

JOURNAL 
of Applied Economic Sciences



Volume XII
Issue 7 (53) Winter 2017

ISSN-L 1843 - 6110
ISSN 2393 - 5162

Editorial Board

Editor in Chief

PhD Professor Laura GAVRILĂ (formerly ȘTEFĂNESCU)

Managing Editor

PhD Associate Professor Mădălina CONSTANTINESCU

Executive Editor

PhD Professor Ion Viorel MATEI

International Relations Responsible

PhD Pompiliu CONSTANTINESCU

Proof – readers

PhD Ana-Maria TRANTESCU – *English*

Redactors

PhD Cristiana BOGDĂNOIU

PhD Sorin DINCĂ

PhD Loredana VĂCĂRESCU-HOBEANU



European Research Center of Managerial Studies in Business Administration

<http://www.cesmaa.org>

Email: jaes_secretary@yahoo.com

Web: <http://cesmaa.org/Extras/JAES>

Editorial Advisory Board

Claudiu ALBULESCU, University of Poitiers, France, West University of Timișoara, Romania
Aleksander ARISTOVNIK, Faculty of Administration, University of Ljubljana, Slovenia
Muhammad AZAM, School of Economics, Finance & Banking, College of Business, Universiti Utara, Malaysia
Cristina BARBU, Spiru Haret University, Romania
Christoph BARMAYER, Universität Passau, Germany
Amelia BĂDICĂ, University of Craiova, Romania
Gheorghe BICĂ, Spiru Haret University, Romania
Ana BOBÎRCĂ, Academy of Economic Science, Romania
Anca Mădălina BOGDAN, Spiru Haret University, Romania
Elena DOVAL, Spiru Haret University, Romania
Camelia DRAGOMIR, Spiru Haret University, Romania
Giacomo di FOGGIA, University of Milano-Bicocca, Italy
Jean-Paul GAERTNER, l'Institut Européen d'Etudes Commerciales Supérieures, France
Shankar GARGH, Editor in Chief of Advanced in Management, India
Emil GHIȚĂ, Spiru Haret University, Romania
Dragoș ILIE, Spiru Haret University, Romania
Cornel IONESCU, Institute of National Economy, Romanian Academy
Arvi KUURA, Pärnu College, University of Tartu, Estonia
Rajmund MIRDALA, Faculty of Economics, Technical University of Košice, Slovakia
Piotr MISZTAL, Technical University of Radom, Economic Department, Poland
Simona MOISE, Spiru Haret University, Romania
Mihail Cristian NEGULESCU, Spiru Haret University, Romania
Marco NOVARESE, University of Piemonte Orientale, Italy
Francesco PAOLONE, Parthenope University of Naples, Italy
Rajesh PILLANIA, Management Development Institute, India
Russell PITTMAN, International Technical Assistance Economic Analysis Group Antitrust Division, USA
Kreitz RACHEL PRICE, l'Institut Européen d'Etudes Commerciales Supérieures, France
Mohammad TARIQ INTEZAR, College of Business Administration Prince Sattam bin Abdul Aziz University (PSAU), Saudi Arabia
Andy ȘTEFĂNESCU, University of Craiova, Romania
Laura UNGUREANU, Spiru Haret University, Romania
Hans-Jürgen WEIßBACH, University of Applied Sciences - Frankfurt am Main, Germany

JOURNAL

of Applied Economic Sciences

Journal of Applied Economic Sciences

Journal of Applied Economic Sciences is a young economics and interdisciplinary research journal, aimed to publish articles and papers that should contribute to the development of both the theory and practice in the field of Economic Sciences.

The journal seeks to promote the best papers and researches in management, finance, accounting, marketing, informatics, decision/making theory, mathematical modelling, expert systems, decision system support, and knowledge representation. This topic may include the fields indicated above but are not limited to these.

Journal of Applied Economic Sciences be appeals for experienced and junior researchers, who are interested in one or more of the diverse areas covered by the journal. It is currently published quarterly in 2 Issues in Spring (30th March), Summer (30th June), Fall (30th September) and Winter (30th December).

Journal of Applied Economic Sciences is indexed in SCOPUS www.scopus.com, CEEOL www.ceeol.org, EBSCO www.ebsco.com, and RePEc www.repec.org databases.

The journal will be available on-line and will be also being distributed to several universities, research institutes and libraries in Romania and abroad. To subscribe to this journal and receive the on-line/printed version, please send a request directly to jaes_secretary@yahoo.com.

Journal of Applied Economic Sciences

ISSN-L

1843 – 6110

ISSN

2393 – 5162

Table of Contents



1	Alexander Alexandrovich GRESKO, Kirill Igorevich LAVRENYUK, Konstantin Sergeevich SOLODUKHIN, Andrei Yakovlevich CHEN Fuzzy Multi-Period Model for Selecting Mixed Types of Stakeholder Engagement Strategies of the Company Taking into Account the Interrelations of Stakeholders	1847
2	Farkhanda SHAMIM, Bora AKTAN, Mohamed Sayed Abou ELSEOUD, Mohammed Ataaat Alla ABDULLA, Hayam Mohie ALSAYED Efficiency in Dual Banking System: A Non-Parametric Analysis	1859
3	Foluso. A. AKINSOLA, Nicholas M. ODHIAMBO Financial Development and Monetary Policy in Sub-Saharan Africa. Dynamic Panel Analysis	1870
4	Elena MIDLER, Valentin FILONICH The Resource Potential of the Region and Tritorial differentiation in the System of the Emerging Markets	1882
5	Andrej GREBENC Mathematical Model of Technology Transition	1888
6	Juliya Sergeevna TSERTSEIL, Viktoriya Vladimirovna KOOKUEVA, Natalya Vladimirovna GRYZUNOVA, Chuluundorj KHASHCHULUUN Analysis and Prospects of Infrastructure Development of Innovation Regional Clusters in Russia through the Example of Specific Economic Zones of Industrial Production and Technology Innovation Types	1896
7	Jiří POSPÍŠIL, Hana VOMÁČKOVÁ Net Assets Valuation in Transformations of Czech Companies	1906
8	Tomáš VALENTINY, Jaroslav GONOS, Veronika TIMKOVÁ, Martina KOŠÍKOVÁ Impact of Selected Factors on the Formation of Regional Disparities in Slovakia	1918



- 9 **Alexey A. NEDELKIN, Sergey V. NOVIKOV, Valery A. TITOV, Dmytro V. SANNIKOV, Anna V. MIKHAILOVA, Lyudmila N. POPOVA**
Development of Human Resources of Agro-Industrial Complex 1932
- 10 **Olga SHVETSOVA**
The Profile of an Expatriate in South Korea: Evidence from the Korean TNC's Employee's Survey 1943
- 11 **Halil Dincer KAYA**
Small Business Owners' Optimism on the Economy: Are Certain Owners More Optimistic than the Others? 1956
- 12 **Mikhail Yakovlevich VESELOVSKY, Marina Alekseevna IZMAILOVA, Alexey Valentinovich BOGOVIZ, Svetlana Vladislavlievna LOBOVA, Alexander Nikolaevich ALEKSEEV**
Business Environment in Russia and its Stimulating Influence on Innovation Activity of Domestic Companies 1967
- 13 **Marwa BILTAGY, Mariam MAHROUS, Mayar SAID, Menna KAMEL**
Entrepreneurship, Unemployment and Economic Growth: Evidence from Egypt 1982
- 14 **Sergei Aleksandrovich NOVOSADOV, Tatiana Aleksandrovna BURTSEVA, Natalia Victorovna REPETSKAIA, Sergey Vyacheslavovich NOVIKOV**
The Formation Prospects of the Command Culture of the Organization Management Thinking in the New Paradigm of Social and Economic Development of the Society 1996
- 15 **Pavla MACUROVÁ, Ladislav LUDVÍK, Martina ŽWAKOVÁ**
The Driving Factors, Risks and Barriers of the Industry 4.0 Concept 2003
- 16 **Roman SIDORCHUK**
Study of the Relationship between Value Orientations and Consumer Preferences of Young Consumers in Russia 2012
- 17 **Monika SOBEKOVA MAJKOVA, Aleksandr KLJUČNIKOV**
Insolvency Risk and Problems with Receivables Payments in the Environment of the Slovak Small and Medium-sized Enterprises and Young Entrepreneurs 2028



18	Dona PRIMASARI, Abdul ROHMAN, FUAD Analysis of Using Accrual Based Accounting System by the Theoretical Approach of Technology Acceptance Model 3	2039
19	Adilet Rashiduly KONGYRBAY, Galymzhan Mustahimuly DUISEN, Lazat Seitkazievna SPANKULOVA Analysis of Kazakhstan's Transport Infrastructure in the Context of the Silk Road Economic Belt Development	2050
20	Fajar SUPANTO, Yuntawati FRISTIN Community-Based Acceleration Model of Entrepreneurship Growth and Development on Telematics Creative Industries in Malang Raya Indonesia	2061
21	Ergin AKALPLER, Huseyin OZDESER, Sagiru MAT Trade-Volatility Relationship in the light of Nigeria and the Euro Area	2074
22	Ludmila Aleksandrovna KORMISHKINA, Evgenii Danilovich KORMISHKIN, Dmitrii Aleksandrovich KOLOSKOV Investments of Innovative Type as the Most Important Condition for the Neoindustrial Development of the Russian Economy	2085
23	Beby Karina Fawzee SEMBIRING, Ami DILHAM, Fivi Rahmatus SOFIAH, Ilyda SUDRADJAT Effect of Marketing Strategy and Experiential Value on Behavior Intention of Community in Dealing with ASEAN Economic Society	2101
24	Pavel KOZLOV, Yulia FINOGENOVA, Irina KHOMINICH On Equilibrium of the Financial Flows within the System of Compulsory Pension Insurance in the Russian Federation	2118
25	Pedro Gabriel DEGIOVANNI, Luis Marcelo FLORENSA, María Luisa RECALDE Latin American Integration Effects on Trade Relationships: Survival, Growth and Initial Volume	2129

Fuzzy Multi-Period Model for Selecting Mixed Types of Stakeholder Engagement Strategies of the Company Taking into Account the Interrelations of Stakeholders

Alexander Alexandrovich GRESKO

Vladivostok State University of Economics and Service, Russia

gresko_al@mail.ru

Kirill Igorevich LAVRENYUK

Vladivostok State University of Economics and Service, Russia

kirill.lavrenyuk@vvsu.ru

Konstantin Sergeevich SOLODUKHIN

Vladivostok State University of Economics and Service, Russia

k.solodukhin@mail.ru

Andrei Yakovlevich CHEN

Vladivostok State University of Economics and Service, Russia

a.chen@inbox.ru

Suggested Citation:

Gresko, A.A., Lavrenyuk, K.I., Solodukhin, K.S., Chen, A.Y. 2017. Fuzzy multi-period model for selecting mixed types of stakeholder engagement strategies of the company taking into account the interrelations of stakeholders. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 1847-1858.

Abstract

The article describes a fuzzy multi-period model for selection of mixed types of stakeholder engagement strategies of the company taking into account the interrelations of stakeholders. Characteristics of relations between the organization and its stakeholder groups are verbally assessed and transformed into fuzzy sets in the model. A set of scenarios is set that define the dynamics of changing relations between the organization and stakeholders, as well as between stakeholders. At the same time, it is assumed that changing the properties (attributes) of stakeholders entails changes in the organization's expectations for each of them in varying degrees, depending on the degree of mutual influence between them. "Ideal" and "real" fuzzy values of the appropriateness of the use of strategy types are calculated based on the evaluation of the characteristics of relations using fuzzy set operations. Then the Hamming distances between the "ideal" and "real" values of the appropriateness of strategies application are calculated, and the strategy of organization engagement with each stakeholder is chosen on its basis. Due to the fact that the corresponding characteristics of the relationship may differ significantly for various resource components involved in the resource exchange, a situation may emerge in which for different sets of resources, the organization should maintain strategies of different types in relation to the same stakeholder. Due to this, the article proposes a method of forming mixed types of strategies.

Key words: stakeholder groups; engagement strategies; fuzzy model; multi-period model; mixed strategies

JEL Classification: C69; L29

Introduction

The stakeholder theory (stakeholder concept) is one of the most popular theories of firms today. Technically, the stakeholder theory of firm can be considered as an independent area in the general and strategic management research. The flow of publications of the relevant subject matter and content, persistent for more than a third of a century, demonstrates a theoretical and practical significance of this approach and its incompleteness and partial inconsistency at the same time (Tambovtsev 2008).

The starting point for the emergence of a stakeholder concept (as a full-scale, detailed theory) is generally considered to be the publication of a book by R.E. Freeman "Strategic management: A stakeholder approach" in 1984. In the book, the author introduces a new concept of a stakeholder, gives its definition (as "any individuals, groups or organizations that have a significant influence on decisions made by a firm and/or influenced by these

decisions" (Freeman 1984) or as "any group or individual, who can influence or be influenced by the achievement of the organization's goals" (Freeman 1984)) and suggests an original model for consideration, in which the company and its environment (external and internal) represent a set of parties interested in its activities, whose interests and demands must be taken into consideration and met by managers as formal (explicit) company representatives. R.E. Freeman has been following this definition until today (Freeman, Wicks and Parmar 2004).

This article appeared not without reason. Even earlier, in the works of other authors, there was a mention that the goals of the company were much broader than the creation of profit or wealth for owners (shareholders) and also care about welfare of a much wider range of agents (individuals and groups) (which, in fact, was the starting point of the theory). First of all, these were the works of Dodd (1932) and Simon (1952).

The theory took on a new lease of life after the publication of the work of Post, Preston and Sachs (2002), which in fact summed up the five-year (1995-2000) project "Rethinking the corporation," supported by a grant from the Sloan Foundation, and laid the foundations for a "new stakeholder approach". According to the authors of the book, the modern corporation acts as a center of a network of interrelated elements (stakeholders), each of which contributes to its performance (voluntarily or compulsorily) and expects some benefit (or at least no uncompensated damage). As such, the "stakeholder system" first appears as an attribute of a corporation (and not just as a set of elements, whose interaction with the corporation must be taken into consideration) (Blagov 2003).

The popularity of this theory has been growing rapidly in recent years and is closely associated with the significant growth of uncertainty in the economy, which leads to the practical impossibility of proper setting of optimization tasks (maximizing profits, sales, *etc.*) and forces firms to use the satisfaction approach and solve the problems of finding strategic solutions acceptable to stakeholders (Gurkov and Saidov 2012). Multiple and conflicting interests of stakeholders has to be taken into consideration when solving such problems. In this case, the lack of ways to choose the proportions of meeting the competing interests of stakeholders (efficient distribution of value created with their participation) remains one of the key problems of the stakeholder theory.

The concept of stakeholders as "contributors" to the firm's resources has been gaining popularity in the last couple of decades. This allows to substantiate their claims for a direct or indirect impact on the company's strategic decisions prior to making these decisions, while the remaining actors of the strategic process protect their interests after making decisions, in the course of their implementation [ibid]. Due to this, the acceptability of strategic decisions for stakeholders (and for a firm) is usually interpreted from the standpoint of the sustainability of resource exchange between them (Gurkov 2011).

In the course of supplying the firm with resources and with aim to maximize the ratio of benefits from interacting with the firm to the costs incurred, stakeholders gain the ability to decide whether the company will receive resources and to determine how the firm will use the resources received. Having proposed the typology of the "stakeholder-company" relationships, which is based on the interdependence of stakeholders and firms (power over each other), J. Frooman formulated four types of strategies of the influence of stakeholders on the firm (Frooman 1999).

The strategy of the firm's actions in relation to the stakeholders is based on the same typology (Gurkov 2011) (as well as on the approach of Scholes (1998)).

The idea that the organization should not just use various strategies for interaction with various stakeholders but also different strategies for the same stakeholder at different times (Jawahar and McLaughlin 2002) is also based on the resource approach. It is assumed that at any stage of the organization's life cycle, some stakeholders have higher resource potential to meet the company's critical needs, and therefore will be more important than others. In this case, the relative importance of each stakeholder will change over time, along with the strategy of interaction. As a result, at each stage of the organization's life cycle – birth (creation), growth, maturity, revival (Drazin, and Kazanjian 1990, Gorshkova, Trifonov and Poplavskaya 2014, Miller and Friesen 1984, Su, Baird, and Schoch 2013), – an attempt is made to assign one of the four strategies proposed by Carroll (1979) – response, protection, adaptation and anticipation – to each of important stakeholders.

