha for Manipulative Behavior of Trader is 0.832	

Source: Authors' own study

The results of the correlation analysis confirmed the correctness of the methodological procedure applied, using the given type of the factor analysis.

6 Discussion and Conclusion

Professional behavior of traders is the basis of success in the business. Successful traders can communicate with customers with understanding and efficiency, listen and receive complaints, ask appropriate open questions, or solve problems they face (Horváthová & Čopíková, 2017). They have the courage, are convinced of what they

Table 4 Cronbach’s alpha values for the Distressed Behavior of Trader factor

Items	α
Customers often observe signs of my stress.	0.669
Customers do not like me to pass my own stress on them.	0.720
Customers do not like when I talk to them about my problems.	0.727
The customer does not feel comfortable in a shop where he/she feels stress.	0.712
Customers are nervous when I serve them under stress.	0.695
When shopping, customers notice when I am stressed.	0.681
Customers can tell when I am exposed to stress.	0.652
Stress during shopping upsets customers.	0.701
Customers appreciate if I don’t apologize for things I can’t control.	0.723
Cronbach’s alpha for distressed behavior of trader is 0.723	

Source: Authors’ own study

Table 5 Differing perceptions of the extracted factors of trading behavior assessment by traders

Factor	Median	Significance
Proactive behavior of trader	5.3125	0.000
Manipulative behavior of trader	4.0000	
Distressed behavior of trader	3.8750	

Source: Authors’ own study

Table 6 Correlations between the extracted factors of trading behavior assessment by traders

Factors	Manipulative Behavior of Trader	Distressed Behavior of Trader
Proactive Behavior of Trader	0.131	0.088
Sig.	0.195	0.387
Manipulative Behavior of Trader		0.143
Sig.		0.161

Source: Authors’ own study

offer, for which they are also recognized; they do not humiliate, offend, judge, or manipulate customers. They show them respect and do their utmost to their satisfaction while maintaining their own values. As mentioned before, we are increasingly encountering unethical, manipulative, and incorrect traders’ approach and behavior. An assertive, committed approach offers traders a number of benefits. In the business environment, a sense of recognition, respect and mutual acceptance is very important and therefore proactive behavior is considered inevitable.

The aim of the paper was to verify the original TBQ-T methodology for assessing trading behavior by traders. The results of the presented data analyses confirmed the meaningfulness of the verified methodology. The extracted factors—Proactive Behavior of Trader (e.g., Medhurst & Albrecht, 2016; Terho et al., 2015; Brown et al., 2011; Joy, 2016; Sood, 2015), Manipulative Behavior of Trader (e.g., Sunstein, 2016; Martínez-Miranda et al., 2016; Aaron, 2016; Edmüller & Wilhelm, 2010; Linder, 2018; Dooley, 2011), and Distressed Behavior of Trader (e.g., Kemp

et al., 2013; Agyapong et al., 2016; Oksanen & Ståhle, 2013; Tapia et al., 2019; Malik et al., 2011)—represent one of the possible theoretical-methodological perspectives on business behavior issues. At the same time, they confirmed that it is possible to consider the structural concept of this construct; a multidimensional approach was confirmed. One of the issues discussed in this context is the universality of the concept in terms of predicting the behavior of traders in different situational conditions. In other words, to what extent is business behavior predictable trans-situationally, or to what extent it is determined by a particular situation or a type of situation. This issue can be seen as one of the productive directions for further research in this area.

At the same time, it is crucial to discuss the acquired findings in the context of cultural and transcultural conditions in terms of how the cultural schemas affect the assessment of the trading behavior forms. From a methodological point of view, it is possible to complement the self-assessment concepts of business behavior research in other studies with methods based on the assessment by customers or, in other words, observation methods. No less important area of further research is acceptance of the broader context of predicting business behavior (Antonyová & Antony, 2017), especially in terms of personality traits. The presented methodology represents one of the possible approaches to the detection of business behavior predictors. It can be included in the dispositional concepts of methodologies that detect behavioral predictors at a high level of generality.

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Part IV
Eurasian Business Perspectives: Marketing

Luxury Goods and the Country-of-Origin-Effect: A Literature Review and Co-citation Analysis



Katharina Stolz

Abstract The paper advances the research in the field of the country-of-origin-effect (COE) by adding a systematic and comprehensive overview of the COE in the field of luxury products across various industries. The literature review analyzes 34 articles in-depth and strengthens the COE, as in twenty studies an effect was observed. All in all, the literature review shows that consumers appreciate information about the CO and take it into account in their decision-making and product evaluation process. Still, the analysis also emphasizes the varying importance of the COE in relation to different industries, in particular the accessories, automotive, fashion, and food industries. An effect was most often reported when investigating accessories like luxury watches. Furthermore, the review confirms the wide variety of defining a luxury product, which is also reflected on the major differences regarding the selected stimulus material used in the analyzed studies. Nevertheless, none of the analyzed studies investigated product innovations, but rather focused on well-established items. In addition, a citation and co-citation analysis was performed showing a weakly connected citation network based on the network density. The analysis of the citation network further revealed one dominant authorship.

Keywords Citation analysis · Country-of-origin · International market · Literature review · Luxury good · Strategic marketing

K. Stolz (✉)

General Business Administration, esp Innovation & Service Management, University of Stuttgart, Stuttgart, Germany

e-mail: katharina.stolz@bwi.uni-stuttgart.de

1 Introduction

In accordance with Koschate-Fischer et al. (2012), people are willing to pay more for a branded product made in a country with a more favorable image than for a product with a less positive country image. The Swiss Federal Institute of Intellectual Property (n.d.), for instance, states that consumers have a 20% higher willingness to pay for Swiss watches in general; for specific mechanical watches even 50% more. The influence of a product's origin on the way consumers perceive this product and how the origination information affects the buying decision process is also known as the country-of-origin-effect (COE) (Balabanis & Diamantopoulos, 2008).

As early as in 1965, Schooler (1965) investigated the influence of national origin on consumer's decision. Pursuant to Liefeld (2004), the publication by Schooler (1965) is the first published study on the role and importance of the country of origin (COO) of a product. Since then, there was a high interest in the research of the COE in general, which is reflected in more than 750 publications (Papadopoulos & Heslop, 2002). Following the meta-analysis (67 studies) by Schudey et al. (2016), there is a medium to high significant COE. Alam et al. (2018, p. 11) state that COE is a key determinant of "brand awareness, brand association, perceived quality and brand loyalty". As Král (2013) states, COO plays a major role in the perception of brands in general and especially when it comes to luxury brands. In accordance with Kapferer (2014), the Made in information is a crucial part of a brand's value proposition.

Besides the numerous articles about COE in general, research lacks a systematic and comprehensive overview of COE in the field of luxury products across various industries. The literature review by Collins and Weiss (2015), for example, focuses on luxury textiles and therefore does not include any other luxury industries. In addition, the citation analysis by Gurzki and Woisetschläger (2017) presents the landscape within the luxury research but misses the COE.

The present paper therefore analyzes and structures existing literature on this topic. The objective of the analysis is to cluster thematic focuses (e.g., analyzed industries and samples) within the field of COE addressing luxury goods as well as presenting the landscape of authorship. In addition, the contributions of the paper extend the literature.

The present work is structured as follows: Section 2 gives a theoretical overview of the general COO issue, including the different subcategories, and a brief definition of what is meant by a luxury product. Section 3 contains the methodology of the literature review, followed by the findings in Section 4. In Section 5, the results of the review are discussed, and limitations of the study are addressed. The work closes with a conclusion and aspects for future research in Section 6.

2 Description of the Country-of-Origin-Effect and Luxury Goods

2.1 *Country-of-Origin-Effect*

The COE summarizes the idea that consumers perceive products differently according to the product origin and, based on this, develop a preference within the buying process (e.g., Balabanis & Diamantopoulos, 2008; Liefeld, 2004; Papadopoulos & Heslop, 2002; Schudey et al., 2016). Even in 1970, Nagashima (1970, p. 68) described the “‘made in’ image” as “the picture, the reputation, the stereotype that businessmen and consumers attach to products of a specific country”. Following Nagashima (1970, p. 68), this image is impacted by “representative products, national characteristics, economic and political background, history, and traditions” and influences the behavior of consumers within the international markets. This was the first time the term image was connected to a country (Listiana, 2015).

The individual place image (PCI) is built on a limited amount of stereotypes and perceptions which, in turn, lead to a generalization on many objects (Papadopoulos & Heslop, 2002). Therefore, the COO can be understood as the country that customers commonly connect with a brand or product even though the product might be manufactured elsewhere (Aiello et al., 2009), which emphasizes the subjective component of the description. The value transferred to the consumer of a product is highly linked to the origin and the production process, which is why the indication of origin is not solely an information, but rather a huge part of the business model (Guercini & Milanese, 2017).

As globalization allows more and more organizations to produce comparable – in many cases even (partially) standardized products – location-unspecific, organizations often emphasize the country to highlight themselves (Papadopoulos & Heslop, 2002). According to Aiello et al. (2009), the COO concept got more complex during the course of globalization. Pursuant to Diamantopoulos and Zeugner-Roth (2011) the labeling of the COO (e.g., made in) historically indicated the country, where the specific product was manufactured, but, as a consequence of the increasing globalization, more and more products are so-called hybrid products, meaning a product with a differing country of association (COA), country of brand (COB), country of design (COD), country of corporate headquarters (COH), and/or in addition another country of manufacture (COM). Nevertheless, Aiello et al. (2009) note that consumers only accept the made in declaration if COD and COM/A correspond.

The COE can further be linked to economic figures. Alam et al. (2018) argue that country of origin has a significant effect on brand awareness, brand association, perceived quality, and brand loyalty. In addition, perceived quality as well as brand loyalty significantly influence brand equity (Alam et al., 2018). Listiana (2015) strengthens the effect of COO on brand association. Furthermore, Listiana (2015) shows an indirect influence of the COO image on the perceived quality as well as on the brand loyalty through the intervening variable brand association. Additionally and

referring to Koschate-Fischer et al. (2012), consumers have a higher willingness to pay for products with designation of origin with a beneficial country image than for products with a less favorable one. The COO can even be seen as a major aspect within the consideration of the highest amount of money consumers would spend for a brand named product (Koschate-Fischer et al., 2012).

2.2 Definition of a Luxury Good

In both, academic and non-academic literature, the term luxury product is often used without being defined (e.g., Deloitte (2018) and Godey et al. (2012)). The literature review by Ko et al. (2019) also found that there is no commonly accepted definition of what a luxury brand is. Nwankwo et al. (2014) note that the understanding of luxury differs in time and space and that the definition is subject to a very subjective assessment in the sense that a product or habit might be a luxury one for one person and commonplace for another. This subjective dimension is also emphasized by Ko and Megehee (2012), Piron (2000), and Sari and Kusuma (2014). According to Král (2013), luxury is based on perceptions, meaning that the emotional part like the convincing and attractive history of the brand (or the founder of the brand) as well as the brands history are key aspects in branding.

Even though there is a lack of definitions of what luxury in general and a luxury brand are, there is a certain consensus that “common denominators are beauty, rarity, quality, and price, and also an inspirational brand endorsing the product” (Godey et al., 2012, p. 1462). This description underlines that luxury products can not exclusively be defined by their price and that the wording luxury includes numerous factors.

2.3 Signaling Theory and Country-of-Origin Information

The signaling theory by Spence (1973, 2002) argues that information is distributed unequally and that some people know certain things about which others in the market have no knowledge, leading to informational gaps. Kirmani and Rao (2000) also state that such an information asymmetry might impact the transaction itself as well as the relationship between the different parties. Signals can therefore carry information from those having more information to the parties having less information (Spence, 2002). Signals to reveal the quality of a product can be transmitted in several ways like the use of a branded name, price, or warranty (Kirmani & Rao, 2000). The last-mentioned three signals can be allocated to extrinsic cues according to, e.g., Agrawal and Kamakura (1999), Lee and Lou (1996), Liefeld (1993), and Qasem et al. (2016) to judge a product quality. In the 1960s, research advanced the description of extrinsic cues by adding inter alia the information on country-of-origin (Liefeld, 1993).

In addition, intrinsic cues include all physical attributes like the style of a product (Lee & Lou, 1996) or the flavor or texture (Liefeld, 1993). Intrinsic cues are more specified, whereas extrinsic cues are more general and can be applied to a variety of products (Lee & Lou, 1996). It seems that consumers are more aware of extrinsic rather than intrinsic cues, which is why consumers focus on extrinsic cues when evaluating a product (Lee & Lou, 1996). In accordance with Liefeld (1993), Olson (1978), and Verbeke and Ward (2006), consumers use cues to evaluate products and to consult as criteria in the decision-making process. In order to avoid reaching an overload of information, it is important to identify which label cues are desired for the consumers (Verbeke & Ward, 2006).

3 Methodology

The purpose of the present literature review is to synthesize relevant studies on the topic of the COE and the use of the designation of origin in the context of luxury goods. The systematic literature review is based on the approach suggested by Webster and Watson (2002). The following search term was used to identify relevant literature:

(("country of origin" OR "COO" OR "COE" OR "designation of origin" OR "place image" OR "PCI") AND ("luxury*"))*

The literature search is based on the three databases Business Source Premier (via EBSCOhost) (Boolean/Phrase search mode, apply equivalent subjects), EconBiz (all fields), and EconLit (Boolean/Phrase search mode, apply equivalent subjects). The databases were selected as both belong to the top five databases in the field of economics according to the Universitätsbibliothek Stuttgart (n.d.).

The initial literature search identified 1246 studies. In addition, the search was restricted on academic articles written in English ($n = 108$). After the exclusion of duplicates, the remaining 94 articles were selected by reviewing the title, keywords, and the abstract. Articles not matching with the topic of interest were excluded; papers dealing with co-creating (e.g., Choi et al., 2016; Harkison, 2018; Hughes et al., 2016), co-branding (e.g., Lim et al., 2016; Shen et al., 2017; Wang et al., 2015), or storytelling (Mora & Livat, 2013) in the luxury market, for example, were not taken into further account. The final sample of 34 papers (see appendix 1) was analyzed in-depth. The content analysis is based on the subsuming content analysis by Mayring (2007).

The citation and co-citation analysis is based on the procedure and measurement by Small (1973). The citation analysis includes all direct citations between the authors of the 34 articles analyzed in-depth. The co-citation analysis includes the 94 articles as a database and investigates whether and in how many articles (frequency) authors of two different articles are commonly cited in a third article. The analysis of collective authorship includes all possible combinations of the 34 articles. In a first step, data were collected in Microsoft-Excel, converted into a matrix based

on Small (1973) and then analyzed and visualized by using the software Gephi (Bastian et al., 2009).

4 Results

Figure 1 gives an overview of the number of analyzed articles published in each year between 1996 and 2019. The first article analyzing the COE within the luxury good industry was published in 1996 by Neese and Hult (1996). Most articles used in this analysis were published in 2009, 2012, and 2018 ($n = 5$ each). As a result, it can be concluded that COO is an ongoing topic of research interest.

An overview of the analyzed literature including the analyzed industry, the analyzed product or products, the sample, and the findings regarding the COE in the field of luxury goods can be seen in Appendix 1. In 27 out of 34 cases an empirical research was done; in three cases, namely Kapferer (2012), Ko and Megehee (2012), and Snaiderbaur (2009), a theoretical research was done. Dallabona (2011), Guercini and Milanesi (2017), and Král (2013) investigated the connection of the COE in regards to luxury goods by using the case study design. Zainol et al. (2018) used a mixed-method-approach to develop and validate their Consumers' Need for Ingredient Authenticity (CNIA) Scale.

Most of the empirical studies analyzed focus on the customer perspective, except three studies. Collins and Weiss (2015) investigated luxury brands by interviewing key strategists of three Scottish and three American textile heritage labels, and therefore consider the organizational point of view. Schultz and Jain (2015) analyzed both sides and interviewed in addition to one hundred consumers fifteen brand managers and ten store managers. Furthermore, Guercini and Milanesi (2017) interviewed the CEO, administrative officer, and marketing manager of a luxury business.

Most articles focused on one country (see Fig. 2). An Asian country ($n = 7, 21\%$), a European country ($n = 4, 12\%$), Australia ($n = 6, 18\%$), USA ($n = 4, 12\%$), and Brazil ($n = 1, 3\%$). Three cases (9%) did not mention a specific analyzed country.

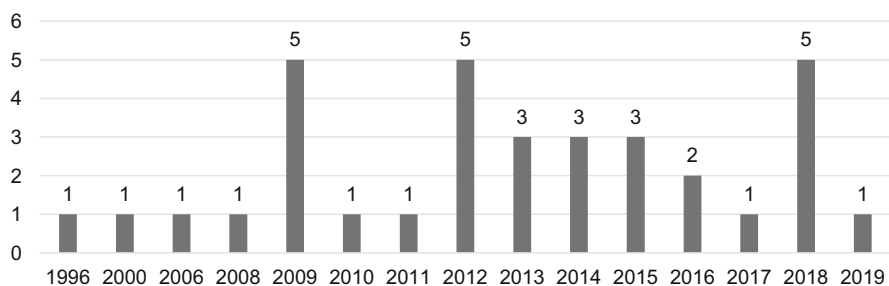


Fig. 1 Number of articles between 1996 and 2019. Source: Own presentation

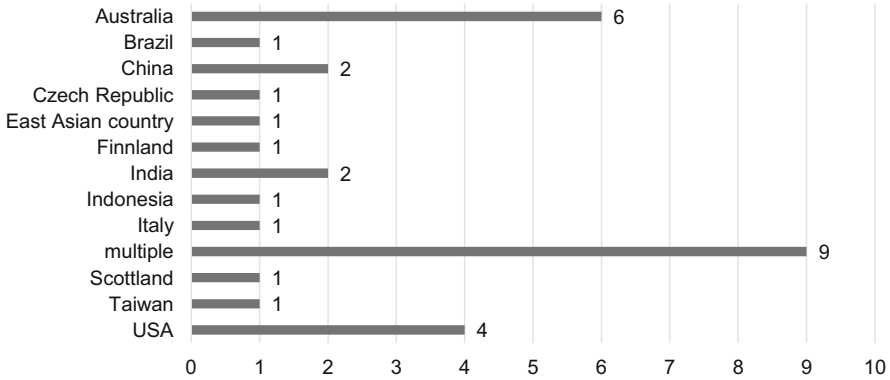


Fig. 2 Country of the sample [number of articles]. Source: Own presentation

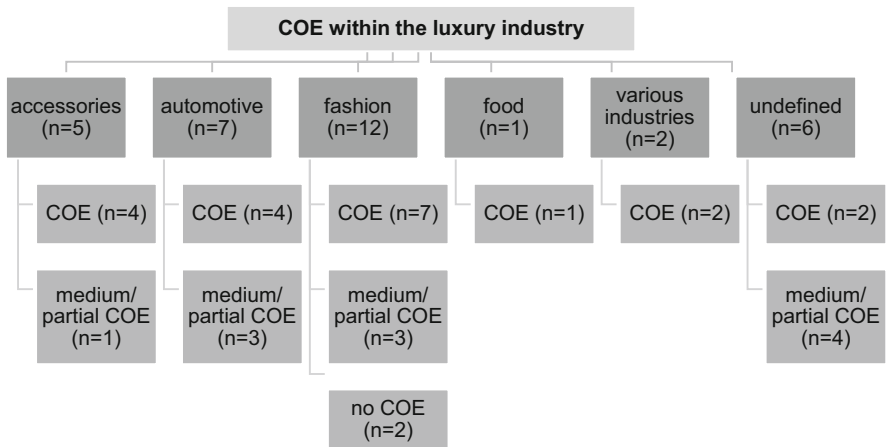


Fig. 3 Overview of the COE within the luxury industry. Source: Own presentation

A multi-country analysis was used in nine cases (26%). Four studies involved two countries, two studies three countries, one seven, and two eight countries. Among these nine articles, a sample of the United States is represented eight times. Within the research of COO and luxury goods, four main industries studied can be identified (see Fig. 3). Firstly, the accessories industry ($n = 5$, 15%), in which watches were analyzed three times. Further industries are the automotive ($n = 7$, 21%), fashion ($n = 13$, 38%) as well as the food industry ($n = 1$, 3%). Eight studies (24%) investigated the COE by using a luxury brand, instead of a specific product (category) or carried out a more general study.

Regarding the findings, a COE can be observed in twenty of the 34 analyzed studies (59%), a medium/partial effect in eleven cases (32%), and no effect in two cases (6%). Separating the findings into the industries, in four of the five studies (80%) investigating accessories, an effect could be observed.

Analyzing the automotive industry, four out of seven studies (57%) found an effect, in the fashion industry seven out of thirteen articles (54%) and in the food industry one out of one article. In addition to the content analysis, a citation and co-citation analysis was performed. The directed graph of the citation analysis revealed 27 edges by using the software Gephi, meaning that in 27 cases one of the 34 articles is cited by another of the 34 authorships (see Fig. 4; the arrows mark the direction of citation).

The overall network density is 0,024. Godey et al. (2012) connected the most with other authors by being cited by eight authorships (in-degree) and citing two (out-degree) within the network.

The co-citation analysis identified eighteen edges between the 34 analyzed articles (see Fig. 5). The lines in bold print (weighted edges) mark the three connections between articles, which are cited twice together by a third authorship, namely Aiello et al. (2009) and Godey et al. (2012) by Jung Jung et al. (2014) and Siew et al. (2018), Aiello et al. (2009) and Piron (2000) by Godey et al. (2012) and Collins and Weiss (2015) as well as Cheah et al. (2016) and Godey et al. (2012) by Bartkowski et al. (2019) and Heine et al. (2019).

5 Discussion

Overall, the literature review indicates that consumers reward information on the COO and include it into their decision-making and product evaluation process. Among the analyzed articles, twenty articles found a COE and eleven a medium or partial COE. These results coincide with the findings by inter alia Liefeld (1993), Olson (1978), and Verbeke and Ward (2006), according to whom cues are included into these processes. This is strengthened by Lee and Lou (1996), stating that especially extrinsic cues, like the COO indication, play a major role in the evaluation process.

The literature reviews revealed a difference in the findings regarding the COE when dividing the analyzed cases of their industries. The most frequent effect could be observed, when addressing the cases investigating luxury accessories (80%). Three of the five cases, namely Boisvert and Ashill (2018), Chapa et al. (2006), and Král (2013) used luxury watches as the analyzed object or stimuli material. In the case of a Czech watch manufacturer by Král (2013), the designation of origin is suggested to being used differently in different markets. The labeling of the Czech Republic is recommended to being primarily used in the Czech Republic and Slovakia, whereby the Czech origin might not be perceived as that favorable overseas, whereas the European roots should be emphasized in this case (Král, 2013). Siew et al. (2018) also emphasize the combination of the brand origin and emotional aspects, like national symbols with recognition value to achieve a strongly perceived brand origin, which, in turn, increase consumers' willingness to pay. The perceived strength of brand origin (PSBO) includes, beside the knowledge of a country, the perception of how French or American the label appears to consumers

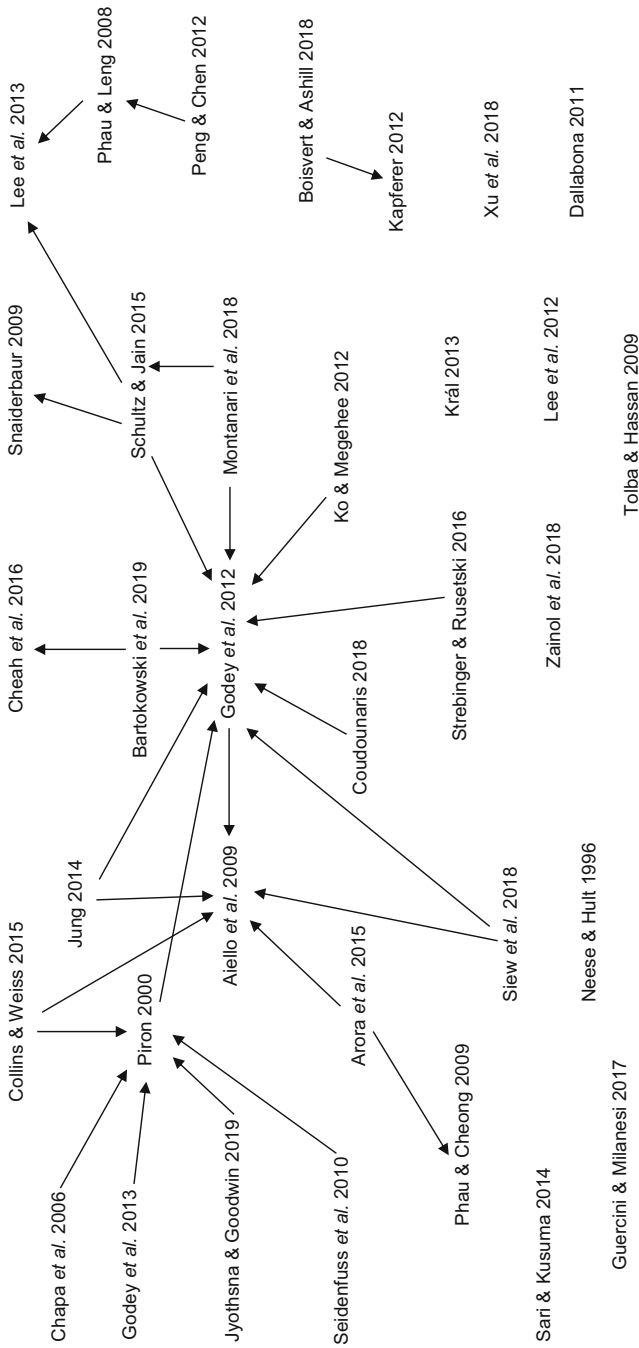


Fig. 4 Citation network. Source: Own presentation

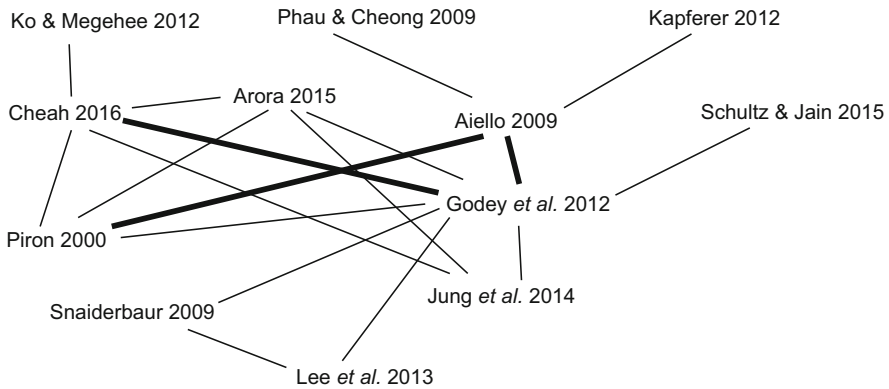


Fig. 5 Co-citation network. Source: Own presentation

(Siew et al., 2018). According to Chapa et al. (2006), the indication of a country gets even more important, when the indication of a brand is absent and the country serves as a substitute. In addition, the relevance to a made in sign increases, when consumers can decide on a product of a known COO and an unknown indication of origin. Even though the knowledge of the known country is unfavorable, consumers preferred the product with the known COO (Chapa et al., 2006).

Different effects have been observed in the automotive industry. Following Coudounaris (2018), the COE is statistically significant, when investigating the purchasing process of luxury automotive brands. Jyothsna and Goodwin (2009) also underline the COE and state that it can be used as a reference for quality, safety as well as comfort, and status. Nevertheless, the authors limit their results since there was no differentiation between sub-factors of COO, like COA, COD, or COC. This step was done by Seidenfuss et al. (2010), who state that automobiles apply to hybrid products, meaning that those products have multiple origins, like a differing COA and COC, with the result that COA is perceived as more relevant compared to COC by consumers. The different relevance to sub-elements of COO is also strengthened by Godey et al. (2013) according to whom COD and COO are of higher relevance than COM, whereby differences exist on different countries. Furthermore, numerous attributes, which are seen as relevant in the purchasing process of an automotive, like the power train, cannot be related to origin cues (Seidenfuss et al., 2010).

Regarding the fashion industry, the discrepancies considering the COE might come from the wide variety of stimulus material, which has been used: the study by Lee et al. (2012) used a Calvin Klein men's underwear as a branded luxury product (price under 30 Euros each (CK Stores B.V., 2020)), who could not find a COE, compared to the case of an Italian fashion business investigated by Guercini and Milanese (2017) with products ranging from €500 for a tie-up to more than €150,000 for a coat made of leather and fur, who strongly support the COE. This wide range of

the definition of luxury products corresponds with the literature review by Ko et al. (2019), who conclude that there is a lack of a commonly accepted definition regarding luxury brands.

Analyzing the products used as stimuli, none of the studies covered the COE within the field of product innovations. The products investigated are well-established ones like sweaters (Cheah et al., 2016; Zainol et al., 2018), watches in general (Arora et al., 2015; Boisvert & Ashill, 2018; Král, 2013), and cars like sedans (Neese & Hult, 1996; Tolba & Hassan, 2009).

Following Magnusson and Westjohn (2011), general criticism within academic research addresses the US-centrism of research limiting the general validity of the results to other countries and continents. Contrary to this general US-centrism, Magnusson and Westjohn (2011) analyzing 114 reviewed articles within the field of COO found a variety of analyzed countries. According to the present literature review, four studies solely focused on a US sample, whereby in eight of the nine multiple-country studies the United States are part of the sample. In summary, 35% included a US sample, still showing a variety of analyzed countries.

The citation analysis revealed a weak connection within the network (density of 0.024). Following the co-citation analysis, about 35% ($n = 12$) are cited with another out of the 34 authorships by a third article, whereby Godey et al. (2012) are part of the pair eight times. Reason for the highest frequency of co-citation might be the reason that Godey et al. (2012) is also the authorship cited the most in direct-citation ($n = 8$) and therefore seems to be popular with in this field of research. This coincides with Trujillo and Long (2018), according to whom co-citation analysis can help to identify important contributions made in the past within a specific field.

6 Conclusion and Future Research

The analyzed 34 articles strengthen the COE, as an effect could be found in twenty studies and a medium or partial effect in eleven studies. The analysis revealed a difference in the COE, when dividing the articles into different industries, whereby the accessories and fashion industry seem to be more receptive for the COE than the automotive industry. The different findings within the analyzed fashion cases may derive from the different stimulus material of luxury products, ranging from about 30 to 150,000 Euros. In addition, the different selection of stimulus material coincides with the missing of a common definition of what a luxury product is and how a luxury product can be distinguished from a “common” product.

Furthermore, the publication dates emphasize the actuality of this topic, as in-between 1996 and 2019 twelve of the articles (35%) have been published between 2015 and 2019. The citation and co-citation analysis structured the landscape of authorship, whereby an overall weak connected network could be observed. Moreover, the analysis shows central articles; especially Godey et al. (2012) were identified as key literature within this research stream.

This literature review and citation analysis has several limitations. Firstly, the review covers articles published in academic journals written in English, which were published in the included databases. This implies an exclusion of possibly relevant articles, which therefore might have been overlooked. Secondly, the number of industry—and product-specific cases does not allow any generalization and can only serve as initial pointers.

Addressing future research, more studies may be taken out with a focus on the organizational point of view (supply side) of the COE within the field of luxury goods as well as other products. A special focus can be placed on the COE regarding luxury product innovations. Additionally, an analysis of the COE comparing different industries might shed light on the relevance to industry-specific factors and characteristics influencing the COE.

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Appendix 1: Literature Overview: Country of Origin and Luxury Goods

Analyzed industry	Author & year of publication	Analyzed product (s)	Sample	Findings (extract): country of origin & luxury goods
Accessories	Arora et al. (2015)	Watch	144 graduate students (USA)	COO and COM are important information for the purchase decision of consumers and their willingness to pay.
	Boisvert and Ashill (2018)	Watch	1920 (commercial online database; 960 France, 960 USA)	Suggestion to consider the COO of consumers in the branding strategies.
	Montanari et al. (2018)	Perfume	329 students (Brazil)	COO has little importance in the purchase decision.
	Král (2013)	Watch	<i>Case study (One Czech watch manufacturer)</i>	COO influences the perception of brands and the willingness to pay.
	Siew et al. (2018)	Two brands (products not specified)	517 (generation Y; professional survey service provider; ~70% US citizen)	The perceived strength of brand origin positively influences the

(continued)

Analyzed industry	Author & year of publication	Analyzed product (s)	Sample	Findings (extract): country of origin & luxury goods
				willingness to pay for luxury brands.
Automotive	Bartikowski et al. (2019)	Not specified	177 (executive education program alumni; China)	A Made-in-China label positively influences the brand attitudes of Chinese consumers.
	Coudounaris (2018)	MB C-Class or E-Series	275 employees of Finnish universities (32 users, 240 non-users)	There is a COE.
	Jyothsna and Goodwin (2009)	18 car brands	100 (online survey; India)	Strong support for the COE.
	Neese and Hult (1996)	Large American-made sedans	646 participants (422 civic organizations members, 244 university students; USA)	COO is important regarding competitive rationality and competitive advantage. Age, income, race, and education predict the COO tendencies.
	Sari and Kusuma (2014)	Two car brands	200 (Indonesia)	COO has a small impact on the luxury brand evaluation.
	Seidenfuss et al. (2010)	Not specified	720 (street-intercepts of actual users; Indonesia, Malaysia, Thailand)	Significant level for country-of-assembly (COA), but not for country-of-components (COC) effects.
	Tolba and Hassan (2009)	Sedans	1282 (survey service provider; USA)	Products with different COO are evaluated differently.
Fashion (textiles)	Cheah et al. (2016)	Wool sweaters and Chicane-embroidered dresses	262 (mall intercept method; Australia)	Relevance of COO image to gain a positive branded product evaluation and buying intention.
	Collins and Weiss (2015)	Six textile brands producing various products	Three Scottish and three American brands (key strategists)	Luxury brand consumers appreciate information on COO. Confirmation

(continued)

Analyzed industry	Author & year of publication	Analyzed product (s)	Sample	Findings (extract): country of origin & luxury goods
				of the COO concept in nature.
	Dallabona (2011)	Venture between a fashion label and a hotel	<i>Case study (One Scottish Hotel)</i>	Case study showing, how elements of cultural heritage can be integrated in the marketing.
	Guercini and Milanese (2017)	One label with various products	<i>Case study (One Italian fashion company)</i>	Strong support for the COE.
	Jung Jung et al. (2014)	Three fashion brands	466 online respondents (Korea, USA)	Country image can lead to greater brand awareness and perceived product quality.
	Ko and Megehee (2012)	Not specified	<i>Theoretical</i>	Weaker influence of COO on the purchase decision than the influence of brand.
	Lee et al. (2013)	Underwear	260 (mall intercept method; Australia)	No COE/country of brand effect.
	Lee et al. (2012)	Underwear	348 (mall intercept; Australia)	No differences in brand evaluation with different origins.
	Peng and Chen (2012)	One brand, various products	31 (mall intercept; Taiwan)	Confirmation of the influence of country image on the international luxury brand perception.
	Phau and Cheong (2009)	Two brands and two product categories (designer jeans and sunglasses)	603 students (Australia)	Declining importance of COO.
	Phau and Leng (2008)	Not specified	365 teenagers (Australia)	Medium impact of COO on product evaluation; especially for status-seeking teenagers.
	Strebinger and Rusetski (2016)	15 global brands	Websites of 15 leading global luxury fashion brands (Asia, Europe, North America)	Importance of geo-referencing for luxury fashion brands.

(continued)

Analyzed industry	Author & year of publication	Analyzed product (s)	Sample	Findings (extract): country of origin & luxury goods
	Zainol et al. (2018)	Alpaca wool sweater, kilt tartan, denim jeans, and Chicane-embroidered dress	Study 1: 3 focus expert groups (each 8–10 participants) and 250 students study 2: 180 students study 3: 180 students study 4: 197 (mall intercept) (Australia)	Development and validation of the consumers' need for ingredient authenticity scale (CNIA scale). COO may have an impact.
Food	Xu et al. (2014)	Red wines	540 (mall intercept; Beijing, China)	Strengthening of the COE.
Undefined luxury good(s)	Aiello et al. (2009)	Not specified; product categories convenience goods, shopping goods, specialty-luxury goods	165 undergraduate management students (China HK, France, Germany, India, Italy, Japan, Russia, USA)	COO only has a medium impact on the luxury product evaluation.
	Godey et al. (2013)	Not specified	1103 respondents (China, France, India, Italy, Japan, Russia, USA; about 150 each)	According to the global model, CoD and CoO are favored over CoM. Differences regarding the importance of CoO and sub-elements exist between different countries.
	Godey et al. (2012)	Not specified	1102 respondents (China, France, India, Italy, Japan, Russia, USA)	Relative importance of COO in the purchasing process of luxury goods.
	Kapferer (2012)	Not specified	<i>Theoretical</i>	The heritage of a (newly) brand should be communicated.
	Schultz and Jain (2015)	Not specified	1. 16 focus groups (160 respondents) 2. structured observations (20 stores, 100 consumers)	COO influences the product perception and purchase process and is moderated by friends and digital media.

(continued)

Analyzed industry	Author & year of publication	Analyzed product (s)	Sample	Findings (extract): country of origin & luxury goods
			3. 25 in-depth interviews (15 brand managers, 10 store managers); India	
	Snaiderbaur (2009)	Not specified	<i>Theoretical</i>	COO indication should be evolved to a “country concept brand”.
Various industries	Chapa et al. (2006)	Watch, tennis shoes, DVD player, detergent	312 (157 American, 155 Mexican; geographical sampling method using neighborhoods)	COO influences the likelihood to purchase a counterfeit.
	Piron (2000)	Convertible sports car, sunglasses, home theater system, toothpaste	296 (people sitting outside office buildings and shopping malls; East Asian country)	Increased importance of COO when purchasing luxury products compared to necessity products.

Source: Own presentation

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Management Model and Dynamic Capabilities: Approaches to Knowledge-Intensive Business Services in Emerging Economies



Oscar Mauricio Cruz-Sanchez, Diana Geraldine Jimenez Garcia, and Oscar Fernando Castellanos Domínguez

Abstract Countries with emerging economies such as Mexico, Argentina, Chile, and Colombia are lagging behind China, India, and others in Knowledge-Intensive Business Services (KIBS), due to their organizational inertia to sense and seize new market opportunities and achieve new and innovative ways of competitive advantage. The objective of this paper is to analyze the dynamic capabilities needed to enhance the management model in KIBS in emerging economies context. The study is carried out by gathering and reviewing successful experiences extracted from the literature on management models for KIBS in developed countries, leading emerging economies, and Latin American countries. As a result, the relevance of this type of service is established in some of the most developed economies, as well as the capabilities that have been strengthened in leading emerging countries, such as China and India, to finally propose the actions that Latin American countries can undertake. Main results show the need to embed absorptive cutting-edge knowledge capabilities in KIBS organizations, to consolidate, reinforce, and innovate in processes reflected in competitive services.

Keywords Knowledge-Intensive Business Services (KIBS) · Innovation · Dynamic capabilities · Latin American countries · Management model

O. M. Cruz-Sanchez (✉)
Universidad Nacional de Colombia, Bogotá, Colombia
e-mail: omcruzs@unal.edu.co

D. G. J. Garcia
Departamento de Administración de Empresas, Fundación Universitaria Los Libertadores,
Bogotá, Colombia
e-mail: djjimenezg@unal.edu.co

O. F. C. Domínguez
Departamento de Ingeniería de Sistemas e Industrial, Universidad Nacional de Colombia,
Bogotá, Colombia
e-mail: ofcastellanosd@unal.edu.co

1 Introduction

In developed economies, services and knowledge sectors have had an increasing importance since the middle of the twentieth century, and currently hold the largest proportion of their GDP. Knowledge-Intensive Business Services (KIBS) are at the intersection between services and knowledge, thus fulfilling a leverage role for other organizations. The importance of these services for the economy as a whole, the regions, the productive systems, and the Government has been frequently declared. Strengthening the business sector (Andersson & Hellerstedt, 2009; Muller & Zenker, 2001; Pinto et al., 2015) and the activities related to production, dissemination, exploitation, and renewal of knowledge (Den Hertog, 2000; Gadrey et al., 1995) have also been emphasized, considering those assets associated with knowledge increase competitive advantages in developed economies.

Sarkar et al. (2016) argue that KIBS operation has not been sufficiently researched and there are still some gaps regarding the measurement of the impact and the drivers that sustain the results of the company. These gaps are remarkable, considering this sector in some regions have presented higher growth than other sectors of the economy. Sarkar et al. (2016) also state that dynamic capabilities approach is an adequate tool to determine essential factors that affect organizational results.

Management model is integrated by a group of activities, processes, and stakeholders that allows achieving results of the organization, based on strategic guidelines and organizational objectives (Birkinshaw & Goddard, 2009). This reinforces the link that cannot be ignored between organizational capabilities, management model, and organizational results.

Knowledge economy is embedded in continuously changing technology and markets; thus, companies must be flexible in making decisions to take advantage of elements such as technology, intellectual property, intangible assets, and business models (Teece, 2007). KIBS are created and developed in the so-called high-speed environments, which represent great challenges in terms of how to manage them, because they are intensive knowledge-based. Therefore, organizations are in search of a competitive advantage to respond effectively to uncertainty. Since the initial introduction of the term dynamic capabilities by Teece and Pisano (1994), this concept has gained great relevance in the management literature, as it establishes a relationship between strategy and the conditions of changing environments. Dynamic capabilities refer to the ability of the firm to build, integrate, and reconfigure internal and external competences in these environments (Baden-Fuller & Morgan, 2010; Eisenhardt & Martin, 2000a, b; Teece et al., 1997; Wang & Ahmed, 2007). They can be classified as high-level processes and competencies (Teece et al., 1997; Teece, 2007; Teece, 2012; Teece et al., 2016) or as specific and identifiable processes (Eisenhardt & Martin, 2000a, b; Garzón, 2015). The objective of this paper is to analyze the dynamic capabilities needed to enhance the management model, specifically in KIBS. This paper contributes integrating management model and dynamic capabilities constructs in the KIBS sector to provide

recommendations to firms in emerging Latin American context and it is divided into three sections. The first section is dedicated to characterizing KIBS, management model, and dynamic capabilities. The second section focuses on dynamic capabilities for KIBS. The third section proposes actions Latin American countries can undertake.

2 Methodology

KIBS are embedded in volatile environments that require a management model that responds to this dynamism. The framework of dynamic capabilities facilitated the interpretation of a management model to face the uncertainty of the market in which the KIBS are immersed. This is qualitative descriptive research (Lambert & Lambert, 2013) by gathering and reviewing successful experiences extracted from the literature on management models for KIBS in developed countries, leading emerging economies and Latin American countries (López & Ramos, 2013). As a result, the relevance of this type of services is established in some of the most developed economies, as well as the capabilities that have been strengthened in the leading emerging economies, such as China and India (Shi et al., 2014), to finally propose the actions that Latin American countries can undertake.

3 Knowledge-Intensive Business Services, Dynamic Capabilities, and Management Model Framework

3.1 Knowledge-Intensive Business Services

Knowledge-Intensive Business Services consider knowledge as the main production factor associated with the provision of a high technology service. The concept was first coined by Miles et al. (1995), who described it as high value-added services whose main input is knowledge, but it has been also described in terms of their processes. According to Miles et al. (1995, p. 23), KIBS are classified into: “people, physical goods and other resources, artefacts and commodities (e.g. buildings, parks), or information (which includes knowledge but is not limited to it)”. The concept of information was later complemented with different positions, as outlined by Zieba (2013).

According to Gadrey et al. (1995), KIBS have three main functions: (1) identification and analysis of problems, (2) the execution of a diagnosis, and (3) participation in the process of solving specific problems. Miles et al. (1995) state that the services that comprise KIBS have the following characteristics: (1) they rely heavily upon professional knowledge; (2) they are either primary sources of information and knowledge, like reports, training consultancy, etc., (3) or use their knowledge to

produce intermediary services for the production processes of their clients (e.g., communication and computer services); (4) they are competitively important and supply primarily to business. The aforementioned industries constitute Knowledge-Intensive Business Services (KIBS). Some of them are traditional professional services, while others are new technologies based on services.

This sector of the economy highlights some components that are considered crucial to achieve the results of the organization. According to Muller and Zenker (2001), these components are related to (i) the use of specialized knowledge, (ii) the functions in organizations through advisory and consulting activities, and (iii) close relationships with stakeholders such as clients from a knowledge transfer process. Strambach (2008) identified two characteristics. First, knowledge in KIBS not only constitutes an input in the service provision process, but also the main factor of production and the main result of the process manifested in the use of knowledge, the generation of the learning curve, and the proposal of a solution to the identified problem. Second, the relationship with members of the value chain can nurture the organization in terms of knowledge. This use of knowledge at the organizational level impacts the territorial dimension, considering that KIBS “play an important role in regional development through innovation, since they have become intermediaries and nodes in the networks of innovation systems”, as mentioned by Alvarado (2014, p. 85).

Some components in the management of KIBS are highlighted, such as the innovation patterns surrounding knowledge (Amara et al., 2009), the need to manage tacit and codified knowledge (Amara et al., 2009), the protections of organizational knowledge as a way to maintain a competitive advantage around knowledge (Amara et al., 2008), the importance of the relationship with qualified human capital (Andersson & Hellerstedt, 2009), and the relationship with other key organizations in the generation or knowledge transfer. This last aspect is related to the location of the organization and its proximity to these stakeholders in geographic terms (Andersson & Hellerstedt, 2009; Corrocher et al., 2009; Guimarães, 2014).

Davis (1999) states that knowledge-intensive services have implications in organizations in terms of the need to make the hierarchy more flexible through processes of coordination, collaboration, and horizontal communication. Knowledge-intensive services have certain particularities that are relevant when analyzing the development of the sector in a defined geographical space. Strambach (2008) highlights three impacts of KIBS development, according to territorial knowledge dynamics: (i) KIBS can drive knowledge dynamics to strengthening the unequal knowledge from lagging regions in a particular direction. It contributes to renew regional trajectories and keep the dynamic stability, (ii) KIBS can create new paths because its nature is not limited to a single knowledge property, and (iii) KIBS make knowledge migration and dispersion easier by the de-contextualization of knowledge.

However, according to Rubiera-Morollón and Morán (2005), KIBS are companies focused on advising other organizations and are considered as units that promote R&D processes by linking specialized knowledge and innovation

processes. This particularity does not exempt them from incurring in efficiency failures associated with the lack of a quality process certification or lack of strategies to attract new clients and position themselves in the market. KIBS in peripheral regions also present a high deviation in the expected results.

3.2 *Dynamic Capabilities*

Dynamic capabilities have received increasing attention and become one of the most relevant approaches in strategic management. Dynamic capabilities explore the foundations of a sustainable competitive advantage. Organizations in a Schumpeterian environment of competition, based on innovation and price-performance ratio, search for better returns. The so-called creative destruction of skills needs to gain and sustain a competitive advantage and this is a function of dynamic capabilities (Teece et al., 1997).

Dynamic capabilities have been approached from different perspectives. Teece and Pisano (1994) state that dynamic capabilities emphasize two aspects to achieve competitive advantage. There is the changing nature of the environment and the strategic role in adopting, integrating, and reconfiguring both internal and external resources, and skills to face these environments. Teece et al. (1997, p. 516) define dynamic capabilities as “The ability of the company to integrate, build and reconfigure internal and external competencies to address rapid changes in environments. The dynamic capabilities thus reflect the ability of an organization to achieve new and innovative forms of competitive advantage, according to the trajectory and the position in the market”.

Eisenhardt & Martin (2000a, b, p.1107) emphasize organizational routines and argue that “dynamic capabilities are organizational, strategic routines, in which organizations achieve new resource configurations as soon as markets emerge, collide, divide, evolve and they die”. Zollo and Winter (2002, p. 340) suggest a focus on learning patterns and processes by stating that a “dynamic capability is a stable and learned collective activity from which an organization systematically generates and modifies its routines in search of greater efficiency”.