Another set of strategy types of interaction between the organization and stakeholders is proposed in the article (Solodukhin 2009): satisfaction of demands, protection, impact, cooperation. They are based on the typology of "stakeholder-company" relationships, which is based not only on the interdependency of stakeholders and firms

(power over each other), but also the mutual desire for changes in relationships. It must be noted that the meaning of "desire for change" is close to "urgency" that is one of the three key attributes of stakeholders in the well-known Mitchell model (Agle, Mitchell and Sonnenfeld 1999, Mitchell, Agle and Wood 1997). However, in this case, not only the desire for change (urgency) of the stakeholder in relation to the company is considered, but also the desire for the firm's changes in relation to the stakeholder. At the same time, the degree of desire for change is a function of satisfaction with resource exchange and expectations about the counterparty.

The article (Gresko and Solodukhin 2015) describes the nature of each of the proposed strategy types in detail, substantiates the advantages of the proposed set of strategy types in comparison with the strategies of A. Carroll, and shows that the strategies of different types can come one after another. Later, the proposed set of strategy types was supplemented by the fifth type – restraint (Gorbunova, Gresko and Solodukhin 2016a).

Choosing the set of strategies of interaction with each stakeholder is determined by the organization's pursuance of long-term balance in relationships with all its stakeholders, for which the organization can consciously allow violation of the balance of relationships with any particular interested party in the short term. It must be noted that in the long term, pursuing the interests of one of the stakeholders to the detriment of other classes of stakeholders can lead to extremely negative consequences (such consequences are described in detail in the work (Gurkov 2011).

In its pursuance of long-term balance in relations with all stakeholders, the company cannot fail to take into consideration the relationships that have developed between the stakeholders. Possible changes in these relations (including in the resource exchange) can directly affect stakeholders' relations with the organization. Accounting for these relationships will allow the organization to choose the appropriate type of strategy for each group of stakeholders more reasonably.

According to the logic described above, when the choice of the strategy of the organization's interaction with the stakeholder is determined by the characteristics of the relationships that have developed between them and are associated with the resource exchange between them in one way or another, the fact is missed that the company and stakeholders are exchanging bundles of resources in reality. At the same time, the corresponding characteristics of relationships (dependence, satisfaction, expectations, desire for change) can differ significantly for each resource component included in the bundle. Due to this, a situation may emerge in which the organization should maintain different strategy types for different sets of resources for the same stakeholder. As such, it becomes necessary to form the mixed strategies from the basic type strategies.

Relationships between an organization and stakeholders (as well as between stakeholders) change over time. Characteristics of the relationship (dependence, desire for change) may weaken or intensify, and not always monotonously. Due to this, a need emerges to develop multi-period models that allow to choose the most appropriate types of strategies for company interaction with each group of stakeholders.

The authors developed such multi-period models of two types earlier. *Firstly*, they are multi-period models that allow to choose the most appropriate strategy types for company interaction with each group of stakeholders, taking into consideration the relationships between stakeholders (Gorbunova, Gresko and Solodukhin 2015a). *Secondly*, they are multi-period models of the choice of mixed strategy types for the organization interaction with stakeholders (Gorbunova, Gresko and Solodukhin 2016b, Gorbunova, Gresko and Solodukhin 2015b). At the same time, the models of the first type did not consider differences in the characteristics of relationships between the organization and stakeholders by certain resource components, which prevented the formation of mixed strategies. The models of the second type, on the contrary, did not take possible changes in the relationships between stakeholders into consideration.

The purpose of this article is to develop a fuzzy multi-period model of the selection of mixed strategy types for interaction between the organization and stakeholders, taking into account the relationships between the stakeholders.

The use of fuzzy set tools in the development of the model is associated with the fact that the strategies are usually chosen in conditions of high uncertainty, lack of relevant information that is of nonprobabilistic nature (with a huge amount of ambiguous information that must be taken into consideration during decision-making at the same

time). In addition, measuring the characteristics of relationships in linguistic scales greatly facilitates the work of experts and increases the accuracy of their estimates and forecasts.

1. Model

The authors outlined the following characteristics of relationships between the organization and stakeholder groups (SGs) in their previous works: degree of desire for change (which is a function of satisfaction and expectations in relation to the counterparty), degree of influence (on the counterparty).

These characteristics are fuzzy, unclear concepts, the values of which are strongly influenced by the expert's judgments, perceptions and emotions. As such, it is often more difficult to evaluate the characteristics of relationships quantitatively than qualitatively (verbally). Let's evaluate the characteristics of relations verbally and transform them into fuzzy sets. To do this, let's represent the characteristics of relationships in the form of linguistic variables Q_i, \dots, Q_s described by fuzzy numbers defined on the set x – a certain segment of the scale of dimensionless units of measurement (score):

$$Q_i = \{(x, \mu(x)): x \in X, \mu(x) \in [0; 1]\}, i = \overline{1, s}, \tag{1}$$

where x is a value of the score on the set X ; $\mu(x)$ are values of the fuzzy number membership function Q_i on X .

It is assumed that the set X is discrete; *i.e.* its elements are only integer values of score. This assumption greatly simplifies the calculations necessary to perform operations with fuzzy sets while maintaining sufficient accuracy of results. Tables 1 and 2 show possible linguistic scales and the corresponding fuzzy set membership functions.

Table 1. Transformation of verbal estimates of the characteristic "degree of mutual influence" into fuzzy sets

Verbal estimate of the degree of mutual influence	x values										
	-5	-4	-3	-2	-1	0	1	2	3	4	5
$\mu(x)$ values											
SGs influence on the organization is incomparably greater than the organization's influence on SGs	1	1	0.4	0	0	0	0	0	0	0	0
SGs influence on the organization is significantly greater than the organization's influence on SGs	0.4	1	1	0.4	0.1	0	0	0	0	0	0
SGs influence on the organization is moderately greater than the organization's influence on SGs	0	0.4	1	1	0.2	0	0	0	0	0	0
SGs influence on the organization is insignificantly greater than the organization's influence on SGs	0	0	0.4	1	1	0.4	0.1	0	0	0	0
Mutual influence of SGs and organization is much the same	0	0	0	0.2	0.9	1	0.9	0.2	0	0	0
Organization's influence on SGs is insignificantly greater than the SGs influence on the organization	0	0	0	0	0.1	0.4	1	1	0.4	0	0
Organization's influence on SGs is moderately greater than the SGs influence on the organization	0	0	0	0	0	0	0.2	1	1	0.4	0
Organization's influence on SGs is significantly greater than the SGs influence on the organization	0	0	0	0	0	0	0.1	0.4	1	1	0.4
Organization's influence on SGs is incomparably greater than the SGs influence on the organization	0	0	0	0	0	0	0	0	0.4	1	1

Considering expectations as a characteristic of relationships between the organization and SGs, two configurations of expectations can be mentioned: the first reflects the expectations of the organization aimed at SGs, the second reflects the expectations of SGs from the organization. However, when considering these configurations, one cannot ignore the fact that there are also relationships between SGs, the changes in which can have a direct impact on mutual expectations between the organization and SGs. Since the properties of SGs in the system of resource exchange have direct impact on the quality and quantity of resource that each group will receive,

it can be said that changes in the properties SG2, SG3, ..., SGn will lead to changes in the resource exchange between them and SG1 (Figure 1).

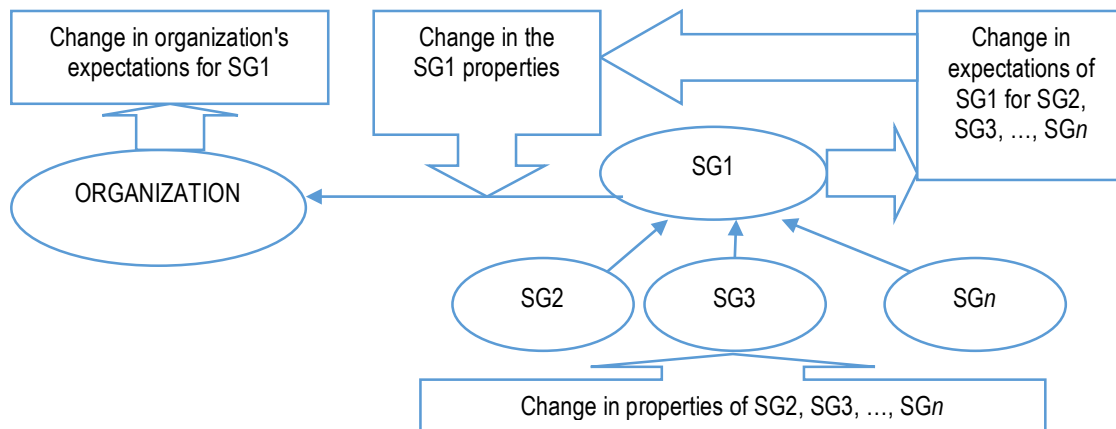
Table 2. Transformation of verbal estimates of the characteristic "degree of desire for change in relationships" into fuzzy sets

Verbal estimate of the degree of desire for change in relationships	x values										
	0	1	2	3	4	5	6	7	8	9	10
	$\mu(x)$ values										
Absent	1	0.5	0.1	0	0	0	0	0	0	0	0
Insignificant	0.6	1	0.8	0.2	0	0	0	0	0	0	0
Small	0.1	0.4	0.8	1	1	0.8	0.1	0	0	0	0
Average	0	0	0.1	0.6	1	1	1	0.6	0.1	0	0
Above average	0	0	0	0	0.2	0.8	1	1	0.4	0	0
Large	0	0	0	0	0	0.1	0.4	0.9	1	0.9	0.1
Very large	0	0	0	0	0	0	0	0.2	0.8	1	1

In turn, changes in this resource exchange will lead to change in the expectations of SG1 to SG2, SG3, ..., SGn. This, in turn, will lead to a change in the SG1 properties, which define the quality and quantity of resources received by the organization from SG1, and therefore the organization's expectations for SG1 will change. At the same time, it is assumed that the SG1 properties depend on the properties of SG2, SG3, ..., SGn (Gresko and Solodukhin, 2014a).

Similar cause-effect relationships also exist for the expectations of stakeholders from the company. This means that changes in the properties of SG2, SG3, ..., SGn will lead to a change in the expectations of SG1 towards the organization.

Figure 1. Impact of changes in the properties of SG2, SG3, ..., SGn, which define the resource exchange between them and SG1, on the organization's expectations for SG1



Due to the fact that the SG properties impact the quantity and quality of the resources received by the organization to a varying degree, some "weights" can be assigned to them (Solodukhin 2009).

As such, it is necessary to examine to what extent the organization's expectations for the resources received from each stakeholder will change in case of change in the properties of other stakeholders; and vice versa, how the expectations of each stakeholder for the company will change in case of change in the properties of other stakeholders.

Table 3 shows a fragment of the table of values of the linguistic variable for the change in expectations of the organization or the stakeholder, taking into consideration the change in some property of the counterparty (for example, another stakeholder) and taking into account the linguistically assigned estimate of the degree of mutual influence (Gresko and Solodukhin 2011).

Table 3. Values of the linguistic variable for the change in expectations of the organization or the stakeholder, taking into consideration the change in the property of the counterparty and taking into consideration the given estimate of the degree of mutual influence

Estimate of the degree of mutual influence	Estimate of the change in property	Will worsen significantly	Will worsen	Will worsen slightly	Will worsen insignificantly	Will not change
SGs influence on the organization is incomparably greater than the organization's influence on SGs	Estimate of the change in expectations	Will worsen significantly	Will worsen significantly	Will worsen significantly	Will worsen significantly	Will not change
SGs influence on the organization is significantly greater than the organization's influence on SGs		Will worsen significantly	Will worsen significantly	Will worsen significantly	Will worsen significantly	Will not change
SGs influence on the organization is moderately greater than the organization's influence on SGs		Will worsen significantly	Will worsen significantly	Will worsen significantly	Will worsen	Will not change
SGs influence on the organization is insignificantly greater than the organization's influence on SGs		Will worsen significantly	Will worsen significantly	Will worsen	Will worsen slightly	Will not change
Mutual influence of SGs and organization is much the same		Will worsen significantly	Will worsen	Will worsen slightly	Will worsen insignificantly	Will not change

Let's consider a case, when n properties influence the organization's or stakeholder's expectations for the counterparty. First of all, it is necessary to find out, what value a linguistic variable of change in expectations for a resource change will take at a given estimate of the degree of mutual influence for each individual property, and translate this value into a fuzzy set. In the next step, a convex combination of n fuzzy sets obtained is calculated. A convex combination of fuzzy sets A_1, A_2, \dots, A_n is a fuzzy set A with a membership function:

$$\mu_A(x_1, x_2, \dots, x_n) = z_1 \cdot \mu_{A_1}(x_1) + z_2 \cdot \mu_{A_2}(x_2) + \dots + z_n \cdot \mu_{A_n}(x_n), \tag{2}$$

where z_1, z_2, \dots, z_n are nonnegative numbers, the sum of which is 1. In our case, weights of properties are used as z_1, z_2, \dots, z_n .

The obtained membership function will reflect the change in the expectations of the organization or the stakeholder for the counterparty resulting from the change in its properties and taking into consideration the weights of the properties and given estimates of mutual influence for each property.

Table 4. Resources received by the university from employees and their properties

Resources received by the university from employees	Properties of employees (weight of a property)	Change in the properties	Estimate of the degree of influence
Knowledge, skills, competences	1. Qualification level (0.8); 2. Performance discipline (0.2)	1. Will improve slightly; 2. Will not change;	Organization's influence on SGs is moderately greater than the SGs influence in organization
Possibility of expanding the range of products	1. Initiative (0.3); 2. Professionalism (0.7).	1. Will worsen; 2. Will improve slightly;	SGs influence on the organization is moderately greater than the organization's influence in SGs
Well-established business processes	1. Professionalism (1)	1. Will improve insignificantly;	Organization's influence on SGs is incomparably greater than the SGs influence on organization
Corporate culture	1. Corporate thinking (0.4) 2. Loyalty to university (0.6)	1. Will not change 2. Will worsen insignificantly	Organization's influence on SGs is moderately greater than the SGs influence in organization

Resources received by the university from employees	Properties of employees (weight of a property)	Change in the properties	Estimate of the degree of influence
Research and development, other intellectual creations	1. Qualification level (0.5) 2. Professionalism (0.5)	1. Will worsen insignificantly 2. Will worsen insignificantly	Organization's influence on SGs is moderately greater than the SGs influence in organization
Organizational and management resources	1. Professionalism (1)	1. Will improve insignificantly	Organization's influence on SGs is significantly greater than the SGs influence in organization
Time worked (man-hours)	1. Performance discipline (1)	1. Will not change	Organization's influence on SGs is incomparably greater than the SGs influence in organization

Let's demonstrate the dependence of the change in the expectations of the university for resources received from this group of stakeholders on the changes in the properties of the group at given degrees of mutual influence for each resource by the example of the university and its employees. The source data are provided in Table 4. It must be noted that changes in the properties of this group result from the changes in the properties of other stakeholders (by changing the expectations of employees to these other stakeholders). The corresponding calculations are similar and omitted for clarity and simplicity of perception.

Taking Table 3 and formulas (2) into consideration, the membership functions of the change in the expectations of the university for the resources obtained can be calculated and normalized (Table 5). The membership functions of changes in the employees' expectations for the resources received from the university can be calculated in a similar way. Then the fuzzy degrees of desire for changes of the organization (university) and the group of stakeholders (employees) in relation to each other can be recalculated.