Dynamic capabilities can be classified as high-level processes and competences or as specific and identifiable processes (Ambrosini & Bowman, 2009; Barreto, 2010; Eisenhardt & Martin, 2000a, b; Teece et al., 1997; Teece, 2007; Wang & Ahmed, 2007). Teece (2007) remark that dynamic capabilities can be divided into: (1) sensing capabilities, which refer to perceiving and modeling opportunities and threats; (2) seizing capabilities that aim to mobilize resources to take advantage of opportunities and create value, and (3) transforming capabilities that intend to enhance, combine, protect and, if necessary, reconfigure the company’s tangible and intangible business assets (Janzkovski & Takashi, 2015; Teece, 2007).

Wang and Ahmed (2007) note three types of dynamic capabilities: adaptive, absorption, and innovation capabilities: (1) an adaptive capability is understood as “the company’s ability to identify and capitalize on emerging market opportunities”

(Wang & Ahmed, 2007, p. 37). (2) absorption capability is defined by Cohen and Levinthal (1990) as “the ability of a company to recognize the value of new external information, assimilate it and apply it for commercial purposes” (p. 128). (3) innovation capability refers to the ability of the company “to develop new products and/or services, the development of new production methods, the identification of new markets, the discovery of new sources of supply and the development of new organizational forms, aligned with an appropriate strategic orientation” (Wang & Ahmed, 2007, p. 38). Accordingly, Wang and Ahmed (2007) state that product innovation is a real dynamic capability to the extent that it allows the renewal and reconfiguration of the firm’s resources. Additionally, Garzón (2015, p. 124) references learning capability as a dynamic capability and defines it as “potential of organizations to create, organize and process information from its sources, to generate new individual, team, organizational and inter-organizational knowledge about the base of a culture that facilitates it and allows the conditions to develop new potentialities, design new products and services, increase the existing offer and improve processes, oriented towards sustainability”.

KIBS play a key role to act as fitting of innovation between scientific knowledge and the manufacturing sector (Koch & Strotmann, 2008). Firms are able to develop new products, markets, and business models by aligning strategic innovative orientation with innovative behaviors and processes (Zahra & George, 2002). The more innovative a firm is, the more it processes dynamic capabilities (Wang & Ahmed, 2007). Dynamic capabilities are essential in KIBS as they are immersed in highly changing technology and market environments. Consequently, they need highly specialized employees, rapid capacity of absorbing external knowledge, building and regulating the transformation of internal and external competencies and strategic assets.

KIBS are highly underpinned providing application-oriented and customized services. Tacit knowledge plays an essential role based on the interaction between suppliers and clients. The stock of experience, knowledge, and the capacity to interact and cooperate reduce uncertainties and develop innovative outputs (Koch & Strotmann, 2008). Internal and external knowledge activities influence innovativeness in KIBS. Firms aligned with collaborative innovators are highly cooperative, thus KIBS need absorption capacity to benefit from external knowledge and appropriability (Rodriguez et al., 2016).

Absorptive capacity is bounded to knowledge acquisition, assimilation, transformation, and exploitation (Zahra & George, 2002). As knowledge is the principal source, process, and product in KIBS, the ability to detect external sources of knowledge and transform them into value-added services, that is, the absorptive capacity, is critical to KIBS (Tseng et al., 2011). It refers to the ability to acquire external information and use the valuable new knowledge to develop new and improved products. This includes the ability of learning from partners and the transformation of external information into specific knowledge of the firm. Firms with higher absorptive capabilities demonstrate learning from several partners, won research experience, and develop first-hand knowledge, higher levels of knowledge, and skills to apply the new technology (Koch & Strotmann, 2008).

Developing an absorptive capacity is fundamental to integrate into a regional innovation system (i.e., a set of public and private agents to embed key external resources) thus promoting collaborative information, knowledge about emerging opportunities, and knowledge-sourcing strategies (Bocquet et al., 2016). Strengthening interactions with external sources facilitates learning in KIBS and positively influence the propensity to explore, sense, and seize external knowledge. Interaction with regional innovation systems agents, like the government or private funding and technology partnership, enables KIBS ability to create and develop routines that combine existing and newly assimilated knowledge, access to complementary assets, and venture capitalists (Lau & Lo, 2015).

External linkages, interaction, and networking are essential in the innovation behavior for KIBS. These sources can be universities, research organizations, suppliers, clients, competitors, and public institutions (Hakanen, 2014; Koch & Strotmann, 2008). Creating and maintaining strong ties contribute to transfer tacit knowledge and to develop innovative product and managerial practices (Amara et al., 2009; Daghfous et al., 2013). Although the role of universities as a valuable source of knowledge must be acknowledged, research and knowledge produced in these institutions are not transformed in services. It is crucial in the context of emerging economies to build KIBS firms' strategies to collaborate with universities and other scientific-related sources (Teixeira & dos Santos, 2016).

Particularly, small firms mostly depend on external resources and small knowledge-dependent firms have limited resources at the outset. The importance of business networks is that they act as a knowledge integrator. Cooperation and co-creation stimulate innovativeness in KIBS. In order to access knowledge and complement their internal competences, networking is a usual routine as it allows firms to access external knowledge that complement internal competences (Paiola et al., 2013). For these firms, embedded network relationships are crucial to renew, develop, and create new products through external knowledge (Macpherson et al., 2004). Resources can supplement internal skills and knowledge. Building relationships with suppliers and customers in KIBS generates structures and integrated routines that benefit all these agents with exploration and exploitation opportunities.

For distinct knowledge, networking-based strategies are suggested by Paiola et al. (2013). A consolidation strategy is oriented to maintain the boundaries, and requires developing, strengthening, and updating the firm to improve services. An expansion strategy refers to the development of a set of technological knowledge in the same applicative area. The exploitation strategy consists in seizing the existing knowledge in a new business context, while exploration transforms existing knowledge into new knowledge to explore new technologies and new market applications.

Managerial capabilities influence and structure the absorptive capacity of management teams (Kor & Mesko, 2013). Adner & Helfat (2003, p. 1012) define dynamic managerial capabilities as "capabilities with which managers build, integrate, and reconfigure organizational resources and competences". These capabilities are underlined in managerial human capital, managerial social capital, and managerial cognition. Human capital refers to learned skills experience and is related to industry and firm-specific skills. Social capital involves social relations. External

relations provide access to external practices, knowledge, and resources, while internal formal and informal relations provide information and resources that influence the decision-making decision process of managers. Managerial cognition refers to beliefs and mental molds that shape strategic decision and outcomes and is shaped by human capital and managerial social capabilities (Adner & Helfat, 2003; Kor & Mesko, 2013).

Emerging countries are characterized by small firms and strategic decision and innovative activities are based on idiosyncratic features. Hence, organizational and technological capabilities lay on the firm's manager. Previous knowledge about services, market and technologies, as well as organizational and managerial competences may indicate the innovative activity of the firm. The manager as a strategic decision-maker in KIBS is decisive in the professional background for the firm innovation. It is necessary that managers be aware to sense and seize external sources of knowledge, thus establishing formal and informal networks (Koch & Strotmann, 2008).

Strategic orientation is crucial in the context of dynamic capabilities, particularly in services. It is related with distinctive competences and organizational behaviors to have a positive impact on the firm performance. Market and entrepreneurial orientation enable KIBS to engage in innovative activities. Market orientation, considered as an aspect of organizational culture, gives special importance to profitable customer value creation, since they better understand customer's needs, trends, and competitors. Entrepreneurial orientation is committed to product market orientation and innovation (Sarkar et al., 2016).

Dynamic capabilities are embedded in firm's processes. Knowledge management processes influence directly organizational innovation in KIBS. As intensive knowledge, it does not only serve as essential input, but it is also the key output delivered by these firms. Knowledge process of acquisition, integration, and application address KIBS to explore and exploit opportunities to create and supply innovative services (Dahiyat, 2015).

Human resources play a key role in KIBS in the processes of organizational learning, adaptation, and performance (Shi et al., 2014; Teixeira & dos Santos, 2016). Human cognition in KIBS is based on scientific or specialized knowledge. The capability to resource exploitation, deployment, acquisition, internalization, and dissemination of knowledge lies on this resource (Wang & Ahmed, 2007; Zollo & Winter, 2002). In this interaction, firms develop tacit and explicit knowledge (Shi et al., 2014). Human resources are characterized by high qualified human resources and play a key strategic asset, since professional knowledge and specific skills are the basis for the creation of innovative services (Aureli et al., 2018; Santos-Vijande et al., 2013). Employees, especially front-line, are fundamental in DC. They interact with the customers and can sense opportunities to improve services as they usually accumulate experience and knowledge about customer needs, supply processes, and operations in KIBS (Santos-Vijande et al., 2013).

Organizational culture plays a predominant factor in dynamic capabilities (Aureli et al., 2018). Firms comprise stable structures and patterns of action that lead to producing predictable collective results, as requirements to guarantee. These patterns

lead to what is called organizational inertia, that is, they adhere to the organization in such a way that they inhibit the opportunities for change and affect the culture of the firms (Sunder et al., 2019). An innovative business culture acts as an enabler or inhibitor in the processes of innovation, while organizational innovativeness culture facilitates interaction supplier-customer in co-creation capabilities (Rodriguez et al., 2016).

Organizational culture represents the set of values and beliefs guiding the behavior of an organization. Firms demonstrate customers and front-line employees their participation in the co-creation of new services for New Service Development (NSD) and achieve higher innovation rates (Santos-Vijande et al., 2013). Embedding the customer in several stages of development processes is essential in KIBS in order to ensure that the services meet requirements and can also achieve related benefits, such as high rate in development of new services, cost-saving, improved quality of services, strengthening of learning processes, and finally creating and sensing opportunities of innovation.

Geographic proximity is a factor that influences cooperation and networking to improve innovation capability. Location attributes influence DC specifically in KIBS, thus supplying knowledge and opening to market opportunities. Location promotes KIBS, since the availability of resource knowledge facilitates generation and diffusion of knowledge and ideas upon KIBS (Andersson & Hellerstedt, 2009). Cluster geographic proximity facilitates interactions, knowledge acquisition, essential to SMEs due to the lack of sufficient resources for this type of networking (Bocquet et al., 2016).

3.3 *Management Model*

Management models have been understood from multiple perspectives that are associated with the administrative process from its different parts: plan, organize, direct, execute, and sometimes it includes feedback or control. Management model is considered as an element within the organization, such as “Knowledge management model”, “Innovation management model”, and “Quality management model”. Management models are also addressed as the construction of protocols and processes or the construction of the philosophical and strategic organization components. Some authors analyze in-depth the concept of management models and sometimes articulate it with similar concepts such as organizational models (Etkin, 2009), good practice models (Lambert, 1994), and models of business (Birkinshaw & Goddard, 2009) that are oriented toward the creation of value and performance (Romdhane & Lakhali, 2015; Zott & Amit, 2010). Quinn et al. (1995, pp. 1-2) relate the concept of management models to “the right way of doing things” and state that “practically everyone has our beliefs or opinions about what the boss has to do. In management studies we call these beliefs sometimes ‘models’”.

Quinn et al. (1995, p. 3) indicate that “the models are representations of a more complex reality. An airplane model, for example, is a physical representation of a

real airplane. The models help us to represent, to communicate ideas on some topic, and to understand better, the most complex phenomena of the real world". Likewise, Baden-Fuller and Morgan (2010) mention models are "copies of things, the models to follow are models to be copied" (p. 159). According to these authors, the notion of management model integrates the two visions on scale and role models. Lambert (1994) states that models "facilitate the transformation of competent theory into effective action, help the manager to take on responsibilities and take advantage of opportunities that optimists now see" (p. 37). In this sense, the usefulness of a model as a representation of the reality and position for the understanding of organizational reality can show the situation of an organization at a given time, in addition to offering a link between theory and practice.

Another perspective analyzes the explicit role of managers in the concept of management model. Birkinshaw and Goddard (2009, p. 78) establish that the management model reflects "the choice made by the top executives of a company, in terms of defining objectives, motivating efforts, coordinating activities, and allocating resources; in other words, how management work is defined (...) a distinctive management model can be a key driver of competitiveness".

According to this, Drucker divided the theory of business into three parts: the assumptions of the organization, its mission, and the capacities it uses to achieve the mission. In this context, the management model explains how these mission processes are achieved, which in turn establishes the relationship of the management model with the conception of organizational strategy, as mentioned by Casadesus-masanell and Ricart (2010).

The relationship between strategy and the management model is evident in some postulates. For example, Duque (2009) addresses this relationship in his proposed concept of management model:

The way to organize and combine resources to meet the objectives; that is, the set of principles, policies, systems, processes, procedures and behavior guidelines to achieve the expected results and improve the performance of the organization. These elements are framed through regulations, mission objectives, basic operational processes, structure and organization, organizational culture, policies and competencies of human talent and formal strategic planning of the organization. (p. 39)

Etkin (2009) addresses the concept of organizational model as the "activities that are integrated into the framework of the organization -considered as a pattern of relationships that guides individual tasks" (p. 40). The organizational model describes how the current things work or how they should. The organizational model is not a fact or a variable but a reflection of a set of "substantive relationships". Etkin remarks "the relationships between teachers and students in an educational institution or the way that commitment and adherence of believers to their church is manifested" (2009, p. 41). The concepts of organizational model and management model are related due to their shared vision of the model as an instrument of analysis of the organization and for management purposes (Etkin, 2009, p. 43).

4 Management Model to KIBS in Developing Countries

There are elements of the management model that can be related to management in KIBS services, thus highlighting the importance of knowledge at all levels; innovation patterns related to knowledge, processes, or in the development of new products (Choi et al., 2021; J-Figueiredo et al., 2017), and interaction with customers that promotes the process of co-creation of knowledge (Andersson & Hellerstedt, 2009).

Additionally, there are components to highlight due to their influence on the organizational management of KIBS that are found in the organizational environment. This refers to aspects such as rural or urban location (Fernandes et al., 2015), location of KIBS in terms of their proximity to other key stakeholders (Romero de Ávila Serrano, 2019; Ženka et al., 2017), the availability of qualified human talent as the main input in KIBS (Andersson & Hellerstedt, 2009), the internal and external collaboration with other agents as strategic alternatives that can generate knowledge management opportunities for an organization (Corrocher et al., 2009; Guimarães, 2014), and agents in regional terms that can promote knowledge management and knowledge business generation alternatives, such as the State or universities (Corsi et al., 2019; Fernandes & Ferreira, 2013). Sarkar et al. (2016) argue that these components that link the organization's environment influence the scope of competitive advantage in organizations more than the internal capacities. In fact, this relationship complements the collective intelligence that, according to Birkinshaw and Goddard (2009), is reflected as a relevant component of management from the management model perspective.

These components related to the environment faced by KIBS reflect the need to analyze the behavior of this sector according to the regions in which it develops. This analysis guides relevant capacities that organizations must develop in developing economic contexts. The following elements in developing economies are emphasized: (i) the large number of micro and SME's that would benefit from the development of KIBS, due to their role in the economy for the promotion of growth in other sectors (Muller & Zenker, 2001), (ii) the lack of qualified human talent, (iii) the lack of scientific-technological infrastructure, (iv) the development of an appropriate productive apparatus, and (v) the deficit of new knowledge created.

According to López and Ramos (2013), computer and information services in Latin America are led by Argentina, Brazil, Uruguay, and Chile. Regarding personal and recreational services, the leading countries are Argentina, Colombia, Ecuador, Mexico, Brazil, and Chile. Finally, regarding other business services: Brazil, Argentina, Costa Rica, Guatemala, Nicaragua, and Bolivia are heading the list. This data reflects a low position and heterogeneity in this type of service without generating a positioning in any classification of KIBS. López and Ramos (2013) state that the problems of the productive structure (pattern of specialization) and technological development are issues to explore in this area (p. 105). However, this is not only a challenge in terms of positioning, but also a problem that involves multiple stakeholders. According to López and Ramos (2013) in the political context, macroeconomic environment and institutions do not generate a stable and predictable business

environment, and if the necessary human capital basis and infrastructure do not exist, the attempts to attract investment and address a development agenda in the services sector may well be wrecked.

In contrast, emerging economies such as China, India, and Russia have had an increasing role in knowledge. Shi et al. (2014) state that the government should increase support for KIBS development and learn from the successful experiences of developed countries (e.g., the United States and the United Kingdom). López & Ramos (2013) declare that without a strong quantitative and qualitative improvement of the human capital available in the region, it will be difficult for knowledge-intensive services to deploy their potential as new engines of growth in the region.

5 Conclusions

Emerging economies cope with institutional and organizational major challenges associated with a lack of institutional capabilities to promote and facilitate mechanisms to strengthen the KIBS sector. Developing firms' strategies in countries as Colombia, Argentina, Mexico, and Chile should focus on human resources training responding to the lack of highly qualified human capital (Kaiser & Siegenthaler, 2015). Management model in KIBS, in this context, is the driver to generate and reinforce sources of knowledge. It identifies specific roles and processes that facilitate interaction and engagement with external partners, including government. The capability to create and maintain networking with clients, suppliers, universities, and to be embedded in regional innovation systems is essential to improve innovativeness and performance (Andersson & Hellerstedt, 2009). KIBS in emerging countries are generally small firms and are not able to invest in R&D activities; therefore, they focus on application instead of being generators of knowledge (Pinto et al., 2015). Universities and research centers are crucial in this interaction as knowledge producer (Garcia-Alvarez-Coque et al., 2020).

As it has been underlined, KIBS are immersed in volatile environments due to knowledge, which is the core, input, and product. They need an adaptive and flexible structure to foster innovation processes. Absorptive capacity is a key ability to develop innovation capability in KIBS. It is crucial for KIBS to develop a major knowledge absorption capacity to recognize new external knowledge, assimilate it, and apply it to develop new and improved services, customer relations, and business models (Choi et al., 2021; Doroshenko, 2014; Teixeira & dos Santos, 2016). This capability is related with knowledge management processes integrated with a dynamic organizational culture (Baia et al. (2019).

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Part V
Eurasian Economic Perspectives: Banking
and Finance

Empirical Modeling of International Banks' Credit Risk: Assessment and Comparison of Credit Ratings



Alexander M. Karminsky, Ella P. Khromova, and Roman A. Kudrov

Abstract The work is devoted to credit risk modeling of international banks by constructing ordered logistic models of credit ratings assigned by the agencies: Moody's, Standard & Poor's, and Fitch ratings. It was demonstrated that mapping the credit ratings into a base scale helps to decrease the possible subjectivity of CRAs and increases models' forecasting power. Using a random sample of 478 banks from more than 40 countries for the period of 2007–2019, a credit rating model was obtained that could be effectively used to assess credit risk using public information, which was demonstrated with a help of out-of-sample forecasts of the obtained regression. The quality of the model prediction was significantly improved by including interaction terms and applying the Principal Component Analysis. We observed that the transparent politics of the government can lead to increased credit ratings of international banks. This helps them in credit risk management and in the client's base extension. Additionally, using marginal effects calculation, the empirical evidence of the importance of maintaining a high level of liquidity by banks in times of crisis was found. At the same time, the highest marginal effects of the whole sample time horizon were reached in factors of asset quality and bank's size among all financial indicators included in the model.

Keywords Banks · Credit risk · Credit ratings · Rating agencies · Liquidity

1 Introduction

Sustainability of a country's financial system primarily depends on the performance of financial institutions. The key financial institutions are banks and credit organizations. The assessment of banks' credit risk is an important issue for the government, regulators, and investors. All the economic agents are interested in the

A. M. Karminsky (✉) · E. P. Khromova · R. A. Kudrov
School of Finance, National Research University Higher School of Economics, Moscow, Russia

well-functioning of banks, which serve as the main financial intermediaries on the market. Credit ratings are the opinions of CRAs on the financial performance and stability of a bank. They are of very important practical significance both for investors and banks themselves.

The activities of CRAs are finite, hence not all the banks are assigned a credit rating. Credit rating modeling is widely used in the academic literature, but there are several limitations in the practical implementation of these models. Firstly, the credit rating models are usually constructed for a sample of banks from one country. This does not allow to use such models for the banks from other regions and challenge the interpretation of significant factors of banks' financial sustainability. Secondly, there are many CRAs operating around the world, their assessment of credit risk may not match each other. Due to difference in methodologies and possible subjectivity, we may not rely on the forecasted credit rating of a single CRA. This prevents the practical use of models obtained in the previous papers. Thirdly, a forecasted symbolic rating may be misunderstood and wrongly interpreted by an investor or bank's internal management. This can lead to incorrect investment decisions and possible losses. To solve these problems, in this paper, we construct a credit rating model for assessing bank's credit risk, namely an ordered logit model with a panel data structure. This type of model is chosen because it allows to evaluate the impact of each indicator included in the model and to interpret its influence on the credit risk.

Despite being studied a lot, the problems of financial stability analysis in the banking sector do not lose their relevance. The topic of this paper may be of particular importance in the current situation, which is critically close to the global economic crisis. Nowadays, only a small number of banks has a credit rating, hence the research is useful for the government, banks, and investors. The aim of this paper is to develop the technique for credit risk assessment using a uniform credit rating model. The uniform model simultaneously includes the credit ratings of several CRAs and allows to forecast a rating score on the base scale. Several econometric techniques are used to increase the accuracy power of the obtained models. The forecasted score can be used to evaluate the credit risk of a bank using a dynamic transmission scale which relates a rating score to average default frequencies of Russian banks.

The paper is structured as follows. Firstly, we introduce the literature review on credit risk modeling. An extensive number of international and Russian articles is analyzed by us in order to cover all the aspects of banks' credit risk assessment. Afterward, the main hypotheses are formulated, and the detailed data description and the methodological issues are discussed. The main econometric results are provided in the main part, where the results of regression estimation of credit risk and interpretation of factors of influence are represented. The paper ends up with conclusion.

2 Literature Review and Hypotheses Development

2.1 *Various Approaches to Credit Rating Analysis and Modeling*

The econometric techniques used for credit risk assessment belong to one of the following groups: company's bankruptcy prediction and credit rating analysis. The first paper which addressed the probability of company's default estimation was Altman (1968), where the linear discriminant analysis was applied. Later, Altman et al (1977) developed the ZETA model which had a stronger accuracy power than the previous bankruptcy model. Although these models have been introduced more than 50 years ago, they still have a practical implementation, which is demonstrated in recent researches (Ko et al., 2017). Altman and Rijken (2004) demonstrated that the models of bankruptcy prediction worked accurately in the short run period (1 year), but for long run (around 6 years) credit risk estimation credit rating models were preferred. Later, the models of credit ratings were applied in the works (Hwang et al., 2010; Bellotti et al., 2011; Le & Viviani, 2018).

Several econometric models can be used to forecast the credit ratings of a company. In the paper by Bellotti et al. (2011), the comparison between ordered choice models and support vector machines (SVM) in credit rating forecasting was provided. SVMs produced more accurate in-sample predictions than ordered choice models. It was also demonstrated that a credit rating served as an indicator of banks' financial sustainability and could be used as a measure of credit risk. Hwang et al. (2010) complemented the standard ordered probit model with a semiparametric function. More than 20 potential explanatory indicators were chosen according to the previous articles. The outcomes depicted the effectiveness and usefulness of such an approach in credit ratings modeling. Karminsky et al. (2019) examined the behavior of different credit rating models for industrial companies from BRICS countries. The statistical models included linear discriminant analysis (LDA) and ordered logit regression (OLR). They were compared to SVM, ANN, and random forest. Machine learning techniques were preferred by the authors due to higher predictive power in both in-sample and out-of-sample forecasts.

2.2 *Potential Indicators of Banks' Credit Risk*

There is a set of factors that can be used in the models of credit risk. The researchers try to explain the variations of some particular factor with a help of different indicators. The table of potential indicators is presented in the paper.

Financial indicators are crucial in the determination of the financial performance of financial organizations. The majority of the factors from the Financial profile constitute the components of the CAMEL(S) methodology. However, the factors from the CAMEL(S) system do not cover all the aspects of companies' financial

sustainability. Le and Viviani (2018) considered 6 indicators of efficiency and concluded that this group of variables was one of the most important in predicting the banks failure. The indicators for banks' efficiency can be also met in the articles (Altman, 1968; Peresetsky, 2009; Le & Viviani, 2018; Ashbaugh-Skaife et al., 2006; Jiao et al., 2007; Karminsky & Khromova, 2018). Age and size of banks also influence on the credit risk (Alrabadi & Hamarneh, 2016; Altman & Rijken, 2004; Sahut & Mili, 2011; Gogas et al., 2014).

Credit risk is related not only to the financial performance of banks, but also to market conditions. The positive effect of macroeconomic variables on the models' predictive power was also demonstrated in papers (Peresetsky, 2009; Sahut & Mili, 2011; Betz et al., 2014; Karminsky & Khromova, 2016a, b). The effects of business environment and market conditions were presented by Schaeck and Čihák (2007) and Betz et al. (2014). Among the qualitative judgments, the most important one is corporate governance. Good corporate governance may be a signal for a rating agency to assign a higher credit rating. The majority of indicators measuring corporate governance were tested by Ashbaugh-Skaife et al. (2006).

2.3 The Main Hypotheses of the Paper

The comprehensive analysis of academic literature helps us to identify the potential spheres in credit risk estimation. We formulate the following list of hypotheses to be tested in our paper.

Hypothesis 1: Subjectivity of CRAs' assessment of international banks' financial sustainability can be reduced by using multiple ratings simultaneously in the base scale.

Hypothesis 2: Transparency of the public authority and government effectiveness benefit banks in credit risk management and help them to obtain higher credit ratings.

Hypothesis 3: The share of a factor of liquidity in the credit rating assessment increases during periods of financial crises and distress.

3 Data Description and Model Specification

3.1 Credit Ratings Issued by International Rating Agencies

The random sample of 1500 banks was generated from the list available at the S&P CAPITAL IQ platform. Afterward, we verified the availability of the credit ratings of either of the three credit rating agencies (CRA) assigned to the banks. For all randomly chosen 1500 banks the fact of rating assignment during the analyzed time period was checked. In total, we were able to obtain the sample consisting of 478 banks. If a rating agency had assigned a credit rating to a bank at the end of a

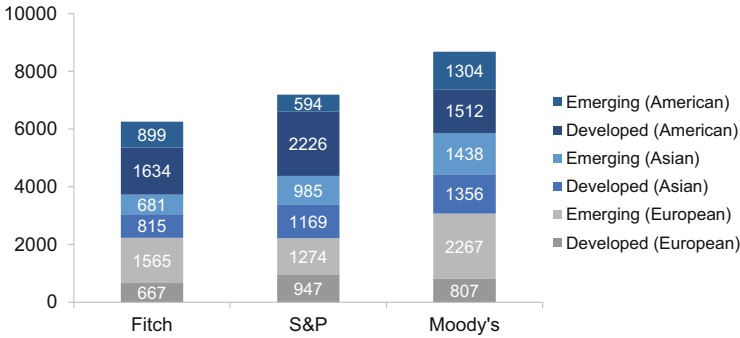


Fig. 1 Distribution of credit ratings across geographic regions, the sample. Source: Authors own study

time quarter, we assumed that this rating remained relevant until the quarter at which the agency had upgraded it.

We have collected the credit ratings assigned by the Big-3 international rating agencies: Standard & Poor's (S&P), Moody's, and Fitch ratings. The credit ratings were collected from the website Cbonds.ru which provided financial information about the international companies. In the models, we include the following credit ratings: Standard & Poor's Issuer credit ratings (foreign currency LT), Moody's LT Bank Deposits (Foreign), Moody's LT Issuer Rating (Foreign), and Fitch Long-Term Issuer Default Rating. We analyze a time period from the first quarter of 2007 to the first quarter of 2019 year. This time interval includes the worldwide financial crisis (2008/2009 years) which allows our econometric calculations to be persistent to shocks. In total, there are 49 quarters. All the data are considered at the end of the corresponding quarter.

The sample consists of 46 countries: 14 developed and 32 developing ones. The selection includes 6261 credit ratings assigned by Fitch, 7195 ratings given by S&P, and 8684 credit ratings assigned to the entities by Moody's. The sample represents different geographic regions, just as the initial data extracted from the portal, which makes it representative. The representation of the ratings included in the model is presented in Fig. 1.

Figure 1 demonstrates that the ratings in the sample are randomly distributed among the regions, so there is no bias toward either of the geographic groups used in the analysis, which helps us to capture different country-specific characteristics of financial institutions.

3.2 Selected Indicators of the Banks' Sustainability

On the basis of our review of previous researches, we are able to gather financial ratios which can help in measuring the financial stability of a banking organization.

We use the portal S&P CAPITAL IQ as a source of companies' financial information. All the indicators are collected for a time period from 1Q 2007 to 1Q 2019. In the cases when the value of some indicator is absent, it is averaged by the nearest time periods. We have managed to collect 29 financial indicators of influence on banks' sustainability (see Table A1 in Appendix).

We collect the macroeconomic ratios that are usually used in the academic literature. The source of information is OECD.org and The World Bank. All the variables are collected from the first quarter 2007 to the first quarter 2019. We represent the full list of macroeconomic variables in Table A2 (see the Appendix).

Macroeconomic indicators cannot fully explain the business risk associated with a particular country. That is why we collect the indicators responsible for the state governance quality. This is the first time when such a set of variables is used in credit rating modeling. We have gathered these variables from The World Bank. These indexes are the components of the database "Worldwide Governance Indicators". We represent the full list of state governance variables in Table A3 (see the Appendix).

3.3 Description of Ordered Logit Model of Credit Ratings

In this paper the models are built to predict a categorical variable y_{it} (a credit rating), hence standard logit and probit models cannot be used. Ordered logit/probit models will be applied. Standard binary logit models were extended to categorical outcomes estimation in Snell (1964). For the first time, a probit model for categorical variables was described in the article (Aitchison & Silvey, 1957).

Categorical outcome y_{it} is ordered, i.e., $y_{it} \in \{1, 2, \dots, h\}$, where h denotes the total number of categories. Numerical order 1 is the lowest credit rating assigned, order h is the highest rating. For each agent i , the relationship between the rating class y_{it} and set of covariates x_{it} is defined using unobserved continuous latent variable y_{it}^* :

$$y_{it}^* = x_{it}'\beta + \varepsilon_{it}, \quad (1)$$

where $\varepsilon_{it} \sim iid(\mu, \sigma^2)$ is the error component which has a logistic distribution with mean $\mu = 0$ and standard deviation $\sigma = \frac{\pi}{\sqrt{3}}$, i is the number of observations, t is the number of periods, x_{it}' is a set of covariates which helps to explain the dependent variable, and β is the vector of coefficients estimated by the model.

In general, for h ordered alternatives, the probabilities that bank i is assigned a credit rating $y_{it} \in \{1, 2, \dots, h\}$ are:

$$\left\{ \begin{array}{l} Pr(y_{it} = 1) = F(m_1 - x_{it}'\beta); \\ Pr(y_{it} = 2) = F(m_2 - x_{it}'\beta) - F(m_1 - x_{it}'\beta); \\ \dots \\ Pr(y_{it} = h - 1) = F(m_{h-1} - x_{it}'\beta) - F(m_{h-2} - x_{it}'\beta); \\ Pr(y_{it} = h) = 1 - F(m_{h-1} - x_{it}'\beta), \end{array} \right. \tag{2}$$

where F is the cumulative distribution (cdf) function of logistic distribution.

It is reasonable to assign the bank to a credit rating for which the estimated probability is the highest one. The parameters are found using the maximum likelihood estimation and the interpretation of coefficients is possible using their marginal effects.

4 Results of Empirical Analysis

4.1 Construction of the Base Scale of Credit Rating Scores

Methodological differences in the approaches of credit agencies (different scales, etc.) make it difficult for us to use these credit ratings in the model. In order to solve all the misperceptions, we try to consolidate the credit agencies' assessments into one scale. In order to build a single rating scale, we form a system of displaying different ratings of all considered agencies into the base scale. The detailed comparison of various credit ratings is presented in the article (Ayvazyan et al., 2011).

In our work, we will use the linear logarithmic model which was successfully applied in the paper (Karminsky & Sosurko, 2010) in order to obtain the pairs of coefficients for displaying each of analyzed scale into the base one:

$$\ln(M) = a_i \ln(R_i) + b_i, \tag{3}$$

where M —Moody's rating in numerical scale; R_i —rating of an agency i in the numerical scale; a_i and b_i are the found coefficients of the model. We use the Moody's international scale as a base one as it has the greatest number of ratings-pairs with other scales. The obtained coefficients a_i and b_i for each of the rating agencies are presented in the Appendix (see Table A4). All the coefficients are significant at the 1% significance level. Based on the resulting coefficients, we can assess the correspondence of ratings of considered agencies with international Moody's scale. The graphical representation of the comparison of rating scales is provided in Figure 2.

Figure 2 demonstrates the values that a particular symbolic rating takes in the sample. The numeric scale varies from 1 (the lowest ratings: D, C) to 21.5 (the highest rating, AAA, assigned by S&P). Rating agencies do not often change their ratings when the financial performance of bank is stable, hence we assume that the

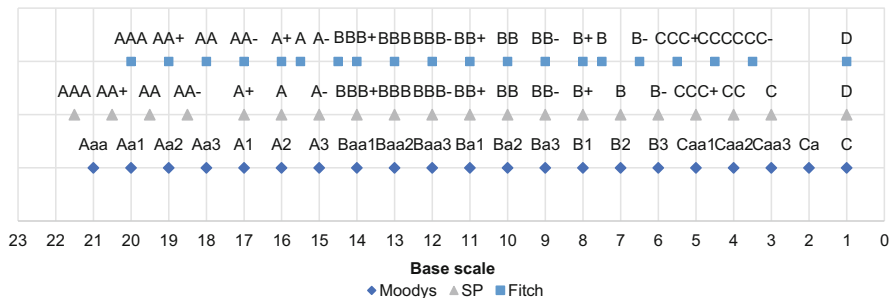


Fig. 2 Correspondence of rating scales. Source: Authors own study

ratings are unchanged until the moment when the new rating is assigned. The figure also depicts the differences in the scales of CRAs. The obtained rating scale is presented in the Appendix (see Table A5).

4.2 Credit Rating Models for Different Agencies

It takes some time for the credit rating agency to prepare and change the credit rating of a bank, hence it is important for us to include the explanatory variables into the model with a lag. The authors (Karminsky & Sosurko, 2010) analyzed the lag which should be used for credit rating modeling. They took different values of a time lag (from 3 to 30 months) and found out that the results were quite similar; the minor differences in the results from the lag selection were confirmed. In our work, we decided to use the time lag of 2 quarters. In order to control for heteroscedasticity, White-Huber standard errors were used.

While constructing the model we control for correlation level between the explanatory variables included (correlation should be strictly less than 40%). We try to include the indicators for all the factors from the CAMEL(S) model, as they are believed to explain the bank’s overall internal financial condition. The choice of a particular indicator was made taking into account its expected economic interpretation, significance (*p*-value), and its influence on the forecasting power of the model (Akaike information criterion and Schwarz information criterion). We have built both random effects ordered logit and probit models, but the ordered logit model has more significant variables and better forecasting power, that is why we show the results of ordered logit model estimation. The models are built for unbalanced panel data, as banks might not have credit ratings during any time period. In order not to cause a possible bias, we have decided not to cut the data.

From Table 1, it can be seen that adding country-specific variables increases the forecasting power of the model. Hence, the interpretation is given for the second specification of the models.

Table 1 Ordered logistic models for different credit rating agencies

Indicators	Moody's		S&P		Fitch	
	m(1)	m(2)	Sp(1)	Sp(2)	f(1)	f(2)
CAP	0.031*** (0.006)	0.049*** (0.006)	0.051*** (0.011)	0.065*** (0.013)	0.029** (0.011)	0.046*** (0.01)
NONL/L	-0.077*** (0.005)	-0.053*** (0.005)	-0.049*** (0.007)	-0.029*** (0.008)	-0.010 (0.007)	-0.049*** (0.007)
IE/DE	-8.236*** (1.715)	-4.223** (1.756)	-1.873* (0.989)	-2.194** (1.012)	-23.353*** (4.242)	-9.986** (4.267)
ROA	3.413*** (1.217)	2.974** (1.296)	3.542** (1.570)	3.930** (1.754)	0.717 (1.268)	0.076 (1.205)
LA/NLA	0.021*** (0.003)	0.018*** (0.003)	0.019*** (0.005)	0.019*** (0.005)	0.003 (0.002)	0.005** (0.002)
EFF	-0.041*** (0.007)	-0.039*** (0.007)	-0.013** (0.006)	-0.016*** (0.006)	-0.009 (0.009)	-0.025** (0.010)
LOGA	0.736*** (0.067)	1.094*** (0.075)	0.822*** (0.144)	1.163*** (0.149)	0.816*** (0.104)	1.465*** (0.118)
(lev)*(EU)	0.324** (0.116)	0.291** (0.111)	0.754*** (0.244)	0.822** (0.249)	0.653*** (0.174)	0.589** (0.174)
Lev*(cis)	0.249*** (0.056)	0.254*** (0.057)	0.078 (0.056)	0.023** (0.007)	0.114* (0.066)	0.051*** (0.077)
(cur)*(Y2008)	0.013*** (0.003)	0.013*** (0.003)	0.011* (0.006)	0.011* (0.006)	0.728*** (0.103)	0.727*** (0.102)
(cur)*(Y2009)	0.027* (0.014)	0.036*** (0.014)	0.069*** (0.019)	0.084*** (0.019)	0.249** (0.08)	0.251** (0.08)
(cur)*(Y2010)	0.013* (0.007)	0.013** (0.007)	0.026* (0.01)	0.028** (0.01)	0.229** (0.07)	0.226** (0.07)

(continued)

Table 1 (continued)

	Moody's		S&P		Fitch	
GROSS	0.024*	(0.014)	0.092***	(0.028)		-0.021 (0.023)
CABAL	-0.055***	(0.013)	-0.094***	(0.024)		-1.369* (0.792)
POLIT	0.251**	(0.107)	0.775***	(0.186)		0.673*** (0.160)
Sample size	8684	8671	7186	7181	6261	6256
AIC	24732.98	24425.01	11121.29	10960.23	13214.53	13072.24
BIC	24937.99	24686.51	11313.93	11207.88	13403.31	13314.93

Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source: Authors own study

Total capital ratio (CAP) has a positive effect on bank's credit ratings of each CRA and is highly significant. If a bank has enough capital compared to the risk it is taking, then it is believed to be financially strong and its credit rating is higher. NONL/L indicator is significant at 1% level for each agency in the second specification of the model. If the share of bad loans among total loans is high, the bank's asset quality is poor, and it is possibly close to default. ROA is an indicator for bank's profitability, and it is significant for Moody's and S&P. Fitch may take into account different variables as a measure of earnings, but we could not find ones in our selection. Banks with stable profitability have higher Operating Assets and this has a positive influence on their credit ratings. Our results are consistent with those obtained by Thomson (1991). As a proxy for liquidity we use LA/NLA, which is significant for three rating agencies. If the ratio LA/NLA is high, then the amount of liquid assets is greater than non-liquid ones. This indicates the ability of banks to convert cash quickly to meet its obligations. Banks with a greater amount of liquid assets tend to have higher ratings of three rating agencies. Efficiency is measured in our model by the bank efficiency ratio (EFF), which is significant in credit rating models and has a negative effect. Banks with higher EFF are less efficient as the amount of operations overhead does not generate enough revenue; such banks get lower credit ratings.

GROSS is significant for Moody's and S&P with positive affect on banks' ratings. Amount of deposits put in the banks directly depends on national gross savings. People with higher savings will deposit their money in the banks. CABAL depicts the Current account balance and is significant for all CRAs. Financial account deficit causes capital outflow from the country. This is harmful for banks inside the country as people withdraw their money from them, that is why CABAL index is reported with negative sign in all the models.

Due to high correlation between indicators of state governance level, we are able to include only one index—POLIT, which is highly significant for all the CRAs we build the models for. This serves as a proof of the Hypothesis 2. Political stability may influence the banks' financial strength both directly and indirectly. Good political situation affords people to earn and save money, putting them on bank accounts.

We include the cross-terms (LEV)*(EU) and (LEV)*(CIS) to see the difference in the effect of leverage on credit risk of banks from emerging (CIS) and developed (EU) countries. CIS and EU are the dummy variables which equal to 1 if the bank operates in one of the countries from CIS or EU organizations respectively. We can see that LEV ratio positively affects the credit rating of each agency. High LEV ratio implies a sufficient amount of Tier 1 capital, a bank's core capital that is considered to be very stable and liquid. LEV is positive for banks from CIS and EU countries and significant in all the final models.

In order to see the influence of liquidity (CUR index) we include the cross-terms: (CUR)*(Y2008), (CUR)*(Y2009), and (CUR)*(Y2010). Variables Y2008, Y2009, and Y2010 equal 1 if the rating was assigned in 2008, 2009, and 2010 years respectively and 0 otherwise. These interaction terms are significant in m(2), sp. (2), and f(2) models and stand with positive sign. This means that CUR ratio

positively influences on banks' financial sustainability in the periods before, during, and after financial crisis happened in 2009 (as lagged variables are included).

Overall, we are able to demonstrate that it is possible to predict the rating scores issued by different CRAs using the same set of explanatory variables. However, we fail to reject the first hypothesis stated in Chap. 2. CRAs may have different methodologies and various external factors (subjectivity, competitiveness, regulations, etc.) may lead to biased credit scores. Hence, we cannot accurately interpret the influence of these explanatory variables on the credit risk, which proves Hypothesis 1. With a help of such models, we can determine the influence of indexes on the credit rating of any CRA, but not on the overall bank's credit risk.

4.3 Uniform Credit Rating Model

Rating agencies use different methodologies to assign the credit rating. While mapping the credit ratings we showed that one bank may get different ratings from agencies. This tells us that the factors and indicators taken into account by CRAs may vary. This brings us to the idea of joint modeling of different credit ratings. We take the minimum value of single-scale numeric credit rating (numbers were assigned according to the mapping provided above). In total, we have 30 different credit values from the lowest rating (1) to the highest one (21.5). We decided to take the minimum value as this would help us to estimate credit risk correctly. Taking the average value would result in numerous non-integer numerical ratings. By taking the minimum rating issued by any of the three rating agencies, we try to minimize the subjectivity and the dependent variable in the model becomes more impartial and fairer. We attempt at smoothing out the external factors affecting the assessment of credit risk provided by CRA. We build two types of models: class model and grade model. Class model predicts the class of credit rating, while grade model predicts the numeric rating grade respectively.

In Table 2, we present models class(2) and grade(2) as the final model specifications which are built by us for credit risk valuation. We include in the models the indicators which showed their significance and intuitive economic interpretation in the previous chapter when the models for different CRAs were built. Interpretation of this set of variables remains unchanged. We notice that the chosen financial indicators remain significant in both models, hence, their influence on banks' credit risk is validated. Low OE/REV indicates a good level of management and positively influences on assigned credit rating. The banks with stable net income growth are assigned higher ratings, according to the grade(2) model, where indicator NI is significant at 5% significance level. NI may serve as an indicator of bank's overall sustainability. If bank's profit quarterly increases (NI is positive), the bank is considered to be in a good position and its rating will be higher.

In the second model specification, we included the squared natural logarithm of bank's total assets LOGA2 to capture the diminishing effect of LOGA on bank's

Table 2 Uniform ordered logit credit rating model

Indicators	<i>Class model</i>		<i>Grade model</i>	
	Class(1)	Class(2)	Grade(1)	Grade(2)
CAP	0.016*** (0.002)	0.016*** (0.002)	0.016*** (0.001)	0.016*** (0.001)
NONL/L	-0.077*** (0.006)	-0.069*** (0.007)	-0.083*** (0.005)	-0.069*** (0.005)
OE/REV	-0.004*** (0.001)	-0.003*** (0.001)	-0.003*** (0.0004)	-0.003*** (0.0004)
ROE	0.056 (0.060)	0.110* (0.062)	0.125*** (0.046)	0.119** (0.048)
LA/NLA	0.000*** (0.000)	0.000*** (0.000)	0.003** (0.001)	0.003** (0.001)
EFF	-0.032*** (0.006)	-0.031*** (0.006)	-0.017*** (0.004)	-0.017*** (0.004)
NI	0.007 (0.005)	0.006 (0.005)	0.007** (0.003)	0.008** (0.003)
LOGA	0.535*** (0.087)		0.247*** (0.057)	
LOGA ²		0.032*** (0.004)		0.081*** (0.011)
(cur)*(Y2008)		0.018*** (0.004)		0.023** (0.011)
(cur)*(Y2009)		0.078*** (0.021)		0.016*** (0.004)
(cur)*(Y2010)		0.033*** (0.011)		0.019*** (0.007)
(lev)*(cis)		0.026*** (0.008)		0.026*** (0.008)
(lev)*(EU)		0.235*** (0.047)		0.0145* (0.0077)
(PROV/G)*(IE/DE)				0.00002* (0.00001)
(ALL/NONL)*(OE/OI)				-0.016*** (0.003)
(ROA)*(age)				0.199* (0.673)
MAC1		0.874*** (0.074)		0.886*** (0.052)
MAC2		-0.316*** (0.059)		-0.953*** (0.121)
GOV1		2.863*** (0.128)		1.603*** (0.092)
Sample size	12,350	12,091	12,350	12,174

(continued)

Table 2 (continued)

	<i>Class model</i>		<i>Grade model</i>	
<i>AIC</i>	12369.24	11567.20	39330.51	38009.13
<i>BIC</i>	12480.46	11737.41	39619.95	38394.29

Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Authors own study

financial performance. The result is intuitive as small banks during their operational development grow in size and this has a strong effect on their sustainability.

The grade model has more credit rating grades to be forecasted (the scale is broader), hence, for accurate training of the model, we include several financial cross-terms. The banks with good management quality may afford a low rate on deposits (low IE). This will attract only conscientious clients (due to honest business conduct) and banks' asset quality increases, hence $(PROV/G)*(IE/DE)$ has a positive influence on the credit rating of a bank. Another cross-product $(ALL/NONL)*(OE/OI)$ shows the interdependence between management quality and efficiency. Banks with high levels of allowance for credit losses (with better management quality) typically have better efficiency as reserves may help banks in difficult situations. Better efficiency suggests lower operating expenses (OE/OI ratio is smaller) and this causes an increase in credit rating. Interaction variable $(ROA)*(AGE)$ captures the dependence of credit rating from bank's age along with its profitability. Older banks are more experienced, and their earnings are higher because of high customer base, which positively impacts on their credit ratings.

In the class(2) and grade(2) models, we also include some cross-terms with dummy variables. We can see that the current ratio (CUR) has a positive influence on credit rating as it captures the bank's ability to pay its obligations. CUR positively affects the credit rating in 2008, 2009, and 2010 years. Both interaction variables $(LEV)*(CIS)$ and $(LEV)*(EU)$ are significant and stand with positive signs.

The PCs for macroeconomic situation (MAC1 and MAC2) and for the state governance level (GOV1) are significant at 1% significant level, which depicts the correct choice of the PCs. High level of significance of GOV1 supports the second hypothesis. The government of a country should not only monitor the conditions of the financial system, but also carry out transparent and legitimate politics. Favorable conditions inside a country benefit banks in several ways. Firstly, the credit standing of country's citizens is better, they save more and put money on bank deposits. Secondly, the possibility of external shocks (political, social, etc.) is limited, and banks will not go bankrupt because of unexpected possible bank run. Thirdly, the CRAs favor the banks from transparent and progressing countries. Higher credit ratings allow banks to attract more clients and investors.

4.4 Marginal Effects Calculation

The estimation results of ordered logit model help us to understand the sign of influence of a particular covariate on credit risk. The coefficients themselves do not show the power of the influence. To evaluate it, we need to calculate the marginal effects. The interpretation of marginal effects for the class(2) model is provided below.

The marginal effect of an increase in some continuous covariate x_c on the probability of selecting some arbitrary rating j is given by:

$$MPE_{jc}(x) = \frac{\partial Pr(y_{it} = j)}{\partial x_c} = [f(m_{j-1} - x_{it}'\beta) - f(m_j - x_{it}'\beta)]\beta_c, \quad (4)$$

where function f denotes the probability distribution function (pdf).

Figure 3 illustrates only significant marginal effects (at any reasonable significance level). All the variables have insignificant marginal effects of influence on probability to get class 4 (Pr(4)); that is why we do not show these effects on the figure and do not analyze them. Also, marginal effects for Pr(1), Pr(2), and Pr(6) are insignificant for ROE, we do not analyze them as well. This observation implies the importance of marginal effects calculation. Indicator ROE is significant in model class(2) at 10% significance level, but the significance of this variable is doubtful for several rating classes included in the model.

Figure 3 illustrates that the largest marginal effects are caused by indicator NONL/L (proxy for asset quality), hence in our sample the credit risk is mostly associated with poor asset quality of a bank. The great share of bad loans may not harm banks much during the ordinary times, but in crises this may lead to failure of banks. Larger banks tend to obtain higher credit ratings as they are more sustainable to credit risk. Other important indicators are: CAP, EFF, and ROE (only for two

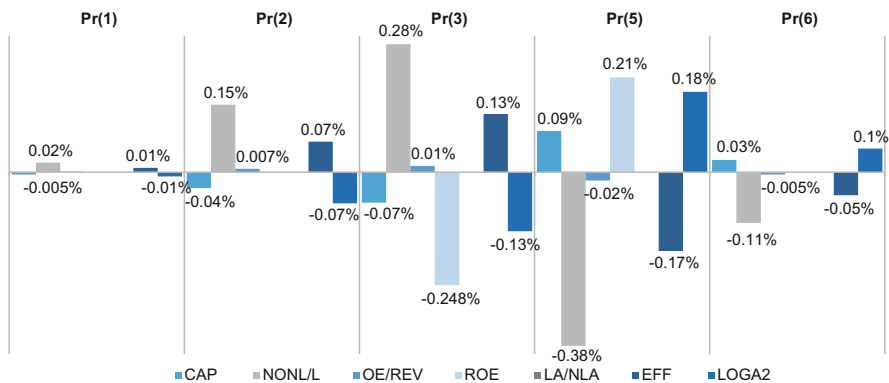


Fig. 3 Marginal effects of financial indicators, class(2) model. Source: Authors own study

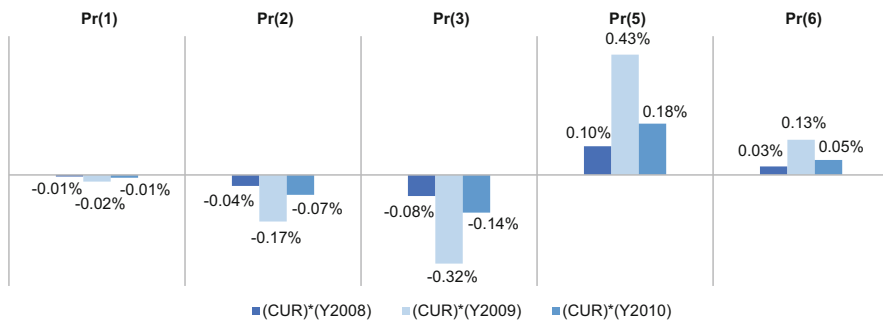


Fig. 4 Marginal effect of CUR in 2008, 2009, and 2010 years. Source: Authors own study

classes). Proxies for management quality (OE/REV) and liquidity (LA/NLA) have significant but very weak marginal effects.

Figure 4 shows that CUR as a proxy of liquidity has the largest marginal effects in 2009 year. We fail to reject the third hypothesis. During the financial crisis in 2009 it was important for banks to keep high liquidity in order to survive and decrease the credit risk. Before crisis and after crisis CUR is not so influential on credit ratings and credit risk. In 2010 the marginal effects of CUR decreases comparing to 2009 year, but do not return to pre-crisis values. During financial crises, banks may face liquidity management problems even if they have a adequate level of capital and earnings (Yeddou & Pourroy, 2020). Hence, for banks, it is crucial to have enough liquid assets in order to withstand the risks. We have managed to show that liquidity proxy is significant in different model specifications, but only with a help of marginal effects calculations, we are able to depict the power of influence.

4.5 Assessment of the Models' Forecasting Power

4.5.1 In-Sample Classification Accuracy

The adequacy of the econometric models is determined by the goodness-of-fit. We will calculate the deviations from the actual rating as a difference of actual rating (R_{actual}) and a forecasted one (R_{model}):

$$\Delta = R_{actual} - R_{model} \tag{5}$$

Table 3 and Fig. 5 demonstrate that there is a negative asymmetry with longer left tail. The distribution is left skewed. The ratings of obtained models are less conservative than the actual ones. Skewness of the models may be explained by the influence of banks from developed countries in the randomized sample. The similar results were obtained in the papers (Karminsky & Sosurko, 2010; Karminsky & Khromova, 2016a, b).

Table 3 Forecast errors of the models for three CRAs

	<i>Model m(2)</i>	<i>Model sp(2)</i>	<i>Model f(2)</i>
$\Delta = 0$	0.13	0.14	0.20
$ \Delta \leq 1$	0.42	0.45	0.56
$ \Delta \leq 2$	0.66	0.71	0.74

Source: Authors own study

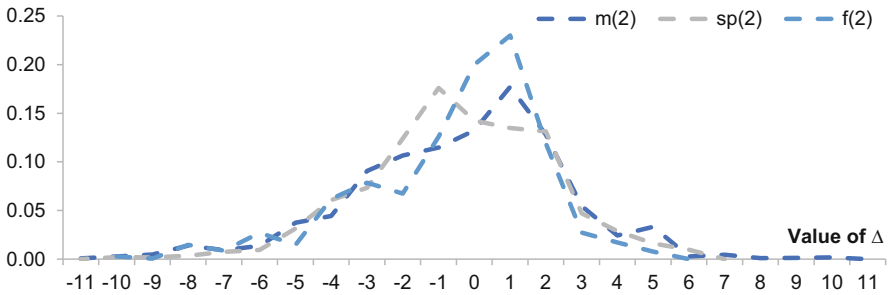


Fig. 5 Distribution of forecast errors of models for three CRAs. Source: Authors own study

Table 4 Forecast errors of uniform credit rating models

	<i>Model class(1)</i>	<i>Model class(2)</i>	<i>Model grade(1)</i>	<i>Model grade(2)</i>
$\Delta = 0$	0.28	0.38	0.17	0.23
$ \Delta \leq 1$	0.70	0.88	0.42	0.56
$ \Delta \leq 2$	0.93	0.99	0.58	0.78

Source: Authors own study

From Table 4 and Fig. 6 it becomes clear that model grade(1) predicts correctly only in 17% cases, while the share of correct forecasts of model grade(2) is 23%.

According to Fig. 7, the error distribution of grade(1) is disproportional, we can see a significant number of errors in the left tail, so the skewness remains similar to the models of different CRAs. With the help of various explanatory variables included in the model grade(2), we are able to smooth the distribution of forecast errors. The final grade model has the highest forecasting power. Our analysis provides us with the model with almost 80% of rating grade predictions with an error less than two rating grades.

4.5.2 Out-of-Sample Classification Accuracy

For the out-of-sample forecast for different time periods, we divide the database on two parts. Part A contains the data from the first quarter of 2007 to the fourth quarter of 2016 (40 time segments). Part B contains the data from the first quarter of 2017 to the first quarter of 2019 (9 time segments). We estimate the model for part A and

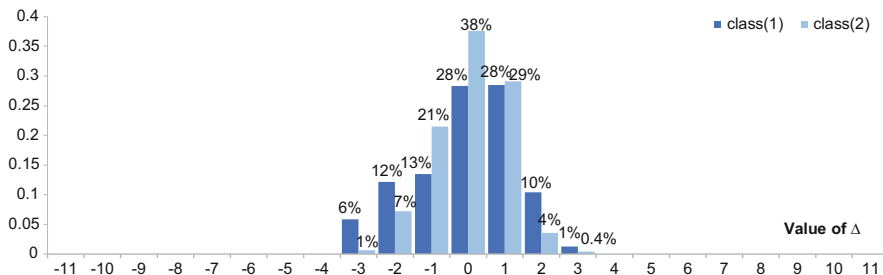


Fig. 6 Distribution of forecast errors of class models. Source: Authors own study

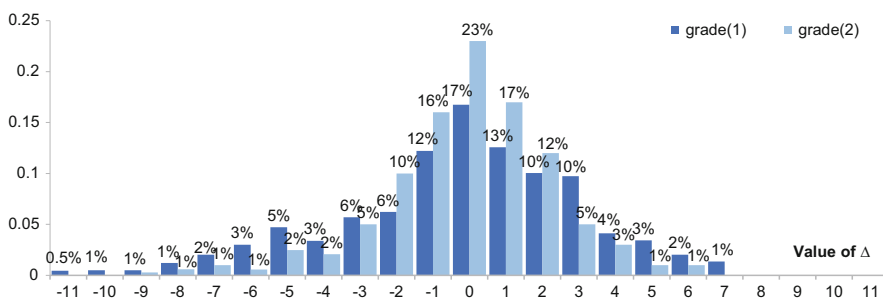


Fig. 7 Distribution of forecast errors of grade models. Source: Authors own study

then use the resulting coefficients to predict the credit ratings for part B. As the time periods from part B are excluded from modeling, their estimation occurs out-of-sample. Below we present the distribution of the errors of the forecasted values.

The probability of obtaining the correct credit rating class is 36% (according to Fig. 8) while the correct rating grade is obtained in 20% of cases (according to Fig. 9). The analysis of out-of-sample forecasting power allows us to conclude that both credit rating models are robust to the changes in the sample. They can be effectively used for credit ratings forecasting of international banks.

5 Conclusions

In our work, we present the method of credit risk estimation for banks. The proposed ordered logit model is helpful for the internal management of banks in the IRB approach and for external investors. The extensive analysis of academic literature allows us to collect valuable indicators of the banks’ financial sustainability and to find out the most significant among them. The indexes included in the final model specification cover all the aspects of bank’s credit risk, which makes our model more accurate than those proposed in the academic literature. We are able not only to find

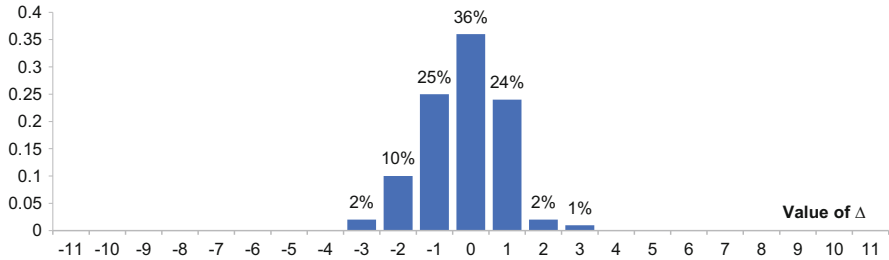


Fig. 8 Distribution of forecast errors of model class(2) (out-of-sample). Source: Authors own study

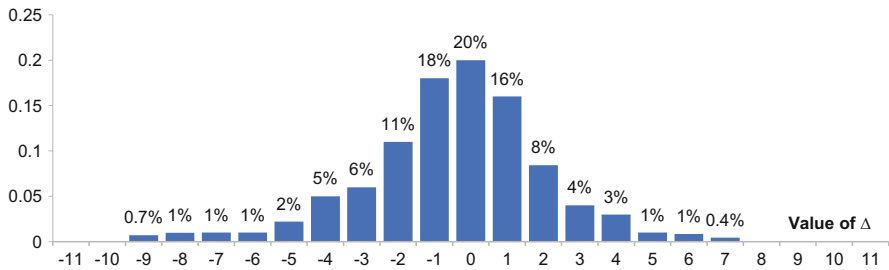


Fig. 9 Distribution of forecast errors of model grade(2) (out-of-sample). Source: Authors own study

the significant proxies for the above-mentioned factors but also to evaluate the power of their influence on the credit risk using the marginal effects calculation.

We fail to reject all the stated hypotheses. It is found out that the same set of explanatory variables can be used to forecast the credit ratings of different CRAs (Moody's, Fitch, and Standard & Poor's), but these models are not accurate in credit risk forecasting. We are able to demonstrate that mapping the credit ratings into a base scale helps to decrease the possible subjectivity of CRAs. The second hypothesis indicates the importance of inclusion of state governance indicators into the model. Using the constructed models, we observe that the transparent politics of the government can lead to increased credit ratings of international banks. This helps them in credit risk management and in the client's base extension. We also reveal the importance of maintaining an adequate liquidity level for banks in terms of financial crisis.

The novelty of the article is the derivation of a credit risk estimation method on a new extensive sample of international banks. We are able to show that in order to assess the credit risk correctly it is not enough to forecast the credit rating of any CRA, as the forecasted scores may vary. We find out new significant indicators on banks' credit risk and evaluate their power of influence. In further research, it is possible to calibrate the credit ratings on the historic default frequencies of a developed country and to compare the transition scale with the Russian one.

Moreover, more significant indicators on banks' credit risk may be found. The obtained ordered logit regression can be also compared to the AI methods of credit risk forecasting on the basis of the same set of indicators.

Appendix

Table A1 Selected indicators of banks' financial performance

Factor	Indicator	Abbreviation
Capital adequacy	Tier 1 capital ratio	TIER 1
	Total Equity to Total Assets	EQ/AS
	Total Equity to Total Debt	EQ/DE
	Total Capital ratio	CAP
Asset quality	Provision for Loan Losses to Gross Loans	PROV/G
	Nonperforming Loans to Total Loans	NONL/L
Management quality	Allowance for Credit Losses to Nonperforming Loans	ALL/NONL
	Interest Expenses to Total Deposits	IE/DE
	Total Debt to Total Deposits	DEB/DE
	Operating Expenses to Total Revenues	OE/REV
Earnings	Return on Assets (ROA)	ROA
	Return on Equity (ROE)	ROE
Liquidity	Net Loans to Total Deposits	NL/DE
	Total Cash and Equivalents to Total Deposits	CASH/DE
	Total Deposits to Total Equity	DE/EQ
	Liquid Assets to Non-Liquid Assets	LA/NLA
	Net Loans to Total Assets	NL/A
	Current Assets to Current Liabilities	CUR
Efficiency	Net Interest Income to Total Revenues	NII/REV
	Net Interest Income to Average Assets	NII/AA
	Operating Expenses to Operating Income	OE/OI
	Operating Expenses to Net Interest and Non-Interest Revenues	EFF
	Total Non-Interest Expenses to Total Assets	NONIE/A
Size	Natural logarithm of Total Assets	LOGA
	Natural logarithm of Total Equity	LOGEQ
Growth rates	Growth rate of Net Income	NI
	Growth rate of Total Revenues	REV
Leverage	Tier 1 Capital to Adjusted Average Total Assets	LEV
Age	Natural logarithm of bank's age	AGE

Source: Authors own study

Table A2 Selected indicators of macroeconomic situation

Indicator	Abbreviation
Inflation(CPI) growth rate (%)	CPI
GDP per capita growth rate (%)	GDP
Ratio of Domestic credit provided by financial sector to GDP (%)	DOMC
Ratio of Current account balance to GDP (%)	CABAL
Ratio of Gross savings to GDP (%)	GROSS
Ratio of Exports of goods and services to GDP (%)	EXP

Source: Authors own study

Table A3 Selected indicators of state governance quality

Indicator	Abbreviation
Control of Corruption (Estimate)	CORRC
Government Effectiveness (Estimate)	GOVER
Regulatory Quality (Estimate)	REGUL
Political Stability and Absence of Violence/Terrorism (Estimate)	POLIT
Voice and Accountability (Estimate)	VOICE
Rule of Law (Estimate)	LAW

Source: Authors own study

Table A4 Coefficients of logarithmic model of ratings mapping

Rating scale	a_i	b_i	Number of observations	R^2
Standard & Poor's	1.156	-0.402	4784	0.86
Fitch ratings	1.019	-0.058	4487	0.86

Source: Authors own study

Table A5 Base credit rating scale

Base scale	Moody's	S&P	Fitch	Class
21.5		AAA		6
21	Aaa			6
20.5		AA+		6
20	Aa1		AAA	6
19.5		AA		6
19	Aa2		AA+	6
18.5		AA-		6
18	Aa3		AA	5
17	A1	A+	AA-	5
16	A2	A	A+	5
15.5			A	5
15	A3	A-		5
14.5			A-	5
14	Baa1	BBB+	BBB+	4
13	Baa2	BBB	BBB	4
12	Baa3	BBB-	BBB-	4
11	Ba1	BB+	BB+	3
10	Ba2	BB	BB	3
9	Ba3	BB-	BB-	3
8	B1	B+	B+	2
7.5			B	2
7	B2	B		2
6.5			B-	2
6	B3	B-		2
5.5			CCC+	1
5	Caa1	CCC+		1
4.5			CCC	1
4	Caa2	CC		1
3.5			CCC-	1
3	Caa3	C		1
2	Ca			1
1	C	D	D	1

Source: Authors own study

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How and why Does the Disclosure of Edgar Filings Differ Among US-Listed Firms? An Empirical Investigation



Michael Dimmer

Abstract This empirical investigation aims to examine whether the disclosing behavior of companies listed in the United States differs depending on their financial performance. The results are based on a sample of 1,726,654 filings from 3440 companies submitted in the EDGAR database of the SEC between 2010 and 2018. The sample is divided into two groups using accounting variables and market data as separating features. The financial reports are also categorized. The analyses focus on filings of the categories insider trading, non-timely filings, and amendments. A Mann-Whitney U-test is used to test the difference between the reporting behavior of companies and their financial performance. The results show that there is a statistically highly significant difference, which thus explains the dependence of the submission behavior and the financial performance of companies. The trend stays robust to adjustments to the research design. The outcomes demonstrate how important the interaction between filings is. In addition to analyzing the content of an individual filing of a company, the findings suggest that the frequency and type of filings of a company also needs to be considered. Consequently, future research should increasingly analyze the interaction of the individual submissions.

Keywords Data analysis · EDGAR · Financial disclosure · Reporting behavior · SEC filings

1 Introduction

Companies that sell shares in the United States must register with the US Securities and Exchange Commission (SEC) (Securities and Exchange Commission [SEC] 1933). In addition to periodic submissions such as the annual report (10-K), listed

M. Dimmer (✉)

Department of Accounting and Auditing, Friedrich-Alexander University Erlangen-Nuremberg, Nuremberg, Germany

e-mail: Michael.Dimmer@fau.de

firms must disclose certain reports depending on specific events (SEC, 1934). The most common example is the statement of changes in beneficial ownership (Form 4), which needs to be disclosed if the ownership of a corporate insider changes (SEC, 1934).

The purpose of this paper is to investigate whether the disclosing behavior of companies listed in the United States differs depending on their financial performance. In current research, the analysis of publications in the Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) plays an important role. Brown et al. (2020) use annual report narratives to predict financial misreporting, while Huang et al. (2019) examine the connection between the use of XBRL tags in 10-K reports and the complexity of mandatory SEC filings. McMullin et al. (2019) use 8-K reports to show that price formation can be enhanced by the increase of mandated disclosures. Other studies are also based on the analysis of SEC filings (e.g., Cannon et al., 2020; Ege et al., 2020; Hasan, 2020; Kim et al., 2019; Lopatta et al., 2017; Mitra et al., 2019). However, most researchers focus only on one specific type of submission and analyze its content in detail. Against that background, this study extends the research of EDGAR filings in different ways. First, all types of submissions to EDGAR are considered in this investigation. Second, the results are not only based on one type of report, but on many different submission types at the same time. Third, the analyses consider the direct or indirect interdependence between the different types of reports.

This study is based on a sample of 3440 individual companies and 1,726,654 filings made with the SEC from 2010 to 2018. The frequency and types of filings represent the disclosure behavior. Since there are hundreds of different types of filings, in accordance with the SEC, the forms are categorized into six groups. Financial performance is measured using market data and accounting variables. By using the median as a dividing line, the sample is split into two groups of equal size. Looking at the descriptive statistics, it is noticeable that the number of submissions within each category of filings varies considerably between the two groups. To test whether the disclosing behavior depends on the financial performance, a Mann-Whitney U-test is applied. The test is repeated for diverse subsamples. The results indicate that there is a statistically highly significant difference between the disclosing behaviors of companies depending on its financial development. The trend stays robust due to adjustments to the research design. When using fundamental data instead of market data the differences become more obvious. The effect increases for longer time periods. In addition, the result is strongest when the sample is divided into four equal-sized groups based on the median and quartiles.

This study extends the state of research on EDGAR filings in several respects. First, it considers all types of reports submitted. Second, the results are always based on several report types at the same time and not on one specific form. Third, a direct or indirect dependency between the individual report types can be observed. Fourth, the results highlight that types of reports submitted are dependent on the financial performance of a company.

The remainder of the paper is organized as follows. The theoretical background and the hypotheses are presented in Sect. II. Section III outlines the research design. Results are presented in Sect. IV. The paper concludes in Sect. V.

2 Theoretical Background and Hypothesis Development

2.1 *The EDGAR Database of the SEC*

In response to the 1929 financial crisis, the Congress passed the Securities Act of 1933 (Securities Act) and the Securities Exchange Act of 1934 (Exchange Act) to regulate the issuance of securities (SEC, 2013). The main purpose of these regulations is to protect investors and ensure stability on the stock market. The SEC was founded to enforce and supervise these rules (SEC, 2013). An essential idea of the new regulations was that companies had to pass on financial and other important information to investors (SEC, 2013).

Today, all filings are made publicly available through the EDGAR database (SEC, 1934). As early as 1984, the Commission started to develop an electronic database for the disclosure of company reports (SEC, 2019c). The aim of the initiative was to meet the information needs of investors in an efficient and cost-effective way (SEC, 2019c). After an initial phase, from 1994 onwards EDGAR was strongly expanded (SEC, 2019a). Since May 1996, all companies have been required to report electronically (SEC, 2019c). All necessary regulations for electronic reporting are primarily set out in regulation S-T and the EDGAR filer manual (SEC, 2020a, b, e). Persons and entities that are subject to mandated electronic filing are defined in Art. 232.100 of the Regulation S-T.

For current research, the EDGAR database is of great use. It provides web-based access to all corporate reports filed with the SEC since 1993. Data can be downloaded free of charge and in masses. The availability of different formats offered by the SEC allows extensive evaluations such as the use of machines. Common application examples are the use of software such as RapidMiner or the use of programming languages like Python (Python Software Foundation, 2020; RapidMiner, 2020).

As it can be seen from Tables 1, 18,323,063 filings by 655,513 unique companies were stored in the EDGAR database between 1993 and 2018. The most frequent filing is Form 4 with a relative share of 36.88% followed by the 8-K (8.46%) and the SC 13G/A (3.58%). Even though the 10 most common types of filings represent 64.57% of all submissions, the sample includes 683 different types of reports. However, it should be noted that the SEC continuously adapts its regulations. As a result, different types of reports are added, while old ones are dropped or replaced. The SEC provides an up-to-date overview of form types on its homepage (SEC, 2020d).

Table 1 Statistics on EDGAR filings

Rank	Form/description	Form type	Filings (Num.)	Filings (%)	Filings (%) cumulative
1	Statement of changes in beneficial ownership of securities	4	6,757,001	36.88	36.88
2	Current report pursuant to Section 13 or 15(d)	8-K	1,549,249	8.46	45.33
3	Amendment of statement of acquisition of beneficial ownership by individuals	SC 13G/A	655,521	3.58	48.91
4	Initial statement of beneficial ownership of securities	3	613,603	3.35	52.26
5	General form for quarterly reports under Section 13 or 15(d)	10-Q	574,478	3.14	55.39
6	Definitive materials	497	417,132	2.28	57.67
7	Report of foreign private issuer pursuant to Rule 13a-16 or 15d-16 under the Securities Exchange Act of 1934	6-K	379,844	2.07	59.74
8	Statement of acquisition of beneficial ownership by individuals	SC 13G	369,280	2.02	61.76
9	Prospectus under Rule 424(b)(3)	424B3	276,685	1.51	63.27
10	Quarterly report filed by institutional managers, Holdings	13F-HR	238,794	1.30	64.57
	Total		18,323,063	100.00	100.00

Source: Own work

2.2 Hypothesis Development

2.2.1 Filings Related to Insider Trading

Insider trading is a very interesting topic for the capital market. As shown by several studies, members of the board of directors are able to profit from investing in shares of their own firms (Chang & Hsieh, 1997; Lin & Howe, 1990; Seyhun, 1986). Insiders have access to company information that is only available to certain members of the company. They have insight into the daily operations of the company and can influence the future strategy. Accordingly, they are in an excellent position to evaluate the current financial situation and the future development of the company. As a result, insiders can draw conclusions as to whether the shares of a company are currently over- or undervalued. This type of information asymmetry has already been the subject to various studies (e.g., Jagolinzer, 2009; Wang & Wang, 2017; Westerlund & Narayan, 2015; Zhang & Zhang, 2018).

Insider trading is legal, but subject to strict restrictions and regulations by the SEC to prevent the unfair use of this information. Accordingly, insider activities must be disclosed (SEC, 1934). Since 2002, the corresponding disclosures must be made in electronic form (United States Code, 2002). In addition to the pure intention to make a profit, there are many other motives for insiders to invest in their own company,

such as clauses in the contract. Nevertheless, an insider is more likely to invest in his own company if he is convinced of the future financial success of the company. Therefore, the insider activities of companies with good financial performance should be different from those of companies with bad financial performance. Thus, hypothesis 1 is stated as follows:

H1: The distribution of filings related to insider trading is different across companies with positive financial performance and companies with negative financial performance.

2.2.2 Non-Timely Filings

Private and institutional investors rely on information provided to them by companies, for example, through an annual report (e.g., Davern et al., 2019; Pawłowski, 2018). Accordingly, a functioning capital market is dependent on the timely disclosure of corporate information. If a company does not manage to publish a report on time, a so-called non-timely report must be published (SEC, 1934). Various studies have found negative effects of late reporting. An analysis of the annual reports of 7887 companies revealed that late reporting is associated with a deterioration in returns and profits, low liquidity, and a negative development of the share price (Alford et al., 1994). A more recent study by Bartov and Konchitchki (2017) found that there is a negative correlation between late submissions of annual and quarterly reports and the development of the share. As research shows a negative correlation between late submissions and market returns, the general submission behavior of non-timely filings should differ between companies with positive and negative financial performance. Therefore, the second hypothesis is stated as follows:

H2: The distribution of non-timely filings is different across companies with positive financial performance and companies with negative financial performance.

2.2.3 Amendment Filings

One of the financial reports most frequently examined in current research is the 10-K form. If errors become evident retrospectively, a restatement of an already published annual report will be required. The amendment of a 10-K is usually made through a 10-K/A report. Various studies dealt with financial restatement and isolated many negative effects. According to a study by Plumlee and Yohn (2015), restatements indicated weaknesses in the management and internal control system of the company. Anderson and Yohn (2002) observed negative market reactions as a response to financial restatements. These findings were confirmed by the analysis of 403 restatements in the period from 1995 to 1999 (Palmrose et al., 2004). A study by Amel-Zadeh and Yang (2015) investigated the association of financial restatements with information risk and concluded that companies became unattractive as a takeover target. Further research also found that amendments had a negative impact

on future profit development and were associated with an increase in the cost of equity capital (Hribar & Jenkins, 2004). In a more recent study, Ye and Yu (2017) showed that restatements had a long-term negative effect on the opinion of analysts. If restatements are largely associated with negative effects, it can be assumed that companies with poor financial performance are more likely to have to amend a report and vice versa. Accordingly, the third hypothesis is formulated as follows:

H3: The distribution of amendment filings is different across companies with positive financial performance and companies with negative financial performance.

3 Research Design and Method

3.1 Data Collection

Extracting data from EDGAR can be managed through different options. Ashraf (2017) is crawling EDGAR data with a Python code. Moreover, García and Norli (2012) developed a Perl routine and Engelberg and Sankaraguruswamy (2007) are using an SAS procedure for downloading and analyzing EDGAR documents. Another option is the R package “Edgar” developed by Lonarc and Patil (2019).

In this study, a Python algorithm is used. The code generates a Stata file with four columns. The first column contains the name of the company, the second column shows the corresponding central index key (CIK). The CIK is the unique identifier of each company within the SEC’s system (SEC, 2019b). In addition to searching the EDGAR database, the CIK is necessary to retrieve further data from other sources. The third column shows the type of disclosure. The exact date of submission is shown in column four. The present paper focuses on the time after the subprime mortgage crisis to minimize irregular effects that arose as the result of the global financial crisis. Therefore, the analyses are based on all submissions published in the SEC’s EDGAR database between 2010 and 2018. Thus, the file has 8,787,566 lines. Each row represents a filing that has been reported with the SEC on a specific date.

Additional data for the analyses are compiled from various sources. Stock market information is obtained from the Thomson Reuters DataStream platform (Thomson Reuters, 2020). Company information like the Standard Industrial Classification (SIC) was taken from Standard & Poor’s Capital’s IQ database as well as all accounting variables (French, 2020; Standard & Poor’s, 2020). For every company, the Total Shareholder Return (TSR) for the last (2018), the last two (2017–2018), and the last three years (2016–2018) were obtained. Besides this, the Earnings before Interest and Taxes (EBIT) for the fiscal years 2016 to 2018 and the Invested Capital for the fiscal years 2015 to 2017 were retrieved.

3.2 *Sample Selection Process*

Table 2 provides an overview of the sample selection process. First, all filers without Capital IQ ID or ISIN must be eliminated. Therefore, 4,522,591 observations were deleted. Even though this figure is high, this is not caused by missing data, but the consequence of the high amount of companies, which are not listed, and as a result of this do not have an ISIN. Due to the Investment Company Act of 1940 companies from the financial sector are obliged to additional disclosures (SEC, 1940). Therefore, 1,218,040 filings from companies with a SIC Code between 6000 and 6799 were deleted. Besides this, 113,752 observations do not find a matching SIC Code. In order to avoid wrong categorizations, these observations were also excluded. Additionally, all observations from non-US companies (333,998) were omitted, as they might also be obliged to additional disclosures (SEC, 2002).

Because of missing data from Thomson Reuters DataStream platform, 604,976 observations must be deleted. Eventually, 267,555 observations were removed due to missing data for EBIT or Invested Capital. The final sample consists of 1,726,654 observation and 3.440 unique firms.

3.3 *Categorization of Filings*

The consideration of individual submissions poses a far-reaching problem. Focusing only on the content of one type of report ignores the fact that one report can be the trigger for another report. It is also possible that a report supplements, changes, or

Table 2 Sample selection process

	Firm-year observations	Observations removed
All observations	8,787,566	
Merge with Standard & Poor's Capital IQ data		
Missing Capital IQ ID	5,475,959	3,311,607
Missing ISIN	4,264,975	1,210,984
Missing SIC	4,151,223	113,752
Other data filters		
Removing companies from the Finance, Insurance and Real Estate Industries	2,933,183	1,218,040
Removing non-US companies	2,599,185	333,998
Merge with Thomson Reuters DataStream data		
Missing Total Shareholder Return (TSR) from 2016 to 2018	1,994,209	604,976
Missing EBIT or Invested Capital from 2016 to 2018	1,726,654	267,555
Final sample	1,726,654	
Unique firms	3,440	

Source: Own work

Table 3 Categories of filings

Category	Filings (Num.)	Filings (%)	Form types (Num.)	Form types (%)
1.: Registration Statements, Registration Withdrawal and Termination Statements, Proxies and Information Statements	127,235	7.37	119	51.52
2.: Quarterly and Annual Reports	112,667	6.53	21	9.09
3.: Statements of Ownership and Insider Trading	1,107,724	64.15	30	12.99
4.: Non-Timely Filings	6312	0.37	8	3.46
5.: Amendments	15,996	0.93	22	9.52
6.: Miscellaneous Filings	356,720	20.66	31	13.42
Total	1,726,654	100	231	100

Source: Own work

replaces a previous report. An example of this is Form 4, which is always preceded by Form 3. Conversely, this means that each Form 4 is automatically an adaptation of a previous Form 3. In order to take these relationships into account, the 231 form types were divided into six groups. The SEC's categorization of form types, which was modified in the course of the investigation, serves as a basis (SEC, 2020c).

Table 3 gives an overview of the categorization of submission types. The first category consists of registration statements, registration withdrawal, and termination statements as well as proxies and information statements. This category thus includes documents that are equally applicable to most companies as they are primarily informative in nature and meet the formal requirements of the SEC. As an example, report S-1 is a pre-effective registration statement submitted when a company decides to hold an Initial Public Offering (IPO) (SEC, 2020c). Although this category includes most submission types (119), since these reports are often published only once per company, the respective filings account for only 7.37%. The second group includes annual and quarterly reports. By law, every company is required to publish these reports at a certain time and on a regular basis. A common example is the annual 10-K report. Category 2 consists of 21 form types and represents 6.53% of all submissions. The third and largest category contains all reports relating to statements of ownership and insider trading. Although the category contains only 12.99% of all form types, the submissions represent 64.15% of all reported filings. The fourth group are reports that have not been filed on time. They are marked in the EDGAR system with the prefix "NT" (non-timely). The fifth group consists of the amendments. One can recognize an adapted report by the suffix "\A" appended to its name. At this point, it is important to explain that there are two types of amendment reports. The first group continuously adapts an original document. An example of this is the SC 13G report, which falls into category three. This document is adapted by a document SC 13 G/A, when ownership changes. The second category of adjustments is made because the presented content of a filing is not right and needs to be corrected. For example, a 10-K/A can be the amendment of an annual report due to an accounting error. The category of amendment filings only

includes reports that are used to correct errors. Reports that function as scheduled amendments are assigned to the respective groups of the original report. The final category is called miscellaneous as it contains all other forms, for example, ad-hoc reports (8-K).

3.4 Procedure of Analyses

First, descriptive analyses are conducted. Then, a Mann-Whitney U-test is used to test the significant difference between the reporting behavior of companies. Therefore, the sample is split into two groups using different separating features. First, the over yield of each company calculated as the difference between the TRS of the S&P 500 and the TRS of each company is used. For the TRS three different time spans (1 yr., 2 yrs., and 3 yrs.) were retrieved. The TRS incorporates the price change and any relevant dividends over the respective period. Second, the Return on Invested Capital (ROIC) is used. It is calculated as EBIT (t_0) divided by Invested capital (t_{-1}). For both criteria, three different time spans are used (one year (2018), two years (2017–2018), and three years (2016–2018)). ROIC is calculated separately for each year. Accordingly, the multi-year figures show the average of the individual years. By using the median as a separator, two groups of equal size are obtained. In the following analyses, companies with a financial performance above the median are titled as group 1, companies with a financial performance below the median are found in group 2.

Robustness checks are conducted for diverse subsamples. First, the considered period is adjusted. Second, the test is repeated only for companies that are continuously in the sample for the whole period. Finally, the original data is split into four groups by using the quartiles and the median as separating variables. Then, a Kruskal-Wallis-test is performed, followed by a pairwise comparison.

4 Empirical Analysis

In the following part, the empirical results are presented. First, the submission behavior is presented descriptively. Here, the submissions are considered in dependence of the time and category. In the second part, the observed differences in the reporting behavior are tested for statistical significance. Additionally, different robustness tests are performed.

4.1 Descriptive Statistics

As shown in Table 4, the number of filings submitted with the SEC per year has increased continuously over time.

Table 4 Filings per quarter

Year	Filings (Num.)				Filings (Num.)	Filings (%)
	Q1	Q2	Q3	Q4		
2018	69,035	57,530	40,999	42,663	210,227	12.18
2017	69,968	57,177	40,861	42,867	210,873	12.21
2016	66,011	54,915	42,264	43,562	206,752	11.97
2015	66,151	56,263	41,581	41,993	205,988	11.93
2014	63,122	52,428	39,801	43,230	198,581	11.50
2013	57,488	49,987	38,649	41,470	187,594	10.86
2012	56,623	45,576	35,244	38,951	176,394	10.22
2011	53,757	44,902	33,363	34,734	166,756	9.66
2010	50,165	42,763	33,228	37,333	163,489	9.47
Filings (Num.)	552,320	461,541	345,990	366,803	1,726,654	100.00
Filings (%)	31.99	26.72	20.04	21.24	100.00	–

Source: Own work

While the number of submitted filings was 163,489 in 2010, it rose to 210,227 reports in 2018. At the corporate level, the number of reports filed rose from an average of 54 to 60 reports per year, which indicates an increase of approximately 11%. Most reports are published in the first quarter (31.99%), followed by the second quarter with 26.72%. With a share of 20.04%, the fewest submissions are made in the third quarter. In the last part of the year, the number of submissions increases slightly (21.24%).

An important factor for this observation is the annual reporting season. The publication of the 10-K usually leads to increasing trading activities by insiders. More than 80% of all 10-K reports are published in the first half of the year. Correspondingly, the proportion of active insiders at the stock exchanges is high. 58% of all Form 4 filings are submitted in the first half of the year.

Table 5 shows the submissions per category and group of companies. The difference between the averages is also shown. As the number of submissions varies considerably between categories, a comparison based on absolute values is not conducive. Consequently, the relative differences in the mean values are calculated. Therefore, the absolute difference of the total average number of submissions of group 1 and group 2 within each category is divided by the sum of these two averages.

Group 1 and 2 both consist of 1720 companies. The results presented are based on a classification according to the ROIC (3 yrs.). The results shown can be reproduced when using other separation variables. Of all the classifications made, the differences are greatest in category 4, followed by categories 3 and 5. Consequently, further analyses will focus on these three categories.

For category 1 it can be observed that companies from group 2 submit more filings of this category. With values of 14.30%, the relative difference in the average value is well below the value of 30.74% for all submissions. The opposite can be observed for category 2. Here, companies from group 1 submits more filings with a

Table 5 Submissions per category

Category by ROIC (3 yrs.)	1	2	3	4	5	6	Total
Total submissions group 1 (Num.)	59,064	60,882	683,856	2487	7002	182,731	996,022
Mean total submissions group 1 (Num.)	34.34	35.40	397.59	1.45	4.07	106.24	579.08
Filings group 1 (%)	46.42	54.04	61.74	39.40	43.77	51.23	57.69
Total submissions group 2 (Num.)	68,171	51,785	423,868	3825	8994	173,898	730,632
Mean total submissions group 2 (Num.)	39.63	30.11	246.43	2.22	5,23	101.10	424.79
Filings group 2 (%)	53.58	44.48	38.26	60.60	57.57	48.77	42.31
Difference mean (Num.)	-5.29	5.29	151.16	-0.77	-1.16	5.14	154.29
Relative difference mean (%)	-14.3	16.15	46.94	-41.96	-24.94	4.96	30.74

Source: Own work

relative average difference of 16.15%. In category 3, large differences can be observed between the two groups. Obviously, companies from group 1 have significantly more insider activity than companies from group 2. The relative average difference lies at 46.94%. Consequently, category 3 has the greatest impact on the observed trends for the whole sample. The categories with the second and third most deviations are non-timely filings followed by amendments. Here, the relative average differences are 41.96% and 24.94%. For both categories, however, the companies in group 2 submit more reports. The findings for category 6 are noteworthy, where it was observed that group 1 publishes more filings when fundamental data is used. However, if market data is used as separator, the results change and companies in group 2 publish more reports in this category. In summary, the distribution in this category is quite similar between the two groups with a relative average difference of 4.96%.

It can be noted that companies from group 1 overall publish significantly more reports, which is reflected by a share of around 63% of all submissions. This effect is largely dominated by category 3. The two categories 4 and 5 are striking. Not only are these the only two categories in which the share of reports from companies of group 2 dominates, but the share is also conclusive at 61% and 58%.

4.2 Statistical Analysis

A Mann-Whitney U-test was used to test the observed differences for statistical significance. As the descriptive statistics show, the most interesting results are to be expected in the categories insider trading, non-timely filings, and amendment, which

Table 6 Mann-Whitney U-test for disclosure of category 3 for ROIC (3 yrs.)

		N	Mean Rank	Sum of Ranks		
3.: Statements of ownership and insider trading	Group 1	1720	1944.68	3,344,844.00	Mann-Whitney U	1,093,616.00
	Group 2	1720	1496.32	2,573,676.00	Wilcoxon-W	2,573,676.00
	Total	3440			Z	-13.239
					Asymp. Sig. (2-tailed)	p = 0.000
					r	0.226

Source: Own work

is why the subsequent analyses will focus on these. The sample is divided into two groups of equal size. ROIC (3 yrs.) is used as the classification variable. Nevertheless, the results can also be reproduced using market data. The calculation and interpretation of the statistical effect size (r) is performed according to Cohen (1988).

4.2.1 Filings Related to Insider Trading

Table 6 presents the disclosing behavior of category 3 when using ROIC (3 yrs.) as separator. As the p -value is 0.000 which is lower than 0.050, the null hypothesis must be rejected. It can be concluded that the disclosing behavior of category 3 is statistically significantly different based on the ratio ROIC (3 yrs.). Consequently, hypothesis 1 can be supported. The test shows an effect size of 0.226, which can be interpreted as a medium effect according to Cohen (1988).

4.2.2 Non-Timely Filings

Table 7 presents the disclosing behavior of category 4 when using ROIC (3 yrs.) as separator. The null hypothesis is that the submission of filings of category 4 is not different between the two groups. As the p -value is 0.000 which is lower than 0.050, the null hypothesis must be rejected. It can be concluded that the difference in the disclosing behavior of category 4 between group 1 and 2 is statistically significant based on the ratio EBIT/Invested Capital (3 yrs.). Consequently, hypothesis 2 can be supported. The test shows an effect size of 0.170, which can be interpreted as a medium effect.

Table 7 Mann-Whitney U-test for disclosure of category 4 for ROIC (3 yrs.)

		N	Mean Rank	Sum of Ranks		
4.: Non-timely filings	Group 1	1720	1580.20	2,717,935.50	Mann-Whitney U	1,237,875.50
	Group 2	1720	1860.80	3,200,584.50	Wilcoxon-W	2,717,935.50
	Total	3440			Z	-10.000
					Asymp. Sig. (2-tailed)	p = 0.000
					r	0.170

Source: Own work

Table 8 Mann-Whitney U-test for disclosure of category 5 for ROIC (3 yrs.)

		N	Mean Rank	Sum of Ranks		
5.: Amendments	Group 1	1720	1616.47	2,780,321.50	Mann-Whitney U	1,300,261.50
	Group 2	1720	1824.53	3,138,198.50	Wilcoxon-W	2,780,321.50
	Total	3440			Z	-6.176
					Asymp. Sig. (2-tailed)	p = 0.000
					r	0.105

Source: Own work

4.2.3 Amendment Filings

Table 8 shows the results of the Mann-Whitney U-test for the disclosure of filings from category 5 between group 1 and 2. The ROIC (3 yrs.) was used as separator. As the p-value is 0.000 which is lower than 0.050, the null hypothesis must be rejected. It can be concluded that the disclosing behavior of category 5 between group 1 and 2 is statistically significantly different based on the ROIC (3 yrs.). Consequently, hypothesis 3 can be supported. The results show an effect of medium strength ($r = 0.105$).

4.3 Robustness Checks and Additional Analyses

4.3.1 Different Timeframes

The consideration of a period of 8 years could include the problem that the submission behavior has changed, for example, due to adjustments in legislation. An indication of this could be the increase in submissions shown in Table 4. In order

to exclude any possible distortions, analyses are repeated, only using submissions for the years 2016 to 2018. The results show that for the timeframe of three years the differences between the two groups stay statistically significant for all categories. Regarding category 3 the strength of the effect increased. However, the increase is significantly lower than for market data when the classification is based on fundamental data. These results suggest that the observation period of three years is already enough to prove the differences in filing behavior of category 3 filings between companies of group 1 and group 2. A probable reason for this is that filings related to insider trading are published more frequently and therefore the differences are more explicit and conclusive. An inverse effect can be seen for the filing behavior of category 4 and 5. Here, only a slight increase in the strength of the effect is observed in isolated cases, whereas it decreases for most of the categorization variants. This could be an indication that the differences between two groups regarding categories 4 and 5 can be identified more clearly over a longer period than three years. A possible reason could be that there are not many filings within these categories overall, for example, compared to category 3. Accordingly, a longer period is needed to show clear differences.

4.3.2 Continuously Listed Companies

The tests carried out do not differentiate according to how many years a company is included in the sample. This means that the sample was subject to continuous adjustments due to the disappearance of companies (e.g., insolvency) or the inclusion of new companies (e.g., IPO). In the following, only companies that are included in the sample over the entire period are examined. The results show that for continuously listed companies the differences between the two groups stay statistically significant for all categories.

The strength of effects has increased significantly for all classifications and categories. This result is in line with the findings regarding the period under consideration. It is noticeable that the longer the submission behavior of a company is considered, the clearer the differences become.

4.3.3 Consideration of the Quartiles

A possible problem with the median classification is that for many companies the strict classification in group 1 or group 2 does not necessarily give a fair assessment of their actual financial situation. This is the case especially for companies in the nearer vicinity of the median. For example, companies could be classified in group 1, although their financial development, for example, within their industry, would suggest that they did not perform very well. The following results will be based on a more detailed classification. Using the median and the quartiles of the ROIC as separator variables, the sample is divided into four equally sized groups. Group

Table 9 Kruskal-Wallis test for ROIC (3 yrs.)

		N	Mean Rank	Kruskal-Wallis-H	df	Asymp. Sig.
3.: Statements of ownership and insider trading	1	860	1808.06	359.858	3	0.000
	2	860	2087.79			
	3	860	1781.78			
	4	860	1204.36			
	Total	3440				
4.: Non-timely filings	1	860	1698.88	220.83	3	0.000
	2	860	1454.81			
	3	860	1688.71			
	4	860	2039.60			
	Total	3440				
5.: Amendments	1	860	1597.64	39.437	3	0.000
	2	860	1636.10			
	3	860	1847.23			
	4	860	1801.04			
	Total	3440				

Source: Own work

1 includes the companies with the highest ROIC, while group 4 contains the companies with the lowest values.

As Table 9 shows, the Kruskal-Wallis tests confirm the statistically significant differences between the four groups for the three categories examined. Therefore, the null hypothesis must be rejected. The results can be reproduced if other variables are used as separator. Although the Kruskal-Wallis test shows that the reporting behavior differs among the tested groups, post-hoc tests must be performed to determine which groups differ significantly.

For category 3, the results of the pairwise comparison are statistically significant for each investigated pair except for the pairing of group 1 with group 3. The pairwise comparison shows that the effect strength is between 0.013 and 0.154, when comparing the first three groups with each other, which is a weak effect. The results are different when taking group four into account. When comparing the first three groups with group 4 the values lie between 0.290 and 0.448, which corresponds to a medium effect strength. From this, it can be concluded that the differences in submission behavior regarding insider filings are most pronounced between group 4 and the other groups. The same effect can be seen in the analysis of filings from category 4. Here, the differences between group 4 and the other groups are dominant too. However, the strength of the effects is slightly lower with values between 0.207 and 0.355. For category 5 there are no statistically significant differences when comparing group 1 with group 2 and group 3 with group 4. The other group combinations are statistically highly significant. The greatest effects can be seen when comparing group 1 with group 3 and group 4. Here the effect strength is 0.126 and 0.103. The results suggest that the differences in the reporting behavior

of filings from category 5 are particularly different between especially good performing companies and companies with a financial performance below the median.

The analysis shows that considering the quartiles provides a benefit because it shows that the differences in reporting behavior of companies above the upper quartile and below the lower quartile show an even greater difference.

In summary, the results extend the existing body of research because, to the best of my knowledge, it is the first such study that places the financial performance of companies in relation to several different financial reports simultaneously. At the same time, however, this confirms earlier research results that see an added value of individual financial reports for the understanding of financial performance.