As already noted in previous works, a certain type of engagement strategy (the most suitable one, all other things being equal) can be chosen for each group of stakeholders, based on the analysis of relationship characteristics: satisfaction of demands, protection, impact, cooperation, restraint. In order to define what type of strategy should be applied to the stakeholder in the current situation, each type is assigned a fuzzy weighting factor that reflects the appropriateness of application of a strategy of this type. The appropriateness of application of the strategy of the l -th type ($l = \overline{1, 5}$) in relation to the k -th SG (w_l^k) is calculated using the following formulas:

$$w_1^k = \frac{5+G_1^k-V^k}{20}, w_2^k = \frac{10-|G_1^k-5|-V^k}{15}, w_3^k = \frac{5+G_2^k+V^k}{20}, w_4^k = \frac{25-G_1^k-G_2^k-|V^k|}{25}, w_5^k = \frac{10-|G_2^k-5|+V^k}{15}, \quad (3)$$

where V^k is the degree of mutual influence of the organization and k -th SG, G_1^k is the degree of desire for changes of the k -th SG in relation to the organization, G_2^k is the degree of desire for changes of the organization in relation to the k -th SG.

Table 5. Membership functions of the change in the expectations of the university for the resources obtained

Resources received by the university from employees	x values										
	-5	-4	-3	-2	-1	0	1	2	3	4	5
	$\mu(x)$ values										
Knowledge, skills, competences	0	0	0	0.05	0.23	0.25	0.23	0.05	0.4	1	1
Possibility of expanding the range of products	0.43	0.43	0.17	0.2	0.9	1	0.9	0.2	0	0	0
Well-established business processes	0	0	0	0	0	0	0	0	0.4	1	1
Corporate culture	0	0	0	0.2	0.9	1	0.9	0.2	0	0	0
Research and development, other intellectual creations	0	0.4	1	1	0.2	0	0	0	0	0	0
Organizational and management resources	0	0	0	0	0	0	0	0	0.4	1	1
Time worked (man-hours)	0	0	0	0.2	0.9	1	0.9	0.2	0	0	0

Assume there are d scenarios of changes in the external environment, in result of which the relations of the organization with the k -th SG change in some way in each of the t periods. Possible changes in the properties of the stakeholder groups that cause changes in the organization's expectations for stakeholders and stakeholders' expectations for the organization are taken into account within each scenario, when assessing the characteristics of the relationships for each j -th period ($j = \overline{1, t}$).

Based on the received estimates of the characteristics of the relationships, the ratios of the appropriateness of application of the l -th strategy type are calculated in relation to the k -th SG (w_{ij}^k) in the framework of the i -th scenario ($i = \overline{1, d}$) (Table 6).

Table 6. Ratios of the appropriateness of application of the l -th strategy type in relation to the k -th SG

Scenarios	Periods			
	Period 1	Period 2	Period t
Scenario 1	w_{i11}^k	w_{i12}^k	w_{i1t}^k
Scenario 2	w_{i21}^k	w_{i22}^k	w_{i2t}^k
....
Scenario d	w_{in1}^k	w_{in2}^k	w_{int}^k

Ratios of the appropriateness of application of the l -th strategy type in relation to the k -th SG within each scenario are reduced to one integral ratio (w_{ii}^k):

$$w_{ii}^k = \frac{\sum_{j=1}^t w_{ij}^k \cdot q_{ij}^k}{\sum_{j=1}^t q_{ij}^k}, \tag{4}$$

where t is number of periods, i is a number of the scenario, q_{ij}^k is a ratio reflecting the degree of confidence of the expert (or of the decision-maker (DM)) in the ratio of appropriateness of application of the l -th strategy type in relation to the k -th SG received for the j -th period within the i -th scenario.

The properties of the ratios q_{ij}^k , which are significant from the point of view of multi-period modeling, are described in detail in the work (Gresko and Solodukhin, 2014b). The integral ratios of the appropriateness of application of the strategy types are calculated using the following fuzzy set operations:

- operation of adding fuzzy numbers $A + B = C = \{z, \mu_c(z)\}$, where A and B are fuzzy numbers with membership functions $\mu_A(x)$ and $\mu_B(y)$, $\mu_c(z) = \sup_{z=x+y} \{min\{\mu_A(x), \mu_B(y)\}\}$ is a membership function of the addition result;
- operation of subtracting fuzzy numbers $A - B = C = \{z, \mu_c(z)\}$, where A and B are fuzzy numbers with membership functions $\mu_A(x)$ and $\mu_B(y)$, $\mu_c(z) = \sup_{z=x-y} \{min\{\mu_A(x), \mu_B(y)\}\}$ is a membership function of the subtraction result;
- operation of dividing fuzzy numbers $A \div B = C = \{z, \mu_c(z)\}$, where A and B are fuzzy numbers with membership functions $\mu_A(x)$ and $\mu_B(y)$, $\mu_c(z) = \sup_{z=x \div y} \{min\{\mu_A(x), \mu_B(y)\}\}$ is a membership function of the division result;
- operation of calculating the absolute value of the fuzzy number $|A| = \{z, \mu_{|A|}(x)\}$, where $\mu_{|A|}(x) = \begin{cases} \max(\mu_A(x), \mu_A(-x)), & \text{for } x \geq 0, \\ 0, & \text{for } x < 0. \end{cases}$

First, fuzzy "ideal" values of the appropriateness of application of strategies $w_1^{uk}, w_2^{uk}, w_3^{uk}, w_4^{uk}, w_5^{uk}$ are calculated. To do so, the fuzzy characteristics of the relations are chosen, under which the weighting factors of the appropriateness of application of the strategy types reach their maximum values (in accordance with the chosen linguistic scales).

Then, "real" fuzzy values of the appropriateness of application of strategies $w_1^{pk}, w_2^{pk}, w_3^{pk}, w_4^{pk}, w_5^{pk}$ are calculated on the basis of real estimates of the characteristics of relationships.

At the last stage, the Hamming distance between the "ideal" and "real" value of the appropriateness of application of the strategy is calculated for each type of strategy, using the following formula:

$$\rho(w_{li}^{uk}, w_{li}^{pk}) = \int_{-\infty}^{+\infty} \left| \mu_{w_{li}^{uk}}(x_h) - \mu_{w_{li}^{pk}}(x_h) \right| dx, \tag{5}$$

where $\mu_{w_{li}^{uk}}(x_h)$ and $\mu_{w_{li}^{pk}}(x_h)$ are membership functions of the "ideal" and "real" appropriateness of application of the strategy types, respectively.

The choice should be made in favor of the strategy type that will correspond to the shortest Hamming distance between the "ideal" and "real" appropriateness of application of the strategy.

2. Results

In the example under consideration, the Hamming distances were calculated for the integral weights of the appropriateness of application of strategy types in three scenarios (Table 7). A detailed description of the scenarios can be found in the works (Gresko and Solodukhin 2014b; Gorbunova, Gresko and Solodukhin 2016a).

As it was noted before, a situation may emerge in which for different sets of resources, the organization should maintain strategies of different types in relation to the same stakeholder. As such, the need emerges to form mixed strategies from the basic strategy types. As a result, the so-called "physical mixes of strategies" appear (Rozen 2002).

In our case, it is necessary to define the shares (weights) of resource components, for which application of a certain strategy is the most appropriate, and then use the method of forming the mixed strategy types.

In similar tasks, the outcome for the decision-maker when choosing an alternative $s = \overline{1, r}$ is a random variable of the following form: $\xi_s = \begin{bmatrix} a_s^1 & \dots & a_s^m \\ p_1 & \dots & p_m \end{bmatrix}$, where $(a_s^1 \dots a_s^m)$ is a payoff vector; $(p_1 \dots p_m)$ is a payoff probability vector. If the decision-maker uses a mixed strategy $x = (x_1, \dots, x_r)$, then the outcome corresponding to this mixed strategy will be a random variable $\xi = \sum_{s=1}^r x_s \xi_s$.

Table 7. Hamming distances

Scenarios (probabilities)	Types of engagement strategies				
	Satisfaction of demands	Protection	Impact	Cooperation	Restraint
Scenario 1 (0,2)	0.88	0.8	0.6	0.7	0.44
Scenario 2 (0,5)	0.76	0.58	0.82	0.64	0.65
Scenario 3 (0,3)	0.61	0.61	0.83	0.59	0.68
Expectation	0.739	0.633	0.779	0.637	0.617
Standard deviation	0.095	0.084	0.089	0.038	0.089

Expectation of this random variable can be found using the following formula:

$$M\xi = M(\sum_{s=1}^r x_s \xi_s) = \sum_{s=1}^r M\xi_s = \sum_{s=1}^r x_s M_s. \tag{6}$$

For the deviation of the random variable ξ from its expected value, the condition $\xi - M\xi = \sum_{s=1}^r x_s \xi_s - \sum_{s=1}^r x_s M_s = \sum_{s=1}^r x_s (\xi_s - M_s)$ is met, whence we obtain the expression for the variance:

$$D\xi = M(\xi - M\xi)^2 = M[(\sum_{s=1}^r x_s (\xi_s - M_s))(\sum_{z=1}^r x_z (\xi_z - M_z))] = \sum_{s,z=1}^r x_s x_z M[(\xi_s - M_s)(\xi_z - M_z)] \tag{7}$$

In this case, the risk of application of mixed strategy types will be less than the risk of using "pure" strategies.

The Hamming distances for all types of engagement strategies were calculated for each resource component participating in the resource exchange between the university and its group of stakeholders

"Employees", for each of the three scenarios. Tables 8 and 9 provide expectations of Hamming distances (taking the probability of scenarios into consideration).

Table 8. Hamming distances for resources received by employees from the university

Resources received by employees from the university	Weight of the resource	Strategy type	
		Satisfaction of demands	Protection
Salary	0.36	0.82	0.95
Social security	0.21	0.68	0.35
Comfortable working conditions	0.11	0.98	0.89
Status in society	0.11	0.98	0.9
Moral satisfaction from work	0.18	0.93	0.89
Easier access to educational programs	0.04	0.96	0.98

Table 9. Hamming distances for resources received by the university from employees

Resources received by the university from employees	Weight of the resource	Strategy type	
		Impact	Restraint
Knowledge, skills, competences	0.23	0.63	0.32
Possibility of expanding the range of products	0.05	0.85	0.97
Well-established business processes	0.12	0.64	0.31
Corporate culture	0.1	0.73	0.44
Research and development, other intellectual creations	0.25	0.63	0.41
Organizational and management resources	0.2	0.65	0.31
Time worked (man-hours)	0.05	0.65	0.27

3. Discussion

It can be easily seen (Table 8) that it is more appropriate to follow the strategy of satisfaction of demands for resources "Salary" and "Easier access to educational programs" with a total weight of 0.4. For other resources with a total weight of 0.6, it is better to follow the strategy of protection. As such, a probability vector of the mixed strategy can be defined (0.4, 0.6). Calculating expectation and standard deviation for the given mixed strategy, the following results are obtained: $M = 0,67$, $\sigma = 0,08$. The value of expectation turned out to be greater than with the pure type of "protection" strategy (which would obviously have been chosen, if the choice was limited to pure strategies only), but significantly less than with the pure type of the strategy of "satisfaction of demands" (Table 7). At the same time, the risk indicator (standard deviation) turned out to be lower in comparison with both types of strategies.

It is necessary to maintain the strategy of impact for the resource "Possibility of expanding the range of products" with a weight of 0.05, because the Hamming distance for this type of strategy is substantially smaller in comparison with the strategy of restraint (Table 9). However, the Hamming distance for the restraint strategy for all other resources with a total weight of 0.95 was smaller than with the strategy of impact, *i.e.* it is better to follow the strategy of restraint for these resources. As such, a probability vector of the mixed strategy can be defined (0.05, 0.95). Calculating expectation and standard deviation for the given mixed strategy, the following results are obtained: $M = 0,625$, $\sigma = 0,089$. The value of expectation turned out to be slightly worse than with the pure type of the strategy of "restraint", but much better than with the pure type of the strategy of "impact" (Table 7). The value of risk (standard deviation) has changed for the better, but very insignificantly (as was expected with such a probability vector).

Conclusion

The developed fuzzy model for selecting mixed types of stakeholder engagement strategies of the organization taking into account the interrelations of stakeholders allows to:

- take the possible changes in the relationships between stakeholders and the resulting changes in stakeholder relationships with the organization in consideration, when choosing the engagement strategies of the organization for each group of stakeholders;

- take the heterogeneity of the organization's relationships with each stakeholder (difference in the characteristics of the relationships for various resource components) into consideration; and
- form the strategies of a mixed type with a lower risk of use.

Acknowledgements

The article was supported by the grant of the President of the Russian Federation MK-6656.2016.6.

References

- [1] Agle, B., Mitchell, R., and Sonnenfeld, J. 1999. Who Matters to CEOs? An Investigation of Stakeholder Attributes and Salience, Corporate Performance, and CEO Values. *The Academy of Management Review*, 22(5): 507-525.
- [2] Blagov, Yu. E. 2003. Business and society: New researchers' paradigm. *Russian Management Journal*, 1(2): 151-159.
- [3] Carroll, A. 1979. A three-dimensional conceptual model of corporate social performance. *Academy of Management Review*, 4(4): 497-505.
- [4] Dodd, E.M., Jr. 1932. For whom are corporate managers' trustees? *Harvard Law Review*, 45: 1145-1163.
- [5] Drazin, R. and Kazanjian, R. 1990. A reanalysis of Miller and Friesen's life cycle data. *Strategic Management Journal*, 4(11): 319-325.
- [6] Freeman, R.E. 1984. *Strategic management: A stakeholder approach*. Boston: Pitman Publishing.
- [7] Freeman, R.E., Wicks, A. C. and Parmar, B. 2004. Stakeholder theory and "Corporate objective revised". *Organization Science*, 15(3): 364-369.
- [8] Frooman, J. 1999. Stakeholder Influence Strategies. *Academy of Management Review*, 24(2): 191-205.
- [9] Gorbunova, M.V., Gresko, A.A. and Solodukhin, K.S. 2015. The dynamic model of selection for mixed types of organization interaction strategies with stakeholders. *Fundamental Research*, (2-25): 5626-5630.
- [10] Gorbunova, M.V., Gresko, A.A. and Solodukhin, K.S. 2016. Fuzzy multi-period model for selection of stakeholder interaction strategies of the company using generalized criterion. *Bulletin of the Astrakhan State Technical University. Series: The Economy*, (4): 46-54.
- [11] Gorbunova, M.V., Gresko, A.A. and Solodukhin, K.S. 2016b. Multi-period model of selecting the mixed types of strategies in the interaction between higher educational institutions and stakeholders. *Problems of the Modern Economy*, (3): 215-218.
- [12] Gorbunova, M.V., Gresko, A.A., Solodukhin, K.S. 2015a. Multi-period model of type selection of organization interaction strategies with stakeholders considering their internal relations. *Fundamental Research*, (12-3): 560-565.
- [13] Gorshkova, L. A., Trifonov, Y. V. and Poplavskaya V. A. 2014. Ensuring adaptability of a company using life cycle theory. *Life Science Journal*, 11(10): 705-708.
- [14] Gresko, A.A. and Solodukhin, K.S. 2011. *Analysis of the impact of changes in the properties of stakeholder groups on organizational expectations*. Intellectual potential of universities - for the development of the Far Eastern Region of Russia and the Asia-Pacific countries: Materials of the XIII International Conference of Students, PhD students and young scientists. Vladivostok: the VSUES Publishing House, pp. 13-14.
- [15] Gresko, A.A. and Solodukhin, K.S. 2014a. *Models and methods for selecting strategies for interaction between the university and stakeholder groups under conditions of uncertainty*. Vladivostok: the VSUES Publishing House.