5 Conclusion

The present paper deals with the reporting behavior of companies listed in the United States. First, the reader was given an insight into the EDGAR database. For this study, a python algorithm was created that enables the extraction of data from EDGAR. This is followed by a description of the procurement of supplementary data and the development of the population to be analyzed. For further analyses, the SEC filings were divided into six different categories. The categorization contributes to a better understanding of the relationships between the individual types of filings.

The descriptive statistics in Sect. 4.1 show that most submissions with the SEC relate to statements of ownership and insider trading. It is also evident that submissions are more frequent in the first half of the year due to the yearly reporting season. Companies with a better financial performance submit more filings related to statements of ownership and insider trading.

An opposite effect can be found in the analyses of non-timely filings and amendments. Here, companies with a worse financial performance publish more reports. The in chapter “The Mediating Role of Emotional Stability between Regulation of Emotion and Overwork” conducted Mann-Whitney U-tests show that the results are statistically significant. Therefore, the hypothesis formulated in chapter “Developing Financial Efficiency Index for Higher Education Institutions” can be supported.

Further analyses have shown that the results are robust to adjustments of the research design. In principle, a longer period of observation is always advantageous, but shorter periods produce also statistically significant results. The analysis of the quartiles has created additional added value. It becomes clear that the differences in reporting behavior among companies with a financial performance above the upper quartile and below the lower quartile are even greater.

However, this study is subject to several limitations. Although a wide range of the submission behavior of companies was covered by considering the frequency and type of reporting, the content of the documents was not considered. As a result, the analyses lack the justifications why a company did not submit a report on time or the reason why it needed to amend it afterward. Accordingly, conclusions cannot be drawn about the effects of the individual reports, which require further analysis. A

detailed evaluation of the reports is also lacking in the analysis of the ownership structure. Here, for example, a lack of analyses of the degree of ownership of a company and the relationship between the insider and the company can be observed. A further limitation is the time sequence of the individual filings. Analyses do not consider the order in which the reports are issued and the distance between the individual publications.

For future research projects, the first step should be to analyze which types of reports have the most significant interplay with other report types. This will require smaller-step analyses in order to determine more precisely which types of reports are particularly dependent on each other. Beyond this, the content of the individual filings should be analyzed. Furthermore, research might take into consideration the order in which form types were submitted and the time that lies in between publications.

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Part VI
Eurasian Economic Perspectives:
Behavioral Finance

The Effect of Personality Traits on Credit Score Using Myers-Briggs Type Indicator (MBTI) Personality Types



Adnan Veysel Ertemel and Gökhan Çaylak

Abstract Credit scoring plays an increasingly important role in our lives. This is true even in various nonfinancial contexts including but not limited to marketing and human resources. This study adopts the notion that one's credit score could be affected by his/her personal characteristics. Therefore, this study investigates the relationship between personality traits and credit score. The study is significant in that, contrary to the extant literature on the subject that uses the well-known Big Five model, it uses the Myers-Briggs Type Indicator (MBTI), which is shorter and more practical for commercial uses. A quantitative study was carried out and a survey was administered on 181 valid respondents. The results demonstrate that sensing and judging dimensions positively correlate with the credit score. As Conscientiousness dimension in Big Five overlaps with MBTI sensing and judging dimensions, and the findings partly conform to the former studies that use the Big Five model. The results obtained have important managerial implications.

Keywords Personality traits · Credit score · MBTI · Financial inclusion

1 Introduction

It is evident that personality traits play a key role in predicting human behavior. There is extensive literature with studies that address personality traits in various contexts. Credit scoring is not an exception to this. The extant literature demonstrates that credit scoring is not merely a function of one's economic data (Heck, 1980; Roberts et al., 2007; Becker et al., 2011; Ladas et al., 2015). Specifically, personality

A. V. Ertemel (✉)

International Trade Department, Istanbul Commerce University, Istanbul, Turkey
e-mail: avertemel@ticaret.edu.tr

G. Çaylak

Istanbul Bahcesehir University, Istanbul, Turkey

traits were found to influence an individual's economic preferences (Khan et al., 2019; Roberts et al., 2007; Ozer & Benet-Martinez, 2006) and eventually credit score (Klinger et al., 2013; Rustichini et al., 2016; Wang et al., 2011; Ottaviani & Vandone, 2011).

Given the fact that credibility score is becoming an increasingly important factor even in nonfinancial circumstances, the motivation behind this study is to elaborate on and identify the specific personality traits that correlate with credit score, whether it be in a positive or negative manner. Among many instruments that classify personality types, Big Five Model and Myers-Briggs Type Indicator (MBTI) are two of the most widely used models for describing individual personalities. The studies on this subject mainly use the Big Five model.

The effect of personality types on credit scoring is probed in different contexts like automobile insurance (Brockett & Golden, 2007), selection of entrepreneurial borrowers (Dlugosch et al., 2018) using different means including using netnographic data taken from social media (Tan & Phan, 2018; Segalin et al., 2017) and even using other forms of openly accessible digital footprints in the extant literature (Berg et al., 2020). These studies all reveal the importance of personality traits in credit scoring in different circumstances. However, exist a lack of studies that use MBTI to assess the effect of personality traits on individuals' credibility score. This study adds value to the extant literature by taking into account the more practical and shorter MBTI instrument, which was not carried out before in assessing the aforementioned phenomenon. Therefore, the study also aims at providing practical managerial implications.

In the remainder of the chapter, the literature on credit scoring and personality theory is reviewed first. Existing studies based on Big Five on the subject are addressed. Subsequently, the analysis of the conducted study that uses BMTI instruments is made, accompanied by relevant discussion. The analysis results, in a sense, conform to the previous findings as it is revealed that sensing and judging MBTI dimension, which overlaps with conscientiousness in Big Five, correlates with credit scoring. In the final part of the chapter, implications for future research along with the relevant managerial implications are provided.

2 Conceptual Background

2.1 Credit Scoring

Credit Scoring aims at the development of models for distinguishing good applicants from bad applicants (Baesens et al., 2003). Credit scoring as we know was not introduced to the market as it is right now. Durand (1941) is the first to apply statistical methods for the selection of credit applicants. Later on, engineer Bill Fair and mathematician Earl Isaac founded an analytics company in 1956, an acronym known as today as FICO. FICO pioneered analytic solutions such as credit scoring that have made credit more widely available, not only in the United States but also

around the world (Kalmar & Blume, 2007). Credit score data consists of multiple data points from banks' information like payment history debt burden, length of credit history, types of credit used, etc. Credit scoring can be defined as the set of decision models and their underlying methods that serve lenders in granting consumer credits (Zhang et al., 2010).

Today, credit scoring systems are used in loan applications. Customers are evaluated by their personal information and historical payment performance. Traditionally, some statistical methods like linear discriminant analysis and logistics regression were used. However, new data mining techniques such as neural networks can be used as alternatives (Wang et al., 2011). Credit scoring has been one of the most successful applications of data mining (Finlay, 2011). Lately, there have been some studies that investigate the effect of personality traits on credit scoring in different contexts using such techniques. Among those, Brockett and Golden (2007) specifically investigated the effect of risk-taking personality characteristics and biological factors on driving behavior in automobile insurance context and inferred a linkage of certain factors to credit risk. Another study was undertaken by Liberati and Camillo (2018) in Italy used a bank's customer data to understand if personal values help better predict credit risk. Using the bank's historical data and by comparing the kernel-based classifiers with the normal ones, the study suggests that personal values seem to affect credit scores. Berg et al. (2020) studied openly accessible digital footprints; and by having analyzed the data from 250,000 distinct users, they concluded that digital footprints do complement, but not substitute credit bureau information.

2.2 *Personality Theory*

Personality can be defined as the organization of the inner world of a person that is consistent and predictable (Piedmont, 1998). Kazdin (2000) referred to personality differences in characteristic patterns of thinking, feeling, and behaving. The study of personality focuses on two broad areas: one is understanding individual differences in particular personality characteristics, such as sociability or irritability. The other is trying to perceive the reasons how the different parts of a person come together as a whole (Kazdin, 2000). Scholars attempt to develop different measures for understanding human personality. Trait theory is one such theory to underline the critical importance of stability parameters in human personality. A trait is a cross-situational distinction of an individual (Ajzen, 2005). It reflects the attributes of individuals who can be used to distinguish between different persons. Carl Jung is known to be one of the pioneers in this area (Jung, 1971). Jungian theory has inspired many scholars to develop new personality models (Myers et al., 1985; Keirsey & Bates, 1984; Rushton et al., 2007). Later on, scholars have elaborated on different theories and models to describe human personality. Within this framework, Big Five Model has been one of the most widely used personality trait models in the last decades.

2.2.1 Big Five Model

Big Five model, also called Five Factor Model (FFM) is a well-known model that describes five higher-order personality traits to explain human behavior (Costa & McCrae, 1992). It aims at characterizing humans by placing them in one or more of five main traits. These traits are extraversion, agreeableness, neuroticism, openness to experience, and conscientiousness (Costa & McCrae, 1992; Furnham, 2002). Extraversion refers to the tendency to be more assertive, highly active, implying preference for interpersonal relations. Agreeableness refers to friendly, trusting, caring, and modest behavior. Neuroticism refers to the tendency to be depressive, anxious, and fearful. Openness-to-experience refers to the tendency to get involved in intellectual activities, and to be more creative as well as imaginative. Conscientiousness is associated with disciplined work ethics, ambitiousness, determination, and responsibility.

Previous Studies in Personality Traits and Credit Scoring

Big Five model has been adopted by many scholars in personality theory in various studies. The literature that relates personality traits to credit score is no exception. The few studies on this subject used the big five model to analyze personality effects on credit scores (Rustichini et al., 2016; Klinger et al., 2013; Heck, 1980).

There are few studies that specifically investigate the effect of personality traits on the credit score of individuals. Among these, Rustichini et al. (2016) explore the effect of personality traits and found negative correlation between neuroticism and credit score. In another study that investigates the default risk of credits, Klinger et al. (2013) similarly find neuroticism as negatively affecting the credit score. Withdrawal and volatility are the main facets of neuroticism. Among these, withdrawal is found similarly by Heck (1980) to be one of the particular traits that characterize those with low credit scores. In explaining this finding, we can say that attitudes toward risk appear to be affected by Neuroticism. Previous evidence suggests that a stronger sensitivity to ambiguity and unpredictable outcomes is associated with a higher level of neuroticism (Hirsh & Inzlicht, 2008). Conscientiousness, on the other hand, is found to be affecting credit score positively in previous studies (Klinger et al., 2013). This makes sense as conscientiousness represents the capacity and propensity to exercise control over behavior and to seek non-immediate goals. Thus, an individual with a high score in Conscientiousness is expected to have a high credit score. Although there are studies on the subject on the Big Five model, the MBTI, which is also a widely used model, has not been used in literature to study the credit score.

2.2.2 Myers-Briggs Type Indicator

Myers-Briggs personality Type Indicator (MBTI) is an instrument developed by Briggs and Myers during World War II for job matching and assignment (Myers et al., 1985; Quenk, 2009). This technique, which can be viewed as one based on Jungian theory, has been administered to millions of individuals in various contexts. It involves responding to a questionnaire that allows the classification of a person's traits according to four main dimensions (Furnham, 1996; Hammer, 1996). As a measure that consists of relatively fewer questions, MBTI has been used in more commercial settings and is regarded as the most commonly used nonclinical personality measure (Davito, 1985; Bayne, 2003).

MBTI differentiates from the Big Five in that instead of traits or continuous variables, it measures distinct personality types. It defines 16 personality types across four dimensions that reveal personal preferences in explaining how people behave under different circumstances. The four dimensions are Extraverted (E)/Introverted (I), Sensing (S)/Intuitive (N), Thinking (T)/Feeling (F), and Judging (J)/Perceiving (P). Each person belongs to one opposite on the scale.

The MBTI type theory encompasses two main assumptions. First, the equal development of all four functions is not suitable (Bayne, 2003), and the prevalent continuum should be the most advanced. Second, people in both dimensions cannot concurrently establish competing interests. This tends to lead to a dominant preference and then to a cumulative cycle, which is further developed. As such, each individual finds slowly what is best for his or her talents.

According to MBTI, extraverts are easier to relate to others, while introverts focus on the inner world of thoughts and ideas. Sensing and intuitive actions are ways to understand the world. Sensing personalities sense through the five senses, whereas intuitive personality is rather unconscious oriented. The two ways of judging are the distinctions of thinking which highlight logic and impersonal processes. Feeling is based more on personal values and judgments. The final dimension is a combination of perception and judgment. Judging type reflects preferences to a scheduled determined and organized way of life, whereas the perceiving type prefers a flexible and spontaneous way of life. Different scholars developed new models based on MBTI, including temperament types developed by Keirsey and Bates (1984), which adopted MBTI to examine psychological preferences.

When we compare the Big Five and MBTI models, we can say that the Big Five model is a descriptive model. Myers-Briggs Type Indicator, however, places an individual in one of the 16 predefined personality types. As opposed to the rather descriptive nature of Big Five, MBTI places the individual in one of those predefined personality types. Scholars have previously investigated the overlap between Big Five and MBTI (Costa & McCrae, 1992; MacDonald et al., 1994; Furnham, 2002). The studies of both Costa and McCrae (1992) and Furnham (2002) confirm that Extraversion–Introversion, Openness was correlated with Sensing–Intuition, Agreeableness with Thinking–Feeling, and Conscientiousness with both Judging–Perceiving and Sensing–Intuition. This chapter aims at filling a gap in the literature

by undertaking a study analyzing the relationship between credit score and MBTI personality types.

3 Research Model and Hypothesis Development

In light of the previous studies, the research question of this study is to test the effect of the four MBTI dimensions, namely Extraverted vs. Introverted, Sensing vs. Intuitive, Thinking vs. Feeling, and Judging vs. Perceiving on the credit score. The research model is depicted in Fig. 1.

Based on the research model, the following hypotheses are developed:

Hypothesis 1: There is a positive correlation between extraverted personality and credit score.

Hypothesis 2: There is a positive correlation between sensing personality and credit score.

Hypothesis 3: There is a positive correlation between thinking personality and credit score.

Hypothesis 4: There is a positive correlation between judging personality and credit score.

4 Research Methodology

A descriptive research was conducted in the study. Resources from past research studies about credit scoring and psychometrics were probed into the study in the literature review part. In this part of the study, subject selection, research methodology, instrumentation, reliability, and data collection procedures are explained.

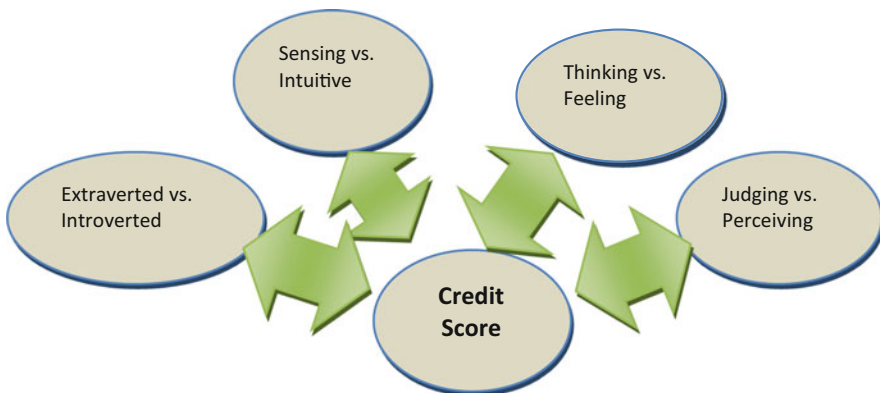


Fig. 1 Research model. Source: Adapted from McCrae and Costa (1989)

4.1 Sampling Procedure

Research questions relating to the personality traits were explored with reference to the credit scores of 181 people. Convenience sampling method was used and an email was sent to more than 300 individuals outlining the details about the study and its purpose, and they were asked to participate accordingly. The study included both male and female individuals in order to create a meaningful sample set for further discovery. Individuals aged between 18 and 60 years are included in the sample in order to understand the life stages of the participants. The information regarding their contact and demographic details was received face to face, professions and background information are excluded, and the most represented categories are age groups between 19 and 35 years, who are the ones with the most engagement with online tools. After the approvals of the individuals, MBTI personality test is conducted. The information is collected from KKB (Kredi Kayit Bureau) via Kredico. Results are analyzed with the SPSS statistics package. To ensure the anonymity of reported responses, each individual’s name is anonymized.

4.2 Analysis Results

4.2.1 Reliability and Validity Analysis

The reliability of the scales was determined. To do this, Cronbach’s alpha values were calculated. The results are shown in Table 1.

As Cronbach’s alpha values are bigger than the threshold value (0.7), the scales were found to be reliable. The second step to determine validity using discriminant validity analysis for the four distinct scales is as follows: Extraverted vs. Introverted, Sensing vs. Intuitive, Thinking vs. Feeling, and Judging vs Perceiving. Table 2 indicates that instrument scales’ coefficients are below the threshold, which means they do not have an impact on each other.

4.2.2 Preliminary Results

The survey was performed in Turkey using a convenience sampling method. Data were collected through email. Data collection processes lasted three months in the

Table 1 Reliability and validity results of the analysis (taken from analysis results)

Scale	Cronbach alpha
Extraverted vs. Introverted	0.87
Sensing vs. Intuitive	0.78
Thinking vs. Feeling	0.75
Judging vs. Prospecting	0.82

Source: Authors’ own study

Table 2 Coefficient values of personality dimensions

	Extraverted vs. Introverted	Sensing vs. Intuitive	Thinking vs. Feeling	Judging vs. Prospecting
Extraverted vs. Introverted		-0.09	0.02	-0.01
Sensing vs. Intuitive	-0.09		0.09	0.37
Thinking vs. Feeling	0.02	0.09		0.08
Judging vs. Prospecting	-0.01	0.37	0.08	

Source: Authors' own study

Table 3 Frequency distribution of the participants

	Frequency	Percentage
Age		
20–29	70	39
30–39	59	32
40–49	38	21
50–59	14	8
Grand total	181	100
Gender		
Male	100	55.2
Female	81	44.8
Grand total	181	100
Education level		
Primary school	7	3.9
High school	40	22.1
University	104	57.5
Masters	22	12.2
PHD	8	4.4
Grand total	181	100

Source: Authors’ own study

Table 4 Descriptive statistics of personality types

	N	Minimum	Maximum	Mean	Std. deviation
Extraverted	181	11	100	71.88	15.712
Introverted	181	0	89	28.12	15.712
Sensing	181	4	100	49.98	14.460
Intuitive	181	0	96	50.02	14.460
Thinking	181	14	98	49.48	14.828
Feeling	181	2	86	50.52	14.828
Judging	181	10	95	55.55	17.630
Prospecting	181	5	90	44.40	17.716

Source: Authors’ own study

second quarter of 2018. Hundreds of the respondents were male and 81 were female. The frequency and percentage of respondents by age, education, and gender are detailed in Table 3.

In this study, as seen from Table 4, personality trait means were calculated with SPSS. Extraverted profile has the highest ratio with participants in the study with minimum 10 and maximum 100 percent. The second highest trait is Judging trait with minimum 10 and maximum 95 percent, and the third-highest trait is Assertive personality trait with minimum 16 and maximum 100 percent. The results suggest that survey participants have a balanced ratio of Intuitive, Sensing, Thinking, and Feeling traits. As discussed in the limitations of the study section, the study is limited to the results considering the location it took place. Therefore, the validity of the results could be suspected as subjective. A bigger sample size is needed to have a

better understanding of population trait distribution. In addition, honesty of survey participants who participated in this study have critical importance for the results.

5 Hypothesis Test Results

5.1 *Correlation of Extraversion (vs. Introversion) Personality Type on the Credit Score*

In this study, correlation test technique is employed for the investigation of the effects on the relationship between extraversion and introversion on credit score. Calculated results are presented in Table 5.

According to the analysis results, there is no correlation between extraversion and introversion of participants according to the credit score ($p = 0.571$, $p < 0.05$). Since our p -value is above 0.05, we can say that there is no statistically significant association of being extraverted and introverted on the credit score. Our correlation coefficients are -0.042 and 0.042 , which means there is not really an association between extraversion and introversion on credit score.

5.2 *Correlation of Sensing (vs. Intuitive) Personality Type and Credit Score*

The relationship between sensing (vs. intuitive) personality type and credit score segment was tested. Calculated results are presented in Table 6.

According to the results, correlation coefficient is 0.288, which means there is a significant correlation between Sensing (vs. Intuitive) personality type and credit score. ($p = 0.000$, $p < 0.05$). This result makes sense in that sensing types of individuals are more concerned with the real world and they have better management of tasks in order base (Ghauri & Usunier, 2003). Dealing with facts is a strong function for individuals having this kind of personality. Credit score is affected by reality so it is understandable that this type of individual scores higher than intuitive types. Conversely, being intuitive is associated with being imaginative (Jung, 1971),

Table 5 Correlation test results of extraversion vs introversion on credit score

		Credit score	Extraverted
Extraverted	Pearson Correlation	0.042	1
	Sig. (2-Tailed, $p < 0.05$)	0.571	
Credit score	Pearson Correlation	1	0.042
	Sig. (2-Tailed, $p < 0.05$)		0.571

Note: $p < 0.05$

Source: Authors' own study

Table 6 Correlation test results of sensing (vs. Intuitive) personality type and credit score

		Credit score	Sensing
Sensing	Pearson Correlation	0.288**	1
	Sig. (2-Tailed, $p < 0.05$)	0.000	0.000
Credit score	Pearson Correlation	1	0.288
	Sig. (2-Tailed, $p < 0.05$)		0.000

Note: $p < 0.05$

Source: Authors' own study

Table 7 Correlation test results of thinking vs feeling and credit score

		Thinking	Credit score
Thinking	Pearson Correlation	1	0.019
	Sig. (2-Tailed)		0.804
Credit score	Pearson Correlation	0.019	1
	Sig. (2-Tailed)	0.804	

Note: $p < 0.05$

Source: Authors' own study

being kind of detached from the real world. Not thoroughly thinking about the results of actions or making necessary preparation for an outcome might negatively affect reality perception as well as the credit score.

5.3 Correlation of Thinking vs. Feeling Personality Type on the Credit Score

The effects on relationship between thinking and feeling on credit score were tested. Calculated results are presented in Table 7.

According to the analysis results, there is no correlation between thinking vs. feeling personality traits of participants according to credit score ($p = 0.804$, $p < 0.05$). Since our p -value is above 0.05 can say that there is no statistically significant association of being thinking and feeling on credit score. Our correlation coefficient is 0.019 which means there is not really an association between thinking (vs. feeling) personality type and the credit score. The results make sense as thinking vs. feeling personality trait correlates with agreeableness dimension of the Big Five model (Costa & McCrae, 1992; Furnham, 2002) and agreeableness dimension did not have any correlation with credit scoring in previous studies (Rustichini et al., 2016; Klinger et al., 2013).

5.4 Correlation of Judging vs. Perceiving Personality Type on Credit Score

In this study, correlation test technique is practiced for investigating the effects on relationship between judging and perceiving on the credit score. Calculated results are presented below in the chart as summary (Table 8).

According to the acquired results, there is a correlation between sensing (vs. intuitive) values of participants according to the credit score ($p = 0.013$, $p < 0.05$). Our correlation coefficient is 0.187, which means there is but weak association between judging and perceiving on the credit score.

For this dimension, the correlation coefficient value infers that there is, but weak association between judging and perceiving on credit score. The reason for this result is that having a judging personality is associated with being prepared for the challenges. This type of personality is known for its consistency and clarity, always being prepared means they have a backup plan for things to come ahead (Jung, 1971). Also, a sense of responsibility is greater with this type. From the financial behavior aspect, judging personalities plan ahead and even before applying for a loan, they devise a plan for their repayment schedule. If they fail to comply with a responsibility (although most likely they do not), they have a plan B to make things get back to normal (Conger, 2005). Therefore, it is understandable to see that this type has a positive association with credit score. They perceive the world as it is and try not to hide or escape from it. If they are using a financial product, they are aware of the necessities to comply beforehand. Financial products by nature are strictly concerned with being rational and factual. In contrast, perceiving individuals are associated with a relaxed attitude toward challenges. The impulsive aspect of character makes them kind of opportunist; therefore, a tradeoff can be seen when it comes to complying with responsibilities. For example, this type of individual can go for a second mortgage loan even though the first one has not yet been paid back.

5.5 Summary of Findings

The hypothesis results are summarized in Table 9. According to the results, sensing and judging levels of individuals have a significant correlation with the credit score. In this case, hypotheses 2 and 4 are supported. On the other hand, extraversion and

Table 8 Correlation test results of judging vs perceiving and credit score

		Judging	Credit score
Judging	Pearson Correlation	1	0.187*
	Sig. (2-Tailed)		0.013
Credit score	Pearson Correlation	0.187*	1
	Sig. (2-Tailed)	0.013	

Note: $p < 0.05$

Source: Authors' own study

Table 9 Hypothesis chart

Hypotheses	Result
1. There is a significant correlation between Extraversion (vs. Introversion) personality type and credit score	Not supported
2. There is a significant correlation between Sensing (vs. Intuitive) personality type and credit score	Supported
3. There is a significant correlation between Thinking (vs. Feeling) personality type and credit score	Not supported
4. There is a significant correlation between Judging (vs. Prospecting) personality type and credit score	Supported

Source: Authors’ own study

thinking personality types were found to have no correlation with the credit score, so hypotheses 1 and 3 are not supported.

6 Discussion

The findings using BMTI personality types are partially in line with those that overlap with the Big Five model in that for conscientiousness dimension of the Big Five which correlates with both sensing-intuition and judging-perceiving dimensions of MBTI, the results are parallel to Big Five confirming the correlation in those dimensions. However, for the neuroticism dimension of the Big Five, which was found to have a weak correlation with extraversion-introversion BMTI dimension, no significant correlation was found.

These results conform to the findings of the previous studies using Big Five traits. That is, as Big Five conscientiousness and credit score correlate (Rustichini et al., 2016; Klinger et al., 2013) and there is an overlap of conscientiousness with BMTI sensing and judging (Furnham, 2002), correlation between credit score and sensing and judging dimensions makes sense.

7 Conclusion

Personality traits explain human behavior to a great extent. Credit scoring is no exception to this. Although this effect has previously been studied in the literature, there is a lack of such a study that uses the widely accepted BMTI personality instruments. As such, this study attempts to bridge the missing gap in the literature by investigating the relationship of the BMTI personality type dimensions and credit score of individuals. As a result of the hypothesis tests, correlations have been found between judging (vs. perceiving) and sensing (vs. intuition) personality types and credit score. On the other hand, no significant correlation was found for extraversion (vs. introversion) and thinking (vs. feeling) personality types.

The results have important managerial implications. Today's highly competitive markets demand further segmentation of their customer base, improvement of profitability, and decrease of loss. A better understanding of customers' financial behavior leads to important insights for companies. In that regard, credit scores become a new instrument for companies to understand their portfolio's preferences and predictability. New ways of acquiring credit scores might be introduced even for those with no previous payment behavior. The limitation of the study is that it was carried out with a relatively small sample and just in Turkey. Future studies can be carried out with a larger sample size and in different geographies.

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Insider Trading and Stock Market Behavior: Evidence from Romania



Ruxandra Trifan

Abstract The aim of this study is to determine the market reaction to insider trades on the Romanian stock market for the January 2017–December 2019' time horizon. The focus is on individual insider trades, especially on management trades, directors having access to private as well as to price-sensitive information, therefore having an advantage over other investors when they trade their company's shares. Using an event study approach, abnormal returns are determined on a 41 days' window. We check for any evidence on inside information known prior to the disclosure of insider trades and analyze the market response to the information quality of the event, respectively, the stock price behavior around the event. Empirical results suggest that these insiders reveal some significant pieces of information to the market through both their acquisitions and sales of shares. Abnormal returns are registered prior to the event date, especially in the case of CEOs, supporting our belief that this category of insiders possesses superior information. Significant abnormal returns are also obtained in the 20 days' window following the event date. Results are significant from a statistical point of view and in line with correspondent work of other researchers on different stock markets.

Keywords Insider trading · Disclosure · Abnormal returns

1 Introduction

Insider trading provides new information to the market with respect to the firm's current and future prospects, both from an operational and a financial point of view. It is generally accepted that insiders trading their own company's shares possess superior information in comparison with outsiders or they can interpret publicly available information better and use it to their advantage (Kallunki et al., 2009;

R. Trifan (✉)

Department of Finance, The Bucharest University of Economic Studies, Bucharest, Romania
e-mail: ruxandra.trifan@fin.ase.ro

Agrawal & Cooper, 2015; Hillier et al., 2015; Lee & Piqueira, 2019). Therefore, the market pays significant attention to the positive, respectively, negative signs these investors send and apply these in investment decisions. An insider purchase carries positive news on a specific company's future, while an insider sale may transmit negative signals related to how that firm would develop or, by the contrary, may transmit no relevant information at all if the insider instructed a transaction based on liquidity needs.

There can be several motives behind these insiders' transactions. First, they may trade for personal benefit (Jaffe, 1974; Seyhun, 1986, 1992; Rozeff & Zaman, 1988; Lin & Howe, 1990; Lakonishok & Lee, 2001; Jeng et al., 2003; Ke et al., 2003; Huddart & Ke, 2007; Agrawal & Cooper, 2015). Due to their privileged access to confidential information related to their firm and its future prospects, they may take advantage of this knowledge and use it for personal gains. Second, they may trade for non-profit reasons, like liquidity necessities or diversification (Ke et al., 2003; Huddart & Ke, 2007; Huddart et al., 2007; Kallunki et al., 2009). Thus, it is essential to distinguish the opportunistic insiders, who trade for profit reasons, from the routine traders, who act on liquidity needs or portfolio diversification (Cohen et al., 2012). And lastly, insiders may also trade being influenced by different behavioral biases (Hillier et al., 2015; Lee & Piqueira, 2019; Favreau & Garvey, 2020).

However, regardless of the trading motive, the information content provided by the insiders' trades can be limited by regulators. Even though there is information asymmetry between insiders and outsiders, regulations put in place restrict trading upon private information, prevent information leakages and promote transparency. Thus, insiders' trading data content may be smaller with fewer transactions instructed on the market.

This chapter aims to determine the stock market reaction to insider trades on the Romanian stock market, with data for a 3 years' time horizon, from January 2017 until December 2019. The focus is primarily on individual insider trades, especially on management trades, as directors have access to private and price-sensitive information and therefore, a clear advantage over the other investors when they are trading their own firm's shares. The current paper checks for any abnormal returns over a 41 days' length window, using an event study approach. With the disclosure of insider's transaction as the event date, we check for evidence on any privileged content known prior to the disclosure, as well as analyze how the market responds to the information quality of the event, respectively, the stock price behavior around the event date.

Even though numerous studies investigated the insiders' activity and determined the abnormal earnings they generated, they concentrated mainly on developed markets such as the United States, United Kingdom, or Central Europe (Jeng et al., 2003; Fidrmuc et al., 2006; Betzer & Theissen, 2009; Ravina & Sapienza, 2010). There has been paid little attention to Eastern European countries, especially Romania, when referring to insider trades and the information that can be extracted from the behavior of these insiders. Therefore, this chapter is important to determine the information content conveyed by individual insiders on an emerging

ex-communist market like Romania and the correspondent abnormal earnings, as well as have an overview on how Romanian management behave by putting their personal benefit or their firm's shareholders first. Taking these into consideration, it provides relevant information for both researchers and investors by picturing the investment environment on an emergent stock market.

We structure the remainder of this study as follows. The second part reviews the related literature. Sections 3 and 4 describe the methodology and the data set used in this chapter to perform the analysis and determine how the market responds to these insiders' transactions. Section 5 presents the main empirical results of this study. Section 6 concludes.

2 Literature Review

There is an extensive body of literature that focuses on insiders' transactions and the correspondent response of the stock market (Jaffe, 1974; Seyhun, 1986, 1992; Rozeff & Zaman, 1988; Lin & Howe, 1990; Lakonishok & Lee, 2001; Jeng et al., 2003; Ke et al., 2003; Huddart & Ke, 2007; Huddart et al., 2007; Kallunki et al., 2009; Agrawal & Cooper, 2015; Hillier et al., 2015; Cohen et al., 2012; Chowdhury et al., 2018; Kelly, 2018; Lee & Piqueira, 2019; Palladino, 2020; Favreau & Garvey, 2020). The insiders' transactions are perceived to offer credible signals to the market with respect to their company's future, one of the reasons behind being the cost of an insider trade if the specific insider who instructed the trade got it wrong. Furthermore, important to point out is also the different degree of informativeness between insider purchases and insider sales, with the first ones driving more pronounced price reactions than the latter (Lakonishok & Lee, 2001; Fidrmuc et al., 2006).

Numerous studies show that insiders instruct transactions based on private information, which afterward determine higher moves in the stock price in comparison with trades done by other investors. The perception that insiders possess better information about their company or that they interpret better the publicly available information is justified in the existing literature body by the profitability of their trades (Seyhun, 1986; Lakonishok & Lee, 2001; Armstrong et al., 2018, 2020; Berkman et al., 2020). On one hand, insiders have a better knowledge about their company's future cash flows (Ke et al., 2003; Chowdhury et al., 2018; Lye et al., 2019). On the other hand, they may exploit any outsiders' biased view on their firm and decide to trade on that, acting like contrarian investors (Lakonishok & Lee, 2001). Whatever the case, insiders' trading receives a lot of attention in the market and some outsiders try to mimic their behavior (Barber & Odean, 2008; Hodgson et al., 2018). The effect of this amount of attention brings three hypotheses to light. Firstly, there is the mimicking hypothesis, when outsiders copy the direction of an insider trade. Secondly, there is the insider attention hypothesis, when outsiders copy exactly the insider trades because those transactions received great attention in the market. If, for example, there is reported an insider's high abnormal trading volume, regardless of the direction of the trade, that specific transaction receives great

attention, mainly due to the fact that the subject is much debated in the financial press. Thirdly and lastly, there is the information event hypothesis, when outsiders look for any information events these insiders' transactions may carry. Here, numerous studies provided evidence that insiders traded some weeks or months before an important corporate event such as takeover bids (Seyhun, 1990), stock repurchases (Lee et al., 1992; Cziraki et al., 2019), earnings surprises (Ke et al., 2003; Markarian & Michenaud, 2019; Contreras, 2020).

Even though the insiders have an informational advantage over the outsiders, this is limited to a certain narrowed opportunity window. As all content is time sensitive, there are two separate cases for debate here (Biggerstaff et al., 2020). On one hand, there is the news that would soon be publicly available through company's announcement related to earnings or future prospects, or information leakage by other insiders. Therefore, it is a question of finite time of how quickly would the prices incorporate the news. Thus, insiders' strategies are focused on enhanced short-horizon trading. On the other hand, there is the one-off type of information that does not happen on a routine basis, which may have a longer time period advantage. Here there can be mentioned a research and development project which may lead to promising results, an investment project with a key partner that would materialize in a couple of months, finding or losing some key players in the clients'/suppliers' chain, mergers' negotiations, etc. Thus, bearing in mind this type of informational advantage, insiders' trading strategies are concentrated on a longer time horizon.

Biggerstaff et al. (2020) analyzed insider trades on the US stock market for the period 1986–2017 and concluded that insiders possessed an informational advantage when beginning their trading strategies. They found that insiders were trading opportunistically on privileged content, with trading strategies designed to maximize their informational advantage. Moreover, trades that were reported after the business hours were associated with larger abnormal returns. With respect to insider purchases, isolated trades were followed by significant positive abnormal returns of 119–143 bps in the following month, whereas sequence trades were followed by positive abnormal returns of 159–187 bps in the following month of the end of the sequence. Also, isolated insider sales were followed by significant negative abnormal returns of 0.59–0.66% and insider sales sequences were followed by negative abnormal returns of 1.26–1.36%.

An important factor with an effect on the market's news incorporation speed into stock prices is the company's specific characteristics. Seyhun (1986), Lakonishok and Lee (2001), and Iqbal and Shetty (2002) emphasized a negative link between firm size and abnormal returns. The smaller the company is, the higher the information asymmetry is and thus, the possibility of obtaining greater abnormal returns. The larger companies are perceived to be more transparent and to have more analysts' coverage, thus leading to a smaller number of opportunistic trade sequences (Frankel & Li, 2004). Also, according to Seyhun (1986), there are certain types of individual insiders, namely the management (CEO, for example), who have access to more valuable content, being involved in the operational part of the business like capital budgeting or the forecast of future cash flows. Thus, they are

more successful in predicting the future abnormal price shifts in their own firm and obtain greater abnormal returns in comparison with the other directors or the other insiders.

Jeng et al. (2003) expanded the analysis on the insider's position within the company, the size of the company and the trade volume. Constructing value-weighted portfolios over a six months' horizon, they found significant positive correlations between trade volumes and the obtained profits. However, unlike Seyhun (1986), they provided evidence that the CEOs' trades determined smaller market reactions and explained them on the basis of a more intense scrutiny over their trades by both the market and the regulators and authorities. Also, Fidrmuc et al. (2006) showed that insiders traded more efficiently by timing their transactions. They pointed out that sales often followed a share price increase by approximately 3% the previous month, while purchases followed a share price decrease by approximately 1.27% the previous month.

While there is a great amount of focus on insider trades and the subsequent market reactions, this study is among the few which targets an emergent ex-communist country like Romania and investigates the management transactions of the existing listed companies, offering insights on the behavior of these investors. Moreover, we contribute to the corporate insiders' literature by analyzing the potential possession of private information through the returns of their transactions, bearing in mind that the company's directors, managers and officers participate in daily operations and management of the firm. Thus, they make their investment decisions either by skilled analysis on already publicly available information, or they are more likely to have privileged access to information not yet disclosed.

3 Methodology

This chapter investigates the effect of management insider transactions on the stock price behavior of listed companies on the Romanian capital market. We employ a standard event study approach to test for the existence of abnormal returns generated by these insider trades prior and after the transaction's disclosure. In terms of methodology, we follow the approach of MacKinlay (1997), Campbell et al. (1997), and Aussenegg et al. (2018).

We analyze the evolution of the stock price over a window of 20 trading days before the transaction's disclosure to provide some insight on the possession of superior information by insiders and their timing capabilities. Also, we look for the market reaction to these trades by studying a window of 20 trading days after the transaction's disclosure, to see if there is a rapid price reaction and if it is possible to assume a certain level of market efficiency. We estimate the model parameters using an estimation window of 120 trading days before the event window, following Campbell et al. (1997). For the local market return, we use as proxy the BET-XT index, a relevant benchmark that incorporates the 25 most liquid stocks traded within the Bucharest Stock Exchange.

We first calculate the daily stock returns and market index returns. The daily return for stock i is computed as follows:

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

where

- $R_{i,t}$ is the return of stock i on day t .
- $P_{i,t}$ is the closing price of stock i on day t .
- $P_{i,t-1}$ is the closing price of stock i on day $t-1$.

We calculate the expected returns and estimate the beta coefficients using the market model and OLS regressions for the 120 days' estimation window:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (2)$$

where

- $R_{i,t}$ is the return of stock i on day t .
- α_i is the model's constant, the excess return above the usual performance of the market.
- β_i is the stock's volatility relative to the market return.
- $R_{m,t}$ is the return of the market on day t .
- $\varepsilon_{i,t}$ is the model's error term.

We estimate using the market model, the abnormal returns, afterward determining the average abnormal returns, the cumulative abnormal returns, and the cumulative average abnormal returns.

The abnormal returns are generated as:

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t}) \quad (3)$$

where

- $AR_{i,t}$ is the abnormal return of stock i on day t .
- $R_{i,t}$ is the stock's i realized return on day t .
- $R_{m,t}$ is the return of the market on day t .
- α_i and β_i are the market model's parameters.

The average abnormal returns of the sample are computed as simple daily averages of the abnormal returns previously calculated for the entire event window ($-20; +20$).

The cumulative abnormal returns are calculated as the sum of all abnormal returns for each stock, following the equation below:

$$CAR_{i,(t_1;t_2)} = \sum_{t=t_1}^{t_2} AR_{i,t} \quad (4)$$

where

$CAR_{i,(t_1;t_2)}$ is the cumulative abnormal return over the event window $(t_1; t_2)$.
 $(t_1; t_2)$ is the event window $(-20; 20)$.
 $AR_{i,t}$ is the abnormal return of stock i on day t .

Last but not least, the average stock market response to the insiders' trades disclosure is represented through the cumulative average abnormal returns, which are calculated as:

$$CAAR_{i,(t_1;t_2)} = \frac{1}{n} \sum_{j=1}^n CAR_{i,(t_1;t_2)} \quad (5)$$

where

$CAAR_{i,(t_1;t_2)}$ is the cumulative average abnormal return over the event window $(t_1; t_2)$.
 $CAR_{i,(t_1;t_2)}$ is the cumulative abnormal return of stock i over the event window $(t_1; t_2)$.

Finally, to test the significance of the cumulative abnormal returns, we implement four different significance tests:

- a. The cross-section t -test (as per Brown and Warner (1980));
- b. The standardized cross-section t -test (as per Boehmer et al. (1991));
- c. The Corrado rank test (as per Corrado (1989));
- d. The Generalized sign test (as per Cowan (1992)).

4 Data Sample

We constructed the data sample by collecting all insider transactions reported to the Bucharest Stock Exchange (BSE) over a 3-years' time horizon, from January 2017 until December 2019. Every transaction incorporates information about the insider who instructed the trade (name and the type of connection established with the company), the gender of the insider in the individuals' case, the type of transaction (acquisition or sale) and the stock involved, the volume and the price of the transaction, as well as the date in which it was booked.

BSE defines as insider "any person that holds a leadership position (such as administrative, management and control bodies) within a listed company as well as those with whom he/she has a close relationship to (spouse, children, relatives etc.) or with whom he/she acts in concert" (Bucharest Stock Exchange, 2020). The focus

Table 1 Transaction frequency—by insider position

Insider position	Frequency	Percent
Purchases		
CEO (*including executive chairman)	63	32.99%
Executive directors (*excluding CEO)	66	34.55%
Non-executive chairman	22	11.52%
Non-executive directors (*excluding non-executive chairman)	40	20.94%
Total	191	100%
Sales		
CEO (*including executive chairman)	85	31.48%
Executive directors (*excluding CEO)	90	33.33%
Non-executive chairman	11	4.08%
Non-executive directors (*excluding non-executive chairman)	84	31.11%
Total	270	100%

Source: Own computation

of this study is particularly on the individuals' insider transactions, especially on the management ones, assuming they have access to more valuable information, most of them participating in the operational aspect of the business.

Between January 2017 and December 2019, 1114 transactions instructed by individuals were reported, out of which 912 transactions were booked by people with a direct link to the company like shareholders, management or other insiders. The remainder were instructed by individuals who have a close relationship with a person discharging managerial responsibilities in the company, spouses, children or relatives, or close relationship with one of the main shareholders.

We considered as shareholders the direct or indirect shareholders and beneficial owners who own a certain percentage of shares in a specific company, but are not in management. We defined the management to be composed of directors, committees, officers, presidents or vice-presidents and affiliates. Lastly, the others' group is represented by the remaining insiders such as employees, controllers and former officers.

In terms of sources used for the data gathering process, all transactions were manually collected for the analyzed time horizon from BSE, while for determining the position within the company and classifying the insiders in the three categories described above, we used the Thomson Reuters Database. In addition, with respect to the stock prices for all listed companies that are subject in our data sample, as well as for the local index levels, we collected the data for the analyzed time period of 2017–2019 from the Thomson Reuters Database.

As the study's focus is on management insider transactions, we classified the management into four groups as follows: CEO (including here also the chairman if he or she is also CEO), Executive directors, Non-executive chairman (the chairman of the board who is not an executive director), and Non-executive directors (board members who do not have executive responsibilities, independent board members).

Table 2 General statistics—value of insider trades

Variables	Observations	Mean	Std. deviation	Min.	Median	Max.
Purchases (*191 trades—with a total of 41,221,760 shares traded)						
Number of shares traded	191	215,820.73	1,171,954.23	7	3500	14,590,858
Value (in RON)	191	92,580.41	334,473.56	2.7	9740	3,939,531.66
Sales (*270 trades—with a total of 89,711,496 shares traded)						
Number of shares traded	270	332,264.8	1,298,879.17	5	30,000	13,385,302
Value (in RON)	270	426,361.15	1,524,676.47	1.86	27,141.1	18,699,779.6

Source: Own computation

Table 1 reports some descriptive statistics related to the transactions instructed by each insider.

Out of the total number of management trades within the time period 2017–2019, statistics indicate that sales occurred more frequently than purchases: 41% purchases (191 transactions), whereas approx. 59% sales transactions (270 transactions). The executive directors are the ones who instructed most of the insider trades, both purchases and sales, followed up closely by the CEOs. With respect to the transactions booked by the chairman of the board, they are not found to trade actively. For the analyzed time frame, there were found only 22 purchases, respectively 11 sales trades. Furthermore, in terms of volume of shares and value of the transactions, Table 2 reports some general statistics.

For the analyzed time period, the sales deals exceed by far the purchases instructed by management with respect to the number of transactions, but also the total number of shares and the trading volume. While the average purchase trade is 92,600 RON, the average sale trade is more than 4 times higher, approx. 426,360 RON. Moreover, the maximum amount per transaction is 18.7 million RON when looking at the sales trades, whereas only 3.94 million RON on the purchases side.

Out of the 42 listed companies' shares traded by the management, there was sufficient data, in terms of closing prices for the analyzed time period, only for 23 companies. Therefore, we employed the methodology described above on these ones.

5 Results

Tables 3 and 4 present the results of the study in terms of cumulative average abnormal returns during the event window of 41 days (20 days prior to the management transaction's disclosure, respectively 20 days after the event date). However, we wanted to see if the abnormal returns trend persists as well after the 40 days

Table 3 CAARs before the disclosure date of the management transactions

	CAR (-20; -1)	
	Purchases	Sales
CEO	7.64%*	2.72%
Executive directors	-1.85%	0.65%
Non-executive chairman	2.23%	-1.56%
Non-executive directors	-9.48%*	6.24%**

Note: *, **, *** represent the statistical significance at the 10%, 5%, and 1% levels of confidence

Source: Own computation

following the trade's disclosure. Therefore, we have also computed the cumulative average abnormal returns for the 40 days following the event window as well. CAARs are reported for insider purchases and sales of the stocks for the event windows (-20; -1), (0; 2), (0; 5), (0; 10), (0; 20), and (0; 40).

The obtained results point to the fact that management earns abnormal returns when they trade their own firm's share as insiders. This is in line with other studies (Jaffe, 1974; Seyhun, 1986; Rozeff & Zaman, 1988; Lakonishok & Lee, 2001; Ravina & Sapienza, 2010; Aussenegg et al., 2018; Berkman et al., 2020; Armstrong et al., 2020). We show that some management transactions are informative, with purchases leading to stronger reactions from the market in comparison with the sales trades. The effect of the sales transactions that occur after the disclosure date of the management trades is softened, one of the main causes being the liquidity needs or the diversification reasons that are behind these operations (Lakonishok & Lee, 2001; Fidrmuc et al., 2006).

In terms of CEO purchases, the (-20; -1), (0; 20) and (0; 40) event windows report significant cumulative average abnormal returns from a statistical point of view. Moreover, the CEO cumulative average abnormal returns are higher in comparison with the other analyzed insiders, as initially specified by Seyhun (1986). The results indicate a positive CAAR of 7.64% in the 20 days prior to the event date, confirming our initial hypotheses, that they have access to more valuable information than the other insiders, using it when trading. Also, they register significant CAARs of 9.05% in the 20 days following their trade's disclosure, respectively 14.01% in the 40 days following the transaction disclosure. Same results were obtained by Armstrong et al. (2020), who also reported an increase in the average abnormal returns earned by CEOs through their purchases, after it is incorporated the indirect benefit of the prolonged tenure. However, we can tell nothing from their sales transactions, as no event window is found to be statistically significant.

The CAARs obtained by the executive directors are significant for the 5, 10, and 20 days following the event date, however, proved to be negative with respect to their purchases. This may imply that they could time their transactions in the sense that they could buy their company's shares lower in the future to strengthen their position within the company. We found no significant CAAR for their sale trades.

Table 4 CAARs after the disclosure date of the management transactions

	CAAR (0; 2)		CAAR (0; 5)		CAAR (0; 10)		CAAR (0; 20)		CAAR (0; 40)	
	Purchases	Sales	Purchases	Sales	Purchases	Sales	Purchases	Sales	Purchases	Sales
CEO	-2.39%	-0.37%	-7.56%	-0.18%	1.36%	-0.37%	9.05%***	0.33%	14.01%***	1.86%
Executive directors	-0.89%	0.27%	-2.51%*	-0.23%	-4.71%**	-0.04%	-4.9%*	-0.96%	-4.37%	-4.16%
Non-executive chairman	-1.56%	1.23%*	-1.22%	0.6%	-3.23%*	1.3%	-2.99%	1.22%**	2.89%	0.91%
Non-executive directors	-0.8%	0.69%**	3.39%	0.71%	1.13%	2.21%	-5.46%	1.91%*	-8.91%	3.19%

Note: *, **, *** represent the statistical significance at the 10%, 5%, and 1% levels of confidence
 Source: Own computation

However, a positive reaction is generated by the non-executive chairmen and non-executive directors sale transactions, significant CAARs being obtained for the (0; 2) and (0; 20) time horizons (significant positive CAARs of 1.23% and 0.69% in the 2 days following the event date, respectively 1.22% and 1.91% in the 20 days following the event date). Moreover, the Romanian non-executive directors instruct their sales trades after periods of high abnormal returns. This can be seen through the significant and positive CAAR of 6.24% in the 20 days prior to the event day. Same results were also obtained by Aussenegg et al. (2018). Lastly, for the non-executive chairmen, purchase trades' CAARs are found to be statistically significant only for the 10 days following the transaction disclosure, but registering a negative value of -3.23% .

6 Conclusions

We analyzed the stock price behavior around the insiders' transactions disclosure date. We focused on the individual investors, the ones who are in the company's management, assuming there is an increased level of information asymmetry between them and the outsiders. We determined the abnormal returns for a 41 days' event window by employing an event study approach. When estimating the results, we also extended the event window with 20 more days following the event date, to see if the abnormal returns' trend persisted. Our results showed significant cumulative average abnormal returns with respect to CEOs purchases before and after the transaction disclosure. They registered a 7.64% CAAR in the 20 days prior to the trade disclosure, respectively 9.05% and 14.01% in the 20 and 40 days after the event date. The findings are in line with the previous research, supporting the hypothesis of access to more valuable information, being involved in the operational part of the business. Moreover, the market is more attentive to their transactions in comparison with their counterparts in management and their insider purchases led to stronger market reactions.

This chapter provides an overview on management transactions with respect to their own companies in an emergent ex-communist market and their correspondent behavior, supporting the informativeness of these trades.

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Part VII
Eurasian Economic Perspectives:
Economics of Innovation

The Rebound Effect in Industry 4.0: Circumstances and Consequences



Giani Gradinaru, Gheorghe Zaman, and Iulia Neagoe

Abstract The chapter aims to present the consequences of using technology in inappropriate ways and to provide an overview of rational consumption. The motivation comes from understanding the phenomenon of rebound effect and from the desire to highlight the potential of technology when used carefully. Following the analysis of the literature, we present a concept that appeared in 1865, the one referring to the rebound effect, in a new economic-social context, the one generated by the appearance and development of industry 4.0. The chapter offers a paradigm shift in approaching the rebound effect, moving from the sphere of coal consumption to new types of fuels, much more efficient but which, precisely for this reason, can cause a much stronger rebound than the one recorded so far. Sustainable economic development facilitates the substitution of energy sources used in production processes. From the perspectives of diminishing the rebound effect as well as from the one of substituting the energy sources, in the last part of the chapter solutions are identified from the perspective of rebound effect versus global warming.

Keywords Rebound effect · Industry 4.0 · Improving efficiency

1 Introduction

We are now part of a world surrounded by innovation. From the first spark of fire, people tended to develop, learn, and create a better life. Over time, there have been several industrial revolutions that have changed the way mankind understood comfort and well-being. If in the past, simple artificial light was a luxury, today we can say that we have reached the economic and social level where dreams are not a barrier (Alcacer & Cruz-Machado, 2019). No one could have thought in the past that

G. Gradinaru (✉) · G. Zaman · I. Neagoe

The Bucharest University of Economic Studies, Institute of National Economy – Romanian Academy, Bucharest, Romania

e-mail: giani.gradinaru@csie.ase.ro; gheorghezaman@ien.ro; iuliaeneagoe@gmail.ro

in less than a moment, all the information would be a click away. At present, it is not enough to have the information, but it is crucial to understand it and use it for the good of all. It is important for everyone to know the advantages and disadvantages of technology, so that the benefits do not backfire on each of us (Rajput & Singh, 2020). Currently, we are facing a rapid evolution of technology and a significant depletion of natural resources, which forces us to take action in this regard (Buchi et al., 2020).

The chapter presents a concept that appeared in 1865 (Jevons, 1865), the one referring to the rebound effect, in a new economic-social context, generated by the appearance and development of industry 4.0. The chapter offers a paradigm shift in approaching the rebound effect, moving from the sphere of coal consumption to new types of fuels, much more efficient but which, precisely for this reason, can cause a much stronger rebound than the one recorded so far. Sustainable economic development facilitates the substitution of energy sources used in production processes (Fatimah et al., 2020). From the perspectives of diminishing the rebound effect as well as from the one of substituting the energy sources, in the last part of the chapter solutions are identified from the perspective of rebound effect versus global warming.

In the first part of the chapter, we will analyze the way in which industry 4.0 appeared and developed. Because data collection and analysis play an extremely important role in Industry 4.0, we will continue the analysis by showing the importance of data for the rapid evolution of Industry 4.0. When we refer to industry 4.0, we also think of revolutionary methods by which to protect the environment and to make efficient the consumption from various energy sources. In this sense, the chapter aims to highlight how industry 4.0 can reduce the occurrence of rebound effect, as well as how it manifests itself at economic level. Sustainable economic development facilitates the substitution of energy sources used in production processes. From the perspectives of diminishing the rebound effect as well as from the one of substituting the energy sources, in the last part of the chapter solutions are identified from the perspective of rebound effect versus global warming.

2 The Historical, Social, Economic, and Technological Moment of the Emergence of Industry 4.0

The first industrial revolution arose when the power of water and steam was used to mechanize manufacturing (Alcacer & Cruz-Machado, 2019). The emergence of electricity, followed by conveyor belts and mass production recommended the second revolution, and the third industrial revolution was dominated by automation and the introduction of information technology in production processes (Ardito et al., 2019). When it comes to Industry 4.0, concepts such as the smart factory or “smart city” appear, assuming that the modular ecosystem of physical-cybernetic systems to monitor physical processes, to create a virtual copy of the situations encountered and make a decentralized decision (following a new situation).

By explaining the analyzed phenomenon and by bringing to light the actions at the international level to stop it, we want to rationalize individuals and encourage their information when it comes to measures taken in support of the environment. A large number of natural resource protection initiatives are supported by the authorities, while rational consumption in an age of consumerism is a step forward.

Romania is one of the countries where, although there are developed cities and counties, there are estimates for the next decade that by 2030 can lose up to 62% of jobs, because there is the possibility of adapting the economy and society to the changes caused of the fourth industrial revolution, also called industrialization 4.0.

The first meeting between Mankind and Industry 4.0 took place in Hanover, Germany, where, through a government initiative, the adoption of ITC-type technologies was prioritized. Traditional manufacturing industries are increasingly using Big Data, artificial intelligence, or Internet of Things technologies. Despite the fact that this program started at the local level, Germany has quickly become a model to follow and a leader in the use of new technologies and industrial automation when it comes to Europe. A concrete example regarding the evolution and level of robotization in Germany is the data obtained at the beginning of 2018, when there were already more than 300 generic robots allocated for every 10,000 employees. Among them, co-robots have been identified, which interact with humans in defined physical spaces, the autonomous ones as well as those that require minimal human intervention. At that time, Germany's main opponents were South Korea, which registered 631 robots for every 10,000 employees, and Singapore with 488 robots. At the beginning of 2018, the global average was 74 robots for every 10,000 employees. If we refer to Romania, it was much below average, counting only 15 robots, which belonged mostly to foreign companies that carry out their production here (International Federation of Robotics, 2018).

Most of the merits of Industry 4.0 belong to interconnected systems, less visible than robots of various sizes. We are currently witnessing how a factory can become a unitary entity, controlled through digital interfaces, where supply and logistics are automatically controlled and in which traditional engineers are no longer relevant, but IT specialists. The transition between the last two industrial periods has been rapid and facilitated by technological developments, but at the same time much more expensive (Carayannis et al., 2021). The moment when it was wanted to robotize most of the production lines coincided with an economically favorable period. In recent years, the prices of robots used in industries have fallen by 30–40%, Chinese labor market prices have risen by 150%, and Germany has reportedly had the opportunity to bring in some of China's production lines.

Making a comparison between Romania and China, we can see that here too there have been increases in the minimum wage, forced by government decisions, without a program to encourage industrial automation and digitization, and the operating cost of a co-robot approximates the cost of an employee when it comes to hourly pay. This is one of the biggest fears of employees today. Undoubtedly, the possible imbalances will be overcome by redistributing jobs, as demonstrated by the latest industrial revolutions.

3 The Importance of Data for the Rapid Evolution of Industry 4.0

For the rapid evolution of Industry 4.0, data collection and analysis play an extremely important role (Gadaleta et al., 2021). Through modernization, we can generate and interpret a very large volume of data that plays an essential role both for building the future and for understanding the past. The condition of current machines and people can be assessed and behavioral typologies can be intuited.

Data that can be analyzed from several points of view and with the help of several scenarios will play an important role in managerial decisions and in building strategies. Artificial intelligence and machine learning algorithms will make their place in every economic branch, within each visionary company with a desire to develop. The recommendation for a successful future comes down to training staff when it comes to using new technologies and understanding data. There are already several operating systems dedicated to factories that collect and interpret all information, both from the environment and from inside mechanical and electronic equipment, in order to create a complete digital experience. In the near future, systems like Mindsphere will enjoy the success that Oracle and SAP enjoy.

Every customer wants a quality product at a convenient price and to be obtained in the shortest possible time, but it is complicated to get such a product. Industry 4.0 aims to solve all the mentioned issues, as it is about precision, speed, and dexterity.

When we talk about benefits, we mention improving efficiency, increasing productivity, gaining flexibility, and agility in terms of production, reducing costs, and a better customer experience. These could be final arguments for investors and traders in the market, even if there are disadvantages both for the company and among the employees. Automation is an advantage in the case of standardized products, while there are also traders who want to provide products that are as creative and original as possible. The number of employees will decrease considerably, which encourages the specialization of people who practiced basic activities in order to avoid the mass increase of unemployment. Legal regulations will also be amended so that new automated activities do not exceed pollution rules. The very high initial costs cannot be neglected either, because in addition to automation, in addition to mechanical robots, the appropriate systems that are part of a range of advanced technology must be implemented, while also requiring regular maintenance and specialization courses for those who use. With the advent of technology that facilitated the installation of Industry 4.0, there have been several cases in which the rebound effect has manifested itself (Enyoghasi & Badurdeen, 2021).

4 Rebound Effect and Industry 4.0

When we refer to industry 4.0, we also think of revolutionary methods by which to protect the environment and to make efficient consumption from various energy sources. Most of us believe that when we use energy-efficient systems, we slow down or reduce pollution and the effects of global warming. Since the middle of the nineteenth century, it has been proven that when we have the opportunity to consume less for the processes we normally perform, most of us consume more than before (Ghobakhloo, 2020).

Jevons (1865) mentioned the observation of coal consumption, through which it was once created. A way to extract energy from fossil fuels more efficiently, the economy has increased and so has the demand for coal. After it was enunciated, the paradox took the name of Jevons. Any of us can be confused, but fuel efficiency is nothing more than speeding up consumption, no matter what it is (Jevons, 1865).

In the Jevons paradox we talk about the use of energy services, which change as we evolve technologically. Theoretically, when we make consumption more efficient, its use should decrease, in the theoretical situation by which we will use the same energy consumers, in the same quantities. If the theoretical model were followed, then there would be many benefits in environmental protection (Wei & Liu, 2017).

The rebound effect is the event that occurs when the theory of economic efficiency is applied in real life. The lower costs of energy services and the increase in energy efficiency put their mark on the economic behavior of individuals and society. This effect represents the way in which investments for energy efficiency manage to save the use of the resource for various events, and consumers choose to practice the same type of event more often or replace it with similar, higher quality, and more costly activities. In the most aggressive forms of the rebound effect, it can be perceived as a boomerang effect, when energy savings are much lower than subsequent consumption.

5 Manifestations of the Rebound Effect

The direct effect is manifested when there is a decrease in the price of energy in the market, and consumers are tempted to consume more energy without increasing their usual costs (Gillingham, 2013). A concrete case is found in the case of hybrid cars, where the engine is designed to reduce fossil fuel consumption, but owners are attracted to the possibility of using the car for a longer period and distance at the same price. On the contrary, they often end up consuming more fuel than before, due to the advantageous price (Wang et al., 2018).

In 1996, a study was conducted at Yale University that estimated the hours of work required for a person to enjoy “artificial” light (from the ordinary fire of cavemen, to electricity for a light bulb/LED). Thus, from 40 to 50 h of rough

labor, to less than half a second, in most cases, light has become an accessible and in many cases an indispensable resource, and darkness a rarity (Nordhaus et al., 1996).

Refrigeration is a model of direct rebound, because in its early days, it offered very little storage space and low efficiency. During the evolution of technology, refrigeration spaces began to be more efficient, more accessible, and higher quality. Currently, refrigerators are among the most common electronics and owners do not care about recycling them. This simple ordinary device, present in the life of each of us, causes immense damage to the environment. From the production of refrigerators through several polluting processing operations to their storage and use, which involve the use of energy from various sources and the long-term storage of food, which we allow ourselves to store and replace. Food disposal involves large investments in agriculture.

The indirect effect occurs when the savings in a given area of consumption are invested in other appliances or activities that consume fuel and energy. When the expenses for the maintenance and use of the devices decrease, it appears the possibility to purchase other devices or experiences (holidays, various recreational activities). The effect of direct or indirect rebound refers to individual behavior, while there are also effects on society as a whole.

The rebound effect created by the decrease in the macroeconomic price is one of the situations in which there are changes in society as a whole. Lower petrol prices, for example, due to lower demand in one region, may lead to higher consumption in another region (Gillingham, 2013).

Macroeconomic growth is another factor that can set in motion the rebound effect. We take into account a growing economic efficiency, which creates an environment conducive to rapid economic development at least in the economic areas and sectors of interest. In this case, we have as an example the development of aeronautical equipment and parts, which are becoming lighter and more efficient, which increase the production and use of aviation systems and equipment (Wang & Wei, 2019).

Making a summary of the four types of rebound effects that are found in the economy, we can see that they are related to both the economic environment and the technological environment. The strongest effects are felt in developing countries, where total satisfaction is not yet reached, while in developed countries there is a relative balance and very few unmet needs.

6 Rebound Effect vs. Global Warming

It can be confusing, but fuel efficiency is nothing more than speeding up consumption, no matter what it is. In the Jevons paradox we talk about the use of energy services, which change as we evolve technologically. Theoretically, when we make consumption more efficient, its use should decrease, in the theoretical situation by which we will use the same energy consumers, in the same quantities. If the theoretical model were followed, then there would be many benefits in

environmental protection. If we had enough natural, technological, and economic resources to replace all the energy obtained from fossil fuels with renewable energy, then we should no longer limit ourselves to energy consumption or stagnation of the economy. Following the Paris Agreement, it was disputed to stabilize global temperatures by 2 degrees higher than in the pre-industrial period by the end of 2035. The plan also includes the International Energy Agency (IEA) estimate of \$ 53,000 billion to be invested in appliances energy production. Until the implementation of all systems, it is the duty of the population to reduce energy consumption, because there will be no supporters to freeze the economy. The twenty-first century is prone to economic growth in most states, because it represents prosperity, jobs, financial, and social opportunities, along with technological evolution.

Chemically, the goal of this century is to reduce the concentration of carbon dioxide (CO₂) to 450 parts per million (ppm). If we follow the specialized models, the overall intensity should decrease annually by 3 percent, given that in the period 1990–2015, the annual decrease was about 1.3 percent. In order to achieve the performance of tripling the global energy intensity decrease index, we will have to control the recoil effect.

Returning to (Jevons, 1865) in the mid-nineteenth century it was said that Britain would have either “short-term greatness” or “long-term mediocrity.” The two variants can be understood as a massive economic growth accompanied by an adequate energy consumption, or by a gradual, sustainable development, and an average energy consumption. Currently, sustainable development is desired, but technology has evolved, and the materials needed by industries are diverse and obtained from many more manipulations that involve energy consumption and pollution (Gillingham, 2013; Nordhaus et al., 1996).

In 2018, the highest values of ocean temperatures were recorded, recorded for a depth of up to 700 meters. Rainfall has increased in some regions and decreased in others. Heatwaves were the most dangerous weather events in 2015–2019, affecting all continents and resulting in new temperature rises in most countries. These were accompanied by fires that occurred mainly in Europe and North America. During the summer of 2019, record wildfires were recorded in North America that spread to both the Arctic and the rainforests of the Amazon. Tropical cyclones have been associated with the largest economic losses, with floods, landslides, and associated damage. The most costly and dangerous event was Hurricane Harvey in 2017, which resulted in an estimated economic loss of over \$ 125 billion. Climate risks start with climate variability and continue with intensifying food shortages in many areas, especially in Africa. Due to droughts, the global risk of climate disease or death has increased. Higher sea surface temperatures have endangered the lives of aquatic animals and marine ecosystems. Higher temperatures threaten to undermine development, negatively impacting gross domestic product (GDP) in developing countries (WMO, 2020).

Carbon dioxide is responsible for about 66% of the total radiant forces of GHGs (Long-Lived Greenhouse Gases—GHG) emitted since pre-industrial times, with methane—CH₄ responsible for about 17% and nitrous oxide—N₂O for 6%. The global anthropogenic carbon budget has continued to grow since 2015, due to rising

CO₂ emissions from burning fossil fuels (coal, oil, and gas) and cement production. CO₂ emissions from 2015 to 2019 are estimated to be at least 207 Gt (gigaton) CO₂, exceeding 200 Gt CO₂ emitted in the previous 5-year period, 2010–2014. CO₂ sinks are distributed in the hemispheres, on land, and in the oceans, but CO₂ flows in the tropics (30°S–30°N) are close to carbon neutral, as the sinking of carbon dioxide is largely offset by emissions. From deforestation, CO₂ sinks in the southern hemisphere are dominated by the removal of CO₂ from the oceans, while stronger diving in the northern hemisphere has similar contributions from both land and ocean (Budescu et al., 2019).

The latest analysis (WMO, 2020) shows how global average concentrations calculated for CO₂, CH₄, and N₂O have reached new highs. The growth rates of CO₂, CH₄, and N₂O in the atmosphere were on average in the period 2015–2017 for which the data are about 20% higher than in 2011–2015. Preliminary analysis shows that in 2018 the average annual concentration of CO₂ at the Mauna Loa Observatory, Hawaii, reached 408.52 ppm, and the increase from 2017 to 2018 was 1.97 ppm. Between January and August 2019, the increase in concentration was 0.85 ppm.

According to WMO (2020), the years 2015–2018 were the warmest four years in history, and 2019, he joined. Therefore, the global average temperature for the period 2015–2019 is currently estimated at 1.1 ± 0.1 °C above the pre-industrial level (1850–1900), probably the warmest of all equivalent periods recorded. It is 0.20 ± 0.08 °C warmer than the average for the period 2011–2015. Average continental temperatures usually show greater variability than the global average. Even so, the average temperatures for the period 2015–2019 are currently the warmest for each of the inhabited continents, compared to the long-term average for the period 1981–2010. The global average surface air temperature for the period 2015–2019 was about 1.7 °C above pre-industrial temperature and 0.3 °C warmer than in 2011–2015. Almost all terrestrial areas were warmer than media, with only a few exceptions. The highest temperatures were recorded for the United States, including Alaska and the eastern parts of South America, most of Europe and the Middle East, northern Eurasia, Australia, and areas of South Africa.

The average global sea surface temperature for the period 2015–2019 was about 0.8 °C above the pre-industrial period and 0.13 °C warmer than 2011–2015. Along the oceans, below average sea surface temperatures have been observed south of Greenland (one of the few areas in the world that have seen long-term cooling), the eastern Indian Ocean, an area off the coast of West Africa, some areas of the South Atlantic, the Drake Passage, and an area of the South Ocean in the Pacific sector. Other areas recorded temperatures well above average. Record heat has been recorded in several areas of the Northeast Pacific, the western North Atlantic, the western Indian Ocean, the South Atlantic, and the Tasman Sea, which has experienced a series of severe sea heat values in the last 5 years (WMO, 2020).

Rio de Janeiro hosted in 1992 the United Nations Framework Convention on Climate Change (UNFCCC). The main objective of the convention was to stabilize GHG concentrations in the atmosphere by lowering the level, in order to prevent a possible anthropogenic disturbance, harmful to the climate system. In 1995, at the Third Conference of the Parties, the Kyoto Protocol was initiated in Berlin, which is

a subsidiary legal instrument of the UNFCCC, and its negotiation was a result of the ineffectiveness of the measures provided in the 1992 Convention. Subsequently, on December 11, 1997, the Kyoto Protocol was adopted. The main features of the Protocol were represented by the 3 firm commitments to reduce GHG emissions compared to the base year (1990), for the first commitment period, 2008–2012, in industrialized countries. The Kyoto Protocol provides for six greenhouse gases: carbon dioxide—CO₂, methane—CH₄, nitrous oxide—N₂O, hydrofluorocarbons—HFC, perfluorocarbons—PFC, and sulfur hexafluoride—SF₆. On February 16, 2005, the Protocol entered into force internationally. 2008–2012 was the first commitment period, and most Member States, including Romania, agreed to an 8% reduction in GHG emissions compared to the base year 1989. In this case, Romania exceeded the target and reduced GHG emissions by more than 8 percent. The interval 2013–2020 represents the second commitment period, established by the provisions of the “Doha Amendment.” The EU is committed to reducing emissions by 20% between 2013 and 2020 compared to 1990. At the XXI Conference of the Parties (COP 21), in 2015, attended by 195 states, the Paris Agreement, part of the UNFCCC Convention on Climate Change, was adopted. Global action will be guided by this agreement, with the aim of limiting the increase in global average temperature. This is the first legally binding multilateral instrument in the field of climate change, in which participation has been universal since 2020. The “principle of common but differentiated responsibilities and capabilities” and the principle of equity are the basic principles of the Paris Agreement (European Commission, 2018).

According to (WMO, 2020), in the period 2015–2019 there was a continuous increase in carbon dioxide emissions—CO₂ and an accelerated increase, by almost 20% higher, of the atmospheric concentration of the main greenhouse gases—GES. Increasing ocean CO₂ levels have increased ocean acidity.

Specialists have concluded that the period 2015–2019 is probably the warmest than any equivalent period recorded globally, recording an increase in global temperature of 1.1 °C compared to the pre-industrial period and an increase of 0.2 °C compared to the previous period of 5 years.

Continued and accelerated trends have affected key climate indicators, including rising sea levels, the continuing decline in Arctic sea ice, the sharp drop in Antarctic sea ice, the continuing loss of ice mass in Greenland glaciers, and the clearing of Antarctic ice snow cover in the northern hemisphere.

We note that the United States has had an average annual economic growth of 3.3% over the postwar period, and China has grown by 9.3% annually since 1989. Comparing these increases of the main economic powers with the decrease of the energy intensity, which in the last century was a little over 1%, the need for a global mobilization is strictly necessary to succeed in mastering the recoil effect.

7 Conclusions

Economic growth is a desirable phenomenon among the political leaders of each state, but it brings with it the consequences of the rebound effect. At the same time, with the application of environmental measures, in order to reduce greenhouse gas emissions, innovative systems are being developed, less polluting, but with greater success in the market. Current climate policies contain several main ideas designed to stop the emission of carbon dioxide and methane in the first phase.

The strategies are divided into two approaches. On one hand, there is talk of increasing the volume of renewable energy and reducing the use and production of fossil fuels, and on the other hand, there is a decrease in energy consumption in general.

The energy consumption equation can be expressed according to two factors when it comes to the second strategy, it follows the size of the economy, expressed in GDP and the energy intensity required for each unit of GDP. In this equation, if the growth rate of the economy is higher than the rate at which the energy intensity decreases, the final energy consumption will be higher than before the increase of energy efficiency. In the last economic century, the evolution of technology and the decrease of energy intensity have led to a continuously sustained economic growth and to a higher energy consumption than ever before.

In order to reduce total energy consumption, energy intensity should decrease at a rate higher than the rate of economic growth. This result could be achieved if we reduce global energy intensity or if we reduce global economic growth.

Regarding global warming, a solution could be to include a tax on energy consumption above a certain threshold as well as on carbon emissions, even if they are not as popular in terms of population. Also, the promotion of electricity-saving solutions in households is an attractive fact for both ordinary users and people interested in environmental issues.

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Model for Development of Innovative ICT Products at High-Growth Potential Startups



Didzis Rutitis and Tatjana Volkova

Abstract Product development teams at ICT companies are using various innovation tools (e.g., Business Model Canvas, Lean Startup) and management methodologies (e.g., Lean Startup, Kaizen). The aim of this chapter is to align selection of innovation tools with company growth in subsequent stages of product development before and during commercialization stage. This chapter introduces a conceptual framework to be applied for creation of new ICT products by technology startups. This model describes the ICT product development path and availability of methods taking into account the product development stages. The choice of the tools and methods for development of innovative ICT products is found to be also correlated with the product IRL (innovation readiness level), choice of the growth financing (self-financing vs. venture money), and internal environment factors. The main findings of the research related to the validation of the proposed model for ICT product development by a number of emerging university spin-offs. The novelty of the research is related to introduction of relationship between currently available product development (innovation) tools and managerial processes, and the product development cycle.

Keywords ICT · Startups · Innovation · Product development

1 Introduction

Traditional ICT enterprises have been around for a while since the early 1950s when the third industrial revolution introduced personal computing and the Internet, thus highlighting the beginning of the digital revolution (Taalbi, 2019). The concept of a startup in a form of an organization established to search for a repeatable and scalable business model (Blank, 2010) has emerged as a commonly recognized

D. Rutitis (✉) · T. Volkova
BA School of Business and Finance, Riga, Latvia
e-mail: didzis.rutitis@ba.lv; tatjana.volkova@ba.lv

form of new ICT product development not only in Latvia, but also globally a bit later in the late-1990s during the so-called dot-com bubble when many Internet companies were founded (Goodnight & Green, 2010). Since then, startups are often considered to be only tech companies. However, as technology is more of a basic prerequisite and natural element of any startup, the essence of startups has more to do with innovativeness, scalability, and growth. In this context, a tech startup can be defined as a company that focuses on technological products and services introduction to market. Such enterprises are likely to deliver new solutions or re-introduce existing products or services of technological nature in a disruptive way (Spender et al., 2017).

ICT product development is crucial for the entire Latvian economy. According to data from the Central Statistics Bureau of Latvia (2020), ICT sector contributed 4.3% of Latvian GDP and it was the fastest growing sector of Latvian economy (+13% vs. 2017). Services activities that include new product and technology development within ICT sector have contributed nearly 2.2 Billion EUR or 56.5% from the total turnover (3.85 Billion EUR) of ICT sector in Latvia in 2018 and the services segment grew faster (+18% vs. 2017) than the entire ICT sector taken together. At the beginning of 2019, there were 418 identifiable startups registered in Latvia (of which, 346 were less than 5 years old, and 72–5 or more years old), while number of ICT companies totaled 6890. Of these 418 startups, 80% or 334 were identified as related to technology segments and niches (software-as-a-service, mobility, aggrotech, EdTech, HealthTech, etc.), while 20% or 84 as other (Gateway Partners, 2019). Thus, technology startups formed 4.8% of total number of ICT companies in Latvia.

The importance of ICT sector in the context of technology startups has been also highlighted by signing of a memorandum on enhancing cooperation in the development of startup ecosystems and public awareness about startup activities by the Ministry of Economics, Latvian Startup Association Startin.lv, the Latvian Association of Private Equity and Venture Capital and the Latvian Business Angels Network in October 2019 (Ministry of Economics of Republic of Latvia, 2019). From the government perspective, startups develop innovations, promote investment attraction, promote the transition of the Latvian economy to a modern, and innovative economy, the formation of new business models and the development of talent, as well as strengthen the venture capital industry. The ecosystem of startups is growing, and the sector's contribution to the economy is also growing rapidly: startups create high value-added products and services, create new, well-paid jobs, and attract skilled labor. Therefore, it is highly important to identify success factors and correlations that may facilitate creation and commercialization of new products with high added value in ICT sector.

Taking into account the growing importance of ICT sector and technology startups, the aim of this chapter is to introduce a conceptual model for development of innovative ICT products at high-growth potential startups. The proposed concept could be used not only as a framework to be evaluated from the theoretical perspective, but also as an input for developing an applicable roadmap to amplify actual performance of business performance of ICT startups in Latvia (and also abroad).

Thus, application of the framework aims to facilitate the startup growth and achieve better business results through commercialization of new and innovative ICT products with high added value. This contributes a practical value for practitioners as well as academic researchers.

The chapter is structured by first introducing a review of innovation concept and existing product development frameworks. Next, a conceptual model for development of new ICT products and services is introduced followed by description of its validation. The chapter is concluded with a summary of conclusions from the performed research.

2 Toward New Framework for Product Development

Analysis of ICT product development requires a short review of both, the innovation concept and evolution of product development frameworks, thus, introducing the theoretical background contributing to the new framework or model for new and innovative ICT product development.

2.1 Innovation

According to Oslo Manual 2018 (OECD, 2019), innovation is a new or improved product or process (or a combination thereof), which is radically different from the previous versions of products or processes. Within the scope of this research, new product development relates to one of the two types of innovations. The first one is a product innovation. This kind of innovation is a new or improved good or service that differs significantly from the firm's previous goods or services and that have been introduced on the market.

In the context of innovative product development, authors also distinguish between concepts of innovation and invention by using Schumpeterian trilogy that brings together three stages: invention, innovation process, and diffusion. According to this theory, the first stage (the invention) is a creative response or entrepreneurial stage where new ideas are generated. The second stage (the innovation process phase) is where novel concepts are used to develop or transform new products or processes. The final stage (diffusion phase) is focused on the market penetration and acquisition of the potential market of these novel products (Schumpeter, 1947). Adam and Cornescu (2019) also emphasize that from consumer's perspective "innovation" means a product or service perceived as new or significantly improved, while the producer should be aware that an innovation is a combination of idea, implementation, and also a commercialization. Therefore, ICT startups should pay attention not only to perfecting pitch decks and formulation of their unique selling propositions on paper, but also development of credible commercialization process

roadmaps where the conceptual model proposed by authors could contribute to more successful implementation of the commercialization stage.

In addition, in the early 2000s it became rather clear that internal processes are not sufficient for innovation creation. Chesbrough (2003) introduced the approach of open innovation, which implies that in order for any business to succeed, internal and external ideas should be combined, together with different channels to market to facilitate the appearance and creation of novel technologies. Chesbrough has concluded that a paradigm shift happens in ways of knowledge commercialization and transfer by enterprises. This results in the altering of borders of an enterprise. Such a phenomenon has been characterized as a shift in the direction of the concept of open innovation. It is defined as a paradigm that is perceived as the opposite of the classical model of innovation where R&D initiatives result into internally developed products that are consequently distributed by the enterprise (Chesbrough, 2006).

2.2 *New Product Development*

One of the most widely used frameworks for ICT product development is a BAH model, named after inventors, that introduces stages of new product development. It was developed by Booz and Hamilton (1982) and follows the sequence of phases of innovation creation proposed by Schumpeter.

According to BAH model (Booz & Hamilton, 1982), its consequent top-down stages are as follows:

1. **New Product Strategy**—It links the ICT product development process to the company objectives. Strategy enables focus for the idea or concept generation and guidelines to establish evaluation criteria.
2. **Idea generation**—During this stage a search for product ideas that match enterprise goals objectives takes place.
3. **Screening**—This stage includes initial analysis to select ideas that are worthwhile and should be examined further in greater detail.
4. **Business Analysis**—During this stage evaluation of the ideas on the basis of quantitative factors takes place.
5. **Development**—During this stage the aim is to turn an idea into an actual product that could serve as demo or prototype and would be possible to produce.
6. **Testing**—This stage is aimed to carry out experiments that are required for validation of previously carried out business assumptions.
7. **Commercialization**—During this stage a product is launched.

BAH model has been the first framework particularly tailored for ICT product development where testing phase referred to implementation of commercial experiments that have been introduced in order to validate and verify the assumptions behind the business model and proposed product innovations. From one side BAH is a traditional Waterfall-type process (Royce, 1970) that requires upfront planning, but due to presence of testing stage it is also to some extent aligned with the Kaizen

philosophy and the idea of continuous improvement, improving all functions and involving all employees from the CEO to the assembly workers, which comes from Japan and industrial manufacturing processes and was first formalized by Imai (1986). However, at some point software development practitioners realized that this approach is not flexible. The main objection was related to the number of possible iterations. Also, the customer (also internal) would need to wait for months before seeing an actual product. In reality, such a long delay may result in situation when the end result may not be in line anymore with the needs of the respective enterprise (Savarit, 2020).

Responding to changing environment, Agile manifesto (2001) was created by a group of software developers. The new manifesto implied a new kind of philosophy and new working principles putting the highest priority on satisfaction of the customer by delivering software early and continuously, by welcoming altering requirements, which could appear in different stages of development. Agile processes implied the connection between the change and the competitive advantage of enterprise and were quite opposite of the Waterfall approach. The values behind the philosophy were formulated in the following way (Agile Manifesto, 2001):

- Individuals and interactions are more important than processes and tools.
- Working software is more important than overwhelming documentation.
- Customer collaboration is more important than strict discussion over agreement terms.
- Responding to change is more important than sticking to a plan.

It is suggested (Kassab et al., 2018) to prefer Agile to Waterfall method in the following cases:

- The final product is not clearly defined yet.
- In case there is a request by end users for changes, there should be provided the possibility to alter the scope of the project.
- One anticipates changes to take place throughout the project.
- Prompt deployment is the target.

Scrum is regarded as a subset of Agile. It is considered to be one of the most popular process frameworks for implementing Agile. It is an iterative software development model, which is applied for managing complex software and product development, created in 1993 and based on the initial model developed by Takeuchi and Nonaka (1986) for manufacturing purposes. The concept named Scrum is considered to be the integral axis of any system that pretends to be Lean. However, this term is never used as such because it has turned into synonymous with an external interpretation of the Toyota Production System (Verheyen, 2014).

The Lean and Agile philosophy reflect assumptions behind initial conceptual framework of Lean Startup developed by Ries (2008). Lean Startup is powered by three drivers, two of which (the second and the 3rd) have become a part of a major trend and characteristic for high growth startups nowadays since then:

- The first assumes use of platforms that have been enabled by free and open-source software.
- The second relates to the use of agile development approaches, which minimize waste and foster creativity in development of new solutions.
- The third is the rapid iteration focused on customers, as it is shown by the customer development process.

Ries (2011) developed Lean Startup as a scientific approach—a three-step iterative approach in the context of new startup creation and business model validation for new products until the product/market fit is achieved. The first step is to find out the problem that needs to be solved. It is followed by development of a minimum viable product (MVP). Once the MVP is established, a startup should focus on adjusting the motor. This process covers measuring progress and must include actionable metrics that can reflect interrelated factors (Ries, 2011). An integral part of Lean Startup methodology is the three-step iterative feedback loop that includes building, measuring, and learning steps.

According to Ries (2020), a lot of startup companies start with concept for a product that they think people want. It is likely that these startups spend months and even years polishing the product instead of introducing the product even in a very rough prototype form to the prospective customers. When startups fail to receive demand from prospective customers, it is often because they have never approached them to find out if the product is sufficiently appealing. The startup basically fails at the moment when customers communicate through their (lack of) choice that they actually do not care at all about the proposed product. After introduction of Lean Startup numerous approaches have been developed by other authors by modification of the original concept. For instance, the model of spiral development for project teams and businesses (Milutinović et al., 2018) suggests implementing interaction with the customers through a series of iterative steps or loops. These steps are implemented as successive versions of the product, which are introduced to the customer to obtain feedback and validation for new product development.

Another approach has been put forward by the market analytics company Gartner, which suggests that every organization must learn and experiment to develop digital products, services, and new ways of working. According to Gartner (2016), a new combo of iterative and experimental methodologies is needed to support innovative activities in the field of ICT sector. It is suggested to use principles behind Design Thinking theory to analyze the customer and discover the real needs on customer's behalf. Afterward, the innovation should be developed using Lean Startup approach. Finally, Agile is to be applied to build and expand the technology elements of the innovative solution.

In terms of systematic approach toward innovation creation Blank (2018) introduced Innovation pipeline concept suggesting that first, the top management needs to communicate clearly support to innovation culture by adjusting processes and procedures within the company. Next, it is important to get company leaders and departments or structure teams to consider the innovation process from end to end. In practice, that means to create a visualization of the entire flow of the process from the

very step indicating the source—how and from where a concept is created—along the path to utilization, which shows how innovation becomes utilized by end users. The model consists of the following stages of pipeline (Blank, 2018):

1. The first is the innovation sourcing. During this stage over several days, a team creates a number of items that might be worth investing in—problems, ideas, and technologies.
2. The next stage is the curation. Innovators need to get out of their own offices and talk to internal and external customers and stakeholders for several days.
3. Afterward, the newly created list should be prioritized. A common choice is to apply McKinsey Three Horizons Model. It is used to categorize ideas into three groups. Ideas that belong to Horizon 1 category are those that complement continuous innovation to the core capabilities and existing business model of the enterprise. Next, ideas that belong to Horizon 2 ideas center on expansion of current business model and core capabilities of the enterprise by integrating new customer segments, new markets, and business goals. Finally, Horizon 3 ideas relate to the formation of new competencies in order to benefit from disruptive business prospects (Coley, 2009).
4. Solution exploration and hypothesis testing phase is considered among longest parts of the pipeline. It is a two-to-three months long process, which provides input for testable and data-based decisions. During this phase, innovation tools like Business Model Canvas (Osterwalder & Pigneur, 2010) can be applied to evaluate each idea.
5. After hypothesis testing comes incubation phase. Once hypothesis testing in Stage 4 is completed, part of projects will require a period of incubation. This is due to the fact that the teams leading the projects will need to obtain extra data about the specific product or area, then continue with building MVP, and finally adjust and improve teamwork.
6. The final stage of the pipeline is integration and refactoring. Here, a strategic choice is made to determine the type of innovation—it is likely to be appropriate to incorporate it into the existing enterprise Horizon 1 or 2 type innovations. However, if the innovation is Horizon 3 type, it is likely to be set up as its own entity or division within the company. It has been also clarified that any attempt to incorporate unplanned innovation project into an enterprise with line-item type budgets for both, resources and people, will most likely result in organizational chaos and frustration by employees.

Above mentioned pipeline has been initially proposed by Blank and Newell (2017), who suggested that innovation requires a rigorous process from idea creation phase, while the most energy will be required in arrangement, sorting, and collecting data, followed by testing and correction phases.

3 Conceptual Model

The authors have incorporated findings from previous research on product development trends and innovation tools (Rutitis & Volkova, 2019, 2020) together with analysis of product development frameworks and developed a conceptual model to be used for development of innovative ICT products by companies that can be described as high-growth potential (see Fig. 1). The proposed framework is based on previous studies and works by Maurya (2016) on scaling Lean, Business Model Canvas (Osterwalder & Pigneur, 2010), Lean Startup methodology (Ries, 2011), and numerous concepts related to Lean Startup concept (Blank, 2010, 2013, 2018). The set of innovation tools has been identified during previous research summarized in a recent paper by Rutitis and Volkova (2020).

The proposed model for ICT product development at high growth startups describes the ICT product development path along four different stages from problem discovery until management of business processes and availability of set of 8 innovation tools (see Table 1) that can be applied for idea and innovation scouting to facilitate achievement of next product development stage.

The model has been developed using the following principles. First, the principle of open innovation by Chesbrough (2003) is applied—this implies combining internal and external environments to facilitate innovation creation within the company. Authors suggest adding the dimension of supportive methods for idea and innovations scouting to facilitate more rapid movement from left to right and achievement of next product development stage faster than without external support.

Next, the time dimension is taken into account, allocating a specific time span to complete each stage and achieve. While Blank (2018) attempted to assign a specific length for each part in his Innovation pipeline, our model implies rather flexible time

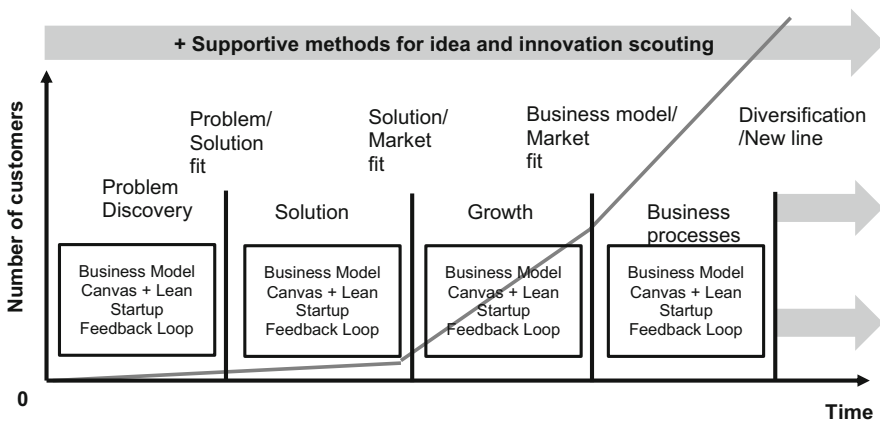


Fig. 1 Conceptual model for development of innovative ICT products at startups Source: Developed by authors, based on Ries (2011), Blank (2010), Maurya (2016), Osterwalder and Pigneur (2010)

Table 1 Set of available innovation tools

Innovation tool
1. Idea banks.
2. Design thinking.
3. Internal and external hackathons (innovation sprints).
4. Direct investment into other companies.
5. Own incubator, accelerator.
6. Partnership with external accelerator (Startup Wise Guys).
7. Partnerships with academia.
8. Corporate venture fund.

Source: Developed by authors, based on Rutitis and Volkova (2019, 2020)

frame for achievement of each milestone. Certainly, the availability of free financing leaves impact on the speed of its implementation.

Finally, during each stage a company has to validate its business model developed using Business Model Canvas (Osterwalder & Pigneur, 2010) or alternatively Lean Startup Canvas by Maurya (2016). Thus, the iterative approach by Ries (2011) for feedback collection is applied throughout the entire process of product development funnel within each stage from the idea creation to diversification of established business since the key to success lies in repetitive validation of assumptions with customers. In the beginning, the validation of problem/solution fit can be considered as satisfactory with a weak correlation, while for growth phase and product/market fit it is essential to achieve a strong correlation (Maurya, 2016).

The choice of the tools and methods for development of innovative ICT products has been found also to be dependent on the product Innovation Readiness Level (IRL), which reflects the stage of product development on a scale developed by Blank (2013), is based on the Technology Readiness Levels (TRL) scale introduced by NASA (2012).

Each stage of the product development within the conceptual model proposed by the authors is associated with a particular milestone to be achieved and suitability of different innovation tools outlined in Table 1:

- Stage 1—Problem discovery with Problem/Solution fit (IRL 1–3).
- Stage 2—Solution discovery with Solution/Market fit (IRL 4).
- Stage 3—Growth stage with Business model/Market fit (IRL 5–7).
- Stage 4—Business processes with Diversification (IRL 8–9).

Source of the growth financing (self-financing vs. venture money). While Lean Startup concept is closely related to bootstrapping concept, the availability of external financing can help drastically shorten time for achievement of next milestone and stage of product development. For instance, some innovation tools would be unaffordable for early startups (Stage 1 with problem discovery), while during later stages (from Stage 4) it can afford to equip itself with more powerful tools like corporate venture fund.

Supportive environment for innovation creation and scouting is another important aspect to consider. If the company culture supports experimentation with a trial-and-error method, it is much easier to test a variety of innovative tools and identify the most suitable set for the particular product or segment.

3.1 Validation

The conceptual model has been validated with a group of 10 startup teams from the Riga Technical University Co. Lab program, based in Riga, Latvia, which is a 3-months long innovation acceleration program. It took place from May–July 2020 and during this period of time teams worked on validation of commercially viable ideas and thus enabled piloting of the conceptual model developed by authors. All 10 teams included at least two members—one (PhD student) covered the technical knowledge, while another one (a mentor) covered the business expertise.

Validation results were used to update the conceptual model and align some of the assumptions with obtained insights from this real-life approbation. The most apparent conclusion was drawn regarding the importance of iterative approach for validation of assumptions behind the business model within each and every stage. Thus, it directly coincides with insights introduced by Ries (2020) who suggests that startups fail to achieve the growth phase and catch the momentum most often because they never checked if the product was interesting to prospective clients. Therefore, a clear conclusion was drawn in line with perspective of Blank (2010) who is an advocate of the field-based research for new product development and suggests getting outside of the building and talking to the customers as soon as possible.

4 Conclusion

New product development is important for startups and enterprises, and also for customers and broader public. It provides new value to the ICT customers and enables the existence and competitive advantage of the companies doing business in ICT market.

Many assumptions incorporated within the conceptual model were obtained during the expert interviews with startup ecosystem stakeholders and startup representatives responsible for product development at their respective companies. During these interviews, the authors had to acknowledge the broad spectrum of unique combinations of practices and methodologies used by startups for product development. Some partially borrowed from established ICT enterprises working in Latvian and foreign markets, some from international high-growth startups that have publicly shared their wisdom and know-how (e.g., Spotify). But in the end, it remains

with each and every company to maintain its unique blend of innovation tools instead of searching for the one and only “silver bullet.”

The conclusions of the authors align with the approach of Drucker (1985) who suggested that innovation relates to a particular type of activity, but it is not correlated with size or age of the enterprise. The center of such activity is the innovation. It is naturally associated with the aim to facilitate determined change in an economic or social potential of the enterprise. With the help of available innovation tools, the changes in company development can be rapid, and impact on core business can be considerable. At the same time, strong innovation can lead to changes not only in business models on company level, but general industry standards and everyday habits of end customers of ICT products and solutions.

The proposed conceptual model has been primarily aimed toward high-growth potential ICT startups in Latvia. Therefore, the future research should involve a wider approach of industries and sectors to be tested within broader geographic scope.

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Fostering Open Innovation by Linking Entrepreneurial Leadership and Knowledge Management: An Empirical Study in the Tunisian Context



Samah Chemli Horchani and Mahmoud Zouaoui

Abstract Entrepreneurial leadership is universally recognized and there are divergences in its effectiveness, which suggests several promising areas of inquiry. The success of this leadership style depends on interrelations between leaders, followers, and the knowledge context. This study offers an interpretative reading of entrepreneurship and leadership theories to describe an innovative approach. It investigates the link between entrepreneurial leadership and open innovation considering the knowledge management importance. A new conceptual model is proposed through a thorough review of the literature. A qualitative research method was used. Five in-depth case studies were conducted. Data was collected from small and medium-sized enterprises belonging to the Tunisian industrial sector. The findings of this study show that entrepreneurial leadership affects open innovation through knowledge management. Moreover, the results show that entrepreneurial leaders encounter difficulties in the use of knowledge into open innovation. In addition, the results reveal the contextual specificities of the Tunisian entrepreneurial leadership. This work would be an opportunity for practitioners allowing them to discover the mechanisms and processes ensuring the maintenance of entrepreneurial intensity in an innovative company but also, opening the door to action when this intensity presents deficiencies.