- [16] Gresko, A.A. and Solodukhin, K.S. 2014b. Multiperiod models for choosing strategies of interaction between a university and its stakeholders in risky conditions. *University Management: Practice and Analysis*, (4-5): 36-43.
- [17] Gresko, A.A. and Solodukhin, K.S. 2015 Multi-period model for selection of stakeholder engagement strategies of the company. *Asian Social Science*, 11(7): 190-200.
- [18] Gurkov, I.B. 2011. Principles for robustness of the firm. *Economic Science of Modern Russia*, 3: 100-114.
- [19] Gurkov, I.B. and Saidov, Z. B. 2012. *Strategii deystviy firmy v usloviyakh neopredelennosti: sistemnyy podkhod analiza ustoychivyykh usloviy vosproizvodstva* [Strategies of actions of the firm in conditions of uncertainty: a systematic approach to the analysis of sustainable reproduction conditions]. Proceedings of the XIIth International scientific conference on the problems of development of the economy and society. Moscow: High School of Economics, pp. 46-55.
- [20] Jawahar, I. and McLaughlin, G. 2002. Toward a descriptive stakeholder theory: An organizational life cycle approach. *Academy of Management Review*, 3(26): 397-414.
- [21] Miller, D. and Friesen, P. 1984. A longitudinal study of the corporate life cycle. *Management Science*, 10(30): 1161-1183.
- [22] Mitchell, R.K., Agle, B.R. and Wood, D.J. 1997. Toward a theory of stakeholder identification and salience: defining the principle of who and what really counts. *Academy of Management Review*, 22(4): 853-886.
- [23] Post, J.E., Preston, L.E. and Sachs, S. 2002. *Redefining the Corporation: Stakeholder Management and Organizational Wealth*. Stanford: Stanford University Press.
- [24] Rozen, V.V. 2002. Mathematical models of making decisions in economy. Text-book. Moscow: Book House "University", Higher School.
- [25] Scholes, K. 1998. *Stakeholders mapping: A practical tool for managers*. In: Ambrosini V. *Exploring Techniques for Analysis and Evaluation of Strategic Management*. London: Prentice Hall Europe
- [26] Simon, H.A. 1952. Comments on the theory of organizations. *American Political Science Review*, 46(4): 1130-1139.
- [27] Solodukhin, K.S. 2009. *University strategic management as stakeholder company management*. St. Petersburg: Publishing house of Polytechnic University.
- [28] Su, S., Baird, K., Schoch, H. 2013. Management control systems from an organizational life cycle perspective: The role of input, behavior and output controls. *Journal of Management & Organization*, 19: 635-658.
- [29] Tambovtsev, V.L. 2008. Stakeholder theory of the firm in the light of the concept of property regimes. *Russian Management Journal*, 6(3): 3-26.

Efficiency in Dual Banking System: A Non-Parametric Analysis

Farkhanda SHAMIM

College of Business Administration, University of Bahrain, Bahrain
fshamim@uob.edu.bh

Bora AKTAN

College of Business Administration, University of Bahrain, Bahrain
gbora@uob.edu.bh

Mohamed Sayed Abou ELSEOUD

College of Business Administration, University of Bahrain, Bahrain
msayed@uob.edu.bh

Mohammed Ataaiaat Alla ABDULLA

College of Business Administration, University of Bahrain, Bahrain
maamohammed@uob.edu.bh

Hayam Mohie ALSAYED

Ithmaar Bank, Bahrain
Hano_910@yahoo.com

Suggested Citation:

Shamim, F., *et al.* 2017. Efficiency in dual banking system: A non-parametric analysis. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 1859-1869.

Abstract

This paper is developed to investigate and compare the efficiency within Gulf Cooperation Council (GCC) based Islamic and conventional banks. The analysis is conducted over a sample of 49 banks for the period of 2006-2015. The paper is divided into two stages of analysis; the first stage was conducted to estimate and analyze the efficiencies of the sample using Data Envelopment Analysis Approach. The second stage was developed to assess the bank-level and country-level determinants of the efficiency through Random Effect Estimation Approach with Heteroscedasticity-corrected Standard Error. First stage of analysis suggests that Islamic banks tend to be more technically efficient than conventional banks due to their managerial efficiency in utilizing their resources and minimizing their waste of inputs. During the period of study, conventional banks tend to operate at 73% of decreasing return to scale and 14% of each increasing return to scale and constant return to scale. However, Islamic banks are operating at 33% of constant return to scale, 30% of increasing return to scale and 34% of decreasing return to scale. The second stage of analysis results indicates that efficiency is not affected by country-level and bank-level variables except the GDP growth rate.

Keywords: GCC; banking; efficiency; Islamic banks; conventional banks; DEA

JEL Classification: C14; D24; G21; N25

Introduction and research background

Financial sector in the Gulf Cooperation Council (GCC) countries - Kingdom of Bahrain, Kingdom of Saudi Arabia, State of Kuwait, State of Qatar, United Arab Emirates and Sultanate of Oman - generally dominated by dual banking system that is divided into conventional banks (CBs) and Islamic banks (IBs).

Recently the banking industry in the GCC has been facing tough years. The financial crisis, political uncertainty and shrinkage of oil prices have all resulted in limiting the banking growth and tightened its liquidity and excess capital (KPMG 2016). To overcome these challenges GCC banking industry emphasizes a greater focus on regulations, control and governance, in addition to taking a proactive approach to ensure the compliance of regulations and Basel III.

During the financial crisis of 2008, CBs faced with several complications unlike IBs that tend to shielded from the crisis (Willison 2009). This could have attributed to the nature of IBs' transactions in which it must be trade-

based and asset-linked and the prohibition of investment in certain types of instruments, which adversely affected the CBs during the crisis. The risk-sharing nature of Islamic finance considers one of the factors that reduce the effect of the crisis on Islamic banks (Hassan and Dridi 2010)

Barros (2004) emphasizes on the significance of efficiency evaluation approaches in assessing and identifying the most appropriate practice to improve performance and increase productivity. Technical efficiency is one of the main determinant of Islamic and conventional banks' performance in microeconomic environment, which reflected on the macroeconomic environment (Jemric and Vujcic 2002).

The objectives of the current study are to (A) assess the overall efficiency within the Islamic and conventional banking systems, which are considered as an important issue for managers, investors and consumers and (B) examine the determinants of the efficiency to identify best practices to improve the performance and increase the productivity of the banks. The analysis conducted over a sample of forty-nine of CBs and IBs operating in the GCC for a period of ten years.

Evaluating the efficiency of the dual banking system can be criticized due to the differences between the business objectives of CBs and IBs. However, Warde (2010) argues, "a direct comparison is applicable between Islamic and conventional banks as both are operating and competing in the same market". Majumdar (1995) favors applying estimation methods that allow for the differences between them such as the non-parametric approach; Data envelopment analysis and the parametric approach; Stochastic frontier analysis.

The current study contributes to the existing literature in several aspects. First, it examines the efficiency of GCC dual banking systems over 10 years during the period of 2006-2015 that includes 2008-2009 financial crisis. Second, based on the previous studies such as Al-Gasaymeh (2016), Mohanty *et al.* (2016), Johnes *et al.* (2014), Riaz and Mehar (2013), Akhtar *et al.* (2011), Ariff and Can (2008), Bader *et al.* (2008) and Mostafa (2007) in investigating the banks' efficiency determinants, it focuses on both the bank-level characteristics along with the country specific characteristics, such as GDP and inflation through applying Random effects estimation approach with heteroscedasticity-corrected standard errors. Unlike, most of the existing studies that applied Tobit regression approach that treated efficiency score as a censored variable despite the fact that it is a fractional data. Third, the study adopts one of non-parametric approaches that is Data Envelopment Analysis (DEA) Compared to stochastic frontier approach. DEA has several advantages such as, it does not require any assumptions to be made prior to the study, minimal specification error and can be employed on multiple inputs and outputs resulted in detailed information about efficient units to be set as role models (Hawdon 2003). Moreover, it is easier in controlling variables and allowing for comparison between countries and between Islamic and conventional banks (Srairi 2010).

The rest of the study is constructed as following, methodology is described in the Section 1, Section 2 presents the variables and database, the empirical results are presented in the Section 3 and then the conclusion is drawn.

1. Methodology

In order to evaluate the banking efficiency, the study applies non-parametric approach, data envelopment analysis (DEA), introduced by Farrel (1957). DEA is a non-parametric approach, which builds a frontier from the data without imposing a specific functional relationship between output and input. DEA considers a common technique used by many researchers for evaluating banking efficiency in various countries such as Jemric and Vujcic (2002), Mokhtar *et al.* (2008) and Rosman, Wahab and Zainol (2014).

In general, DEA model based on the assumption that each bank or decision-making unit (DMU) has (m) inputs to generate (n) outputs. To figure the best possible efficiency, DEA assigns weights to inputs and outputs of a DMU (Naidoo *et al.* 2016).

Charnes, Cooper and Rhodes (CCR) (1978) used the term of DEA and applied input oriented approach under constant return to scale (CRS) assumption in which all decision making units (DMUs) were assigned technical efficiency scores (TE) compared to its peers. CRS based on the assumption that there is no association between the scale of operation and efficiency and it estimates the overall technical efficiency (OTE). It is better applicable

when all DMUs are operating at an optimal scale, which is not a case in reality as DMUs might face either economies or diseconomies of scale.

Scale inefficiency will affect the measurement of technical efficiency scores in case of applying CCR model over DMUs that are operating at a non-optimal scale.

The basic of the CCR -represented by model 1- is to maximize the efficiency value of a firm (k) compared to a set of (s) firms which are considered as a reference by assigning the optimal weights to the inputs and outputs with a maximum efficiency score of 1.00.

$$\text{Maximize } E_{kk} = \frac{\sum_y O_{ky} V_{ky}}{\sum_x I_{kx} U_{kx}} \quad (1)$$

$$\text{Subject to } E_{kk} \leq 1 \quad \forall \text{ firms } s, \quad U_{ks}, V_{ky} \geq 0$$

where E_{kk} is the efficiency score of firm k, O_{ky} is the value of output y for firm k, I_{kx} is the value of input x of firm k, V_{ky} and U_{kx} are the weights assigned to the firm k for output y and input x respectively.

Banker, Charnes & Cooper (BCC) (1984) then introduced the DEA model by relaxing the CRS assumption through variable return to scale assumption (VRS). VRS assumption adopted to measure the pure technical efficiency (PTE). The difference between the technical efficiency and pure technical efficiency indicates the existence of scale inefficiency (Coelli 1996). The value of efficiency will range between zero (relatively inefficient) and one (fully efficient). The variable return to scale model calculated by modifying the CRS linear programming problem, presented in model 2 (Coelli 1998)

$$\begin{aligned} \text{Minimize } & \sum_x I_{kx} U_{kx} \\ \text{Subject to: } & [\sum_x I_{kx} U_{kx} - \sum_y O_{ky} V_{ky}] \geq 0 \quad \forall s=1,2,\dots,49 \\ & \sum_y O_{ky} V_{ky} = 1 \\ & U_{ks}, V_{ky} \geq 0 \end{aligned} \quad (2)$$

MUs' scale efficiency measured by applying both CRS and VRS on the same set of data. Then, by comparing the results of technical efficiency from both the models we conclude whether the DMU has scale inefficiency or not. SE measure indicates the degree of inefficiency following the failure to operate at CRS that measured by model 3.

$$SE = TE_{CRS} / TE_{VRS} \quad (3)$$

Malmquist total factor production index (TFP) first introduced by Caves *et al.* (1982) and then by Färe *et al.* (1985), is a most commonly used approach developed for output comparison. It used to measure the indices of total factor productivity change (TFP) which includes technological change, technical efficiency change and scale efficiency change between the periods. Model (4) represents the calculation of output-oriented Malmquist productivity index between period (t) and period (s).

$$m_0(q_s, x_s, q_t, x_t) = [m_0^t(q_s, x_s, q_t, x_t) \cdot m_0^s(q_s, x_s, q_t, x_t)]^{\frac{1}{2}} \cdot \left| \frac{d_0^t(q_t, x_t)}{d_0^t(q_s, x_s)} \times \frac{d_0^s(q_t, x_t)}{d_0^s(q_s, x_s)} \right| \quad (4)$$

where $m_0^s(q_s, x_s, q_t, x_t)$ and $m_0^t(q_s, x_s, q_t, x_t)$ represent the minimal output deflation factor using period (s) and period (t) as a reference in technology respectively. $d_0^s(q_t, x_t)$ represents the distance between period (t) observation to period (s) technology and TFP index, which is represented as a function with period (s) and period (t) inputs and outputs vector.

If the firm is inefficient, then the productivity change will be reflected in the Malmquist TFP index. This change could be attributed to improvement in technical efficiency or production technology. Determination of inputs and outputs is considered as a crucial steps in adopting DEA. Researchers argue upon the definition and measurement of banks' inputs and outputs in the banking function. The determination of banks' inputs and outputs remain an

arbitrary issue (Ariff Can 2008, Berger *et al.* 1987) and there is no agreement till present regarding the definition and measurement of banks' inputs and outputs (Casu and Molyneux 2003). In this paper we employ the financial intermediation approach (banks purchase labor, materials and deposits to produce loans and investmesnts) to evaluate the efficiency of the dual banking systems within the GCC countries as it is more common and preferable among many researchers (Shamim *et al.* 2017, Srairi 2010 and Rosman *et al.* 2014).

In the second stage of analysis, we considere the effects of bank and country specific characteristics to investigate the determinants of efficiency using model 5. Based on a number of studies applied to investigate the determinants of efficiency we apply random effect estimation approach with heteroscedasticity-corrected standard error, recommended by many researchers such as Hoff (2007).

$$y_{n,t} = \alpha + B' X_{n,t} + Y' Z_{c,t} + \delta F_t + u_n + e_{n,t} \tag{5}$$

where (y) is the dependent variable which is the efficiency, (α) is the intercept. The random heterogeneity specific to the n^{th} bank is denoted by (u_n) which is constant overtime, while the ($e_{n,t}$) is error term uncorrelated over the time, (n) is used to represent banks (n = 1, 2, , N), while (t) represents time (t = 1, 2,...10), and (c) represents country (c=1, 2, ,5).

In order to test the existence of the heteroscedasticity we use Breusch-Pagan(BP) test in this study.

2. Variables and database

The study is based on a panel data for a period of 10 years from 2006 to 2015 for 49 banks operating in the six GCC countries that decompose into 33 CBs and 16 IBs. Two conditions have been applied before choosing the banks for this study: first, the availability of finanacial information for the period of the study and second, data should be positive for the outputs and inputs to be applicable for DEA (Sarkis and Weinrach 2001). The data has been extracted from Thomson Reuters and World Development Indicators database. All the data employed are at nominal price and expressed in million of US dollars in order to retain homogeneity between the set of data.

In the first stage of analysis, the study adapts the producation approach to quantify the efficiency of both CBs and IBs with restricted choice of variabile. Accordingly, two inputs are selected namely total assets (X_1), that includes cash, short-term fund and other assets; and deposits (X_2), that consists of deposits from customers and deposits from other banks, and two ouputs which are total loans (Y_1), which includes short-term and long-term loans and income (Y_2), that shows all income from investments, banking operations and depositors' fund.

In the second stage of analysis, the study considers one bank-level variable; a binary variable to indicate whether the bank is classified as Islamic or conventional and two country-level variables; real GDP growth rate and inflation rate. Furthermore, crisis dummy variable is also included in the study to measure the impact of the financial crisis of 2008 on the efficiency which takes value (0) for 2008-2009 and value (1) for the rest of the period.

Table 1 shows descriptive statistics of the variables averaged over 2006-2015. During the period of study typical IBs has almost \$9 millions in loans and almost \$0.32 million in total income while CBs has \$14.41 millions in loans and almost \$0.86 million in total income. This indicates that CBs' loans and income are 1.6 and 2.7 times the value of IBs respectively. The mean of total value of IBs' assets is \$13.67 million while CBs' mean total assets is \$23.16 in which conventional banks' assets is 1.7 times the IBs' total assets.

Table 1. Descriptive statistics of the variables

	CBs (n= 330)			IBs (n=160)			All banks (n =490)		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
Loan	14.41	8.09	15.99	9.00	4.08	10.84	12.64	7.15	14.72
Income	0.86	0.54	0.87	0.67	0.32	0.89	0.80	0.45	0.88
Assets	23.16	14.23	24.81	13.67	6.73	16.32	20.06	10.75	22.82
Deposits	17.69	11.20	18.86	10.74	4.63	13.68	15.42	8.62	17.63

Note: Data reported is in millions of US dollars.

3. Empirical results

3.1 First stage results: Estimation of efficiencies

Table (2) illustrates the mean efficiency scores of CBs and IBs year wise. Technical efficiency scores are measured under CCR (constant return to scale assumption) and BCC (variable return to scale assumption) model then the results from the two models are used to measure the scale efficiency.