Keywords Entrepreneurial leadership · Open innovation · Knowledge management

S. C. Horchani (✉)

Management Department, Tunis El-Manar University, Faculty of Economics and Management Sciences of Tunis FSEGT, Tunis, Tunisia
e-mail: samah.chemli@isg.u-tunis.tn

M. Zouaoui

Management Department, Business School of Tunis ESCT, Tunis, Tunisia

1 Introduction

The economy description shows an uncertain environment characterized by the complexity of technologies and the arrival of generations Y and Z (Sahni, 2018). These generations are different from the old ones. They are more optimistic and confident. They take the risk and treat failure as an opportunity to learn (Egnatoff & Tapscott, 1998; Bolton et al., 2013). These generations tend toward a new entrepreneurial management (Hoque et al., 2018). They are endowed with innovative ideas and want to create their own businesses. New entrepreneurs should no longer rely on natural and physical resources but on knowledge and sharing (Alavi & Leidner, 2001; Wong & Aspinwall, 2005). Modern leadership styles must replace traditional leadership that is obsolete and incomplete (Le Saget & Luc, 2013). Indeed, an innovative idea does not mean that a company will progress and develop. Leadership is also necessary since it is the innovation engine (Donate & De Pablo, 2015). However, the wealth of contributions on innovation, as well as on entrepreneurship and leadership, appears to be incomplete. The entrepreneurial leadership concept developed in this chapter is a preliminary step that attempts to initiate more research in these directions and constitutes a new contribution in the knowledge management field within companies. The study examines how entrepreneurial leadership affects the innovation in a Knowledge context. It is aligned with new research on leadership and entrepreneurship combining orientation and action, with characteristics and behaviors (Cogliser & Brigham, 2004; Renko et al., 2015). Therefore, organizations become more open to information that is available beyond their boundaries (Liu et al., 2002). This study outlines how innovation becomes a blend of knowledge and conditions, both internal and external. It retraces the path from knowledge managing to innovation. People jointly exchange their explicit or implicit knowledge and mutually generate new knowledge seen as an innovation (Van Den Hoof & De Ridder, 2004).

To address the research gap concerning conceptual development, we first provide a framework for entrepreneurial leadership. We develop a new conceptual model explaining in part how entrepreneurial leadership works within companies. The research offers advice to future entrepreneurs to promote their leadership at every level in their organizations. We first present a literature review on entrepreneurial leadership, open innovation, and knowledge management. We examine the existing works on entrepreneurial leadership. Then, we discuss related constructs like entrepreneurial orientation and additional leadership styles. After describing the entrepreneurial leadership field, we specify three levels of studies that we associate with knowledge management and therefore try to detect their effects on open innovation. The study addresses the levels involved in managing knowledge in open innovation from individual to a collective level.

2 Literature Review

2.1 *Entrepreneurial Leadership*

In the approach by the entrepreneur characteristics, some researchers have tried to present the entrepreneurial orientation through the company's leadership style by speaking about entrepreneurial leadership (Chung-Wen, 2008). However, leadership is still an enigmatic theme (Plane, 2015). This is due to many changes induced by globalization, digital transformational, and the technology dynamics. The leadership concept lacks a standard and formal definition (Conger, 1992) nevertheless a consensus remains present on its determining value and its main played role for the company's excellence. Thus, leadership is the investigation for an individual, labeled a leader, influencing a second individual, or group of individuals, labeled followers (Yukl & Van Fleet, 1992; Shao, 2018) to accomplish shared objectives (Northouse, 2010; Yukl, 2012). The leading entrepreneurs will put their proactivity into practice through new combinations of organizational capabilities to promote the reconfigurations and transactions necessary for their business development (Gupta et al., 2004). The entrepreneurial leader must do the framing. Thanks to empowerment, he/she will give power by ensuring the balance between the desire to improve and his understanding of the individuals' capacities. The leading entrepreneur combines ambitious goals with an insightful limits understanding (Brazeal & Herbert, 1999). By taking risks, the leading entrepreneur must absorb the uncertainty. This is done by absorbing the followers paralyzing effects and by building their confidence. The leader entrepreneur negotiates internal and external environmental relationships in order to clarify the followed path to reduce the resistance to change (Thompson, 1983). Information resources are crucial to carrying out this task (Daily & Dalton, 1993). An entrepreneurial leader is able to reshape the perception that individuals have of their own abilities by eliminating limitation self-imposed ideas (Gupta et al., 2004). The entrepreneurial leader empowerment and sharing, mold the team to deploy extraordinary energy and effort (Bandura, 1989). In the literature, the entrepreneurial leadership concept is seen through three essential levels (Den Hartog et al., 1999; Gupta et al., 2004): individual, organizational, and social levels. The individual level relates to the leaders' specifics and the roles they assume within the organization. The organizational level is about interactions within the organization. The social level relates to the exchange between the organization and its external environment.

2.2 *Open Innovation*

Le Loarne-Lemaire and Blanco (2012) distinguish three innovation approaches: the "idea management" approach, the "research management" approach, and a hybrid "concept-knowledge" approach. The first approach gives a prime location for the

new ideas production, a production organized within companies by “brainstorming” and other communication techniques and technologies, thereby stimulating creativity. This approach is criticized because the choice of useful knowledge is difficult, given its abundance. The second approach is based on research in specific laboratories and centers. However, the knowledge produced may or may not lead to an innovation, firstly because of the costs but also due to the lack of a direct link between the research effort and the innovation launch. Finally, the hybrid approach according to which the concepts produced will guide the creation of knowledge which in turn will clean up and clarify the produced concepts image. Open innovation takes place in the latter approach. Indeed, open innovation is born from knowledge reflecting the internal and external symbiosis of the company (Chesbrough & Bogers, 2014; Naqshbandi, 2016; Singh et al., 2019). Knowledge is at the innovation heart. The knowledge production function is at work in different industrial sectors (Pellegrino & Piva, 2020). The concept of open innovation results from a system of links, relationships, and interactions. This concept was proposed by Chesbrough and Crowther (2006). It is an innovation of internal and external collaborations (Öberg & Alexander, 2019), which focuses on resources, the market paths favoring innovation, and the sharing of its process (Gassmann & Enkel, 2004). This collaboration ensures the request then the selection of new ideas and internal or external initiatives.

2.3 Knowledge Management

The emergence of knowledge management coincided with the importance given to knowledge as a strategic source. It deals with the creation, sharing, and use of knowledge resources (Spender, 1996; Dabić et al., 2019). Some researchers distinguish two components of knowledge management: The Knowledge management capabilities and knowledge management systems (Friedrich et al., 2020). The capabilities redo the human component and the knowledge sharing process. The most important capabilities are knowledge acquisition, transfer, application, and protection (Santoro et al., 2020; Sun et al., 2020). Indeed, having knowledge must be combined with a great capacity for assimilation and understanding strongly associated with motivational aspects within a company (Gagné et al., 2019). The knowledge-sharing processes include having Knowledge and participating in knowledge sharing (Sheng & Hartono, 2015). All the enterprise members are involved in the generation of new ideas (Foss et al., 2011). They react to the market needs (Sher & Lee, 2004) and foster learning leading to innovation (Lin, 2007). The literature reveals that people who perceive great utility in technologies will spontaneously accept them. According to Davis (1993), same variables, such as education, age, and the technology’s duration use, influence this acceptance. Ease of use is just as critical to the acceptance and the technology use. People who came into contact with technology relatively early will find it easier to use and master it. The initial training

and the individual curriculum determine the ease of use. In some cases, age and gender have also been shown to be an ease of use and acceptance indicators.

3 Impact of Entrepreneurial Leadership on Open Innovation Through Knowledge Management

3.1 Relationship Between Entrepreneurial Leadership and Knowledge Management

In this context, some authors speak about top management value ensuring the creation of an environment favorable to the knowledge manipulation (Davenport et al., 1998; Politis, 2008; Singh, 2008). This environment is characterized by the delegation, the empowerment, and the employees’ commitment to share knowledge (Singh, 2008; Wang & Noe, 2010). In the literature, the concept of entrepreneurial leadership is seen through three essential levels (Den Hartog et al., 1999; Gupta et al., 2004): individual, organizational, and social. The individual level relates to the leader specifics and the roles they assume within the organization. The organizational level is about interactions within the organization. The social level relates to the exchange between the organization and its external environment. In Table 1, we have classified the literature components on entrepreneurial leadership influencing knowledge management according to these three levels:

Table 1 Entrepreneurial leadership influencing knowledge management

Individual level	Organizational level	Social level
<ul style="list-style-type: none"> * Leader’s character and skills (Asurakkody & Hee, 2020) * Capacity to identify problems and generate new ideas (Asurakkody & Hee, 2020) * Effect of leaders and their directions (West et al., 2003) * The leader’s support for knowledge sharing (Delaney & Huselid, 1996; Lin, 2007) * Leader’s intention ported to knowledge as a strategic source (Lee et al., 2007; Al-Ahbab et al., 2017) 	<ul style="list-style-type: none"> * New and more flexible structures (Sun et al., 2019) * Culture of trust and involvement (Nonaka & Takeuchi, 1995) * Corporate culture to facilitate knowledge absorption (Popa et al., 2017) * Characteristic employees (Appu & Sia, 2017). * Innovation climate (Popa et al., 2017) * Motivation (Friedrich et al., 2020) * Communication system and technology (Davis, 1993 Horchani & Zouaoui, 2019) 	<ul style="list-style-type: none"> * Respond to customer needs, acquire new knowledge about the company’s partners and its competitors (Popa et al., 2017) * Cooperation with outside to innovate (Huisingh, 2016) * Mastery of e-technology, e-communication, e-trust, and e-collaboration (Van Wart et al., 2017) * Crowdsourcing social machines: Human capacities and information technology (Bozzon et al., 2013; Simperl, 2015)

Source: Own work

3.2 Relationship Between Knowledge Management and Open Innovation

It is recognized that knowledge management increases the innovation frequency (Sun et al., 2019). Open innovation requires relationships with partners and value relationships allowing information and knowledge flows. In the literature, the link between knowledge management and open innovation is mainly expressed in terms of openness and in terms of knowledge specification. Openness involves knowledge creation, sharing, and transfer (Santoro et al., 2018; Öberg & Alexander, 2019). According to Gassmann and Enkel (2004), the openness degree will depend on the intensity and the sourcing quality (like conference, convention, or customer relation networks), the market path or also the marketing (like customer relationship or business transactions) and shared activities (like collaborations, networks, or community).

Within an organization, the degree of innovation's openness depends on the links formalization between the actors. Strong formalization creates obstacles to creativity which is an innovation source (Thomson, 1965). Reducing formalization will provide a freedom margin making the knowledge transfer more efficient (Schmoch, 2003). However, some researchers support the formalization positivity on the knowledge passage and sharing (Brunswick & Chesbrough, 2018) favoring open innovation.

The knowledge specification makes it possible to distinguish mainly between explicit knowledge and tacit knowledge. Explicit knowledge comes in the form of clearly articulated information in easily transferable documents or computer systems (Rogers et al., 2016). Tacit knowledge is difficult to formalize. It relates to skills and knowledge accumulation through collaborative practices, experiences, and observations (Maravilhas & Martins, 2019). Tacit and explicit knowledge influences positively and significantly the idea generation part of innovation (Asurakkody & Hee, 2020). Having tacit/explicit knowledge and participating in charring this knowledge, will improve the innovative work behavior (Hu & Zhao, 2016) and the idea generation (Asurakkody & Hee, 2020) leading to open innovation (Lee et al., 2010; Singh et al., 2019).

3.3 The Mediating Effect of Knowledge Management on the Link Between Entrepreneurial Leadership and Open Innovation

According to the resources-based view, employees are considered as a radar monitor helping entrepreneurial leaders to align their knowledge management by sharing, value creation, and organization processes, in order to influence open innovation (Snell, 2003). The entrepreneurial leaders' knowledge value influences knowledge sharing practices (Wang & Noe, 2010; Singh et al., 2019). Authors speak about the

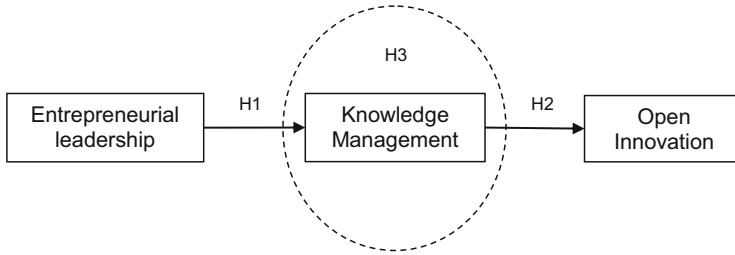


Fig. 1 Conceptual Model. Source: Authors' own study

organizational process established by management in order to produce a favorable environment for the new product creation and consequently, the establishment of an organizational culture favorable to innovation (Viala & Léger-Jarniou, 2010). The leader entrepreneur is a knowledge-oriented leader. This orientation will allow risks taking to proactively improve the innovation's opportunities, while, facilitating the knowledge exploration and exploitation (Singh et al., 2019). Through sharing and empowerment, the entrepreneurial leader will offer a freedom margin advantageous to the knowledge transfer. Indeed, the entrepreneur leader will instill a trust and involvement culture. Thanks to a leader's common language delivery (Malhotra et al., 2007); the organization members will follow by developing innovative ideas and by embarking on risk-taking and proactivity.

Then, we can advance the following hypotheses:

- H1: Entrepreneurial leadership influences positively knowledge management.
- H2: Knowledge management is positively associated to open innovation.
- H3: Knowledge management has a mediating effect between entrepreneurial leadership and open innovation.

A new conceptual model is proposed in Fig. 1.

4 Research Methodology and Results

A qualitative study was conducted to explore the model and to better understand the context's role on its functioning. The choice focused on five cases of small and medium-sized enterprises belonging to the Tunisian industrial sector. This sector constitutes a promising target for the public authorities ensuring competitiveness and openness to the outside world. Several bonuses were granted to entrepreneurs in order to encourage them to invest in research and development but also aimed at supporting projects in innovative and high value-added activities such as the creativity incentive scheme and innovation in the field of information and communication technologies or the consolidation of the equity capital of innovative projects before the effective start-up phase such as "the seed fund." There is also an extension of business incubators through the establishment of technological poles. Enterprises

were chosen for technical and not statistical reasons, therefore the sample is not representative of a statistical population but of the research object (Hlady-Rispal, 2015). Indeed, studying open innovation and entrepreneurial leadership in this business type has received reliably a little attention (Singh et al., 2019). The conduct of the data request was made by rewarding the geographical proximity of the selected units, because the research was accomplished by a single researcher. It is important to mention that the cases handled number depended on the resources and time available to accomplish the investigation (Nieto & Pérez, 2000). We first conducted semi-directive interviews with the founding directors of each company. Following the interview, we spent a self-observation period in each company. During this period, observations and descriptions were made. We were also able to collect or consult documents on each company. As a result, we proceeded to the analysis of speeches and representations by following three sub-steps namely data collection, coding, and analysis (Bardin, 2007). In our study, we carry out a thematic content analysis by dividing discourse into meaning, or analysis units of forms, sentences, or themes (Allard-Poesi, 2003). This process is called coding (Miles & Huberman, 2003). The meaning units are categorized according to the object of our research, more precisely according to the studied variables.

The majority cases result in entrepreneurial leadership presenting a weak tendency toward proactivity, in the sense of wanting to be the first on the market. Tunisian entrepreneurs tend to accommodate competition and follow trends in the national and international markets. Entrepreneurial qualities, human resources, skills, communication, and flexibility, are themes raised by entrepreneurs during their interviews to talk about proactivity. The interviewed entrepreneur leaders expressed a total reluctance and risk mistrust. This is manifested in their companies by the need to calculate and take the necessary precautions in order to limit the inconvenience and avoid damage or failure leading to bankruptcy. The entrepreneurial leadership in the studied cases shows a strong tendency to innovate.

The link between entrepreneurial leadership, knowledge management, and innovation is manifested through a market's intelligence behavior. The leaders observe the competitors strategies and detect needs in the market to be able to surprise customers with products presenting a different vision from the others and having affordable prices. The innovations are generally geared toward protecting market share. Indeed, companies are hesitant about changing tastes. They focus on their market share and listen to existing customers in order to improve the product by operating innovations. Thus, arguments support the hypotheses H1, H2, and H3 of the proposed model. Nevertheless, the vision of partners' expectations is unclear and market knowledge will be useful only after the use of the product or service resulting from the innovation.

At the corporate level, the entrepreneurial leader implies a mutual and constructive influence between the team members. This will promote trust and cooperation. Employees will emit novel ideas or share knowledge that drives innovations. The entrepreneurial leaders generally accept new ideas from their employees or collaborators to reduce costs without affecting quality. Our observations prove that the entrepreneurial leadership favors the knowledge sharing in the team by stimulating

the organizational memory where all the shared and created knowledge is recorded so that the reactivity and the enterprise speed are improving. Regarding open innovation, the Tunisian entrepreneur raises several difficulties including mainly financial, legislative barriers, and market uncertainty. The costs inherent in installing new technologies draw on the companies' capacities. The web and informal communication are important sources in the studied cases. Given the small size of the companies, the contact is direct between the leader and his/her employees. He/She corrects, trains, and informs without formalization obstacles. Knowledge sharing takes place through direct contact and on-the-job experience.

5 Conclusion

Open innovation is an evolutionary artifact that is constantly nourished by exchanges between the entrepreneurial leader and the various actors in his/her environment. The transition from a traditional to a virtual environment necessarily implies very different entrepreneurial styles. Our research supports that entrepreneurial leadership affects open innovation through knowledge management (Brunswick & Chesbrough, 2018). Entrepreneurial leadership is an entrepreneurial commitment to innovation based on the desire to go beyond the wisdom received, to combine ideas from unconnected sources, to embrace change as an opportunity, and to test one's limits (Kanter, 1983). The entrepreneurial leadership creates an internal dynamic ensuring the company's adaptation to its environment by triggering and maintaining open innovation (Cheng & Shiu, 2015). The entrepreneur leader takes risks in the choices, the opportunities selection, and the resources combination. Its proactivity enables projection in time and knowledge use. The sharing of the entrepreneur leader and his/her capabilities will ensure his/her orientation transmission to the various members in the organization. Internal and external synergy is the origin of open innovation.

In addition, open innovation requires effective knowledge management tools (Sun et al., 2019) to involve and integrate knowledge flows. Indeed, the entrepreneurial leader, through his/her orientation, will instate internal and external channels to promote knowledge sharing. He/She will encourage knowledge exchange practices (Mina et al., 2014) and reinforce the absorption capacities (Sun et al., 2019). He/She has to motivate employees to share more efficiently knowledge. Additionally, it is indubitable that knowledge management enables the use of systems in order to operate innovations responding quickly to emerging needs. Our research suggests that the leaders adopt an open innovation culture. The present research will help enterprises to build practical understanding about the mechanisms linking leader entrepreneurship and knowledge management to reinforce engagement into open innovation. The entrepreneur leader will be able to choose better the channels leading to enhanced knowledge management. Our study used qualitative inquiry. Further research should explore the variable measurement scales and investigate the

developed model quantitatively. More expansion could be done by considering other innovation typology like the innovation ambidexterity.

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Part VIII
Eurasian Economic Perspectives: Regional
Studies

Conceptual Framework for Attracting Foreign Patients to Health Care Services



Daiga Behmane, Didzis Rutitis, and Anda Batraga

Abstract Given the global nature of health services and increasing competition between regions and health care providers, the aim of the study is to develop a theoretical framework and conceptual model for attracting foreign patients to the health care services. In this study, the authors have summarized the results of their previous empirical research based on integrative literature review to develop a comprehensive understanding of the dimensions and factors characterizing the phenomenon of international competitiveness of health care services. The theoretical study results were validated in expert interviews and applied research studies and the applicability of the developed model was tested in the study of experience and satisfaction of foreign patients with the health care services in Latvia. The authors proposed framework and model is based on the system of factors including five dimensions of acquisition and attributed to micro, mezzo, and macro levels. The study confirms and highlights the need for a person and patient-centered care approach in the context of cross-border health care, the importance of international requirements for ensuring service quality and patients' rights, reinforced by general travel factors, destination marketing, health service-specific communication tools, and choice determinants.

Keywords Cross-border health care · Competitiveness · Patient acquisition

D. Behmane (✉)

Riga Stradins University, Riga, Latvia

e-mail: daiga.behmane@rsu.lv

D. Rutitis

BA School of Business and Finance, Riga, Latvia

e-mail: didzis.rutitis@ba.lv

A. Batraga

University of Latvia, Riga, Latvia

e-mail: anda.batraga@ba.lv

1 Introduction

The health care market is changing rapidly, and many factors bring it closer to the classical consumption model. Patients are becoming well-informed consumers who are actively involved in choosing health care services. The global challenges in the health sector are related to consumer mobility, the rapid development of medical technologies, the development of new information and communication channels, increased patient education and knowledge in both their health and their choice of services. The main restrictions on the functioning of the market mechanism in health care are mentioned: significant information asymmetry, monopoly of individual services, state ownership, government-regulated basket of services and tariffs, etc. (Rechel et al., 2009). Fontanarosa and Bauchner (2017) draw attention to the different interests and opposites of the public and private sector, specific professional research objectives, provider-induced demand, and other sector-specific features. There are more barriers for service providers to enter the health sector than there are in any other sectors. In a study on the role of competition between health care providers Barros et al. (2016) have discovered that attempts to avoid or correct market failures can also have consequences that are related to system management failure.

At the same time, the conceptual approach of person-centered care creates a new relation model with health professionals building a partnership between the patient, their family, and the health care team (Ekman et al., 2011). The patient-centered care model achieves a certain level of quality of medical care, reflecting the level of fulfilment of patient's expectations, interests and needs, and patient's opinion on how the medical institution should operate.

The framework for integrated and patient-centered health services is a call to fundamentally change the way health services are funded, managed, and delivered to such a way where the perspectives of individuals, families, and society are consciously responded in a holistic way (WHO, 2015).

Given the objectives of the growing health care market and competition between providers on the one hand, and patient power and expectations on the other hand, there is a gap in the literature related to a comprehensive factor system determining the choice of consumers in cross-border health care.

2 Determinants of Patient Acquisition and Their Assessment Tools in the Context of Cross-Border Health Care

Reasons for the need for cross-border health care in addition to population mobility include factors such as limited access to health care in the country of residence, poor patient experience with health care services in the country of residence, development of tourism, low-cost airline offers, increased access to information that is related to

the development of communication technologies and social media, changing attitudes and views toward other countries, but particularly the increase in the share of private payments for the population after the crisis of 2008, as well as the poor experience of cross-border patients (Lunt et al., 2011). Individual person's decision to get cross-border treatment is primarily influenced by the health care system in their country: service coverage, financing, regulation, the cost of services, quality and wait times, as well as their gained negative experience.

Taking into account new models of the free movement of European citizens and patient mobility and health care consumption, health care providers are refocusing their services to ensure demand for cross-border health care services. Consequently, external competition between health care providers is increasing, which, in turn, potentially contributes positively to the quality of health services and innovative approaches to the provision of services, which in turn can have a positive impact on patients' experience. According to M. Porter and Teisberg (2006), the success of health care providers in attracting patients from other countries and creating positive experiences for patients depends on their ability to be competitive at regional and global levels, ability to provide high-quality services, and to meet patient expectations and confidence in the long term.

As a positive aspect, Hopkins et al. (2010) point out that positive patient experience in cross-border health care provides additional investment in national health systems that can be used to provide services to the local population. Countries with many medical tourists, local patients may be subject to negative experiences due to price increases in the domestic market (Hanefeld et al., 2013). A study carried out in Canada confirms that medical tourism may have a negative impact and an adverse effect in patients' country of residence on the costs of treatment of postoperative complications (Crooks et al., 2013). The literature discusses cases where patients return to their home country with complications and negative experience and incur additional costs in their home country's health system for further treatment and prevention of complications, and there is also limited communication and access to patient medical records (Hanefeld, 2014).

The main cause for concern remains the quality of service received in another country and the motivation and competence of health care professionals. Existing gaps in patient acquisition and creating positive experiences relate to the limited information on patient safety, quality of care, problems with forwarding medical data, continuity of care, and reimbursement of costs (Turner, 2011; Verra et al., 2016).

Patients are usually eager to seek medical help in institutions where patient-centered approach is implemented, as well as recommend them to friends and relatives, which has a positive impact on the financial position of the medical organization, which reversibly improves the ability to better satisfy the wishes and needs of clients in the future.

The patient-centered care model achieves a certain level of quality of medical care, reflecting the level of fulfilment of patient's expectations, interests and needs, and patient's opinion on how the medical institution should operate. This approach has made the implementation of optimal health care organization possible in areas

that are truly relevant to the population, where patient experience plays an important role, as proposed by Cleary (2016).

In order to implement a patient-centered approach, health care institutions must take into account the potential risk factors associated with patient care, possible care models, patient values, and experience gained during treatment.

When switching to a patient-centered approach, health care institutions should take into account that:

- Patient-centered approach often requires a change of attitude.
- The customer (patient) is the most important in patient-centered care (comprehensive quality management).
- The safety of the patient and monitoring of medical care should be ensured.
- The available treatments should be explained to the patient.
- Effectiveness of treatments and prevention of possible complications should be discussed with the patient.

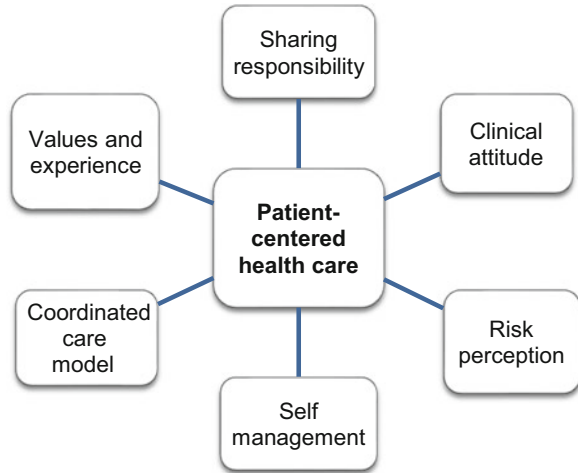
Patient-centered care should be based on an assessment of patients' experience, feedback, and care results (Price et al., 2018). The current and traditional approaches of many health care institutions are to place their focus on optimizing the productivity of its personnel and doctors, which can, unfortunately, often negatively impact patient satisfaction and experience. To get a better understanding of the impact of patient care on patient-centered care, patient questionnaires are developed, and patient engagement measures are taken. In the authors' opinion, the coordination of the care and support for workers during the care are important aspects of the patient-centered care model, which can influence patient satisfaction, since it not only creates satisfaction with the received service, but also shapes the experience which will influence the future decisions of the patient (see Fig. 1).

The level of satisfaction with the quality of medical care reflects the level of fulfilment of patient's expectations, interests and needs, and patient's opinion on how the medical institution should operate. Patient-centered care can be measured by the level of patient satisfaction and serves as an indicator of the quality of medical services provided (Kruk et al., 2018).

Developing a tool to measure satisfaction levels requires an integrated approach and has a number of challenges: firstly, there is a need for a clear understanding of the definition of "satisfaction"; secondly, a number of indicators including sociodemographic ones that affect the interpretation and validity of data have to be taken into account; and thirdly, the measurement results should also be applied to the practical daily assessment of medical facilities using questionnaires (Prakash, 2013).

One must take into count that today health care is increasingly becoming the object of direct payments from patients, and consumers are looking for value in obtaining medical services. Value in this context can be explained as the relationship between expenses and quality which stands for the service and positive experience to most health care consumers. The health care institutions that respond to this are able to have a successful development in this age of health care consumers. Consumer demands have increased not only in the provision of medical care, but also in the conditions in which they receive care: comfort, facilities, equipment, etc.

Fig. 1 Patient-centered health care model. Source: Created by the authors based on Cleary (2016)



The quality of medical care is described as a set of medical care processes that contribute to patient satisfaction with medical personnel in the process of building relationships, and satisfaction with the provision of the necessary resources, qualifications, and technologies. To research patient satisfaction, questionnaires are conducted and the demands of patients are monitored (Carey, 2017). Dissatisfaction with medical care is caused by negative behavioral reactions, negative reviews of the clinic (Kayden et al., 2015). Satisfaction with the services received at the health care institution determines patients’ desire to use the services of the institution or to continue a long-term course of treatment.

When studying the satisfaction factors on general practitioners, 4 groups of characteristics were distinguished: professional characteristics of a doctor, access to medical services, the convenience of a doctor’s office, and personal qualities of a doctor (Drain, 2001). In a study of the satisfaction factors on general practitioners by Morrison et al. (2003) the following key indicators were identified: doctor’s communication with the customer; the type of relationship between doctor and customer; gender of patient and doctor; doctor’s recommendations for treatment and prevention; and involvement of patients in the treatment decision-making.

The concept of patient experience has been in the forefront of assessing patient satisfaction since the beginning of the twenty-first century, as the health care system has set new higher standards (Sofaer & Firminger, 2005). “Patient experience” and “patient satisfaction” are often used as interchangeable terms in health care. The authors believe that this is misleading and that they are separate terms with different meanings. In order to assess the patient’s experience, it is necessary to find out what happened in the health care setting (for example, how clear and frequent was the communication with the health care service provider). Satisfaction describes whether the patient’s expectations regarding their care, health and its improvement have been met. The definitions of patient satisfaction and patient experience are closely related

and in some cases they overlap, but they are not interchangeable (Wilson et al., 2013).

Patient experience includes the interaction between the patient and the health care system, provided by doctors, nurses, and other hospital personnel in medical practices and health care institutions. Today, there is a trend where the role of the patient in the choice of treatment facility is increased, which is consistent with a model based on consumer experience (Smarta, 2017). The positive patient experience is influenced by early diagnosis, coordinated care, emotional support, and other factors. On the other hand, it may be negatively influenced by a lack of follow-up and lack of emotional support for a patient, but in the case of various diseases, these indicators can have different values.

Measuring positive patient experience based on patient experience and satisfaction questionnaires is very important in today's health care setting and it also includes an assessment of the payment of service. This is especially important at a time when new payment models that might not always be clear to the patient are introduced. Health support mechanisms provided by employers tend to focus on the value of the service based on price, convenience, and service experience (Claxton et al., 2013).

In recent years, a significant role has been given to research that focuses on reorientation to health care models that are based on health outcomes, leading to demand new technologies and data platforms that provide, align and combine the information needed for the treatment process and which is the most important aspect for achieving the best outcome for the patient (Accenture 2017). Patient experience, individual data, and values are at the core of the Accenture model.

The need for an innovative approach to improve patient experience leads to providing services based on the accumulated medical data of the patient, which simultaneously implies a paradigm shift from monitoring the treatment process to monitoring patient results, as confirmed by Pessaux and Cherkaoui (2018). Bloom et al. (2015) conclude that competition in health care systems could potentially be introduced through open access to information, providing patients and their doctors with options and directing money to service providers based on the decision of patients. As critical element and barrier to patient experience and implementation of new technological and organizational innovations, are health management and service payment systems. Dunbar-Rees (2018) points out and proposes the introduction of alternative outcome-based service payment models instead of quantitative payments.

The discussion on changing the paradigm of health care to improve the efficiency of health care services demonstrates that the value-based approach means introducing new elements of the care process and transforming the care process itself (see Fig. 2).

Value orientation is characteristic for patient-centered health care models based on an assessment of patients' experience, feedback, and care results that are based on health outcomes.



Fig. 2 Elements shaping the value of health care service. Source: Created by the authors, based on Porter and Tesiberg (2006), Bloom et al. (2015), Rūtītis (2016), Pessaux and Cherkaoui (2018)

3 Development of the Conceptual Model

3.1 Importance of the Multilevel Marketing and Communication Approach

Every foreign patient should be considered as a marketing target audience for health services as the growth of cross-border health care is affected by both economic and legal circumstances. Consequently, in further research, the authors have studied marketing and communication aspects in depth to identify the factors that lead to successful marketing of services and attracting patients to health care. Studies show that aspects of marketing and communication can be addressed at the micro, mezzo, and macro levels. The role of marketing communication at micro level, as in other industries, is to convey information about the offer to individual patients (who are potential customers) and convince them to choose the services provided by a particular company in a particular country. The role of marketing activities and communications at the mezzo level is to attract certain groups of interrelated elements (such as all medical tourism companies at the level of the health care industry), while actions at the macro level are focused on marketing activities at country level (Oliver, 2010).

Marketing and communication are equally important for providers who provide services to foreign patients, both within the framework of the Directive and the EU Regulation, as well as out-of-pocket paid medical tourism services (Connell, 2011). From a service theory point of view (Goyal, 2013; Kotler et al., 2010) in a free-market environment, accessible health care services correspond to the characteristics of a traditional service.

The authors conclude that a traditional service marketing approach should be used to promote health care services and to conduct marketing activities taking into account the specifics of the health care market. One of the most popular theories of

marketing services is the “Marketing mix” model, which describes a combination of instruments that optimally meet the needs of customers and ensure their satisfaction with the service they receive. The model is considered as the main goal of marketing activities in the service sector and is based on a combination of four traditional marketing tools—product, price, location, and promotion—that best meet customer needs. These four marketing instruments are known as “4P”—Product, Place, Price, and Promotion. In terms of patient acquisition and experience-shaping, it is recommended to identify a slightly different combination of “4P”—Physicians, Partners, Places, and Processes.

In the case of traditional marketing of services, the Marketing mix model includes at least three additional factors: People, Physical evidence, and Process, and it becomes a “7P” model, while in the marketing of tourism the “7P” can also be supplemented with instruments such as Packaging, Programming, Partnerships, and Public. In the context of health care and medical tourism, several new factors to the marketing mix related to patient education, patient privacy, patient medical and cultural sensitivity, creating a “14P” model specifically for health care service can be introduced (Medhekar & Ali, 2012; Goyal, 2013). Health care institutions should view foreign patients as a separate consumer segment, focus on excellent customer service, and in-depth customer analysis in order to better understand the expectations of clients to optimize their business strategy.

The communication of the service provider (including the content of marketing communication and its effective management) plays an important role in increasing the competitiveness of a health care provider and attracting foreign patients at all levels—including meta (national image), macro (national policy, economic, and social indicators), mezzo (industry policy/strategy), and micro (service provider’s strategy) levels. The authors have identified four dimensions of the cognitive image of a medical tourism destination, which can be useful for attracting medical tourists: (1) medical offers, (2) general environment and infrastructure, (3) tourism facilities, and (4) social environment (Zhan, 2014; OECD, 2016).

According to the theory (Melewar & Karaosmanoglu, 2006) marketing communication is one of the completely manageable factors that make up the aspect of corporate communication at the company level. Previous studies on corporate identity management in Latvian health sector companies indicate that effectively managed corporate identity contributes to acquisition of medical tourists, strengthening the competitiveness of businesses, and improving patient satisfaction (Rūtītis et al., 2014).

Websites and social networks are currently the most important information channels for attracting patients. It is where potential clients are searching for information on how to receive health care services quicker, cheaper, and in higher quality (Huerta et al., 2014). Through social network communication channels, information can be easily passed on not only domestic patients to improve their acquisition, but also to foreigners. Patients are also known to read other patients’ reviews on the Internet (John et al., 2018). Therefore, it is important for health care providers to effectively present themselves and their services on the Internet in order to attract foreign patients and thus to facilitate medical tourism (Huerta et al., 2016).

Wider promotion of services and a wider range of services help to attract more medical tourists (Jabbari et al., 2013; Johnston et al., 2010; Chen and Wilson, 2013). Effective information models are important for making cross-border health decisions, especially in various socioeconomic settings (Ngamvichaikit & Beise-Zee, 2014).

Studies indicate that patients and providers are often unhappy with the current consultation and referral process in cross-border health care. Communication barriers can lead to significant interruptions in care, inappropriate treatment, and potential harm to the patient's health, damaging the perceived experience (Liddy et al., 2013).

The literature emphasizes the need to critically consider the intuitive views of health care providers in determining the needs and perceptions of the patient. Patients and their families are true partners in creating a health care environment. The indivisibility of the service, as well as the scale, complexity, and specialization of the service increase the complexity of the assessment for patients (Eriz & Figueiredo, 2005). Evaluation of care quality has been the focus of many studies (Coovadia, 2008; Parasuraman et al., 1998; Tam, 2007; Sofaer & Gruman, 2003). Marketing researcher Naidu (2009) has developed a comprehensive model seeking a better understanding of health care services.

The importance of service quality dimensions vary from sector to sector (Bopp, 1990; Parasuraman et al., 1994). Patient choice is determined by the complex interaction between the patient and the service provider, which reflects the patient's perception of the acceptability of the service. Health outcomes and comparative information have not proven to be conclusive; personal experience and the professional attitudes and recommendations of doctors, as well as distance to the service provider or general practitioner's referral, all play an important role (Dijs-Elsinga et al., 2010; Victoor et al., 2012).

Geographic accessibility in attracting patients means travel distance and convenient location. In general, patients prefer service providers that are geographically close to them, that can be reached by their own or public transport, that have accessible parking or transportation organized by the service provider (Delamater et al., 2012). With regard to medical tourism services, geographical proximity is recognized as an important but not decisive factor in the selection of services (OECD, 2016).

The price of the service is an essential element of the service provided that determines satisfaction. The importance of the costs of services varies when the costs of the service are covered by public funds or by the insurer or by the patient in the form of direct payment. Patient expenses include both direct payments for services (due to lack of insurance) and patient co-payments. To a large extent, the choice of the patient and patient acquisition depends on whether the costs of the service are covered by public funds or included in the insurance package in patient's country of origin (Rice et al., 2018).

Communication aspects have an increasing role in the patient's perception of the assessment of their health status (Adams, 2010). The ability of health care providers to explain, listen, and feel empathy can have a significant impact on biological and

functional health outcomes, as well as patient satisfaction, care experience, and patient acquisition (Rosiek & Leksowski, 2016). On the other hand, poor communication can lead to a variety of negative results: interruption of care, risks to patient safety, etc. (Vermeir et al., 2015).

Studies on corporate identity management in health sector companies indicate that effectively managed corporate identity contributes to the acquisition of medical tourists, strengthening the competitiveness of businesses and improving patient satisfaction (Batraga and Rutitis, 2012).

Thus, communication and marketing factors can be considered as cross-cutting multi-level factors determining and reinforcing the significance of other patient acquisition factors.

In the context of a comprehensive marketing approach and the specifics of cross-border health care, the authors propose to base the conceptual approach of assessing the patient's experience and satisfaction on multi-level factor groups related to general travel, choice of medical institution, communication, and choice of health care service.

3.2 Conceptual Model of Attracting Foreign Patients to Health Care Services

The authors base the conceptual approach of attracting foreign patients on the following principles:

- Specific nature of health care provision in the context of globalization, increasing expectations, and mobility of the population.
- A systemic approach to patient acquisition, which includes a combination of macro, mezzo, and micro level multidimensional factors.
- Specifics of cross-border health care related to international requirements for ensuring patients' rights, safety, and quality of service.
- Changing the paradigm of health care approach to demonstrate the value-based approach and patient-centeredness.
- Assessment of consumer experience and satisfaction as a prerequisite for the acquisition of foreign consumers.

The authors have developed a system for the acquisition of foreign patients, which includes 5 dimensions and respective groups of factors (see Table 1) at micro, mezzo, and macro levels.

Dimension of internal factors covers such factor groups as the resources of the company, strategy of the management, personnel skills, and competences. The patient can only partly evaluate the performance of the dimension of internal factors; therefore, the patient's assessment is provided through the overall assessment of the satisfaction of the service. For example, a patient cannot directly assess the adequacy of company resources, management strategies, and other aspects. Consequently, an

Table 1 Foreign patient acquisition dimensions and factor groups

No.	Dimensions	Related factor groups	Level
1.	Internal factors	Resources Management Competences	Micro
2.	External factors	Political factors Economic factors Social factors Technological factors	Macro Mezzo
3.	International requirements	Respect for patient rights Safety and service quality assurance	Mezzo Micro
4.	Marketing and communication	Marketing communication Requirements for online websites	Macro mezzo micro
5.	Patient experience and satisfaction	Choice of the destination Communication Choice of health care provider Choice of health care provider	Macro Micro

Source: Developed by the authors

assessment performed by experts and company management is essential in the assessment of the dimension of internal factors.

Dimension of external factors (within this research—external environmental factors of the company within the country) covers such factor groups as political, economic, social, and technological factors, which relate to macro and mezzo level and preferably have to be evaluated by experts working in health care institutions with experience in providing services to foreign patients.

The dimension of international requirements includes the requirements for the environment in which health care service is provided to a foreign patient. International requirements establish requirements for the rights of patients in the provision of cross-border care, which guarantee patients’ safety and quality of care, which directly affect patient satisfaction, as well as establish requirements to provide information on compliance with these rights or action that can be taken in the event of breach of rights.

The dimension of marketing and communication interacts with all other dimensions because its elements are crucial at all levels of activities. The management of marketing and communication factors forms the communicative and informational accessibility framework, which ensures the image and visibility of the destination at the macro level; while at the level of industry and companies it means the assurance of service safety and quality provision (marketing of the medical institution), and at the level of services it means the provision of medical and organizational information (in marketing of the service).

Marketing activities and communication at the mezzo level refer to a group of companies that share certain interrelated elements (e.g., companies focused on attracting foreign patients at industry level), while measures at the macro level

focus on targeted marketing communications and tools designed for foreign consumers (e.g., EU citizens).

The dimension of patient experience and satisfaction in the context of patient-centered care reflects the *value* of the received medical care for the patient, and which in the author's study describes the indicator of patient acquisition, which is an indicator characterizing the choice. Thus, the assessment of dimension of patient experience and satisfaction includes groups of factors that influence patient's choice: (1) choice of destination, (2) communication. (3) choice of a provider, and (4) choice of a specific service.

Sociodemographic aspects and context serve as moderating factors influencing patient satisfaction, which can be influenced by other dimensions, such as access and quality of care. Patient experience assessment approach proposed by the authors using the service gap model is an appropriate approach for the assessment of the satisfaction of foreign patients in relation to patient acquisition factors. There is reason to believe that health care institutions that have their own strategic approach to assessing patient experience will be more successful in attracting patients and improving the quality and safety of medical care.

Based on the results of the study, authors have developed a conceptual model for attracting foreign patients to health care services (see Fig. 3).

The authors base their approach to attracting foreign patients on three main elements: the health care service environment, multilevel marketing, and patient experience and satisfaction assessment. The proposed model was validated in expert interviews and applied research studies (Behmane & Rutitis, 2018; Behmane et al., 2019, 2019) and the applicability of the developed model was tested in the study of experience and satisfaction of foreign patients with the health care services in Latvia (Behmane et al., 2020).

Authors conclude that health care service environment depends on external, sectoral, and internal factors affected by the international requirements. The uptake of these requirements in national systems mainly depends on health sector policies and measures implemented, which appear to be key to developing all the determining factors of patient acquisition. The environmental factors are linked to marketing and communication environment and tools creating the context for patients experience and satisfaction. Specific health service marketing communication tools and approaches are increasingly important pre-requisites for patient attraction.

Patient experience assessment relates to the factors determining the choice of travel destination, service and service provider, which as a set of factors constitute patient satisfaction and directly affect patient acquisition. Consequently, the challenge of the service provider is to reduce the gap between the patient's expected and perceived health service result in order to ensure the best possible service and increase acquisition. The application of the gap model begins with the process of understanding the nature and extent of the consumer gap which must be prevented in order for the customer to become satisfied.

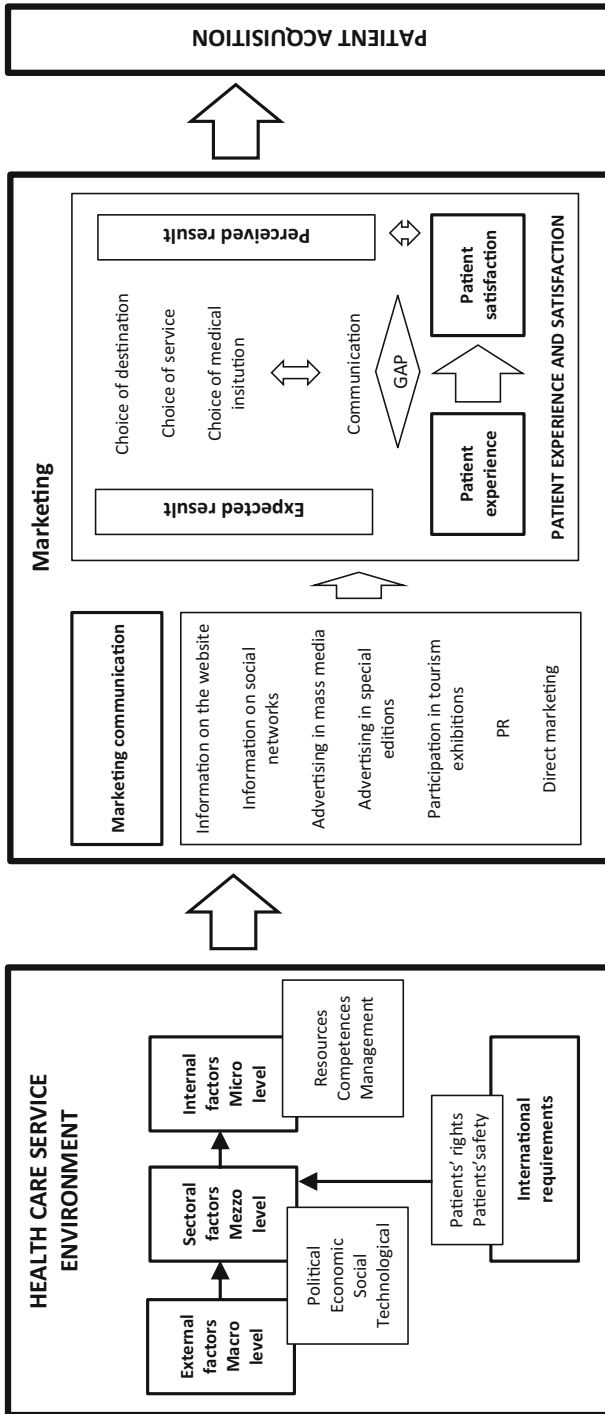


Fig. 3 Conceptual model of attracting foreign patients to health care services. Source: Developed by authors

4 Conclusion

The study shows that the acquisition of foreign patients is a multidimensional issue characterized by the need for patient-centered and value-based care approach due to increased patient engagement and expectations. The assessment of patient experience using the gap model of service quality is an appropriate approach to determine patient satisfaction and in cross-border health care it can be extended to factors of general travel, communication, and factors influencing the selection of services and medical institution.

The ability of health care institutions to attract foreign patients largely depends on the internal management factors of the institution, resources, and personnel motivation, while in the group of external factors it depends on political, economic, and technological factors that shape and determine health sector policy and performance at national level. The growing international attention to cross-border health care quality identifies the need to implement international quality and patient safety standards at national level to ensure medical supervision of patients and prevention of potential harm. The study reveals the importance of the marketing elements at macro, mezzo, and micro levels. Specifically, what relates to service providers, there is a need for sufficient information provision about the service offered and information regarding the provision of medical monitoring, electronic circulation of patient medical data, and the selection of appropriate communication tools. The study confirms the applicability of the conceptual model developed by the authors thus demonstrating the essential elements for developing competitive health care services that simultaneously increase the quality and experience of local patient care, could also facilitate the attraction of foreign patients.

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Selected Aspects of Nature Conservation Management at Local Level on the Example of Communes in Poland



Jacek Witkowski

Abstract The purpose of the present chapter is to characterize the impact of the lowest level self-government in Poland on the protection and environmentally friendly use of local natural values by means of some available management instruments. The research sample consists of a group of mayors performing management functions in 49 communes, i.e. administrative units characterized by the smallest territory in Poland. The research method is a diagnostic survey based on a questionnaire containing 34 closed questions, as well as an additional analysis of selected statistical data concerning the municipalities covered by the study. The survey shows that some local governments still base their activities on planning documents, which have been adopted before the entry into force of currently applicable regulations in the scope of nature protection and before the end of the process of creation of the areas of Natura 2000. Not all local development plans wholly encompass the surface of the areas subjected to protective regimes, which may pose a risk of their insufficient protection. The fiscal instruments and the legal administrative tool in the form of right to place selected areas and objects under legal protection are marginally used by local authorities.

Keywords Commune · Nature conservation · Sustainable development · Local self-government · Management · Fiscal instruments · Poland

1 Introduction

Local governments, managing their subordinate areas, achieve many social and economic goals, and their main task should be caring for the interests of the local community. In the era of the popularity of the concept of sustainable development,

J. Witkowski (✉)

Department of Economy and Economic Management, Faculty of Administration, Lublin University of Technology, Lublin, Poland
e-mail: j.witkowski@pollub.pl

which was born in response to a significant degradation of the natural environment, local authorities should also take care of the protection and environmentally friendly use of local natural values, which is also enshrined in the legal acts of many countries. With a range of competences and instruments at their disposal, they may attempt to directly or indirectly affect the state of valuable ecosystems, and their activities in this field may be complementary to actions taken at higher levels of power.

The issue of environmental management is becoming more and more the subject of interest of researchers, however, the publications are dominated by the issue of influence on the state of the environment of transnational and governmental organizations. The latter, despite some differences in national environmental protection systems (Mazur, 2011), still have relatively the broadest competences to develop and then implement various pro-environmental solutions. However, some papers from the turn of the twentieth and twenty-first centuries also emphasize the role of local actors in the development process taking into account socioeconomic and ecological needs (Harris, 2000; Kates et al., 2005; Organisation for Economic Co-operation and Development, 2002). One of the factors that have caused increased interest in nature protection management at the local level in recent years was the implementation of Natura 2000 in European countries and delineation of European ecological network areas within it, which have become another legal form of nature protection. Thus, local governments were put in a new situation in which they were forced to carry out their tasks in the conditions of restrictions on the use of some parts of their subordinate areas (sometimes significant). This thread is touched upon by many authors, however, most often they focus primarily on the problem of the attitude of local officials to the new form of protection and related concerns.

The purpose of the chapter is to characterize activities undertaken by the lowest level self-governments to strengthen the protective functions of legally protected areas and facilities using selected economic, legal and planning instruments. This problem was presented and discussed on the example of the smallest territorial self-government units in Poland called communes. Such an approach to the topic, which emphasizes the role of local authorities in the protection of natural resources and presents the real possibilities of the influence of municipalities on the state of natural values, is still rarely present in the literature on the subject.

The work consists of several parts. After introducing the subject of the chapter and defining the research goal, a short review of the literature is presented. The empirical part includes the characteristics of the applied method and the research sample, as well as the presentation of the obtained research results. The final part contains conclusions.

2 Literature Review

Among the research threads presented above, the topic of local spatial planning in the context of nature protection requirements is relatively often discussed in the literature. In some publications, the creation of the European ecological network was an impulse to consider this issue. For example, Beunen (2006) writing about the implementation of the Habitats and Birds Directive in the Netherlands, states that this caused a delay in the planning processes themselves and points out that in the initial phase these plans took insufficient account of the recommendations contained in the directives. In another study (Simeonova et al., 2017) attention is drawn to the need for spatial planning that will ensure connectivity between individual protected areas and their surroundings. In addition, the authors postulate the use of integration strategies or strategies for the division of conflicting social and economic functions of Natura 2000 areas in development plans. Woźniak (2011) writes about conflicts that may occur when planning sustainable development, distinguishing between conflicts on the line: individual interest—individual interest, individual interest—public interest, and conflict within the public interest itself, when the state (regional) interest does not coincide with the municipal. According to Proebstl (2003), something that can protect against similar conflicts and at the same time increase the effectiveness of nature protection is involvement in the planning processes of local interest groups. Private owners' understanding of the needs of nature protection and informing them about long-term development plans and including them in the process of creating these plans seems to be crucial. Otherwise, Alkan et al. (2009) state that the local community, losing benefits due to imposed restrictions on use, could continue to degrade the environment. The topic of the participation of local entities in the creation and implementation of sustainable development plans is also taken up by Čiegis and Gineitiene (2008), who note that local authorities have a special responsibility for the success of the process, as they should support and stimulate the enthusiasm of social participants during the creation of the strategy, as well as monitor progress in this area. The decentralization process in planning and environmental management sometimes goes even further. In the publication about the situation in the Scandinavian countries (Hongslo et al., 2016) one can read, among others, that as a result of the reorganization carried out in Sweden in 1991, the role of local self-governments with traditionally strong powers in the field of spatial planning was marginalized in favour of the newly created local structures associating private official organizations. Hoffman (2017) raises an interesting aspect related to spatial planning in the context of nature conservation management. Based on a case study, he comes to the conclusion that the challenge in the process of spatial planning, if it is to lead to the protection of natural resources on private land, is to ensure the mutual cooperation of their owners with each other when negotiating their commitment to a shared vision of the future. Planners should therefore take care of participatory aspects of planning so that the process of creating plans is also a forum for public discussion. Finally, it is worth mentioning several publications in which the authors analyze whether local planning documents meet the requirements for

nature protection on the example of specific Polish municipalities (Gałęcka-Drozda et al., 2019; Mastalska-Cetera & Krajewski, 2015; Antolak, 2011; Giedych, 2017).

In order to implement the idea of sustainable development at the local level, it is necessary for local governments to finance pro-environmental activities, which can also be done through an appropriate tax policy. For example, in a study prepared by the Directorate-General for Economic and Financial Affairs operating at the European Commission (European Commission, 2012), it is noted that in virtually all EU countries property taxes are imposed at the local level, and in some they are even the main tax base for local authorities. On the other hand, there is a widespread view that they are partly a kind of fee for goods and services provided locally. Meanwhile, concessions in this and other local taxes can be oriented in a way that serves the purposes of nature protection. The authors of the report issued by the Institute for European Policy (Kettunen & Illes, 2017) claim that such possibilities exist in the fiscal systems of various countries, but are currently not used on a larger scale. As for direct funding, although the example of Australia shows that local environmental expenditure, related to total expenditure, may be higher than that borne by central authorities (Wild River, 2006), in Europe this is rare and local governments often expect funding from central governments. This problem is raised in the work discussing the solutions used in Portugal in recent years (Santos et al., 2010). In this case, the authors focus on the issue of compensation to local authorities for restrictions on the use of protected areas. The conclusions state, among other things, that the regulations introduced in this country and the related transfers of funds were of importance above all for those self-governments that managed units with the largest share of protected area. As the study by Guzal-Dec (2015) shows, also heads of communes in Poland would expect compensation for the presence of legally protected areas in their territory.

The involvement of local authorities in conservation protection of nature can also be an important element of eco-development management of a given area, because it not only builds a specific image, but also creates the basis for developing local entrepreneurship based on the use of natural values for tourism in an environmentally friendly way. However, this thread is rarely discussed in the literature, especially when it comes to the European continent. For example, the results of research on the creation by local authorities of new forms of nature protection in the Polish legislative conditions generally indicate low activity of officials in this area (Wolańska-Kamińska & Ratajczyk, 2014; Dawid & Deska, 2014). In another document (Supreme Chamber of Control, 2018) many irregularities are found regarding the creation and functioning of protected areas and objects, such as outdated legal provisions that have not been adjusted in a timely manner, the lack of rules, standards, or procedures for the protection of valuable natural objects, and no reviews of their status.

3 Data and Methodology

To achieve the research objective, a study was conducted on a group of communes located in the Lubelskie Voivodeship in the south-eastern part of Poland. The diagnostic survey method based on the questionnaire containing 34 closed questions was used, as well as statistical data obtained and analyzed.

The survey was conducted in the first half of 2019, and the respondents were mayors, i.e. persons managing the work of 49 local governments. The respondents completed the questionnaire forms by checking one or more of the available options in each of the points. The communes represented by the persons covered by the survey were selected in such a way that within each of them protected areas and objects were located (including areas of the European ecological network Natura 2000 delineated in 29 communes). Information on the occurrence of legal forms of nature protection in individual areas was taken from the database of the General Directorate for Environmental Protection (GDOŚ), an institution which in the Polish legal system is responsible for the implementation of tasks in the field of environmental protection and nature protection.

In addition, the data of the Central Statistical Office (GUS), i.e. the central office of state administration in Poland dealing in the collection and access to statistical data, was analyzed. The materials used in the work refer to the 49 communes surveyed and relate to the percentage of areas of municipalities covered by development plans and the area of legal forms of protection occurring in each of the communes. In the second case, the appropriate conversion into indicators showing the percentage share was made by the Author comparing the given values with the total area of communes. Data on the forms of protection created under the decisions of municipal bodies were obtained from local government documents (resolutions of municipal councils) shared by GDOŚ.

4 Results

4.1 *Spatial Development Plans and Legal Forms of Nature Protection*

In Poland, communes authorities are required to prepare and implement the document called the study of land use conditions and directions of spatial development. Furthermore, communes authorities may optionally adopt the local spatial development plans containing the provisions which, in contrary to the study, are legally binding. The purpose of the above plans is to determine the land use conditions and methods of development thereof while the legislator clearly provides that it is mandatory to determine, on this occasion, the principles of environment, nature and landscape protection (Planning and Spatial Development Act of 27 March, 2003, Art. 14–15). Already in the 1990s, the obligation has been imposed on the

Table 1 The share of areas covered by local spatial development plans in the total area of examined communes

% of total area	Number of communes
0–1	10
1–10	5
10–20	2
20–40	3
70–80	1
90–99	2
99–100	26

Source: Central Statistical Office (2019)/own work

communes to prepare the study under the pain of loss of binding force of previously applicable local development plans (Spatial Development Act of 7 July, 1994). Nevertheless, the research carried out by the Author many years later in Lubelskie Voivodeship demonstrated that this task was not completed by the significant part of commune authorities within the prescribed time limit and that there were still communes without this basic planning study (Witkowski, 2008).

Currently, all communes encompassed by the research are in the possession of the study of land use conditions and directions of spatial development. However, from answers given in questionnaires, it appears that only a part of them have relatively new documents prepared during the period of recent 5 years (22 indications—45% of total number) but the study implemented more than 15 years ago is used as the basis in almost every third commune, i.e. at the time when the outlining of Natura 2000 areas was commenced and when the provisions of already expired Act on Nature Protection from 1991 were binding. When it comes to the local plans of spatial development, the degree of coverage of the surface area of individual communes with them is obviously diversified. In case of 28 communes (57% of their total number subjected to analysis) their whole surface area is covered by above plans or this coverage is almost equal to 100%. However, on the other hand, the local development plan in 10 communes covers less than 1% of their territory (Table 1).

As already mentioned above, the local development plans are the acts of local law. Therefore, their provisions should directly determine the admissibility of planned undertakings. This is very important, among others, in case of legally protected areas with obligatory limitations in use. This applies, to different extent, to each commune encompassed by the research, with the following forms of nature protection: areas of Natura 2000, ecological sites, protected landscape areas, landscape parks and, less commonly, nature reserves and national parks (General Directorate for Environmental Protection, 2019). In 50% of communes, the total percentage of the above area is not higher than 20%. However, the research sample encompassed the units with significantly higher percentage of protected areas (Table 2).

Based on the indicator illustrating the percentage of areas under nature protection and areas covered by local spatial development plans in the entire area of individual municipalities one can found that land use has been determined in some communes in a legally binding manner only for a part of areas encompassed by legal protection.

Table 2 The share of areas covered by legal forms of nature protection in the total area of examined communes

% of total area	Number of communes
0–20	24
20–40	12
40–60	8
60–80	3
80–100	2

Source: Central Statistical Office (2019)/own work

Such situation takes place in every third self-government unit (16 communes). Additionally, it should be stated that the disproportions in this scope are really significant, among others in the communes which are known in the region for the presence of many natural values.

In order to correctly determine the methods of management in terms of nature protection needs, it is necessary to thoroughly identify the occurring naturally valuable elements through the execution of natural stocktaking encompassing the diagnosis of environment condition as well as the characteristics of its resistance to anthropopressure as well as evaluation of environment transformations status (Koreleski, 2009, p. 38–39). In an item contained in the questionnaire, the respondents have been asked whether such type of action has been carried out in the territory of their commune and, in case of positive answer, how long ago this action took place. The answer that the stocktaking was carried out more than 10 years ago (20 indications—41%) was the most frequently selected option and the answer that such procedure was never carried out (13 indications—26%) was indicated more seldom. Due to the fact that, in the year 2015, new solutions have been introduced in the scope of execution of nature stocktaking (The Act of 9 October amending the act on providing information on the environment and its protection, public participation in environmental protection and on environmental impact assessments and certain other acts, 2015) from the research, it appears that these solutions could be applied only by less than every fifth self-government from among the units subjected to analysis (9 communes).

4.2 Fiscal Instruments and Their Role in Stimulation of Pro-ecological Behaviours

Although, the capabilities of local self-governments in the scope of formulation their own fiscal policy are limited in Poland, certain instruments are available to them and can be used by the local self-governments in order to stimulate pro-ecological behaviours. The scope of the above instruments encompasses the local taxes and expenditures.

Pursuant to applicable Polish laws, there are some taxes administered by commune authorities, e.g. real estate tax, tax on means of transport and agricultural tax. The possibilities of the impact of commune council (commune legislative body) on

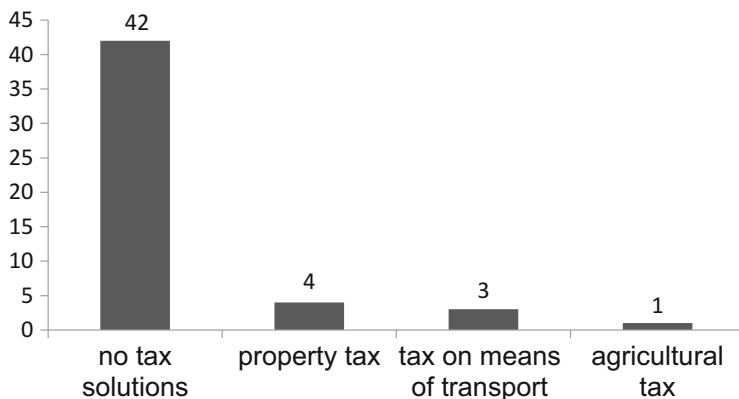


Fig. 1 The use of tax solutions for supporting selected activities related to nature protection by the number of communes. Source: Own work

the taxable base as well as on the value of applied tax reliefs are clearly determined in applicable acts governing these issues (Local Taxes and Fees Act of 12 January, 1991; Agricultural Tax Act of 15 November, 1984). In case of real estate tax and tax on means of transport, only tax exemptions can be applied by commune councils. However, in case of agricultural tax commune councils are additionally entitled to adopt tax reliefs (Etel, 2004, p. 82). The respondents had the opportunity to indicate in the form reliefs and exemptions in the above-mentioned taxes previously or currently used to support the following activities: environmental education, development of ecotourism services, and exclusion of some areas from normal agricultural activity for conservation purposes. The answers show that such measures of influence were not used at all by the vast majority of the self-governments studied (42 indications—85% of total number). Other local governments applied tax incentives in real estate tax and tax on means of transport (4 units and 3 units correspondingly) as well as agricultural tax preferences (1 commune) (Fig. 1). If pro-ecological activities were supported, then preferably those related to the promotion of knowledge about local natural values and their protection.

From obtained results, it appears that commune offices are slightly more ready to participate in the projects contributing to nature protection when their participation takes the forms other than application of tax reliefs and exemptions. First of all, from declarations of commune heads it appears that the majority of their offices used or use the external sources for financing of undertakings in the scope of environment and nature protection. Most frequently the funds for such undertakings are raised by communes from European funds (37 indications—75% of total number) and from national ecological funds, i.e. from the National and Voivodeship Fund for Environmental Protection and Water Management (42 indications—86%). The above funds are mainly used for co-financing of projects, e.g. construction of onsite sewage facilities and for energy harvesting from renewable sources. Moreover, about every fourth respondent (12 persons from 49) in the item concerning the projects

implemented with the whole or partial participation of self-government indicated also the direct activities intended to protect the local natural resources.

4.3 *Creation of Legally Protected Forms*

The local self-governments in Poland are legally empowered to create some legal forms of nature protection (Nature Conservation Act of 16 April, 2004). The scope of the above forms encompasses the following: nature monuments, nature and landscape complexes, documentation sites and ecological sites. Although their functioning might lead to the occurrence of certain impediments for the owners of the areas encompassed by such form, on the other hand, however, this may be an essential factor encouraging for greater attention to valuable elements of natural environment and can be also used for economic purposes, for instance, for development of environmentally friendly tourism. It should be concluded that the introduction of the above forms leads to the best results in case of the protection of endangered areas, objects or species (Symonides, 2008, p. 396).

From the data of the General Directorate for Environmental Protection it appears that up to the present time, in 49 self-government entities subjected to the research, the total number of the new legally protected forms, i.e. area-oriented as well as object-oriented forms created on the basis of decisions made by the local officials (commune councils) is equal to 68 (Fig. 2). The majority of them are nature monuments (37) with significant part of this number occurring in one commune (21). Furthermore, 29 ecological sites have been created in this area. This case is also characterized by certain asymmetry because one-third of them (10) have been

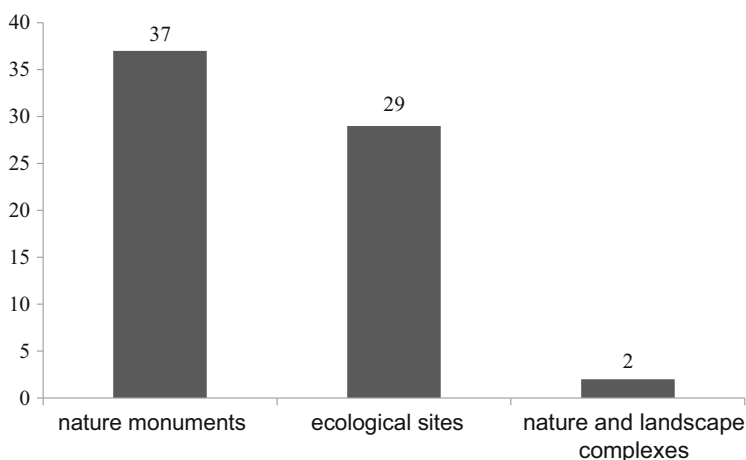


Fig. 2 The number of legally protected areas and objects established by the decision of local authorities. Source: General Directorate for Environmental Protection (2019)/own work

Table 3 Selected indicators for Poland and the area of 49 examined communes

Indicator	Poland	49 communes
Number of nature monuments per 100 sq. km	11.2	5.0
Percentage of area covered by legal protection	32.6	23.7

Source: Central Statistical Office (2019)/own work

created as a result of resolutions adopted by the council of one commune. Moreover, in two cases the creation of a nature and landscape complex has been adopted by communes councils. In 30 communes (61% of total number), there was no activity of self-governments in the scope of coverage of selected objects or areas with legal protection (General Directorate for Environmental Protection, 2019). At this point, it is worth mentioning that the number of nature monuments per 100 square kilometres as well as percentage of land covered by legally protected areas are significantly less in examined communes than national average values (Table 3).

Relatively poor engagement of self-governments in this type of activity will be probably not changed in near future. Only less than every fifth head of commune (9 indications) said that in his/her office there are any plans to adopt future resolutions concerning the creation of new protection forms. Such lack of readiness to increase the activity in this scope seems to be confirmed by other answers which, among others, indicate to the fact that any increase of the land covered by area-oriented protection would be accepted by 20 respondents (41% of total number) only and that, additionally, in the group of heads managing the communes with Natura 2000 areas (29 such units have been considered in the research) almost everybody represented critical attitude towards the present range of occurrence of the European Ecological Network expressing their reduction will or even declaring their protest against setting—out thereof.

5 Discussion

The engagement of self-governments in the scope of environmental management on the planning level is mainly characterized by relatively frequent occurrence of low attention to the consideration of the present condition of natural resources which might lead to dangers in the scope of effectiveness of their protection as well as in the scope of the methods of use of “green potential” for communes needs associated with development. Numerous studies of local development prepared a long time ago and, therefore, potentially nonconforming with currently applicable regulations and the lack of thorough natural stocktaking may result, for instance, in wrong decisions associated with investments made by self-governments which, obviously, could contribute to hampering of local development and/or to environmental destruction. The potential effects of this situation are described by Beunen (2006), and to some extent they are presented in the case study of the Sęszew commune (Gałęcka-Drozda et al., 2019). Antolak (2011) and Giedych (2017) also point out the

imperfections of municipal development plans in selected local government units and insufficient consideration of the requirements for nature protection in these documents. On the other hand, the conclusions drawn on the basis of the results presented above do not seem to be confirmed in the publication by Mastalska-Cetera and Krajewski (2015). These authors conclude that the documents of the communes of the Bolesławiec powiat in western Poland that they analyze give a good basis for proper management of local Natura 2000 sites. From the questionnaire, it appears that communes are managed by a significant part of self-governments on the basis of planning studies implemented many years ago which, in combination with the results of the research carried out by the Author previously (Witkowski, 2008), indicates to the fact that the above documents have been often prepared by external entities and therefore they may be less suitable for local circumstances. A similar problem occurs in other countries of Central and Eastern Europe, which is indicated in particular in the article on the situation in Lithuania (Čiegis & Gineitiene, 2008).

After the completion of the research in the territory of Lubelskie Voivodship, the conclusion can be drawn that it is probable that at least a part of local planning documents (in particular, the studies of land use conditions and directions of spatial development) could be created with relatively limited participation or even without participation of local communities. For example, it is indicated by the answers from which it appears that no registers of the owners of Natura 2000 areas are available to local offices as well as the fact that a part of studies has been adopted, in accordance with information obtained from respondents, before the entry into force of the act governing the issue of participation of private entities in the processes associated with the assessment of environmental impact as well as disclosure of environmental information to the public (The Act of 3 October on providing information on the environment and its protection, public participation in environmental protection and on environmental impact assessments, 2008). The need to ensure the proper participation for the local actors not only at implementation but also already in the development plans creation phase is strongly emphasized in many publications (e.g. Proebstl, 2003; Čiegis & Gineitiene, 2008; Hoffman, 2017; Hongslo et al., 2016; Cent et al., 2007). Obviously, the admittance of private owners to participate in works associated with local development plans should not be regarded as a warranty ensuring any provisions favourable from nature protection point of view. On the other hand, however, the exclusion of this group may cause an opposite effect, i.e. intensification of environment degrading activity in the face of the loss of benefits stemming from imposed limitations in use (Alkan et al., 2009).

The analysis of activities initiated by self-governments in the scope of economy indicates that tax reliefs and exemptions encouraging the local entities for behaviours promoting the performance of protective tasks are not used. This is despite the potential that exists in this area, especially in the case of real estate tax, because, as a note by Podstawka and Rudowicz (2010), revenues from this tax to local budgets are the largest in Poland, and most often municipal authorities use exemptions precisely in this tax. Similar conclusions for the whole European continent are drawn by the authors of the report issued by the Institute for European Policy (Kettunen & Illes, 2017). As regards direct financing, the self-governments in Lubelskie Voivodship

are engaged in various projects mainly in undertakings co-financed from ecological special-purpose funds, i.e. public funds. The surveyed local governments, therefore, expect financed state participation in implemented pro-ecological projects, which would partly confirm the statements contained in the work related to Portuguese conditions (Santos et al., 2010). Furthermore, it was found that the group of supported actions is dominated by those that can be classified as indirectly contributing to the improvement of the state of the environment (sewage treatment plants, obtaining energy from renewable sources).

The activity of local authorities in establishing legal forms of nature protection may constitute an essential element of management of specified area in a manner considering the principles of sustainable development because it is important for building of positive image and creates the basis for development of local entrepreneurship based on the use of natural values for eco-friendly tourism. Data analysis indicates that the legal possibilities for the protection of valuable elements of the natural environment are used only to a small extent by the local offices, despite the fact that the presence of such forms in the analyzed area is generally smaller compared to other Polish regions. These results confirm those obtained by the authors who conducted the research in other regions of Poland (Wolańska-Kamińska & Ratajczyk, 2014; Dawid & Deska, 2014).

6 Conclusion

The results of the research carried out on the group of persons managing the works of selected communes offices in Lubelskie Voivodeship as well as the data analysis indicate that local authorities are trying to take action to support the protection of valuable ecosystems. However, the scale and sometimes the choice of available impact instruments raises certain doubts and may lead to situation where the protective functions will be not performed successfully and valuable environmental resources may be used in a manner not always conforming with the idea of sustainable development.

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The Effects of COVID-19 Crisis on the Southern Italian Labor Market: Employment Elasticity Estimation Approach



Salvatore Perri and Gustavo Di Santo

Abstract The falling in production and income due to the COVID-19 pandemic will cause a wide impact on employment. The outcome will depend on the reactivity of the labor market to economic shocks. Specifically, in this work, we propose an analysis to estimate the impact of the COVID-19 crisis on the employment level in the Italian macro-regions: North-West, North-East, Centre, and Mezzogiorno. Using the employment elasticity indicator for the 2015–2019 period, we can observe that the elasticity of employment is greater in the Mezzogiorno in respect to other areas. This result suggests that the job loss in Mezzogiorno will be proportionally higher even if the reduction in income will be lower. The data showed that in southern Italy, the newly unemployed could be a number between 405,000 to more than half a million. Indeed, the estimation of employment elasticity of GDP suggests that the COVID-19 crisis could determine a decline in the occupation rate in the South of 0.83 for each point of GDP loss, which has no comparison with the other Italian regions. These results, due to the particular structure of the southern economy—characterized by low aggregate demand and small dimensions of firms—suggest necessary changes in economic paradigms with respect to the neoclassical approach adopted in the past 20 years. Demand-driven policies, such as basic income and labor redistribution, could avoid or mitigate the socioeconomic tragedy caused by the COVID-19 crisis.

Keywords COVID-19 · Southern Italy · Labor market segmentation · Policy design · Employment elasticity

S. Perri (✉)

Department of Law, Economics and Sociology, University of Magna Graecia, Catanzaro, Italy
e-mail: s.perri@unicz.it

G. Di Santo

Department of Political and Social Sciences, University of Calabria, Rende, Italy
e-mail: gustavo.disanto@unical.it

1 Introduction: Understanding Employment Effect of the COVID-19 Crisis

The structure of the Italian labor market is characterized by different and multiple levels of segmentation, not only for the geographical position (vertical segmentation) but also (horizontally among public and private workers and transversally) by different types of job contracts. Geographically, it is worth mentioning that Italy is arguably the only Western country where regional imbalances still play a major role, even in 2021; the division in terms of GDP between the North and South of Italy is a *unicum* among the advanced countries of similar size.

Also, if we exclude Eastern Europe, southern Italy is the biggest underdeveloped area within the European Union. During the second half of the twentieth century, the process of convergence toward the income level of North-West, by the other macro areas of the country begins, in the following decades, however, the convergence of the South and islands (or the “Mezzogiorno”) came to a halt, while that of the North-East and Centre accelerated. (Bank of Italy, 2017).

For aforementioned reasons, our analysis focuses on the Italian regions divided into four macro-areas: North-West, North-East, Centre, and Mezzogiorno during the period 2005–2019. In our opinion, this period well reflects the economic structural conditions of today’s Italian economy. Indeed, the geographical distribution of firms and production has been stabilized since the country’s entry into the Euro (Toniolo & Bastasin, 2020), and therefore, it is possible to assume that the COVID-19 crisis could have comparable effects to those of the global financial crisis, in qualitative terms; precisely because the macroeconomic structure has remained basically unchanged.

Learning from the recent international literature, the impact of the COVID-19 crisis on employment “is being clearly asymmetric, with the most vulnerable countries and segments of the workforce being hardest hit by the pandemic” (Fana et al., 2020). The negative impacts on labor market indicators are larger for women, younger workers, part-time workers, minorities, and less-educated workers, indicating that the COVID-19 crisis increases labor market inequalities (see, for instance, Béland et al., 2020). These differences among workers, with different employment statuses and conditions, are related to some degree to the segregation of different types of workers across economic sectors (Palomino et al., 2020). Italy is a paradigmatic example of the segmentation of labor markets because historically, there are differences in industrial structures that determine permanent differences in the employment rate.

In this work, we used the “employment elasticity” to measure the impact of the change in GDP on the employment rate for the different areas of Italy (in the 2005–2019 period). After that, we used the estimated values of the falling of GDP for Italy, due to the COVID-19 crisis, to estimate the potential effects on employment. Indeed, we suppose that the distribution of regional impact between growth and employment will be similar to those that occurred after the global financial crisis of 2006–2008.

In the next section, we will introduce the literature of the employment elasticity indicator that we have selected to develop our empirical analysis (Sect. 2). The estimation procedure, the strategy, and the results are showed and explained in Sect. 3. In Sect. 4, we reflect on the severe consequences of the COVID-19 crisis for the employment structure and the economy of the Italian Mezzogiorno. The results of our analysis suggest some necessary reforms of economic policies that are introduced in Sect. 5. Conclusions follow in Sect. 6.

2 The Employment Elasticity Indicator: A Brief Literature Review Insight

Among the employment-related economic indicators (i.e., employment and unemployment rates), there is the elasticity of employment; a measure of the relationship between employment and economic growth. Indeed, the elasticity of employment indicates the responsiveness of the labor market to changes in the economic growth process as can be represented by fluctuations in GDP. Hence, employment elasticity is a measure of the percentage change in employment induced by a change of one percent in gross domestic product.

Compared to the so-called *Okun's law*, the elasticity of employment allows us to avoid some measurement problems of the unemployment rate, particularly those due to different definitions of unemployed persons and to interactions between unemployment and labor force participation (Boltho & Glyn, 1995). Most of the studies in the literature focus on employment elasticities that are at the multinational or national level. However, several authors have introduced a sub-national dimension in the analysis on the relationship between output growth and labor market dynamics.

Given the aims of the present chapter, we mention some works focusing on sub-national levels of analysis of employment elasticity with respect to output. Islam and Nazara (2000), focus on the topic from the perspective of poverty reduction in Indonesian provinces, using different time periods for estimating *arc* and *point* employment elasticity (cross-section and time-series approaches). It should be noted that *arc elasticity* is the elasticity of one variable (i.e., employed people) with respect to another (i.e., GDP) between two different points in time, as opposed to the *point elasticity*, which measures the percentage change in the number of one variable (i.e., employed people) when the other (i.e., GDP) changes infinitesimally close to zero. Kangasharju and Pehkonen (2001) examined the employment–output relation using panel data on 452 Finnish municipalities grouped into 85 areas to estimate employment elasticity utilizing a dynamic panel approach. Perugini and Signorelli (2006) analyzed co-movements of employment and output for the European regions, calculating simple arc elasticity and correlation indexes. Tadjoeiddin and Chowdhury (2012) examined two different periods, pre and post 1998—in Indonesia at the provincial level—to see the changes in output elasticity of

employment before and after the crisis, by using the GMM estimator of dynamic panel data.

Concerning the Italian case, Perugini (2009) used the regional data dividing Italy into four geographical areas (North-West, North-East, Centre, South, and Islands) to estimate employment elasticity to growth over the period 1970–2004, adopting a static panel approach. The author argued that, although remarkable regional differences exist in levels of elasticity, its fluctuating trend is substantially uniform. According to him, this relative “uniformity” of the dynamics of elasticity for the geographical divisions may mean that, at the GDP level, movements of employment elasticity in time do not depend on spatially specific factors, but are probably influenced by complex and interacting aggregate dynamics. Finally, in line with the analysis technique adopted in this work, Busetta and Corso (2008) used a first difference technique to analyze respectively the trade-off between real GDP and the unemployment rate, and between real GDP and the employment rate for the Italian regions over the period 1992–2004. Their results showed greater suitability of the employment rate compared to the unemployment rate in interpreting the relationship between the Italian labor market at a sub-national level and GDP. Indeed, in line with the existing literature, the authors outlined the different territorial dynamics, deriving from the different conditions of the labor market between the regions belonging to the Centre-North and the south of Italy. The latter is characterized by low values of the participation rate on the labor market, compared to the former.

3 The Elasticity of Employment to Output in the Italian Macro-regions

There are several ways of estimating employment elasticity (see Perugini, 2009, for a comprehensive overview). One of the methodologies consists of only measuring the *arc elasticity*. The equation formula is:

$$\varepsilon_i = \frac{(E_{it0} - E_{it1})/E_{it0}}{(Y_{it0} - Y_{it1})/Y_{it0}} \quad (1)$$

The numerator gives the percentage change in employment in the country i , E_i , between periods t_0 and t_1 , while the denominator gives the corresponding percentage change in output, Y_i that is the GDP for the economy as a whole. However, the employment elasticity calculated using this method tends to exhibit a great deal of instability over time (see Islam & Nazara, 2000; Islam, 2004). As a result, we use an alternative estimation method for generating the *point* elasticity, which involves a double-log linear equation in the first difference (Okun, 1970; Busetta & Corso, 2008) relating employment and GDP for each macro-region (North-West, North-East, Centre, Mezzogiorno). This is given in the following equation:

Table 1 Estimation table: changes between 2005 and 2019

North-West (n = 14)	ΔLnE		North-East (n = 14)	ΔLnE	
	Coef.	p-values		Coef.	p-values
ΔLnY	0.182**	0.029	ΔLnY	0.320**	0.013
Intercept	0.003*	0.092	Intercept	0.004	0.133
Adj R ²	0.285		Adj R ²	0.367	
Centre (n = 14)	ΔLnE		Mezzogiorno (n = 14)	ΔLnE	
	Coef.	p-values		Coef.	p-values
ΔLnY	0.142	0.238	ΔLnY	0.830***	0.000
Intercept	0.007	0.007***	Intercept	0.003	0.294
Adj R ²	0.040		Adj R ²	0.699	

Notes: *** significant at 1%; ** significant at 5%, * significant at 10%

$$\Delta LnE_{it} = \beta_0 + \beta_1 \Delta LnY_{it} + e_{it} \tag{2}$$

where Δ represents the difference operator, E is the total employment unit, Y is the real GDP (constant prices 2015), e is a white noise disturbance term, and subscript i denotes macro-regions at time t. β₀ is the time-invariant intercept and captures the average growth rate and, therefore, the trend of the dependent variable (Lee, 2000; Virén, 2001; Guajarati, 2003). Coefficient β₁ is the estimated elasticity.

We, therefore, prefer here to focus on the simplest form of point elasticity, not distinguishing between short- and long-run effects, which may be obtained by adopting dynamic specifications. The transformation of variables in natural logarithms serves to linearize the relationship between the trend of real GDP and that of employment (Silvapulle et al., 2004), while the use of the first differences allows us to eliminate the unit root from the series (Mankiw, 1994; Lee, 2000). Indeed, if the time series involved was containing unit roots, the results would be misleading. The regression model in the first difference also reduces the problems deriving from the multicollinearity between the variables investigated. One of the reasons behind multicollinearity derives, in fact, from the possibility that the variables move over time in the same direction and their linear transformation into differences represents one of the ways in which this dependence is minimized (Guajarati, 2003). Finally, the linear transformation in the first difference is not affected by the discretion inherent in the estimate of potential GDP, necessary to calculate the gap with current real GDP—as is the case for models that use the *output gap*.

So, to analyze employment elasticity, with respect to GDP in Italian macro-regions—North-West, North-East, Centre, and Mezzogiorno—for the periods under investigation, we use a first difference regression model outlined in the previous section (Table 1).

The Pearson correlation is significant for three out of four macro-regions analyzed; indeed, only for the Centre, there is no significant correlation between

employment and GDP trends.¹ For the other macro-regions, the results show an employment elasticity of almost 0.2 for North-West, 0.3 for North-East, and 0.8 for Mezzogiorno, which basically implies that every 1-percentage point of GDP growth (or loss) is associated with employment growth (or loss) for each macro-region of 0.2, 0.3, and 0.8, respectively. Based on these findings, in the next paragraph, we provide a hypothesis on the impact of the current economic crisis on the employment of the Mezzogiorno.

4 The Effects of COVID-19 Crisis on the Mezzogiorno: Where Are We Going?

The impact of the COVID-19 crisis could lead to another drop in production with a similar impact compared to the last financial crisis, but more serious in terms of GDP falling. Indeed, according to the International Monetary Fund (IMF), the Italian economy is forecast to contract by 9.1% this year (IMF, 2020); likewise, SVIMEZ (2020) expects a fall of GDP by 8.5%. The Bank of Italy (2020) provides the worst scenario, assuming a 13% drop in GDP. These negative outlooks are also reflected on the GDP of the Italian macro-regions to a greater extent in the Centre-North than in the South, mainly due to the different industrial structure that characterizes the two areas of the country. The Centre-North is, in fact, the area in which the weight of the industry is greatest, representing the heart of Italy's production system, and therefore both internal and foreign exchanges undergo a stronger slowdown with a consequent impact on the territory. However, the southern economy, structurally more fragile, would reveal greater difficulties at the moment of the (possible) recovery, since the loss of consolidated income is strongly linked to the drop of employment in a more evident way than in other regions (see Table 1).

Following the path of *employment elasticity with respect to GDP*, our analysis suggests that for every unit of GDP lost in the South, employment drops by almost 0.83 points. So, for this year, if we assume for the South a drop in GDP between 7.9% and 8.6%, it would correspond to a loss between 6.6% and 7.1% in terms of the employment rate. In the worst-case scenario, the loss would be around 10.1%, if we suppose a 12.2% drop in GDP.² Basically, at the end of 2020, we will have in southern Italy—with a grain of salt—between 405,000 and 439,000 people out of

¹One of the possible explanations is the presence of the Lazio region in Centre Italy, which has an enormous concentration of public employees due to the presence of constitutional bodies and ministries. The public employment is insensitive to output variations due to the impossibility to dismiss for redundancy. However, this point needs further investigations, which represent avenues for future research.

²The first data (7.90%) is estimated by SVIMEZ (2020), while the second (8.56%) and third (12.23%) percentages are our elaborations based respectively on the projections of the IMF (2020) and the Bank of Italy (2020) at the national level, taking into account the proportions with respect to Svimez's forecasts for the South.

the legal labor market and more than *half a million* jobs (627,000 thousand) lost in the worst-case scenario.

The scenario is an employment collapse, persistent over time compared to other areas of Italy with permanent destruction of part of the legal employment. The inevitable consequences in terms of a drop in aggregate demand will end up further compressing the size of the southern economy (which is the cause of the balances of underemployment and segmentation). A social and economic plague that needs courageous interventions before the drop in production and employment can challenge the unity of the country itself.

5 Learning from the Past Some Policy Suggestions

Strictly conditioned by the neoclassical view, European and national funds were oriented toward the promotion of new business and investments in training for workers to fight unemployment (Pissarides, 2009). In terms of labor market reforms, the aim was to achieve greater contract flexibility and, consequently, lower wages (Boeri et al., 2019). However, this mix of policies was unable to increase employment in the South. Also, there are two other forms of intervention to change the structure of southern markets and increase its competitiveness: reduce costs for business, support shadow firms to emerge, and reduce the minimum wage only in the South to compare the cost of living. Nevertheless, if we consider the interaction between the different sectors of the economy, there is not sufficient reason to sustain these policies.

In 2001, there was a law for the surfacing of underground companies to reduce costs of “emersion” from shadow to legal. The results were insignificant in terms of firms that emerged. This fact suggests that the costs gap between shadow and legal is greater than a simple tax reduction, and involves the entire production structure in shadow firms, which are unable to pay taxes or legal wages (and relative costs). A new form of wage rationing in the South could have counterproductive effects. If aggregate demand is lower in the South and this affects the dimension of firms, then a reduction in wages can exacerbate this phenomenon instead of producing competitiveness, thus leading to another negative shock. Furthermore, one of the milestones of the “wages reduction policy” is that workers in the South are less productive but have the same wages as their counterparts of the North. Considering the data, this fact is not true, at least for the private sector, where wages in the South are even lower, even before the financial crisis (Bank of Italy, 2009). Besides, if we consider a more detailed breakdown of productivity, the argument of the productivity gap of the southern population seems to be also really fragile (Daniele, 2019). Furthermore, we know that the southern economy is characterized by an underemployment equilibrium, firms suffering, low aggregate demand, and high mobility between formal and informal sectors (both for firms and for workers).

The question is how to deal with the actual crisis. Multiple segmentation of the labor market requires a strategy that considers the above-mentioned conditions

(Fields, 2007). As we stated before, a low level of aggregate demand shifts the focus on business costs. To be competitive, the firms have to compress wages, and when they are unable to act in the legal sector, they move into the shadow. Then the first objective of the political economy is to increase workers' income. Two tools could be used for this: the redistribution of work (Mazzetti, 1997) and a form of basic income (Standing, 2002). The first one can be used to support firms to increase their size and efficiency. Not all firms are "completely shadow"; some of them integrate part of shadow workers in a legal structure, and the redistribution of the work can favor their complete emergence.

The basic income can be used to reduce the base of workers that offer their skills to shadow firms. Also, it should be designed as an "integration" of income and not a replacement for it.³ This could have two positive effects: firstly, increasing aggregate demand for consumption; secondly, reducing incentives to work in shadow because the firms could legally integrate their labor force, even for short periods.

On the supply side, southern firms are characterized by their small dimension. The incentives for the birth of new firms are useless and dangerous at the same time. The intervention paradigm has to shift from birth to duration of company activities, by supporting them to have financial assistance, in particular. Firms in the South pay twice as much interest rates for their loans as businesses located in the North (Perri, 2014). So, the necessary contribution to react to this crisis is to have continuity over time and increase the average size. To do these two things, resources are needed for investment.

6 Conclusions

Summarizing what has been said, Italy is a "mature economy" with a declining growth rate for about 30 years. Within this economic framework, we find at least two macro-regions with different productive structures and different reactions to economic shocks. The negative effects of recessions are more severe in the South, where production is falling and there is more difficulty in recovering. That is especially evident after the last financial crisis and it was reflected in the employment rate and its structure. The reasons concern, among others, the dimension of firms, the low level of aggregate demand, the quality of public services, and the presence of organized crime. All these factors determine a particular form of segmentation in the labor market, which has been exacerbated by neoclassical economic policies and reforms. The effects of the COVID-19 crisis could be very serious and very persistent over time. The southern economy is fragile, and the labor market is undergoing transformative impacts with each crisis. Employment drops recover

³There is in this moment in Italy a form of basic income, called "Reddito di Cittadinanza"[citizens' income] but it has a lot of limits, particularly because it is not compatible with a regular job and then, paradoxically, it finishes being an incentive to work again in the shadow (Perri, 2018).

very slowly, and at least a part of the workforce moves into the underground sector while regular companies end up resorting more to underpaid work.

Considering that between 405,000 and more than *half a million* workers can be lost in the first year after the crisis, the repercussions on aggregate demand and southern income could be catastrophic, well beyond the worst forecasts. For these reasons, it is necessary to change the paradigms of economic policy, above all because the neoclassical instruments have proved ineffective in reducing the economic gap between the South and other areas of the country in terms of employment. It seems necessary that the focus of the interventions move toward individuals' income, and through forms of redistribution of work and basic income, which allows flexible use of the workforce that does not penalize workers in terms of income.

An effective strategy must be complex, and include infrastructure policies; financial support for the dimensional growth of firms and bureaucratic reforms; and expensive and long-term interventions. Instead, insisting on the same policies of the past 30 years could only represent the maintenance and tolerance of an even more underdeveloped South, where alternatives for workers are underpaid jobs, informal work, or emigration.

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Risk Analysis and How to Select the Option for Adapting and Mitigating Changes Climate: An Instrument for Planning Climate Change Measures



Robert Adrian Candoi Savu and Liviu Adrian Stoica

Abstract This chapter is an indicator for drafting the proposed mathematical approach of the Climate Change (CC) Action Plan. The CC action plan must be based on the consolidation and coordination of both mitigation and adaptation measures or options. Selection of recommended measures constitutes a significant phase in drafting such a plan. This selection involves the involvement of competent authorities in key sectors, including transport, energy, urban, water, agriculture, and forestry. The selection process must be transparent, pragmatic, and safe operation. The different categories of measures need to be discovered and analyzed in the circumstance of the associated risks and benefits. The selection and appreciation of measures are crucial for the success of CC policies and yet the process is time consuming and quite expensive. The chapter proposes a mathematical risk equation, developed for the scope of reducing the value of the risks identified by evaluating all the vulnerabilities and threats that CC proposes and quantify them in points of measurement to can unify all their types as one final result. Based on the result score, there can be made adjustments or improvements in the risk decision making as lowering the costs of investments in technology or reducing the eventual losses caused by the risks.

Keywords Climate · Plan · Measurement · Evaluation · Risks

R. A. Candoi Savu
Economy Department, Bucharest University of Economic Studies, Bucharest, Romania

L. A. Stoica (✉)
Finance Department, Bucharest University of Economic Studies, Bucharest, Romania
e-mail: liviu.stoica@csie.ase.ro

1 Introduction

Selection methods are used to facilitate a transparent decision-making process in various areas, such as the effect on the environment, hazardous substances, the environmental footprint of products, or CC measures. A significant percentage of CC measures can be identified, evaluated, selected, or excluded through the selection process. If any gains on CC measures do not clearly offset costs or produce obvious irreversible effects, a detailed analysis will be needed, such as a cost–benefit analysis (CBA), a cost–effectiveness analysis (CEA), a multicriteria analysis, modelling, etc. The use of selection methods has become an increasingly used process in the field of environment to analyze actions, policies, measures, technologies, and effects. These selection procedures are mainly used to ensure that all feasible options are discovered, to highlight as much as possible the opinion of the relevant expert regarding the measures envisaged, allow selection, and move on to a more detailed analysis only if and when this is the case necessary, creating a transparent decision-making process and saving time and money resources.

The drafting of an action plan is an important step in addressing the challenges of CC. The strategy is a planning tool for recognizing opportunities and responsibilities. The basis of measures related to climate change is the application of the necessary measures. Drafting an action plan on climate change is an essential clause for the implementation of precise measures to initiate the reduction of carbon emissions and climate-resilient growth. Climate change and related global agreements require key policy decisions in the coming years. New policies will be needed to address both mitigation and adaptation issues, and the implementation of these policies will require significant investments, economic incentives, legislative tools and standards, technical assistance, and technological solutions.

In 2012 the Uttarakhand Action Plan on Climate Change, according to Jogesh (2013), based on wide consultations, assessed possibilities, and steps needed to avert such disasters. Despite the extensive information provided in the document, it fails to be “implementable” due to issues of financing and bureaucratic initiative among others. Climate change vulnerability assessments, as well as adaptation actions in India, are on the rise according to Patra (2014). Ensuring the efficiency and cost-effectiveness of these actions are essential to tackle the uncertainties and complexities. This chapter suggests ways to enhance real time and proactive linkages between vulnerability assessments and adaptation action. Based on Nordhaus (2018), climate change remains one of the major international environmental challenges facing nations. Up to now, nations have adopted minimal policies to slow climate change. Moreover, there has been no major improvement in emissions trends as of the latest data. The current study uses the updated DICE model to develop new projections of trends and impacts of alternative climate policies. It also presents a new set of estimates of the uncertainties about future climate change and compares the results with those of other integrated assessment models.