The results suggest that in 2015 CBs operating in GCC have a mean technical efficiency equals to 79.2% with a waste of 20.8% of inputs. The decomposition of technical efficiency under CCR model indicates that inefficiency is attributed mainly to pure technical inefficiency 12.6% rather than scale inefficiency 9%. The 79.2% technical efficiency indicates that CBs could have produced the same amount of outputs using only 79.2% of inputs in which that the CBs in GCC could have reduced their inputs by 20.8% without affecting the level of outputs produced.

Table 2. Summary Statistics of Banks' Efficiency Score (Yearwise)

Years	Conventional Banks (DMUs = 33)			Islamic Banks (DMUs = 16)		
	Technical efficiency, CCR	Pure technical efficiency	Scale efficiency	Technical efficiency, CCR	Pure technical efficiency	Scale efficiency
2006	0.783	0.882	0.889	0.873	0.91	0.959
2007	0.78	0.878	0.893	0.834	0.883	0.939
2008	0.812	0.905	0.898	0.832	0.895	0.931
2009	0.806	0.894	0.902	0.804	0.849	0.947
2010	0.79	0.905	0.874	0.853	0.888	0.96
2011	0.794	0.893	0.89	0.896	0.925	0.969
2012	0.79	0.889	0.891	0.908	0.947	0.959
2013	0.805	0.836	0.964	0.909	0.944	0.964
2014	0.8	0.854	0.939	0.965	0.975	0.99
2015	0.792	0.874	0.91	0.944	0.959	0.985

Over the ten years of study, the average technical efficiency ranges between 78% (lowest) in year 2007 and 81.2% (highest) in year 2008 which indicates that the waste of inputs used range between 18.8% and 22%. These results suggest that CBs in GCC countries failed to improve their technical efficiency and to reduce their waste over the last ten years. In 2015, the technical efficiency score of IBs is 94.4% which is higher than CBs by 15.2%. This indicates that IBs are more managerially efficient in utilizing their resources than CBs. IBs have a waste of 5.6% in inputs in order to produce their outputs which is could be attributed to the pure technical inefficiency of 4.1% rather than scale inefficiency of 1.5%.

During the period of study, the mean of technical efficiency of IBs reach its lowest score of 80.4% in 2009 and its highest score of 96.5% in 2014. This suggest that IBs are on increasing trend and improving their managerial efficiency in utilizing their resources over the years but they are still not fully efficient.

Regarding to scale inefficiency and return to scale, CBs tend to operate at 73% of DRS and 14% of each IRS and CRS while IBs are operating at 33% of CRS, 30% of IRS and 34% of DRS. Thirteen CBs are operating at DRS. This could be attributed to the fact that CBs are large in size compared to IBs. Our findings are in line with Drake (2001) that suggest that increasing the size of bank would only result in a smaller increase of outputs compared to the increase in their inputs.

IBs tend to be operating more on IRS than CBs. This means that IBs have an advantage over CBs in improving their efficiency and achieving substantial gains. IBs tend to be more technically efficient than CBs due to the efficient use of inputs. (see the Appendix)

Table 3 presents the decomposition of the efficiency for both IBs and CBs during the period of 2007-2015. Technical efficiency change is relative to CRS assumptions. Technical efficiency vary between IBs and CBs over the period of the study. The mean technical efficiency change of IBs is 1% per annum higher than CBs. In the last two years, CBs tend to have a declining rate of efficiency change. In 2014, IBs had the highest growth rate of technical efficiency of 7.1% per annum. While CBs had the highest growth rate in technical efficiency of 4.1% in 2008. The mean technical efficiency of conventional banks is 1% per annum.

Table 3. IBs and CBS distance summary of efficiency score change

		2007	2008	2009	2010	2011	2012	2013	2014	2015	Mean
Technical efficiency change score	IBs	0.945	1.000	0.967	1.067	1.056	1.015	0.997	1.071	0.977	1.01
	CBs	0.996	1.041	0.995	0.975	1.005	0.993	1.018	0.994	0.996	1.001
Technological change score	IBs	0.987	1.000	0.783	0.834	0.959	0.999	0.959	0.986	1.038	0.946
	CBs	0.951	1.056	1.001	0.991	0.997	1.004	0.987	1.002	1.007	0.999
Pure technical efficiency change score	IBs	0.97	1.000	0.957	1.05	1.047	1.025	0.995	1.038	0.982	1.007
	CBs	0.996	1.033	0.988	1.008	0.985	0.992	0.938	1.023	1.027	0.999
Scale efficiency change score	IBs	0.974	1.000	1.011	1.016	1.009	0.989	1.003	1.032	0.995	1.003
	CBs	1.000	1.007	1.007	0.967	1.02	1.002	1.085	0.972	0.969	1.003
Total factor production change	IBs	0.933	1.000	0.757	0.890	1.012	1.014	0.956	1.056	1.014	0.955
	CBs	0.947	1.098	0.996	0.966	1.002	0.997	1.005	0.996	1.003	1.000

While the mean efficiency scores of technological change for both IBs and CBs are negative. CBs tend to have a positive growth rate of technological change for 2014 and 2015. In 2015, IBs have a 3.8% growth in technological efficiency change compared to 0.7% growth rate for CBs. During the financial crisis, CBs manage to maintain a positive growth rate compared to IBs. IBs tend to have a positive and a higher mean growth rate of pure technical efficiency compared to CBs. Where IBs have a mean pure technical efficiency of 0.7% per annum compared to -0.1% per annum for CBs which indicates that IBs' production unit resources are well managed than conventional banks. In 2008 and 2009, CBs maintain a pure technical efficiency rate of 3.3% and -1.2% respectively while IBs' rates are 0% and -4.3% in 2008 and 2009 respectively.

The overall mean scale efficiency scores for CBs and IBs in GCC is 1.003 which is used to evaluate whether DMU that operates at an optimal level or not. During the financial crisis, both IBs and CBs maintained a growth rates. In 2013, CBs had the highest growth rate 8.5% of scale efficiency change over the whole period of the study while IBs had the highest growth rate of 3.2% in 2014.

Furthermore, IBs show significant variations in scale efficiency from year to year while CBs tend to be more stable scale efficiency. During the financial crisis, IBs tend to be more scale efficient than CBs. The overall mean total factor production change for CBs is 1.0 while IBs have a mean total factor production change of 0.955. IBs have a declining rate of -4.5% per annum while CBs show no annual growth.

Looking at the total factor productivity indexes, CBs appear more productive by showing the highest rate of 5.6% in 2014, while in 2008, both IBs and CBs tend to have positive rates. Regarding the total productivity index, sixteen CBs of the sample had a growth rate in productivity, which is considered to be almost 50% of the sample compared to IBs that had only three banks out of sixteen maintains a positive growth rate. IBs maintain positive rates in change of technical efficiency, pure technical efficiency and scale efficiency while CBs maintain a positive mean rate in change of technical efficiency, scale efficiency and total factor productivity index.

Most of the IBs maintain a growth rate in their pure technical efficiency and scale efficiency change. These results are in line with our findings in Table (2) that suggests that IBs are on increasing trend and improving their managerial efficiency in utilizing their resources over the years.

3.2 Second stage results: Determinants of efficiency

Table (4) presents the result of applying linear regression model on the dependent variable (efficiency) and the independent variables and applying the heteroscedasticity test to ensure the validation of the results. The table shows that none of the independent variables is consider significant in explaining efficiency at 5% level of confidence. This result is in line with Besar (2016) who concluded in his paper that industry-specific and macroeconomic factors have no impact on efficiency, unlike the paper of (Mohanty *et al.* 2016) who emphasized in their paper the significant impact of country-level variables.

GDP growth is significant in explaining the efficiency of the banks at 10% confidence. This result is in line with Bilal, et al (2013) and contradict the result of Alper and Anbar (2011). P-value of BP test results is not significant at 5% level of significance where P-value = 0.079 which indicates that heteroscedasticity is not present in our model and we accept the null hypothesis.

Table 4. Overall efficiency determinants

	Constant	Crisis Dummy	Bank Type	GDP Growth	Inflation
Unstandardized Coefficients	1.039 (0.00)*	0.207 (0.317)	-0.166 (0.341)	0.031 (0.069)**	0.003 (0.715)
LM =8.353 P-value =0.079					

Note: () : indicates the P-value, * significant at 5%, ** significant at 10%,

Conclusion

In this paper, we applied two stages of analysis over a sample size of forty-nine CBs and IBs in the GCC countries for the period of 2006-2015. In the first stage of analysis, we estimated the banks efficiencies in the sample using DEA approach. We found that under both CRS and VRS assumptions; IBs tend to be more efficient than CBs. During the period of study, the mean of technical efficiency of IBs reach its lowest score of 80.4% in 2009 and its highest score of 96.5% in 2014. This suggest that IBs are on increasing trend on improving their managerial efficiency and utilizing their resources. CBs' mean technical efficiency range between 78% (lowest) and 81.2% (highest) in which the waste of inputs used range between 18.8% and 22%. These results suggest that CBs in GCC countries failed to improve their technical efficiency and reduce their waste over the last ten years. Furthermore, we found that CBs tend to operate at 73% of DRS and 14% of each IRS and CRS while IBs are operating at 33% of CRS, 30% of IRS and 34% of DRS.

IBs tend to be operating more on IRS than CBs, this means that IBs could achieve a significant gains through internal growth or merger and acqusition, and it has an advantage over CBs in improving their efficiency and achieving substantial gains.; therefore IBs tend to be more technically efficient than CBs due to the efficient use of inputs. In the second stage analysis, we found that efficiency is not affected by the country-level and bank-level variables which is in line with the conclusion of Besar (2016). These results concluded through applying random effect estimation approach with heteroscedasticity-corrected standard error.

References

- [1] Akhtar, M., Ali K., and Sadaqat, S. 2011. Factors influencing the profitability of Islamic banks of Pakistan. *International Research Journal of Finance and Economics*, 1(66):125-132.
- [2] Al-Gasaymeh, A. 2016. Bank efficiency determinant: Evidence from the gulf cooperation council contries. *Research in International Business and Finance*, (38): 214-223. Available at: <https://doi.org/10.1016/j.ribaf.2016.04.018>
- [3] Ariff, M., and Can, L. 2008. Cost and profit efficiency of chinese banks: a non-parametric analysis. *China Econ. Rev.*, 19(2), 260-273. ownership in the Lebanese banking sector. *Review of Middle East Economics and Finance*, 5(2):1-22. Available at: <https://doi.org/10.1016/j.chieco.2007.04.001>

- [4] Bader, M., Mohamed S., Ariff, M., and Hasan, T. 2008. Cost, revenue and profit efficiency of Islamic versus conventional banks: international evidence using data envelopment analysis. *Islamic Economic Studies*, 15(2): 23-76.
- [5] Banker, R., Charnes, A., and Cooper, W. 1984. Some Models for Estimating Technical and Scale Inefficiencies in Data Envelopment Analysis. *Management Science*, 30: 1078-1092. DOI: <https://doi.org/10.1287/mnsc.30.9.1078>
- [6] Barros, C. 2004. Measuring performance in defence-sector companies in a small NATO member country. *Journal of Economic Studies*, 31: 112-128. DOI: <https://doi.org/10.1108/01443580410527105>
- [7] Berger, A., Hanweck, G., and Humphrey, D. 1987. Competitive viability in banking: scale, scope, and product mix economic. *Journal of Monetary Economics*, 20(3): 501-520. DOI: [https://doi.org/10.1016/0304-3932\(87\)90039-0](https://doi.org/10.1016/0304-3932(87)90039-0)
- [8] Casu, B., and Molyneux, P. 2003. A comparative study of efficiency in European banking. *Applied Economics*, 35: 1865-1876. DOI: <http://dx.doi.org/10.1080/0003684032000158109>
- [9] Caves, D., Christensen, L., and Diewert, W. 1982. Multilateral Comparisons of Output, Input and Productivity using superlative Index numbers. *Economic Journal*, 92: 73-86. DOI: <http://dx.doi.org/10.2307/2232257>
- [10] Charnes, A., Cooper, W., and Rhodes, E. 1978. Measuring the efficiency of decision making units. *European Journal of Operational Research*, 2: 429-444. DOI: [https://doi.org/10.1016/0377-2217\(78\)90138-8](https://doi.org/10.1016/0377-2217(78)90138-8)
- [11] Coelli, T. 1996. A guide to DEAP: version 2.1: A Data Envelopment Analysis (computer program). Armidale: University of New England.
- [12] Coelli, T. 1998. A Multi-Stage Methodolgy for the Solution of Orientated DEA Models, *Operations Research Letters*, 23: 143-149. DOI: [https://doi.org/10.1016/S0167-6377\(98\)00036-4](https://doi.org/10.1016/S0167-6377(98)00036-4)
- [13] Färe, R., Grosskopf, S., and Lovell, K. 1985. The Measurement of Efficiency of Production. Kluwer Academic Publishers.
- [14] Farrell, M. 1957. The Measurement of Productive Efficiency. *Journal of the Royal Statistical Society*, Part 3: 253-290. DOI: <https://doi.org/10.2307/2343100>
- [15] Hassan, M., and Dridi, J. 2010. The Effects of the Global Crisis on Islamic and Conventional Banks: A Comparative Study. IMF Working Paper.
- [16] Hoff, A. 2007. Second stage DEA: comparison of approaches for modelling the DEA score. *European Journal of operational Research*, 181(1): 425-435. DOI: <https://doi.org/10.1016/j.ejor.2006.05.019>
- [17] Jemric, I., and Vujcic, B. 2002. Efficiency of banks in Croatia: A DEA approach. *Comparative Economic Studies*, 44(2-3): 169-193.
- [18] Johnes, J., Izzeldin, M., and Pappas, V. 2014. A comparison of performance of Islamic and conventional banks 2004-2009. *Journal of Economic Behavior & Organization*, S93-S107. DOI: <https://doi.org/10.1016/j.jebo.2013.07.016>
- [19] Majumdar, S. (1995). X-efficiency in emerging competitive markets: the case of US telecommunications. *Journal of Economic Behavior and Organization*, (26): 129-144. DOI: [https://doi.org/10.1016/0167-2681\(94\)00065-M](https://doi.org/10.1016/0167-2681(94)00065-M)
- [20] Mohanty, S. K., Lin, H.-J., Aljuhani, E. A., and Bardesi, H. J. 2016. Banking efficiency in Gulf Cooperation Council (GCC) countries: A comparative study. *Review of Financial Economics*, 31: 99-107. DOI: <https://doi.org/10.1016/j.rfe.2016.06.004>
- [21] Mokhtar, H., Abdullah, N., and Alhabshi, S. 2008. Efficiency and competition of Islamic banking in Malaysia. *Humanomic*, 24(1): 28-48. DOI: <https://doi.org/10.1108/08288660810851450>

- [22] Mostafa, M. 2007. Benchmarking top arab banks' efficiency through efficient frontier analysis. *Industrial Management and Data Systems*, 107(6): 802-823. DOI: <https://doi.org/10.1108/02635570710758734>
- [23] Naidoo, T., Yadavalli, V., and Naidoo, A. 2016. A new approach for extreme values in data envelopment analysis. *Pakistan Journal of Statistics*, 32(4): 279-299.
- [24] Riaz, S., and Mehar, A. 2013. The impact of bank specific and macroeconomic indicators on the profitability of commercial banks. *The Romanian Economic Journal*, 16(47): 91-110.
- [25] Rosman, R., Wahab, N., and Zainol, Z. 2014. Efficiency of Islamic banks: a comparative analysis of MENA and Asian countries. *Pacific-Basin Finance Journal*, 1-15. DOI: <https://doi.org/10.1016/j.pacfin.2013.11.001>
- [26] Shamim, F., Yamori, N., and Anjum, S. 2017. Clicks business of deposit taking institutions: an efficiency analysis. *Journal of Economic Studies*, 44(6): 1-22. DOI: <https://doi.org/10.1108/JES-01-2017-0003>
- [27] Srairi, S. 2010. Cost and profit efficiency of conventional and Islamic banks in GCC countries. *Journal of Productivity Analysis*, 1(34): 45-62.
- [28] Warde, I. 2010. *Islamic Finance in the Global Economy*. Edinburgh: Edinburgh University Press.
- [29] Willison, B. 2009. Technology trends in Islamic investment banking. *Islamic Finance News*, 6(19): 22-23.
- *** KPMG. 2016. GCC listed bank results. kpmg.com

Appendix. Return to Scale of CBs and IBs

No	Bank	RTS										Count bank (%)			Count bank (No.)		
		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	CRS	IRS	DRS	CRS	IRS	DRS
Conventional Banks																	
1	Bank Dhofar SAOG	CRS	CRS	DRS	CRS	DRS	DRS	DRS	CRS	DRS	DRS	0.4	0	0.6	4	0	6
2	Bank Muscat SAOG	DRS	DRS	DRS	DRS	DRS	DRS	DRS	CRS	DRS	DRS	0.1	0	0.9	1	0	9
3	National Bank of Oman	DRS	DRS	DRS	DRS	DRS	DRS	DRS	CRS	CRS	CRS	0.3	0	0.7	3	0	7
4	Ahli Bank SAOG	CRS	CRS	CRS	IRS	IRS	IRS	CRS	CRS	IRS	IRS	0.5	0.5	0	5	5	0
5	HSBC Bank Oman SAOG	DRS	DRS	CRS	IRS	IRS	DRS	DRS	CRS	IRS	IRS	0.2	0.4	0.4	2	4	4
6	Ahli Bank QSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	CRS	DRS	DRS	0.1	0	0.9	1	0	9
7	Commercial Bank QSC	DRS	DRS	DRS	CRS	CRS	CRS	CRS	IRS	DRS	DRS	0.4	0.1	0.5	4	1	5
8	Doha Bank QSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
9	Qatar National Bank SAQ	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
10	Arab National Bank	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
11	Riyad Bank SJSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
12	Samba Financial Group SJSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
13	Saudi British Bank SJSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
14	Banque Saudi Fransi SJSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
15	Saudi Investment Bank SJSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
16	National Bank of Bahrain	DRS	DRS	DRS	DRS	DRS	DRS	DRS	CRS	IRS	IRS	0.1	0.2	0.7	1	2	7
17	BBK BSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	CRS	DRS	DRS	0.1	0	0.9	1	0	9
18	Al Ahli Bank of Kuwait	DRS	DRS	DRS	DRS	DRS	DRS	DRS	CRS	DRS	DRS	0.1	0	0.9	1	0	9
19	Burgan Bank SAKP	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
20	Commercial Bank of Kuwait	DRS	DRS	DRS	DRS	DRS	DRS	DRS	CRS	DRS	DRS	0.1	0	0.9	1	0	9
21	National Bank of Kuwait	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
22	Gulf Bank KSCP	DRS	DRS	DRS	DRS	DRS	DRS	DRS	CRS	DRS	DRS	0.1	0	0.9	1	0	9
23	Bank of Sharjah PJSC	IRS	IRS	IRS	IRS	DRS	DRS	DRS	IRS	IRS	IRS	0	0.7	0.3	0	7	3
24	Mashreqbank PSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
25	National Bank of Fujair	DRS	DRS	CRS	IRS	DRS	DRS	DRS	IRS	IRS	IRS	0.1	0.4	0.5	1	4	5
26	National Bank of Abu Dhabi	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
27	Union National Bank PJSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	CRS	DRS	DRS	0.1	0	0.9	1	0	9
28	United Arab Bank PJSC	IRS	IRS	IRS	IRS	IRS	IRS	DRS	IRS	IRS	IRS	0	0.9	0.1	0	9	1
29	Abu Dhabi Commercial Bank	DRS	CRS	CRS	CRS	DRS	DRS	DRS	CRS	DRS	DRS	0.4	0	0.6	4	0	6
30	Emirates NBD Bank PJSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0	1	0	0	10
31	Invest Bank PSC	DRS	IRS	CRS	IRS	CRS	CRS	CRS	IRS	IRS	IRS	0.4	0.5	0.1	4	5	1
32	National Bank of Ras Al Khaimah	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	1	0	0	10	0	0
33	National Bank of Um Al Qaiwain	DRS	IRS	DRS	IRS	IRS	IRS	IRS	IRS	IRS	IRS	0	0.8	0.2	0	8	2
												0.14	.14	0.73	45	45	240

Islamic Banks																	
1	Masraf Al Rayan QSC	CRS	CRS	CRS	CRS	CRS	IRS	CRS	CRS	CRS	CRS	0.9	0.1	0	9	1	0
2	Qatar Islamic Bank SAQ	IRS	DRS	DRS	IRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0.2	0.8	0	2	8
3	Qatar International Islamic	DRS	IRS	IRS	IRS	CRS	IRS	CRS	CRS	IRS	IRS	0.3	0.6	0.1	3	6	1
4	Bank Albilad SJSC	DRS	DRS	DRS	IRS	IRS	IRS	CRS	CRS	CRS	IRS	0.3	0.4	0.3	3	4	3
5	Al Rajhi Banking & Inv.	CRS	DRS	CRS	CRS	CRS	CRS	DRS	CRS	CRS	DRS	0.7	0	0.3	7	0	3
6	Bank Aljazira JSC	CRS	DRS	IRS	IRS	IRS	IRS	IRS	CRS	IRS	CRS	0.3	0.6	0.1	3	6	1
7	Bahrain Islamic Bank BSC	IRS	CRS	CRS	CRS	CRS	CRS	CRS	IRS	CRS	IRS	0.7	0.3	0	7	3	0
8	Ithmaar Bank BSC	DRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	IRS	DRS	0	0.1	0.9	0	1	9
9	Khaleeji Commercial Bank	IRS	IRS	CRS	IRS	IRS	IRS	IRS	IRS	CRS	CRS	0.3	0.7	0	3	7	0
10	Al Salam Bank Bahrain BSC	IRS	CRS	IRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	0.8	0.2	0	8	2	0
11	Boubyan Bank KSCP	DRS	IRS	IRS	IRS	IRS	IRS	IRS	IRS	IRS	IRS	0	0.9	0.1	0	9	1
12	Kuwait Finance House KSCP	DRS	DRS	DRS	IRS	DRS	DRS	DRS	CRS	CRS	DRS	0.2	0.1	0.7	2	1	7
13	Kuwait International Bank	DRS	DRS	IRS	IRS	IRS	IRS	IRS	IRS	CRS	CRS	0.2	0.6	0.2	2	6	2
14	Abu Dhabi Islamic Bank	DRS	DRS	IRS	DRS	DRS	CRS	CRS	DRS	DRS	DRS	0.2	0.1	0.7	2	1	7
15	Dubai Islamic Bank PJSC	DRS	DRS	IRS	DRS	DRS	DRS	DRS	DRS	DRS	DRS	0	0.1	0.9	0	1	9
16	Sharjah Islamic Bank PJSC	DRS	DRS	IRS	IRS	IRS	CRS	CRS	CRS	CRS	DRS	0.4	0.3	0.3	4	3	3
												0.33	0.3	0.34	53	53	54

Notes: CRS: constant return to scale, IRS: increasing return to scale, DRS: decreasing return to scale

Financial Development and Monetary Policy in Sub-Saharan Africa. Dynamic Panel Analysis

Foluso. A. AKINSOLA

Department of Economics, University of South Africa (UNISA), South Africa
akinfo@unisa.ac.za, akinfo@unisa.ac.za

Nicholas M. ODHIAMBO

Department of Economics, University of South Africa (UNISA), South Africa
odhianm@unisa.ac.za, nmbaya99@yahoo.com

Suggested Citation:

Akinsola, F.A., Odhiambo, N.M. 2017. Financial development and monetary policy in Sub-Saharan Africa (Dynamic Panel Analysis). *Journal of Applied Economics Science*, Volume XII, Winter 7(53): 1870-1881.

Abstract

After the catastrophic consequences of the global financial crisis on the financial market, the effectiveness of the monetary policy in curbing price volatility and ensuring financial stability is in question. Therefore, the paper examines the impact of financial development on monetary policy in Sub-Saharan Africa (SSA). Unlike the previous studies, we attempt to capture financial reforms in different African countries from 1970 to 2016, including the banking crisis period. Using dynamic panel data analysis, our results show that there is a negative correlation between financial development and the monetary policy (lending interest rate used as a proxy) in SSA. As the financial sector develops, there is less distortion in the financial market, which leads to a decrease in the lending rate. This result applies irrespective of whether domestic credit to the private sector or money supply was employed as a proxy for measuring financial development.

Keywords: Financial development; economic growth; monetary policy; dynamic panel-analysis

JEL Classification: E44, O16; E52; C58

Introduction

The major roles of most central banks around the world are to ensure financial stability using direct and indirect instruments to ensure price stability, output growth, high employment, and exchange rate stability. However, given the complexity of the financial system and recent global financial crisis, the role of monetary policy has become more complex in the presence of illiquid market system, misaligned asset prices and credit crunch. Therefore, the level and structure of financial development are paramount to the effectiveness of monetary policy.

The financial system in Africa has developed and evolved over the years to withstand and survive series of banking crises. However, the pivotal role played by most central banks' monetary policies are mainly hinged on the survival and development of the financial system. For instance, Ma and Lin (2016) suggest that any policy that affects the financial development will ultimately have a concomitant effect on the "transmission mechanism" of the monetary policy. Some studies have established that the strength of the monetary policy lies mainly on the stage and structure of financial development (Carranza *et al.* 2010, Krause and Rioja 2006). However, after the global financial crisis, many economies have adopted an expansionary monetary policy of low interest rate (and low inflation rate) but these policies have not induced the aggregate demand.

Therefore, the assessment of the nexus between the financial development and monetary policy becomes crucial to make aligned policies for many countries in Sub-Saharan African (SSA). The issue of monetary policy and financial development has received very little attention both empirically and theoretically. Unlike previous studies, we attempt to capture financial reforms in different African countries including banking crisis period. We deliberately did not include stock market as a proxy for measuring financial development because the stock market is still at a novel stage in most African countries.

The monetary policy mechanisms are instruments adopted by the central bank to influence investment spending and aggregate demand in an economy through the changes in money supply and policy induced interest

rate (Ncube 2008). Theoretical literature is abreast with the four main channels of monetary policy mechanism namely: interest rate channel; credit channel; exchange rate channel and asset price channel. However, most empirical literature is still concerned about the effectiveness of one channel over the other and predominance of one channel over the other in the financial system especially for a small open economy (Carranza *et al.* 2010). The traditional interest rate channel and the demand for money have not been an effective tool in Africa over the years because of the weak responsiveness of aggregate demand and level of financial development in most SSA countries (Khan 2011). Most theories have shifted focused on the credit channel away from the traditional monetary and interest rate channel. The credit channel of monetary policy seems to be more relevant and responsive in SSA such that it amplifies the impact of monetary policy shocks to the real sectors through the borrower's net worth and the external finance premium. For instance, central banks still set a high spread between the deposit rate and lending rate and these to have a high implication for the borrowers (cost of borrowing) and availability of credit (especially to small and medium scale (SMEs) in SSA countries.

Many central banks in Sub-Saharan Africa have adopted different strategies to curtail price volatility and ensure financial stability. For many central banks in SSA, short-term domestic interests' rates are being implemented to modify the household's consumption and investment pattern. For others, it is the exchange rate and in countries with Islamic banking systems, the profit rate can be used as an operational target. South Africa, Ghana, and Uganda are the only countries that have adopted inflating targeting strategy to curb price volatility. Many Central banks in Africa are moving into the forward-looking monetary framework and greater monetary independence with little fiscal interruption (more flexibility in the exchange rate and discretionary policies). Some Central banks prefer dual objectives of price stability and high short run employment but there seems to be a conflict between these two goals since price volatility or high inflation distorts the real sector's ability to invest or save which can ultimately affect economic growth. However, since most countries in SSA are still a small open economy, they are still vulnerable to external shocks (distortion in commodity prices; drought, exchange rate volatility, volatility in capital flows). Therefore, the paper examines the nexus between monetary policy and financial development across countries in Sub-Saharan African countries. Unlike the previous studies, we attempt to capture financial reforms in different African countries from 1970 to 2016, including the banking crisis period. Using dynamic panel data analysis, our results show that there is a negative correlation between financial development and the monetary policy (lending interest rate used as a proxy) in SSA.

The rest of the paper is organised as follows. Section 2 gives a brief summary of the theoretical literature on monetary transmission Mechanism and financial development. Sector 3 develops econometric models that enable the testing of the nexus between financial development and monetary policy. Section 4 concludes and discusses some policy implication.

1. Literature review

An efficient financial system should be holistic and encompass. Therefore, a developed financial system should be benched marked against a wide combination of depth (size and liquidity); access (the ability of individuals and firm to access financial services) and efficiency (low transaction cost and sustainable revenue). Svirydenka (2016) points out that financial development is a multidimensional process and the modern financial system has become multifaceted (banks, stock market, money market, investment banking, pension fund and venture capital market). They posit that one needs to examine the financial systems against multiple indicators to accurately measure the financial development.

The financial system in the SSA countries has gone through tremendous structural reforms, since the mid-1980s, moving from the period of financial repression, liberalising interest rate, credit allocation and exchange rate, privatisation of state owned development and commercial banks to a period of heightened financial innovation and infrastructural development. However, for the monetary policy to be effective and sustainable in SSA countries, the banking system has to boost their financial depth (private sector credit to GDP and liquidity liability to GDP), reduce the transactional cost and improve the overhaul structure of the financial system. Some authors strongly believe that monetary policy is highly irrelevant and ineffective in Sub-Saharan Africa, because of the absence of a domestic bond market to sell government securities in most of the financial system in Africa. Most African countries result to

adjusting their domestic interest rate to influence the real sector (Weeks 2010, Ma and Lin 2016). For example, according to Weeks (2010), across 46 African countries, the median ratio of domestic credit to GDP was 13% between 2000 to 2008 (with the exceptions of Mauritius, Seychelles, and South Africa). According to the monetary view, most monetary policy shock is only effective in affecting the real sector of any economy through changes in bank deposits and loans, which is highly dependent on a well-functioning and mature financial system.

According to the theories of balance sheet channel, the impact of the monetary policy depends on the net worth, debt collateral and external premium of the borrowers while the bank lending theories view that the impact of monetary policy on the supply of loanable funds. The central bank responds to financial market frictions and implements unconventional monetary policy through the balance sheet channel. Risk taking channel posits that contractionary monetary policy can encourage investors and household to take on more risk which can enhance economic activities but can also affect the effectiveness of the monetary policy to ensure financial stability ultimately (Bernanke and Gertler 1995, Aretis *et al.* 1997, Levine 1995, 2003m Aysun *et al.* 2013, Adrian and Lang 2014, Ansart and Monvoisin 2016, Ma and Lin 2016).

The financial market plays a significant role in efficiently circulating funds from lenders to borrowers, fostering economic growth and development. It is a common predication that without a functional financial market, the economy cannot grow or develop (Ikhida 1992, Ikhida and Alawode 2001, Levine 2005, Rajan and Zingales 1998, Beck *et al.* 2000, Knoop 2008). Essentially, the financial market provides liquidity and contributes to the capital formation and investment risk reduction by offering opportunities for portfolio and risk diversification (Levine 1995).

Empirical evidence has shown that higher levels of financial development stimulate long-run growth (Schumpeter 1911, Gurley and Shaw 1955, Goldsmith 1969, Hicks 1969, McKinnon 1973, King and Levine 1993a, Levine and Zervos 1998, Rajan and Zingales 1998). While some schools of thought believe that finance does not engender growth (Robinson 1952, Lucas 1988), Goldsmith (1969) established in a cross-country study of 34 countries that the financial system is a significant contributor to economic growth. However, the study did not detect any relationship between economic growth and financial structure. King and Levine (1993b) later replicated the work of Goldsmith (1969) to a sample size of 77 countries, using a different scope of financial development measurements (credit to the private sector over GDP, liquidity liabilities over GDP, bank credit over bank credit plus central bank domestic assets). The results show a positive relationship between each financial measure and economic growth.