According to Bosello et al. (2010), it has become commonly accepted that a successful climate strategy should compound mitigation and adaptation. The

accurate combination between adaptation and mitigation that can best address climate change is still an open question. Their paper proposes a framework that integrates mitigation, adaptation, and climate change residual damages into an optimization model. This set-up is used to provide some insights on the welfare maximizing resource allocation between mitigation and adaptation, on their optimal timing, and on their marginal contribution to reducing vulnerability to climate change. Bosello et al. (2013) states that they analyze the optimal mix of adaptation and mitigation expenditures in a cost-effective setting, in which countries cooperate to achieve a long-term stabilization target (550 CO₂-eq). It uses an Integrated Assessment Model (AD-WITCH) that describes the relationships between different adaptation modes (reactive and anticipatory), mitigation and capacity building to analyze the optimal portfolio of adaptation measures. The report made by Agrawala et al. (2011) examines adaptation and mitigation within an integrated framework. Global and regional costs of adaptation are assessed dynamically and the resulting benefits are quantified. This is accomplished by developing a framework to incorporate adaptation as a policy variable within three Integrated Assessment Models (IAMs); the global Dynamic Integrated model of Climate and the Economy (DICE), the Regional Integrated model of Climate and the Economy (RICE), and the World Induced Technical Change Hybrid (WITCH) model. The framework developed here takes into account investments in reactive adaptation and in adaptation “stocks,” as well as investments in building adaptive capacity.

In our research, we propose a mathematical approach to quantify the identified risks associated with measures or options regarding the Climate Change Action Plan. We took into consideration the aspects involved in the proposed action plan by the minister of resort and other specialists and tried to find a way to expose all the threats involved and quantify them on the same level of measurement, an approach we could not find in other research that can help the government reduce the costs for protecting the climate change.

2 Classification of Measures or Options Related to CC

Based on the Ministry of the Environment (2015) European Commission (EU) (2010), the mitigation and adaptation measures represent two complementary areas for action on climate change challenges as it follows: mitigation measures are actions to limit or control greenhouse gas (GHG) emissions. By recognizing the main sources of emissions, these measures make it easier to limit total accumulation of GHGs. Reduction measures certainly have a global dimension, as any local emission reduction measure automatically reduces total global emissions. Based on this idea, the effects of diminution may have gaps, which can be assessed only on the basis of the cumulative long-term effect. Diminution options must be considered as an anticipatory policy. These are *ex ante* measures that are expected to help reduce the future effect of CC and adaptation measures are measures to reconfigure natural or human systems in response to actual or predicted climatic

stimuli and their effects. Thus, there can be distinguished different types of adaptation policies such as anticipatory and reactive adaptation, public and private adaptation, and autonomous or planned adaptation. Adaptation policy options are usually policy ideas to support change in how we respond to the adverse effects of climate change, an eloquent example being the use of climate change resource efficiency. Adaptation measures are those measures that can be implemented to reduce the negative effect of climate change. Adaptation measures must be considered as a local solution, which generates benefits at the local level.

The categories and measures of diminution and adaptation, as in Ministry of the Environment (2015) are: physical investments that means improving the energy mix (switching from coal to renewable energy sources), modernizing district systems, building and rehabilitating dams and dams to ensure flood protection), economic incentives like cost pricing, taxes, quotas, etc. and, for example, the carbon market with taxes on carbon dioxide emissions and subsidies for renewable energy, legal instruments that can also play an important role in reducing and adapting to the impact of CC and government may consider preparing standards and legislation to increase infrastructure resilience to climate change risks, technical assistance like training, studies, capacity building, etc. can be a valuable means of supporting analytical work, research, staff training, and institutional capacity development to facilitate the development and implementation of mitigation and adaptation policies and technology selection, which is the main engine for both reduction and adaptation. In terms of adaptation, the promotion of drip irrigation systems, for example, could be considered an effective measure and insurance mechanism, where increasing the frequency of extreme events like floods, droughts, heatwaves, etc. will have an impact on insurance demand.

Risks associated with measures or options regarding CC classified in the Ministry of the Environment (2015) by basic criteria used to classify measures or options for mitigation and adaptation to CC are costs and risks. Thus, the risks must be analyzed both in terms of intensity (high, medium, low) and in terms of variety (financial, institutional, social, technological, etc.), the selection must be designed in such a way as to allow for measures with tangible benefits for adaptation and/or mitigation and for low incremental risks and costs to be directly included in the CC Action Plan. In conclusion, the measures with reliable results must be the first to be included in the action plan. Both mitigation and adaptation measures can involve significant investments in infrastructure, facilities, and equipment.

The elaboration of a national action plan on CC requires the identification, selection, and implementation of measures/options for mitigation and adaptation to climate change. Detailed analyses, such as multicriteria analysis (MCA), CBA, CEA, or modelling are expensive and time consuming; these analyses are applied to measures that do not fall into the category of “safe results” measures or to measures whose benefits clearly do not exceed costs. Figure 1 describes how to filter these measures/options through the selection process.

Overview of the proposed selection method consists from the selection process for measures with reliable results, measures “with safe results” (or so-called “beneficial for all” measures) are activities that have benefits even in the absence of

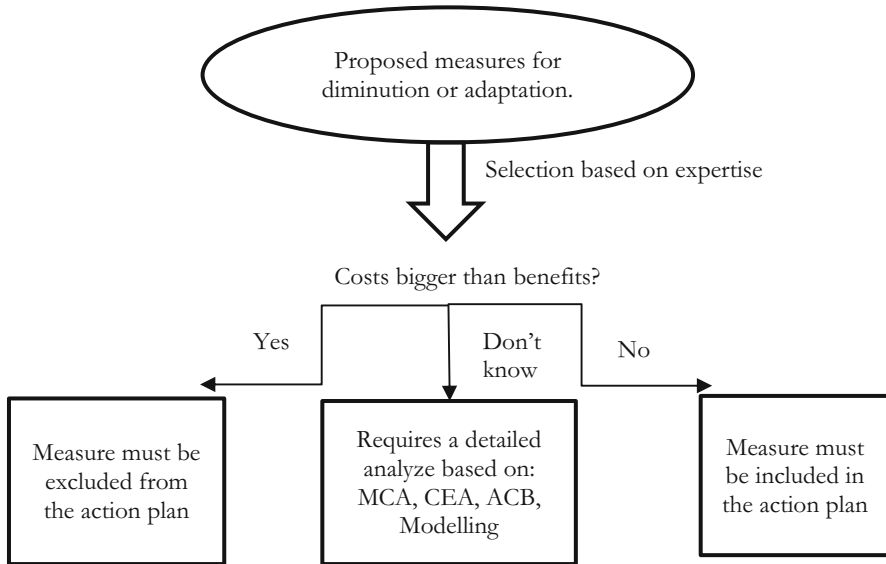


Fig. 1 Selection method used to ensure a pragmatic process and transparent decision-making. Source: Adapted by authors from literature Ministry of the Environment (2015)

climate change and the selection process for measures with safe results, those with low risks and those with high risks.

The proposed selection process uses a qualitative approach, designed to increase the transparency of the decision-making process. The selection is based on the understanding that, even in the case of the best possible mitigation and adaptation measures, there will still be residual risks related to CC. Three main techniques are recommended to be applied in the economic assessment of climate change adaptation and mitigation options: multicriteria analysis (MCA) that describes any structured approach used to determine general preferences between several alternative options, if they contribute to the achievement of several objectives. Within the MCA, the objectives pursued are specified and the corresponding attributes and indicators are identified; cost efficiency analysis (CEA), which is an evaluation technique that can be used to classify alternative measures/options for SC according to their cost-effectiveness, in which the first position is occupied by the most cost-effective measure. The CEA analysis proposed here considers an economic perspective on cost efficiency. This contributes to issuing an opinion on the most cost-effective adaptation and mitigation measures that can be implemented to reduce the potential impact of SC and the cost-benefit analysis (CB) that is a basic tool for identifying the public interest related to a certain measure/action/option/for a certain project and contributes to the evaluation of costs (financial, social, economic, environmental, etc.) and to compare them with the anticipated benefits. This approach is in line with the Kaldor-Hicks principle of potential compensation, which is a widely accepted variant of the Pareto criterion (Pareto efficiency is achieved when it is not possible to

improve the situation of some people without worsening the situation of others). This principle requires only that the value of the net gains obtained as a result of a measure be positive and that the benefits exceed the costs in order to implement the evaluated measure. The CBA helps decision makers to identify projects/programs/policies with potential net gains by assessing all costs and benefits in monetary terms.

3 Risk Equation Resulting from the Implementation of Mitigation and Adaptation Measures

After the analyses of the studies conducted by Bosello et al. (2010, 2013) with his team, we tried to come and provide the mathematical approach on the risks involved in the implementation of the mitigation and adaptation measures. Based on the risks exposed and identified in Ministry of the Environment (2015), European Commission (2010, 2013, 2014, 2016) we developed the propose formula identifying the following variables as it follows:

To determine the risk equation (REM), we need to take into consideration the main risk types categories identified, such as financial (FR), social (SR), institutional (IR), related to technical and economic feasibility (TER), and technological (TR).

$$\text{REM} = \text{FR} + \text{SR} + \text{IR} + \text{TER} + \text{TR} \text{ where :} \quad (1)$$

$$\text{FR} = \sum_{i=1}^n (p \text{ or } q) * \text{MSR}_i + \sum_{j=1}^m (p \text{ or } q) * \text{MSA}_j \quad (2)$$

where:

MSR = measure introduced to reduce.

MSA = measure introduced to adapt.

p = coefficient in case of the measurement was carried out with the help of micro-credits or community-based insurance schemes (private) and have a value between 5 and 10 based on value amount.

q = coefficient in case of the measurement was financed by grants and public funds and have a value based on 1 and 5 based on value amount.

i = position of measure to reduce and n = number of measures of reduction.

j = position of measure to adapt and m = number of measures of adaptation.

In particular, many adaptation measures do not have a sufficient market-based return on investment to be financed by the private sector.

$$SR = \sum_{i=1}^n (IV_i * TNA_i) + QI + FL + HTR \quad (3)$$

where:

IV = impact value of the climate change calculated on a scale from 1 to 5 where 1 is low and 5 is high.

TNA = number of threats identified based on where the people living areas: areas prone to floods, droughts, soil erosion, coastal erosion, or rising sea levels.

i = position of threat identified and n = number of threats.

QI = quality of the infrastructure calculated on a scale from 1 to 5 where 1 is low and 5 is high.

FL = financial level calculated on a scale from 1 to 5 where 1 is low and 5 is high.

HTR = human and technological resources on a scale from 1 to 5 where 1 is low and 5 is high.

All the social risks used to withstand the impact of climate change will lead to a decrease in the autonomous capacity to adapt. Equity issues must be taken into account when selecting adjustment or mitigation measures. It is important to ensure at least that the possible adverse effects of possible policies or activities will not increase the social risks of those categories that are already extremely vulnerable.

For this reason, selection procedures must assess the social risks associated with the proposed mitigation or adaptation measures.

$$IR = \sum_{i=1}^n dmg_i * AD_i - \sum_{j=1}^m MRV_j \quad (4)$$

where:

dmg = the coefficient of the disaster occurred on a scale from 1 to 5 where 1 is the lowest category and 5 the highest.

AD = associated damage (economic and social damage, loss of life) evaluated on a scale from 1 to 10 where 1 is the lowest and 10 the highest based on total economical money loss calculated.

i = current disaster identified and n = number of disasters.

MRV = measures and options that promote a proactive and integrated approach at national or local level that could help to limit institutional risks: lack of action and poor coordination measured on a scale from 1 to 10 based on the costs of implementation.

For most of the people, the climate change are perceived mainly post-factum, after the occurrence of a disaster meaning that at this time, the authorities can only intervene to manage the crisis and not to prevent it. National authorities should give priority to measures or general options for adaptation and promote the development of activities in an integrated way.

It is clear that in the event of a disaster, the population will always try to understand why no measures have been taken to reduce vulnerability. In terms of

reduction, institutional barriers often prevent the implementation on an appropriate scale of measures with seemingly secure results, with net benefits and rapid effects (such as energy efficiency). In the case of energy efficiency measures, the economic benefits usually far outweigh the costs. However, implementing a successful program to increase energy efficiency remains a difficult process, and institutional processes often present significant obstacles to implementation.

$$\text{TER} = \text{EFY} + \text{TFY}, \quad (5)$$

where:

EFY = economic feasibility measured on a scale from 1 to 100.

TFY = technical feasibility measured on a scale from 1 to 100.

Before proposing the implementation of any adaptation or mitigation measure, it is important to be able to assess its economic and technical feasibility. There is no one-size-fits-all solution. In order to assess the feasibility, the proposed solution must be analyzed in context, using pragmatic selection procedures, which take into account local conditions and circumstances. Some mitigation measures, such as the promotion of specific renewable energy sources, may be accepted in a particular location, but they may not be good enough for other regions or countries. The situation must be assessed for each case in terms of economic and technical feasibility and the most appropriate options in the local context must be recommended.

$$\text{TR} = \prod_{i=1}^n \text{pr}_i * \text{ELV}_i \quad (6)$$

pr = probability of a loss arising from the execution of a technical process whose outcome is uncertain.

ELV = technical process that might fail assessed on a scale from 1 to 10 based on the economic costs that appear in case of failure, where 1 is minimum costs and 10 highest.

i = position of technical process and n = number of processes assessed.

Untested technical, technological, and production procedures involve a certain level of technical risk that can lead to a loss of time, resources, and possibly injury to individuals and property damage. Technological risk is measured as an anticipated value based on previous experience that has led to undesirable results.

As an example, to reduce emissions, there is a significant demand for large-scale innovation and fundamental changes in electricity generation, transmission and electricity supply technologies for industry, businesses, and utilities. Any technical process implemented can fail or be successful.

The final equation for calculating the risk is:

$$\begin{aligned}
\text{REM} = & \sum_{i=1}^n (p \text{ or } q) * \text{MSR}_i + \sum_{j=1}^m (p \text{ or } q) * \text{MSA}_j + \sum_{i=1}^n (\text{IV}_i * \text{TNA}_i) \\
& + \text{QI} + \text{FL} + \text{HTR} + \sum_{i=1}^n \text{dmg}_i * \text{AD}_i - \sum_{j=1}^m \text{MRV}_j + \text{EFY} + \text{TFY} \\
& + \prod_{i=1}^n \text{pr}_i * \text{ELV}_i
\end{aligned} \tag{7}$$

To calculate the Risk evaluation method (REM) and to obtain the result in same unit of measurement are used points of measurement (pm) for all the risks involved and identified.

Based on the REM you can make a ladder for the risks for evaluating purpose on the total value of the equation. The value can be used on a scale from low to high, with different steps of evaluation based on how fine you want to adjust the values and improve the investments and lower the risks. The easiest and simplest way to evaluate is on a 5-steps ladder with values very low, low, middle, high, and very high. Each value would have the points of measure allocated in increments of 200 points where very high is 1000+. All the risks with a result of over 600 points (considered medium on the scale) should be thoughtfully revised and those over 800 should stop the process since the risks are too high.

4 Conclusions

A national action plan is a decisive step in implementing effective climate change policies. The measures to be supported in the action plan will need to be analyzed, taking into account both the associated risks and the potential benefits. The selection of measures and their analysis will have to be as transparent as possible and involve the main actors (line ministries, government agencies, etc.) in the core sectors.

Where possible gains do not clearly outweigh the risks, a detailed analysis of the measures subject to the acceptance process in the action plan, such as a multi-criteria analysis, CBA, CEA, or other sectoral or macroeconomic models, should be carried out in order to decide to include or exclude them from the CC action plan.

The risk evaluation method we tried to define as accurately as possible is supposed to give the best evaluation on the risks exposed from the implementation of mitigation and adaptation measures. A lowest value indicates a safer risk exposure. The plan of the implementation should be adapted and corrected until the value of the risk evaluation is as low as possible with the minimum investment required, always taking into balance the cost versus benefit.

Any investment and any implementing plan for climate change that affects the environment should be treated from the point of view of risks more than from the point of view of economical spending.

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Financial Inclusion and Welfare: New Evidence on the Role of Government



Talnan Aboulaye Toure

Abstract In this paper, we judge the role of government in promoting financial inclusion, measured through owning a basic bank account, but also examine the effects of this access on economic well-being, in Japan, India, and Ivory Coast. We use an optimal consumption model in competitive economy with government that embeds financial inclusion, which is endogenous. First, we find that financial inclusion leads to a higher equilibrium state. In fact, as financial inclusion increases, from low to high level, the economic equilibrium raises. Besides, a greater access to a bank account crowds out the harmful effects of taxes on the stationary state. Second, we find that, while the economy with high financial inclusion promotes greater welfare, low financial inclusion's economy yields weaker welfare. Third, financial inclusion boots capital accumulation. This positive impact is greater for Japan, India, and Ivory Coast respectively. Accordingly, government has to play a key role to support financial inclusion. Basically, for the three economies, government can promote financial inclusion, and enhance savings, by making tax incentive schemes or social transfers, and move their payments, including wages, and pensions onto banking system. Particularly, in Ivory Coast, shifting individuals from informal to the formal sector can improve savings.

Keywords Financial inclusion · Accessibility · Bank accounts · Economic growth · Welfare · Deterministic dynamic programming methods

1 Introduction

Global and national-level policy makers have considered financial inclusion as a primary public policy issue following the 2008 financial crisis. Moreover, financial inclusion is defined as a world where everyone, in particular low-income individuals

T. A. Toure (✉)

Graduate School of Economics, Department of Economics, Kobe University, Kobe, Japan

and firms can access and use financial services such as credit, savings, and insurance in order to make investment opportunities, smooth consumption, acquire better health and education, and reduce vulnerability (poverty). Indeed, lack of financial inclusion (financial exclusion) is recognized as a major concern of economic growth. [Sarma \(2008\)](#) emphasizes that financial exclusion may result from problems with access, condition, price, marketing, and self-exclusion in response to adverse experiences and perceptions. For example, cultural and religious factors may undermine the demand for banking services. In addition, [Demirgüç-Kunt and Klapper \(2012\)](#) mention seven self-reported reasons for lack of financial inclusion, which rank lack of trust sixth.¹ Particularly, in Ivory Coast, illiteracy, and not enough money are seen as the real causes of financial exclusion. Furthermore, a strong informal sector in certain areas, especially in developing countries may also lower demand for formal banking services state ([Sarma & Pais, 2011](#)). [Chibba \(2009\)](#) explicitly points out market power as a source of lack of financial inclusion in the case of Botswana, which can be found in other countries as well. He moreover cares about poor governance in areas with weak institutions, which impede the take-up. Similarly, low banking activities could be observed in small regions due to the lack of economies of scale on the side of the banks.² Furthermore, transaction costs such as account opening fees, minimum balance requirement, and administrative procedure are a significant barrier to the take-up and use of formal financial services. These prevent the poor from opening bank accounts ([Dupas & Robinson, 2013](#)). The distance to the nearest bank or mobile money agent is a key predictor of take-up of savings accounts ([Dupas et al., 2018](#)) and mobile money ([Jack & Suri, 2014](#)).³ This means that the path to reach a financial institution could be a barrier. It may bring about indirect transaction costs such as travel time and fees.

However, a growing number of evidences suggest that financial inclusion has significant economic and social beneficial effects. In addition, [Demirgüç-Kunt et al. \(2017\)](#), [Beck \(2015\)](#) stipulate that more efficient payment systems can help individuals by allowing better integration into modern market economies. They pursue to say that this can have a direct impact on income-earning opportunities and thus incomes of the poor. Other empirical evidences prove that gaining better access to savings and credit services enables poor to pull out of poverty by investing in human capital accumulation, thus reducing rural and aggregate poverty, and increasing welfare ([Galor & Zeira, 1993](#); [Burgess & Pande, 2005](#); [Suri & Jack, 2016](#)). Similarly, [Banerjee and Newman \(1993\)](#) also think that better access to credit services allows poor to invest in their microenterprises, leading to higher income opportunities. Meanwhile, access to savings services through formal savings accounts

¹[Demirgüç-Kunt and Klapper \(2012\)](#) point out seven self-reported reasons for lack of financial inclusion, such as not enough money, too expensive, family member already has account, too far away, lack of necessary documentation, religious reasons.

²Operational costs may also be a consideration for financial exclusion. For more details see ([Claessens & Perotti, 2007](#); [Andrianaivo & Kpodar, 2011](#)).

³[Bachas et al. \(2018\)](#) find a correlation between financial activity and change in travel distance. Moreover, they show how the use of debit cards enhances financial inclusion.

empowers micro-entrepreneurs to invest more in their businesses (Ashraf et al., 2010; Dupas & Robinson, 2013). Accordingly, a greater access to efficient savings, credit, and insurance services allows low-income households to smooth consumption when hitting with income or expenditure shocks (Jappelli & Pagano, 1989; Bacchetta & Gerlach, 1997; Ludvigson, 1999). In turn, an increased access to financial services raises household savings (Aportela, 1999; Brune et al., 2016; Somville & Vandewalle, 2016; Allen et al., 2016), employment, and income (Prasad, 2010; Bruhn & Love, 2014), improves mental well-being (Karlan & Zinman, 2010; Angelucci et al., 2013), favors education (Flug et al., 1998), helps making a better decision (Mani et al., 2013), enhances new firm creation (Chauvet & Jacolin, 2017; Guiso et al., 2004; Klapper et al., 2006; Banerjee et al., 2013), and ensures bank stability (Ahamed & Mallick, 2019). Hence, greater financial inclusion can have welfare effects that extend beyond benefits in the financial realm to the real economy.

Therefore, we ask about the following question: Does an increase in financial inclusion affect greater welfare? The goal of this work is to not only judge the role of government in promoting financial inclusion, but also to examine the effects of the latter on economic well-being. To do that, we choose a sample involving three countries, namely, Ivory Coast, India, and Japan, which are developing, emerging, and developed economy respectively. Given that, financial inclusion dynamically evolves a comparative study pertaining to this subject for countries with different income levels is relevant. At the core of our analysis is an optimal consumption model in a competitive economy along the line of Ramsey (1928), Cass (1965), and Koopmans (1965), with government. A main reason for choosing this model is technical namely under conditions where certain structures of the economy (such as utility functions) do not change over time, we could use dynamic programming methods to solve for stationary states. Our model has also a property of handling endogenous savings by allowing the agents to live infinitely and making plans, taking into account their future consumption stream. The main contribution of this paper consists of incorporating the variable financial inclusion, which is mainly measured via owning a basic bank account.⁴ Thus, the rise in the access to a transaction account stimulates both capital stock, and consumption, and hence turns out to be welfare improving. We use the Newton-Raphson's method to solve the nonlinear dynamics of the system, which is based on the Fair and Taylor (1983) algorithm. The numerical problem consists of solving a nonlinear system of simultaneous equations in n endogenous variables in T periods.

The rest of the chapter is as follows: Section 2 describes the dynamics programming methods. Section 3 indicates the basic model. Section 4 shows parameters values. Section 5 treats the numerical results. Section 6 presents conclusion and policy implications.

⁴Moreover, investigating the type of people who are excluded from formal finance systems in Britain, Kempson and Whyley (1999) point out that a necessary financial service for low-income people is a basic bank account.

2 Deterministic Dynamics Programming Methods

Consider an economy with only one individual. At time t an infinitely lived individual wants to maximize a lifetime utility function of the form:

$$\sum_{i=0}^{\infty} \beta^i u(c_{t+i}), \quad (1)$$

where $u(\cdot)$ is a sub-utility function that does not change with time, $0 < \beta < 1$ is the factor by which future utility is discounted, c_t stands for consumption of individuals in period t . The function $u(\cdot)$ is assumed to be increasing, continuous, concave, and with as many derivatives as are required.

The individual begins period t with a given amount of capital stock carried over from the previous period, k_t , will provide one unit of labor in every period, and decides how much to consume subject to budget constraints of the form:

$$k_{t+1} = (1 - \delta)k_t + i_t, \quad (2)$$

and

$$y_t = f(k_t) \geq c_t + i_t. \quad (3)$$

The capital stock, k_t , is per worker capital by definition in a one-person economy and by the assumption that an individual provides one unit of labor in each period. Investment, i_t , is the only other use for production that is not consumed. δ is the depreciation rate.

From the two budget constraints at equality, we can write consumption at time t as:

$$k_{t+1} = f(k_t) + (1 - \delta)k_t - c_t. \quad (4)$$

In discrete time, the social planner maximization problem is as follows:

$$\max \sum_0^{\infty} \beta^i u(c_{t+i}), \quad (5)$$

subject to

$$k_{t+i+1} = f(k_{t+i}) + (1 - \delta)k_{t+i} - c_{t+i}, \quad (6)$$

setting it otherwise, we get:

$$\max \sum_{s=0}^{\infty} \beta^{-(s-t)} u(c_s), \quad (7)$$

subject to

$$k_{s+1} = f(k_s) + (1 - \delta)k_s - c_s. \quad (8)$$

Suppose that we are at time t on the optimal path. Since maximized sum of discounted utilities depends solely on state at time t , let denote it as $V(k_t)$, which is called value function:

$$V(k_t) = \{ \max \sum_{s=t}^{\infty} \beta^{-(s-t)} (u(f(k_s)) + (1 - \delta)k_s - k_{s+1}) \}. \quad (9)$$

Denoting it as

$$V(k_t) \equiv \sum_{s=t}^{\infty} \beta^{-(s-t)} u(c_s^*),$$

$V(k_{t+1})$ becomes: $V(k_{t+1}) = \sum_{s=t}^{\infty} \beta^{-(s-(t+1))} u(c_s^*)$,
and

$$\begin{aligned} V(k_t) &= u(c_t^*) + \beta \sum_{s=t}^{\infty} \beta^{-(s-(t+1))} u(c_s^*), \\ V(k_t) &= u(c_t^*) + \beta J(k_{t+1}). \end{aligned} \quad (10)$$

Equation 10 is called Bellman Equation or Recursive equation. c_t^* satisfies two-period optimality condition, and hence optimality condition for entire program. This is the principle of optimality. Substituting $k_{s+1} = f(k_s) + (1 - \delta)k_s - c_s$ into the Bellman equation and deriving first-order conditions:

$$V'(k_s) = u'(c_s) - \beta J'(k_{s+1}) = 0,$$

Then

$$u'(c_s) = \beta V'(k_{s+1}). \quad (11)$$

Applying the Envelope theorem to Bellman equation (Eq. 10), yields:

$$V'(k_s) = \beta V'(k_{s+1})((1 - \delta) + f'(k_s)),$$

and

$$V'(k_{s+1}) = \beta V'(k_{s+2})((1 - \delta) + f'(k_{s+1})).$$

(Eq. 11) gives: $u'(c_{s+1}) = \beta V'(k_{s+2})$, thus,

$$\beta^{-1} u'(c_s) = u'(c_{s+1})((1 - \delta) + f'(k_{s+1})).$$

Therefore

$$f'(k_{s+1}) + (1 - \delta) = \frac{u'(c_s)}{\beta u'(c_{s+1})}. \quad (12)$$

Equation 12 is the so-called Euler equation for consumption. At the stationary state, $k_{s+1} = k_s = k_{s-1} = \bar{k}$, hence the first-order condition yields:

$$f'(\bar{k}) = \frac{1}{\beta} - 1 + \delta. \quad (13)$$

$$k_{t+1} = H(k_t). \quad (14)$$

where the function $H(k_t)$ is called the policy function.⁵

3 Basic Model

This section treats the long-run Ramsey-Cass-Koopmans model in a competitive economy in which there are consumers who provide labor to the market and firms who hire this labor at the competitive wage. We assume that there is a continuum of identical agents of measure 1. All individuals are the same, therefore, we consider the representative household's problem.

3.1 Firms

Firms are owned by households. In addition, the representative firm produces by using the Cobb-Douglas production function technology as follows:

$$y_t = A_t (IFI_t k_{t-1})^\theta. \quad (15)$$

where y_t , A_t , θ , IFI_t , and k_t are respectively per-capita output, total factor productivity, capital share in production, index of financial inclusion, and per capita capital standing for both physical and banking service infrastructure as far as building a banking service infrastructure is capital, too. Further, we assume that financial inclusion through access to bank accounts increases individuals' savings, therefore investment, capital accumulation, and output. As financial inclusion increases the amount of funds being made available and reduces borrowing costs, capital should increase as well (Claessens & Perotti, 2007; Kim et al., 2018).

⁵The policy function describes how the controls behave as a function of the current state variables, k_t .

Firms also hire capital from households at rate $r(t)$. As a result of profit maximization, we get:

$$r_t = \theta A_t I F I_t^\theta (k_{t-1})^{\theta-1}, \quad (16)$$

$$\pi_t = y_t - r_t k_{t-1} = (1 - \theta)y_t. \quad (17)$$

where π_t is the profit in period t of firm at the aggregate level, (Eq. 16) the marginal product of capital.

3.2 Government

Government pays a cost to support financial inclusion (greater access to bank accounts) either through tax incentive schemes or subsidies. In turn, households pay taxes to government that we suppose can distort capital income.⁶ We assume that these channels are connected to basic transactions accounts. Cole et al. (2011) believe that this process can lead to large increases in take-up, thereby favorably shapes the financial ecosystem to be more inclusive. As a result, the government's budget constraint is given by:

$$\tau r_t k_{t-1} = T_t. \quad (18)$$

where τ is corporate tax rate and T_t stands for lump-sum transfer at period t .

3.3 Households

There is a continuum of measure 1 of agents. We assume that a representative household maximizes the following utility function:

$$\sum_{t=0}^{\infty} \beta^t \log c_t, \quad (19)$$

subject to

⁶For instance, to provide financial support to households following the containment of COVID-19, Japanese government made a bank transfer to them. By contrast, those who did not have a bank account should open one to receive the support. Unlike Japan, Ivory Coast government sent the financial support to households with a mobile money account through mobile money providers and to firms by bank transfers. Similarly, those without an account should also open one to get the transfer. By doing so, both governments contribute to an increase in financial inclusion, in particular either access to basic bank or mobile money account.

Table 1 Calibrated parameters values

Parameters names	Japan	India	Ivory Coast
Account (% Age 15+) (IFI)	0.98	0.80	0.41
Discount factor β	0.980	0.980	0.980
Capital share (θ)	0.36	0.36	0.36
Depreciation rate δ	0.10	0.10	0.10
Corporate tax (τ)	0.3062	0.2517	0.25

Source: Author

Note: Table 1 summarizes calibrated parameters for the full model

$$c_t + i_t + \tau r_t k_{t-1} = r_t k_{t-1} + \pi_t + T_t, \quad (20)$$

where c_t is per capita consumption, β is the discount factor. In addition, capital and investment are linked by the following capital accumulation equation:

$$k_t = (1 - \delta)k_{t-1} + i_t. \quad (21)$$

where i_t is the investment and δ is the depreciation rate. Note that household takes both π_t and T_t as given. The optimization problem is set in Appendix A. We derive the optimality conditions from the first-order conditions, and use them to solve and simulate the results. Finally, to conduct simulations, we normalize the total factor productivity to 1, and assign to the variable financial inclusion, the country index value, as presented in Table 1.

4 Parameters Values

This section illustrates parameters values used for the policy simulation of the model. Our calibration covers the three countries, namely Ivory Coast, India, and Japan, respectively, a lower middle, upper-middle, and high-income country. We keep all parameters identical for all countries. On the other hand, the index of financial inclusion, and the corporate tax rate change from a country to another. Moreover, we choose the discount factor (β) to 0.980, which is consistent with estimations of the discount factor for models with annual data. In the aggregate production function, the capital share is $\theta = 0.36$, this value is common in the business cycle analysis. Capital depreciates at $\delta = 0.10$ annually. Corporate capital income tax data come from trading economics database, therefore, the corporate tax rate is equal to $\tau = 30.62\%$, $\tau = 25.17\%$, and $\tau = 25\%$ in Japan, India, and Ivory Coast, respectively. Global Findex Database of World bank provides annual data, regarding the index of financial inclusion. Database covers more than 140 economies worldwide. We pick up our index values from the latest version of annual data on financial inclusion measures Demirgüç-Kunt et al. (2018). Thus, in this work, we choose the index of accessibility to bank accounts that we call *IFI at the steady-state*,

and equals 98% in Japan, 80% in India, and 41% in Ivory Coast. Table 1 describes the parameters of the model. Appendix B indicates the description of account bank accessibility.

5 Numerical Results

In this section, we present numerical results, and draw the long-run implication of the model that is, the capital-consumption paths, the value and policy functions for the three economies.

5.1 *The Capital-Consumption Paths*

The following graphs (Fig. 1) present the simulations of Ramsey-Cass-Koopmans's model in a competitive economy with government for Japan, India, and Ivory Coast's economy. Indeed, Fig. 1 shows how consumption (c) and capital (k) evolve over time to satisfy the representative household's intertemporal optimization conditions in the economy, given by the equilibrium (optimality) conditions (Eqs. A5 and A6, see Appendix A). Therefore, Fig. 1 describes the phase diagram of each economy, so our results show that each economy is at its steady state. Immediately after the policy shock of financial inclusion on capital accumulation, the equilibrium requires that each of the three economies is on its saddle path indicated by the star blue line. Hence, after the policy shock there is a jump of each economy from the initial point, in red star, to the equilibrium represented by the intersection of the two blue lines.

In addition, our results show that financial inclusion has significant economic outcomes in terms of promoting consumption and capital accumulation for the three economies. Furthermore, comparing the equilibrium level from a country to another we notice that the equilibrium obtained by including financial inclusion in our model is greater in Japan, India, and Ivory Coast's economy respectively. Thus, greater access to a bank account provides the largest equilibrium for Japan's economy, despite its high tax rate (Table 1). This implies that a higher level of financial inclusion can crowd out the harmful effects of the tax on the economy. Moreover, the capital at the steady-state, almost identical for Japan and India's economies, is higher for both countries, compared to that of Ivory Coast's economy. This means that the capital stock in India's economy could be growing as fast as that of Japan, if financial inclusion improves, and that, policy makers encourage savings through tax incentive schemes in India. Intuitively, a permanent increase in taxes reduces households' lifetime wealth and welfare.

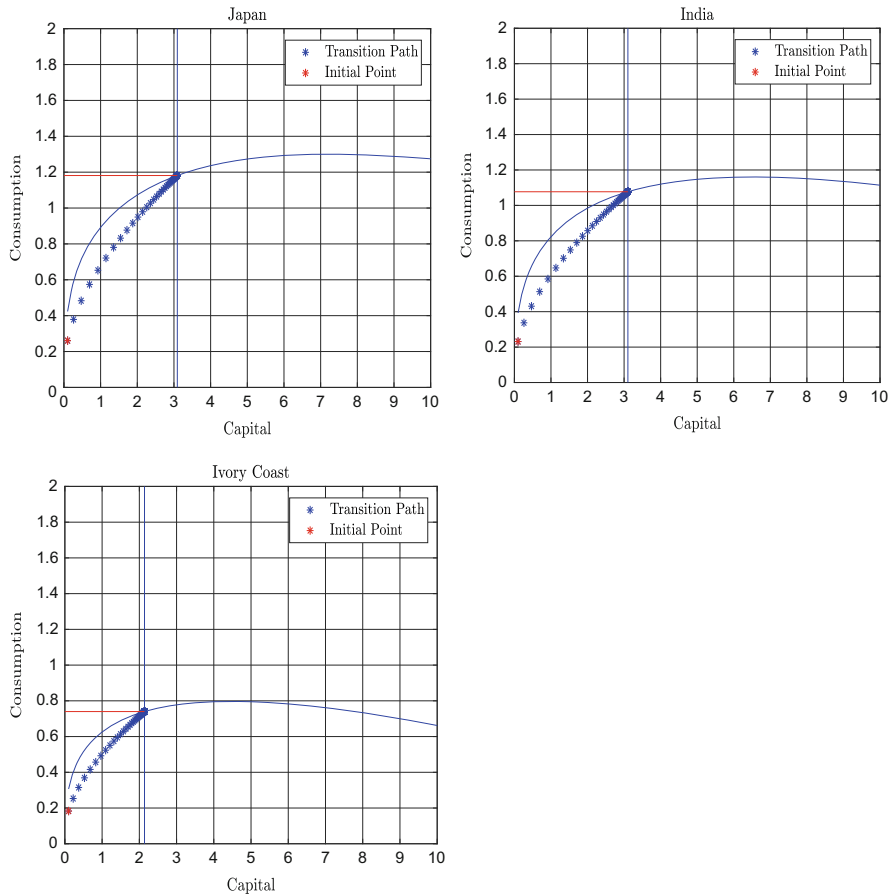


Fig. 1 Phase diagram. Note: We set the initial value of capital equal to 0.1, which is determined by the assumption that the initial capital stock is an exogenous parameter of the model indicated by the red star. The star blue line represents the saddle path from the initial value of capital toward the equilibrium determined by the intersection of capital locus and consumption locus both in blue line. While the blue vertical line is the consumption locus, the red line pins down the consumption at the stationary state. Figure 1 is computed using Dynare 4.5.7 version

In short, our findings highlight three different scenarios of the effects of financial inclusion on economic growth and welfare, that is, developed, emerging, and developing countries. First, results from Japan show that financial inclusion supports economic progress in high financial inclusion economies such as high-income countries. For example, an individual’s access to formal accounts (% age 15+) is about 98% in Japan. Second, the case of India indicates significant beneficial effects on economic growth in emerging economies. This is possible through reforms that policy makers undertake to strengthen financial inclusion, which avail more to businesses. Furthermore, the emergence of the middle class, and the financial

literacy’s improvement allow individuals and firms, a large accessibility to formal finance.⁷ Third, the results from Ivory Coast economy, as a developing country highlight that the economic gains obtained of accessing to a basic bank account are weak, despite its low tax rate, compared to that in Japan and India. welfare obtained of accessing bank accounts is lower despite its low tax rate compared to that in Japan and India. This means that the rate of accessibility and use still remains low, due to a broader informal sector, population illiteracy, an embryonic private sector and poor institutions. Therefore, financial inclusion insignificantly influences economic activity.

5.2 Value Function Analysis

We first rewrite households’ budget constraint (Eq. 20).

By replacing π_t, r_t, T_t and y_t by their expressions, and since government budget is balanced, yields:

$$c_t = A_t(IFI_t k_{t-1})^\theta - k_t + (1 - \delta)k_{t-1}, \tag{22}$$

Then, using (Eq. 9), the value function is expressed as follows:

$$\max_{c_s} E_t \left(\sum_{s=t}^{\infty} \beta^{-(s-t)} \ln c_s, \text{ subject to } k_s = A_s(IFI_s k_{s-1})^\theta + (1 - \delta)k_{s-1} - c_s \right). \tag{23}$$

The graphs in Fig. 2 indicate the optimal payoff that may provide the policy shock of accessing to a transaction account over time. Therefore, Fig. 2 shows how the value function as in Eq. 23 is converging after 240 iterations for Japan, India, and Ivory Coast. The green line is the highest line calculated. From the graphs, the steps are gradually getting smaller as the number of iterations increases. Moreover, the figure shows that while the line moves upward, remains in positive region for Japan and India’s economy, it moves downward, remains in negative region for that of the Ivory Coast. Therefore, welfare gains are greater for Japan, India and Ivory Coast respectively.

Consequently, findings in Fig. 2 confirm those in Fig. 1 above and prove that financial inclusion provides greater welfare in high income (Japan), emerging (India), and developing (Ivory Coast) economy, respectively.

⁷Grohmann et al. (2018) stress financial literacy positively influences the country level financial inclusion.

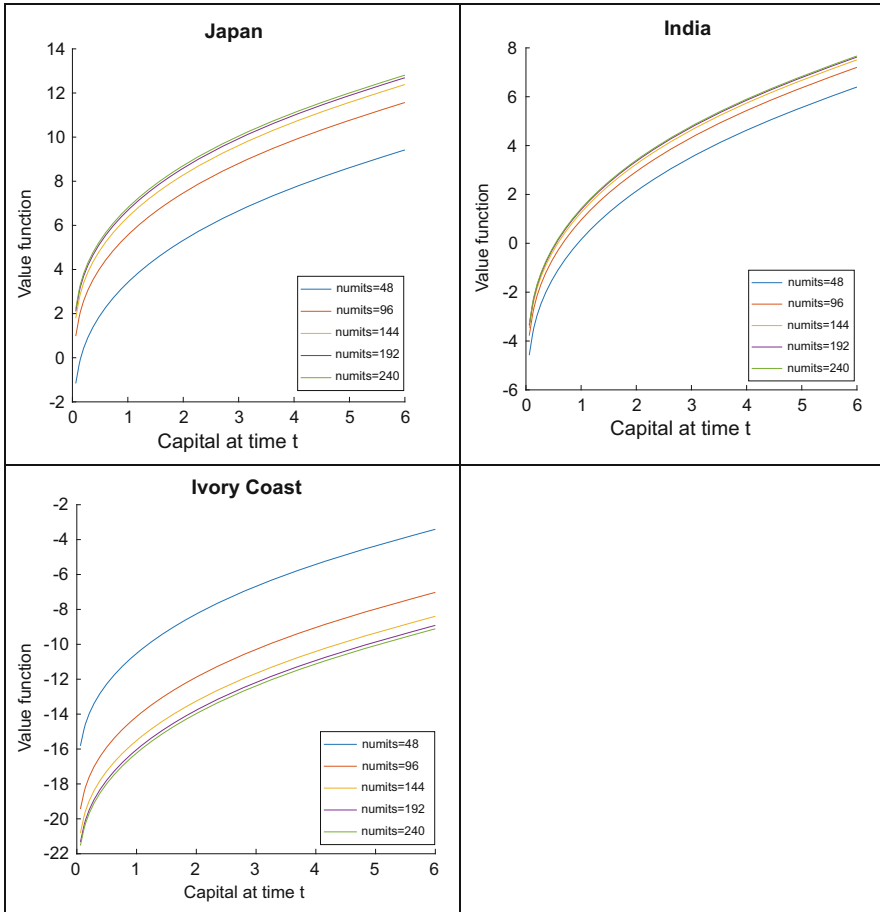


Fig. 2 Value function. Note: Numits indicates the number of iterations. Each line in the figure represents the results of 48 iterations, so there are a total of 5 lines that come from the calculations. Given the representative household’s intertemporal maximization function, the value function measures the welfare over time. Welfare is in % consumption equivalent units. This figure is simulated from MATLAB 2019a. Basic code is provided in the book of George McCandless edition 2008

5.3 Policy Function

Figure 3 respectively gives the policy function for Japan, India, and Ivory Coast’s economy after the policy shock of financial inclusion. In addition, the policy function for each economy, which finds the optimizing value of consumption (c) (control variable) for each value of time t capital (k) (state variable), is set by Eq. (14), and more specifically by (Eq. 22), and is generated at the same time as the value functions above (Fig. 2). Therefore, the policy function for each economy,

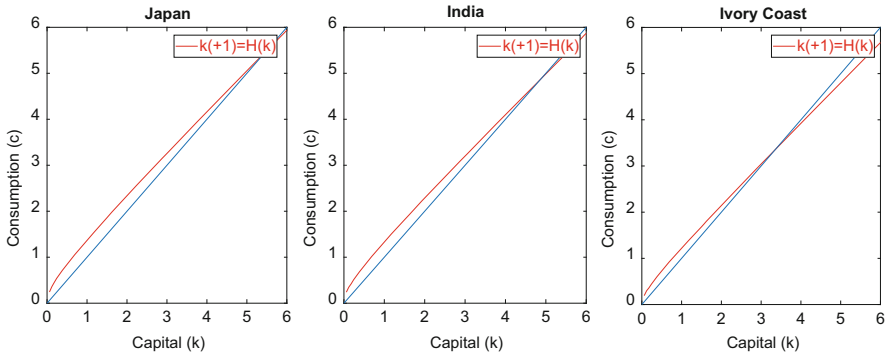


Fig. 3 Policy function after 240 iterations. Note: The policy function describes how the control variable behave as a function of the current state variable. Using the functional form (Eq. 14), the policy function is finally given by (Eq. 22). Figure 3 is also simulated from MATLAB 2019a. Basic code can be also found in the book of Georges McCandless edition McCandless, 2008

after 240 iterations, is described by the red line in Fig. 3, while the blue line stands for the 45-degree line.

We find moreover that the policy function crosses the 45-degree line at the stationary state value of about $k = 5.60$ for Japan, $k = 4.90$ for India, and $k = 3.52$ for Ivory Coast. So, Japan’s economy has the highest capital at the stationary state, followed by that of India, and then Ivory Coast. Our findings, therefore, underline that as financial inclusion increases, capital accumulation rises, and hence economic growth.

6 Conclusion

In this work, we discuss whether financial inclusion through owning a basic bank account, brings about a greater welfare. We use an optimal consumption model with government that endogenously includes financial inclusion. Moreover, we drive a comparative study focusing on Japan, India, and Ivory Coast. In addition, these countries are substantial for our paper, since they belong to separate income groups, with different levels of financial inclusion. First, we find that financial inclusion leads to a higher equilibrium state. In fact, as financial inclusion increases, from low to high level, the economic equilibrium level raises. Besides, a greater access to a bank account crowds out the distortionary effects of taxes on the stationary state. Second, when simulating household’s value function, we find that, while the economy with high financial inclusion promotes greater welfare, low financial inclusion’s economy generates a weaker welfare. Third, financial inclusion boots capital accumulation. The positive impact on capital stock is greater for Japan, India, and Ivory Coast respectively. Accordingly, government has to play a central role to support financial inclusion. Basically, for the three economies, government can promote a

better access to a transaction account, and enhance savings by making tax incentive schemes or social transfers, and can move their payments, including wages, and pensions onto banking system. In particular, in developing countries such as Ivory Coast, a large share of individuals undertakes in the informal sector, therefore, policy makers have to organize the sector and implement long term effective financing policy to shift them towards the formal sector in order to promote a greater access to bank accounts. Since, financial literacy plays a central role in the access and use of financial services, evaluate the impact of financial inclusion on human capital accumulation is desirable. In this instance, the index of accessibility to formal education as the financial inclusion index will be appropriated. Therefore, we leave this for future research.

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Appendix A: Optimization Problem

We set the Lagrange function as follows:

$$L_t = \sum_{t=0}^{\infty} \beta^t \{ \log c_t - \lambda_t (c_t + k_t - (1 - \delta)k_{t-1} - r_t k_{t-1} + \tau r_t k_{t-1} - \pi_t - T_t) \}, \quad (\text{A1})$$

Where λ_t is the Lagrange multiplier.

F.O.C:

$$\frac{\partial L_t}{\partial c_t} = 0 \Rightarrow \lambda_t = \frac{1}{c_t} \Rightarrow \lambda_{t+1} = \frac{1}{c_{t+1}}, \quad (\text{A2})$$

$$\frac{\partial L_t}{\partial k_t} = 0 \Rightarrow \lambda_t = \beta \lambda_{t+1} (r_{t+1} - \tau r_{t+1} + 1 - \delta), \quad (\text{A3})$$

$$\frac{\partial L_t}{\partial \lambda_t} = 0 \Rightarrow (c_t + k_t - (1 - \delta)k_{t-1} - r_t k_{t-1} + \tau r_t k_{t-1} - \pi_t - T_t) = 0. \quad (\text{A4})$$

Substituting (A1) into (A2), and using the first-order condition of capital $r_{t+1} = \theta A_{t+1} IFI_{t+1}^{\theta} (k_t)^{\theta-1}$, we get the Euler equation (A5).

As government budget is balanced, then replacing π_t , r_t , T_t , y_t by their expressions, and rearranging leads to (A6).

Finally, we get the following optimality conditions:

$$1 = \beta \frac{c_t}{c_{t+1}} (1 + (1 - \tau) \theta A_{t+1} IFI_{t+1}^{\theta} k_t^{\theta-1} - \delta) \quad (\text{A5})$$

$$c_t + k_t - (1 - \delta)k_{t-1} = A_t(IFI_t k_{t-1})^\theta. \quad (\text{A6})$$

Appendix B: Definition

Account (% age 15+): the percentage of respondents who report having an account (by themselves or together with someone else) at a bank or another type of financial institution (microfinance, cooperative, etc.) or report personally using a mobile money service in the past 12 months.

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