Country case studies on financial depth and growth linkages have been provided by McKinnon (1973), Rousseau and Wachtel (2011), Patrick and Park (1994), Ndebbio (2004), Fowowe (2011), Odhiambo (2014) and Adeniyi *et al.* (2015). These studies conclude that better functioning financial systems support faster growth. Researchers have also established the importance of the banking system in facilitating a country's economic growth, real sector, and stability (Allen and Gale 2000, Levine 2006). The credit channel plays a crucial role in the transmission of monetary policy in order to achieve the main macroeconomic objectives of economic growth and financial stability. Empirical evidence has also demonstrated that a deeper credit fosters financial deepening and can help augment economic development, especially through a well-developed credit market. Supply-side driven economic growth holds that an economy with better access to credit will increase productivity and capital accumulation (Schumpeter 1911, Levine 1997, Hansen and Sulla 2013). For example, King and Levine (1993b) established a positive relationship between credit market depth and economic growth. Hansen and Sulla (2013) studied credit growth in Latin America using variables such as private credit to GDP level ratio and emphasised the special role of private credit in economic development.

Most theories propounded in the literature have established and advocated for regulatory techniques that will create a forum for competitive equilibrium. The earlier work of Keynes (1936) established the need for the intervention of the government to cure market failure; while Stigler (1971) established that most regulators would not serve a single economic interest because cartels or powerful political groups might influence them, which might encourage misallocation of resources (Stigler 1971, Posner 1974, Peltzman 1976). Another school of thought asserted that the inefficiency of market failure and the need for a corrective measure was also exclusively established as a failure of natural monopolies, externalities, rent seeking, asymmetric information, unemployment

and unequal distribution of wealth and inequitable market practices (Breyer 1982, Göran and Hägg 1997). The pivotal reasons or regulation in the financial market is due to inadequate information, conflict of interest problems, free rider problems, high transaction costs, and contraction incompleteness that usually preclude the efficient performance of financial intermediaries. The financial system has been planned mainly to facilitate the efficiency of the real sector in any economy.

In conclusion, there seems to be broad consensus that a developed financial system that provides credit will enhance growth and development. However, credit market problems arise because of market failure, information asymmetry, and credit rationing. These have caused biased bank lending and the central banks tend to use the monetary policy instrument to constrain credit in the system.

Table 1. Selected empirical literature on monetary policy and financial development in SSA

Authors	Country	Period	Variables	Methodology	Conclusion
Boivin & Giannoni (2006)	USA	1959:01-2002:04	Inflation, GDP, Interest (Federal Fund Rate)	VAR analyses, impulse response	There is a reduced effect of Monetary Policy (MP) after the 1980s. a stronger response to Inflation targeting
Angelopoulou <i>et al.</i> (2014)	Euro Area	2003-2011	Financial Condition Index (FCI); interest rate, interest rate spread, credit quantities	Principal Component Analysis,	FCI impact differs across EU Area after the global financial crises
Carranza, Galdon-Sanchez & Gomez-Biscarri (2010)	53 countries	1986-2005	Central bank assets, private credit to GDP, Bank deposits	Non-hierarchical Cluster analysis, dynamic panels, VARIMAX	MP has a larger impact when financial system is developed but impact of changes in MP are larger in smaller countries (with small central bank)
Ma and Lin	41 economics	2005Q1-2011Q4	Domestic credit to GDP, stock market capitalization to GDP, Crisis dummy, inflation rate, GDP	Pooled least square, Fixed effect, random effect,	Effect of MP on output and inflation are significantly and negatively correlated showing declines in the effect of MP
Jawadi, Mallick, and Sousa	BRICS Countries	1990Q1-2012Q2	Real GDP, Government spending, interest rate, price deflator, CB rate, M2	Panel VAR Approach	Unexpected increase in Central bank rate in real economic activities, inversely affecting the spillover between fiscal and monetary policies
Batuo and Mlambo	53 African Countries	1985-2010	Real per capital GDP growth, dummy variable for Financial liberalisation and dummy variable for banking crises;	Treatment effect, two step methods, and a panel probit method.	Results show banking crises have negative impact on economic growth while financial liberalisation tend to reduce banking crises
Aitunbas, Gambacorta & Ibanez	USA and the European Union	1999Q1-2008Q4	Nominal GDP, Money market rate, Loan growth, liquidity of total asset, ROA, housing prices	Generalized method of moments(GMM)	Expansionary monetary policy for a longer period contributes to risk sensitive in US and EU and affect the stability of financial system(risk taking channel)

2. Data

2.1 Data measurement and sources

We investigate the nexus between monetary policy and financial development across countries in Sub-Saharan African countries. To estimate the model, this study employs panel data of 20 selected countries in SSA based on data availability over the period of 1980 to 2016. The data set is collected mainly from The World Bank Indicators (WDI). Some of the missing data from 2016 were extrapolated. For monetary policy proxy, this study uses lending rate as an indicator for interest rate channel (lr), for financial development proxy, this study uses indicators such as the ratio of liquid liabilities of financial intermediaries to GDP (m2_gdp), which is a measure of overall financial depth. The ratio of domestic credit to the private sector as a share of GDP (dc_gdp) is also employed as a proxy for financial development because it accurately captures the extent of financial intermediation in an economy. Economic growth is defined by the rate of growth of Income Per Capita (ggdp). To account for control variables in the monetary process, the study employed the following variables: foreign direct investment as a share of GDP (fdi_gdp), inflation as a share of consumer price index (inf_cpi), inflation as a share of GDP (inf_gdp), investment (gfcf_gdp). We also employed the crisis dummy following Leaven and Valencia (2012) database where the author detailed a comprehensive crisis episode. We excluded the exchange rate gap because different African countries are still employing different exchange rate policies.

2.2 Modelling

We specified the relationship between financial development and monetary policy following theoretical and empirical modelling in an econometric framework by following previous literature by Carranza *et al.* (2010). We followed a dynamic panel modelling where we examined whether financial development has a significant impact on monetary policy in SSA:

$$MP_{it} = \beta_1 (FD)_{1,it} + \beta_2 (INF_CPI)_{2,it} + \beta_3 (INF_GDP)_{3,it} + \beta_4 (FDI_GDP)_{4,it} + \beta_5 (Crisis)_{5,it} + \beta_6 (CV)_{it} + \epsilon_{it}$$

where MP_{it} is the monetary policy measurement (lending rate), FD_{it} is the Financial development measures (dc_gdp and m2_gdp), GGDP is the per capita income growth proxy for output gap, the inflationary gap (INF_{cpi}) for consumer price index and price deflator (INF_{gdp}).

We explore panel regression model following an empirical investigation from other similar studies. Panel regression can be estimated using pooled least squares, fixed data, and random data. We employed the Hausman specification test to choose between the fixed effects and random effects model in estimating the levels equations. The dynamic panel model (in which all the variables are in first difference) is estimated following the Arellano–Bond approach was also employed. We use the overall sample, which comprises of 20 Sub-Saharan African countries to represent the general picture for SSA due to inadequate data availability. The results as shown in the lower section of Tables 6 and Table 7 consistently indicate that the individual unobserved country-specific effects are uncorrelated with the regressors, suggesting that the fixed effects model is preferable to the random effects model for the levels regression estimates. Hence, for the levels estimates, we only consider the results from the fixed effects estimates in our discussion of findings. For the dynamic model, the results from the Sargan tests as shown in the lower portion of tables 8 indicate that the instruments are valid in all the dynamic panel regressions. Finally, the test for second order serial correlation shows no problem of serial correlation in the residuals from the dynamic panels' regressions.

3. Empirical result and interpretation

Macroeconomic variables are subjected to Im, Pearson and Shin and Levin-Lin Chu unit root test stationarity test to avoid spurious regression estimate, even in panel estimations. The panel unit root test has become very crucial to assess the characteristics of various variables and derive panel specific result. The null hypothesis for the unit root test is that the series contains a unit root, and the alternative is that the series is stationary. The Levin–Lin–Chu test assumes a common autoregressive parameter for all panels. The result in Table 2 shows that all the

variables except domestic credit to private sector (dc_gdp), money supply to gdp (m2_gdp) and gross fixed capital formation (gfcg_gdp) are stationary at levels.

Table 3 shows pair wise correlation matrix, which depicts correlation coefficient between the variables. The correlation matrix table is essential to avoid multicollinearity problem and take account of cross sectional dependence between variables in a panel dynamic system. M2_gdp and dc_gdp have a high correlation of 0.65. Like we expected consumer price index (inf_cpi) and Gdp deflator (inf_gdp) are also highly correlated.

Table 2. Im-Pesaran and Shin W-stat Unit root Test

Variables	Im-Pesaran and Shin W-sta Stationarity Test	Levin-Lin Chu Unit root test	Result
dc_gdp	1.1920	-0.9201	I(1)
m2_gdp	2.4919***	1.1110	I(1)
Lr	8.9994***	9.5251***	I(0)
Gddp	-13.1425***	-9.5375***	I(0)
fdi_gdp	-5.7061***	-3.7179***	I(0)
gfcg_gdp	-2.6211***	-0.7885*	I(1)
inf_cpi	-7.7184***	-9.9924***	I(0)
inf_gdp	-12.2805***	-12.5060***	I(0)

Note: ***and * indicate statistical significance at 1% and 5% level

Table 3. Pair-wise Correlation Matrix

Variables	M2_gdp	Dc_gdp	Ggdp	Fdi_gdp	Gfcf_gdp	Inf_cpi	Inf_gdp	Lr
m2_gdp	1.00000							
dc_gdp	0.6534	1.0000						
Ggdp	0.0981	0,0149	1,0000					
fdi_gdp	0.1163	0.0843	0.0688	1.0000				
gfcf_gdp	0.3082	0.0825	0.0917	0.1210*	1.0000			
inf_cpi	-0,1171	-0,1345	-0,0040	-0,0417	-0,1154	1.0000		
inf_gdp	-0,1845	-0,1498	-0,0051	-0,0515	-0,1580	0,6754	1,0000	
Lr	-0,0389	-0,0133	-0,0047	0,00504	0,0074	-0,0898	-0,0898	1.0000

Table 4. Pedroni Cointegration test

* Pedroni Cointegration	Value
Panel Statistic	
Panel v-Statistic	-0.773
Panel rho-Statistic	1.156
Panel PP-Statistic	-1.512
Panel ADF-Statistic	-0.8284
Group Statistics	
Group- rho Statistic	1.973*
Group- PP Statistic	-1.999*
Group- ADF Statistic	-1.916*

Note: ***and * indicate statistical significance at 1% and 5% level

The unit root test in Table 2 shows that the variables follow both I(0) and I(1) process. To ascertain if the variables are cointegrated, we employed Pedroni (1999, 2004) test in a balanced panel since it allows heterogeneity among the individual countries. Seven tests statistics of Pedroni Cointegration are reported in Table 4. The tests show that there is no cointegration across the panel countries since only three Pedroni tests out of the seven tests statistics rejects the null of no-cointegration at 10% level of significance.

Table 5. Pedroni PDOLS (Group mean Average)

Variables (time and trend)	t-statistics
dc_gdp	1.83
m2_gdp	8.68***
Ggdp	0.223
fdi_gdp	-1.130
Inf_gdp	1.423

Note: ***and * indicate statistical significance at 1% and 5% level

This study adopted the Dynamic OLS estimator since OLS estimator is biased (given the endogeneity and autocorrelation problem) and can give an inconsistent result in the panel analysis. The fully modified OLS approach of Pedroni (2001, 2004) can give a better estimator. Table 5 shows that on m2_gdp and Ir have a long run relationship.

Our result in Table 6 shows that there is a negative correlation between financial development (dc_gdp) measures and monetary policy measures in SSA. As the financial sector develops, there is more competition and less distortion in the financial market. The financial sector responds positively by lowering the cost of lending and reducing the interest rate with ease.

For robustness of the test, we employed two components of financial development measure (m2_gdp and dc_gdp). From Table 6 and 7, we see that the lending rate is positively related to the financial intermediaries but not significant. Other control variables (foreign direct investment and investment are clearly significant. The financial crisis dummy is also clearly significant and negatively correlated with the financial development. This result clearly shows the effect of the various banking crisis on monetary policy.

Turning to Table 8, the dynamic model was employed to capture the potential endogeneity problems associated with dynamic panel regression. The result confirms our previous result in Table 6, that financial development has a statistically negative effect on monetary policy measures. However, the contemporaneous linkage of dc_gdp seems to be negative and significant. Our result is similar and complements other works (e.g. Ma and Lin 2016, Carranza *et al.* 2010, Fowowe 2011, Odhiambo 2014 and Batuo and Mlambo 2010).

Table 6. Panel estimation results for selected SSA countries: using lending rate as a dependent variable

System GMM regression				
Variables	Dyn Fixed effect	GLS Correlated	GLS hetero	Twostep
lag_lr	0.888*** (0.0169)	0.966*** (0.00854)	0.971*** (0.0108)	
dc_gdp	-0.0198** (0.00845)	-0.00348*** (0.000932)	-0.00108 (0.00363)	-0.0190** (0.00932)
Ggdp	0.0872*** (0.0244)	0.0625*** (0.00526)	0.0449** (0.0208)	0.0571*** (0.0157)
fdi_gdp	0.00401 (0.0130)	-0.00309 (0.00395)	-0.00203 (0.0109)	0.00568* (0.00311)
gfcf_gdp	0.0383** (0.0181)	0.00937*** (0.00287)	0.0110 (0.00734)	
inf_gdp	0.0122 (0.00818)	0.0135*** (0.00223)	0.00398 (0.00364)	0.0294*** (0.00811)
fincrisis	-2.569** (1.036)	-2.278*** (0.164)	-3.303*** (0.978)	2.407 (3.446)
L.lr				0.708*** (0.109)
Constant	1.014** (0.499)	0.0430 (0.133)		
Observations	720	720	720	720
R-squared	0.806			

System GMM regression				
Variables	Dyn Fixed effect	GLS Correlated	GLS hetero	Twostep
Arellano Bond Test Autocorrelation order 2		0.356	YES	0.339
Hansen Sargen test			YES	
Number of countries id	20	20	20	20

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Source: Author computation

Table 7. Panel estimation results for selected SSA countries: using lending rate as a dependent variable

System GMM regression				
VARIABLES	Dyn Fixed effect	GLS Correlated	GLS hetero	Twostep
lag_lr	0.892*** (0.0169)	0.972*** (0.00808)	0.972*** (0.0108)	
m2_gdp	-0.0211** (0.00997)	-0.00483*** (0.00181)	-0.00394 (0.00456)	-0.0301* (0.0161)
Ggdp	0.0843*** (0.0245)	0.0633*** (0.00574)	0.0457** (0.0209)	0.0327** (0.0165)
fdi_gdp	0.00271 (0.0130)	-0.00251 (0.00409)	-0.00160 (0.0109)	0.00666 (0.00678)
gfcf_gdp	0.0422** (0.0185)	0.0124*** (0.00296)	0.0151* (0.00885)	0.0446** (0.0207)
inf_gdp	0.0126 (0.00817)	0.0130*** (0.00233)	0.00422 (0.00366)	0.0182* (0.0106)
fincrisis	-2.767*** (1.036)	-2.251*** (0.183)	-3.346*** (0.977)	2.005 (3.138)
L.lr				0.521*** (0.159)
Constant	1.157** (0.542)	0.0420 (0.150)		
Observations	720	720	720	720
R-squared	0.787			
Number of country_id	20	20	20	20
Arellano Bond Test Autocorrelation order 2		0.250	YES	0.355
Hansen Sargen test			YES	

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Source: Author computation

Table 8. Panel Estimation Results for selected Sub-Saharan African Countries: using lending rate as a Dependent Variable

VARIABLES	Arellano Bond System regression		
	Arellano Bond 1	Arellano Bond 2	Blundell Bond
L.lr	0.751*** (0.0755)	0.788*** (0.0378)	0.912*** (0.0205)
L2.lr		-0.0268 (0.0358)	
dc_gdp	-0.0379*** (0.0131)	-0.0306*** (0.0109)	-0.0127 (0.0103)
Ggdp	0.0560* (0.0318)	0.0598** (0.0266)	0.0564** (0.0266)
fdi_gdp	-0.000563 (0.00712)	-0.000225 (0.0127)	0.00857 (0.0131)

Arellano Bond System regression			
VARIABLES	Arellano Bond 1	Arellano Bond 2	Blundell Bond
gfcf_gdp	0.0444***	0.0404**	
	(0.0163)	(0.0192)	
VARIABLES	Arellano Bond 1	Arellano Bond 2	Blundell Bond
inf_gdp	0.0275**	0.0293***	0.0381***
	(0.0108)	(0.0101)	(0.0102)
Fincrisis	-2.391	-2.460**	-3.619***
	(1.591)	(1.089)	(1.125)
Constant	3.021**	2.755***	1.081**
	(1.204)	(0.602)	(0.470)
Number of countries id	20	20	20
Observations	700	680	720

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Source: Author computation

Table 9. Panel estimation results for selected Sub-Saharan African countries: using lending rate as a dependent variable

Arellano Bond System regression			
VARIABLES	Arellano Bond 1	Arellano Bond 2	Blundell Bond
L.lr	0.754***	0.786***	0.914***
	(0.0740)	(0.0378)	(0.0204)
L2.lr		-0.0230	
		(0.0359)	
m2_gdp	-0.0466***	-0.0388***	-0.0102
	(0.0141)	(0.0126)	(0.0120)
ggdp	0.0490	0.0534**	0.0555**
	(0.0343)	(0.0268)	(0.0268)
fdi_gdp	-0.00251	-0.00160	0.00701
	(0.00666)	(0.0125)	(0.0131)
gfcf_gdp	0.0509***	0.0464**	
	(0.0169)	(0.0194)	
inf_gdp	0.0279***	0.0295***	0.0395***
	(0.0104)	(0.0100)	(0.0101)
fincrisis	-2.684*	-2.697**	-3.626***
	(1.569)	(1.083)	(1.123)
Constant	3.630***	3.281***	1.098*
	(1.270)	(0.686)	(0.613)
Observations	700	680	720
Number of countries id	20	20	20

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Source: Author computat

Conclusion

The paper examined the relationship between the financial development and the monetary policy gave the output and inflationary gap. The issue of monetary policy effectiveness has received very little attention by policy makers and in various theoretical studies. This study used dynamic panel data analysis to examine the nexus between

financial development and monetary policy nexus. Our results show that there is a negative correlation between financial development and the monetary policy (lending interest rate used as a proxy) in SSA. Unlike the previous studies, we attempt to capture financial reforms in different African countries from 1970 to 2014, including the banking crisis period.

We deliberately did not include stock market as a proxy for measuring financial development because the stock market is still at a novel stage in most African countries except in some few SSA countries like South Africa and Mauritius. As the financial sector develops, there is more competition and less distortion in the financial market. The financial sector responds positively by lowering the cost of lending and reducing the interest rate with ease. Considering the crucial role played by most financial intermediaries in developing countries, the result has some implications for different African countries especially for economies still undergoing different financial reform.

References

- [1] Adeniyi, O., Oyinlola, A., Omisakin, O. and Egwaikhide, F.O. 2015. Financial development and economic growth in Nigeria: evidence from threshold modelling. *Economic Analysis and Policy*, 47: 11–21.
- [2] Adrian, T. and Liang, N. 2014. Monetary policy, financial conditions, and financial stability. *FRB of New York Staff Report*, (690).
- [3] Allen, F. and Gale, D. 2000. *Comparing financial systems*. New York: MIT Press.
- [4] Altunbas, Y., Gambacorta, L. and Marques-Ibanez, D. 2010. Does monetary policy affect bank risk-taking? *SSRN Working Paper Series*.
- [5] Angelopoulou, E., Balfoussia, H. and Gibson, H.D. 2014. Building a financial conditions index for the euro area and selected euro area countries: what does it tell us about the crisis? *Economic Modelling*, 38: 392-403.
- [6] Ansart, S. and Monvoisin, V. 2017. The new monetary and financial initiatives: Finance regaining its position as a servant of the economy. *Research in International Business and Finance*, 39: 750-760.
- [7] Arestis, P. and Demetriades, P. 1992. Financial development and economic growth: assessing the evidence. *The Economic Journal*, 107(442): 783–799.
- [8] Arestis, P., and Demetriades. P. 1997. Financial Development and Economic Growth: Assessing the Evidence, *Economic Journal*, 107(442): 783-99.
- [9] Aysun, U., Brady, R., and Honig, A. 2013. Financial frictions and the strength of the monetary transmission. *Journal of International Money and Finance*, 32: 1097–1119.
- [10] Batuo, M. and Mlambo, K. 2012. *Financial liberalisation, banking crises and economic growth in African countries*. Germany, University Library of Munich.
- [11] Beck, T., Demirgüç-Kunt, A. and Levine, R. 2000. *A new database on financial development and structure*. World Bank Policy Research Working Paper 2146. Washington, DC: World Bank.
- [12] Beck, T., Lundberg, M. and Majnoni, G. 2006. Financial intermediary development and growth volatility: do intermediaries dampen or magnify shocks? *Journal of International Money and Finance*, 25(7): 1146–1167.
- [13] Bernanke, B.S. and Gertler, M. 1995. *Inside the black box: the credit channel of monetary policy transmission* (No. w5146). National Bureau of Economic Research.
- [14] Boivin, J. and Giannoni, M.P. 2006. Has monetary policy become more effective? *The Review of Economics and Statistics*, 88(3): 445–462.
- [15] Breyer, S.G. 1982. Two Models of Regulatory Reform. *SCL Rev.*, 34: 629.
- [16] Carranza, L., Galdon-Sanchez, J.E. and Gomez-Biscarri, J. 2010. Understanding the relationship between financial development and monetary policy. *Review of International Economics*, 18(5): 849–864.

- [17] Fowowe, B. 2011. Financial sector reforms and private investment in sub-Saharan African countries. *Journal of Economic Development*, 36(3): 79 -97
- [18] Goldsmith, R.W. 1969. *Financial structure and development* (No. HG174 G57).
- [19] Goran, P., and Hagg, T. 1997. Theories on the Economics of Regulation: A Survey of the Literature from a European Perspective, *European Journal of Law and Economics*, 4: 337-370.
- [20] Gurley, J.G. and Shaw, E.S. 1955. Financial aspects of economic development. *The American Economic Review*, 45(4): 515-538.
- [21] Hansen, N.J.H. and Sulla, M.O. 2013. *Credit growth in Latin America: financial development or credit boom?* (No. 13-106). International Monetary Fund.
- [22] Hicks, J. 1969. *A theory of economic history* (Vol. 163). Oxford: Oxford University Press.
- [23] Ikhide, S. and Alawode, A. 2001. *Financial sector reforms, macroeconomic instability and the order of economic liberalisation: the evidence from Nigeria*. AERC Research Paper, 112. Nairobi (Kenya): African Economic Research Consortium.
- [24] Ikhide, S.I. 1992. *Financial deepening, credit availability and the efficiency of investment: evidence from selected African countries*. Development Research Paper series, research paper No. 2.
- [25] Jawadi, F., Mallick, S.K. and Sousa, R.M. 2016. Fiscal and monetary policies in the BRICS: a panel VAR approach. *Economic Modelling*, 58: 533–542.
- [26] Keynes, J.M. 1936. *The general theory of interest, employment, and money*. London Macmillan.
- [27] Khan, M.S. 2011. The design and effects of monetary policy in sub-Saharan African countries. *Journal of African Economies*, 20 (suppl 2): ii16–ii35.
- [28] King, R.G. and Levine, R. 1993a. Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics*, 108(3): 717–737.
- [29] King, R.G. and Levine, R. 1993b. Finance, entrepreneurship, and growth: theory and evidence. *Journal of Monetary Economics*, 32: 513–542.
- [30] Knoop, T.A. 2008. *Modern financial macroeconomics: panics, crashes, and crises*. Wiley-Blackwell.
- [31] Levine, R. and Zervos, S. 1998. Stock markets, banks, and economic growth. *American Economic Review*, 88(3): 537–58.
- [32] Levine, R. 1997. Financial development and economic growth: views and agenda. *Journal of Economic Literature*, 35(2): 688–726.
- [33] Levine, R. 2003. More on finance and growth: more finance, more growth. *Federal Reserve Bank of St. Louis Review*, (Jul), pp.31–46.
- [34] Loayza, N.V. and Ranciere, R. 2006. Financial development, financial fragility, and growth. *Journal of Money, Credit, and Banking*, 38(4): 1051–1076.
- [35] Lucas, R.E., Jr. 1988. On the mechanics of economic development, *Journal of Monetary Economics* XXII, 3-42.
- [36] Ma, Y. and Lin, X. 2016. Financial development and the effectiveness of monetary policy. *Journal of Banking & Finance*, 68: 1–11.
- [37] McKinnon, R.I. 1973. *Money and capital in economic development*. Brookings Institution, Washington, DC. 42.

- [38] Ncube, M. 2005. *Financial systems and monetary policy in Africa* (No. 20). Economic Research Southern Africa.
- [39] Ndebbio, J.E.U. 2004. *Financial deepening, economic growth, and development: evidence from selected sub-Saharan African countries*. AERC Research Paper, 142. Nairobi (Kenya): African Economic Research Consortium.
- [40] Odhiambo, N.M. 2008. Financial depth, savings and economic growth in Kenya: a dynamic causal linkage. *Economic Modelling*, 25(4): 704–713.
- [41] Odhiambo, N.M. 2014. Financial systems and economic growth in South Africa: a dynamic complementarity test. *International Review of Applied Economics*, 28(1): 83–101.
- [42] Patrick, H.T. and Park, Y.C. 1994. *The financial development of Japan, Korea, and Taiwan: growth, repression, and liberalisation*. Oxford University Press on Demand.
- [43] Pedroni, P. 1999. Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and statistics*, 61(s 1): 653-670.
- [44] Pedroni, P. 2000. Fully modified OLS for heterogeneous cointegrated panels. *Advances in Econometrics*, 15: 93-130.
- [45] Pedroni, P. 2004. Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric theory*, 20(03): 597-625.
- [46] Peltzman, S. 1974. *Regulation of pharmaceutical innovation: The 1962 amendments* (Vol. 15). American Enterprise Institute for Public Policy Research.
- [47] Posner, R.A. 1974. Theories of Economic Regulation. *NBER Working Paper Series*, p.41.
- [48] Robinson, J. 1952. *The Generalization of the General Theory of the Rate of Interest and other Essays*. Macmillan, London.
- [49] Rousseau, P.L. and Wachtel, P. 2011. What is happening to the impact of financial deepening on economic growth? *Economic Inquiry*, 49: 276–288.
- [50] Sahay, R., Čihák, M., N'Diaye, P. and Barajas, A. 2015. Rethinking financial deepening: stability and growth in emerging markets. *Revista de Economía Institucional*, 17(33): 73–107.
- [51] Schumpeter, J.A. 1911. *The theory of economic development: an inquiry into profits, capital, credit, interest and the business cycle*. Cambridge, MA: Harvard University Press.
- [52] Şen, H. and Kaya, A. 2015. *The relative effectiveness of monetary and fiscal policies on growth: what does long-run SVAR model tell us?* Germany: University Library of Munich.
- [53] Stigler, G.J. 1971. The theory of economic regulation. *The Bell Journal of Economics and Management Science*, 2(1): 3-21.
- [54] Svirydenka, K. 2016. *Introducing a new broad-based index of financial development*. International Monetary Fund.
- [55] Valencia, F. and Laeven, L., 2012. *Systemic banking crises database: An update* (No. 12-163). International Monetary Fund.

The Resource Potential of the Region and Tritorial differentiation in the System of the Emerging Markets

Elena MIDLER
Southern Federal University, Russia
Midler2005@yandex.ru

Valentin FILONICH
Rostov State University of Economics, Russia
filonv75@yandex.ru

Suggested Citation:

Midler, E., Filonich, V. 2017. The resource potential of the region and tritorial differentiation in the system of the emerging markets, *Journal of Applied Economics Science*, Volume XII, Winter 7(53): 1882-1887.

Abstract:

An attempt was made to investigate the influence of non-uniformity and asymmetry of development of Russian regions on resource opportunities in emerging markets in terms of macroeconomic constraints. Differentiation of resource market is presented in terms of economic dynamics. Exacerbated peripheralization in Southern Russian regions, as well as in the country as a whole is shown. The trends of the market in terms of regional asymmetries, imbalances spatial distribution of natural resources. We used quantitative and qualitative methods, institutional and comparative analysis. Empirical studies were supplemented by official data service Rosstat. It was found that the asymmetry of the resource development of the regions is defined by reproductive constants of spatially peripheral economies (access to natural resources, rent-seeking, deficit of own financial resources, multi-structural). Roll toward worsening of peripheralization regional economies strengthens resource constraints.

Keywords: regional economy, spatial development, institutions, resource markets, emerging markets, regional asymmetries

JEL Classification: R10

Introduction

Spatial non-uniformity and territorial heterogeneity become the inevitable attribute of development and economic growth in the evolution of any social-economic system. Russia makes no exception in this regard.

Asymmetry, as an organic feature of the internal organization of the vast economic space of Russia, poses additional threats to the social-economic development of the country, increases the imbalances. The effect of the peripheralization of Russian regions arises and escalates. According to some estimates, 70% of the territory of Russia can be attributed to the outer periphery and another 15% – to the internal (Druzhinin, Kolesnikov & Ovchinnikov 2014). To the greatest extent these processes are expressed in the development of the Southern Russian regions, first of all – the Russian Caucasus, where numerous threats and risks emerge, tension arises, and a conflictual social environment is reproduced.

The South of Russia as a model object for the study of regional asymmetry allows us to view the development of various resource markets through a prism of concepts of marginality, institutional imbalance, capitalization. At the same time, guidelines for convergence, an unevenness reduction, which is particularly customary for the French school of spatial economics, remain the leitmotif of any research in the field of spatial economics (e.g. Carrincazeaux, Lung & Vicente 2008, Fujita Thisse 2002, Fujita, Krugman & Venables 1999, Isard 1960, Krugman 1991, Lucas 2008). Such a concept also suggests the search for sources of competitiveness for emerging markets, without reducing the latter to only good geography or simple institutions (Bondarenko 2009, 2010, Busygina & Filippov 2013).

Thus, the aim of this paper is to investigate the impact of unevenness and asymmetry in the development of Russian regions on the resource opportunities of emerging markets under macroeconomic constraints.

1. Research hypothesis

The main hypothesis of the research is the assumption that the complexity and inconsistency of the territorial-resource phenomenon of the Russian regions is determined, on the one hand, by the persistent fragmentation, multi-structure, small-scale regional economic systems that form the resource markets. On the other hand, it is determined by the subordination of regional markets to macroeconomic dynamics.

As a result, there occurs an original effect when the resource markets of "bad" institutions are replaced with the "good" geography of development. The mechanism of regional asymmetry is extremely simple: with a low quality of management and institutions in general, resource flows (*for example*, investments) are shifted to the regions with the unique geographical advantages. The very nature of such investments acts as a kind of "function" from this uniqueness, which undermines the very idea of inter-territorial competition and sustainable development (Busygina and Filippov 2013). A factor aggravating the deformation of resource markets (*e.g.* labor market), a catalyst, may become the opening of foreign markets. And this, in turn, triggers the peripheralization mechanism, forming simultaneously both successful regions (*for example*, the Moscow agglomeration with highly developed labor markets, investments, etc.), and depressive regions (*for example*, monotowns) (Table 1).

Table 1. Comparative analysis of the development of investment markets in the Rostov region and the Krasnodar Krai

Investment projects implemented and submitted for implementation in the regions in 2011-2013.	Rostov region	Krasnodar Krai
Total projects	55	60
Ones with an innovative character (out of a total number)	11	9

Source: Entrepreneurial climate in Russia (Druzhinin 2011)

The effect of such substitution is observed in the economics of the South of Russia, with an emphasis on the development of traditional mixed sectors of the economy of the South of Russia. Comparative analysis of investment activity of two neighboring regions (Rostov region and Krasnodar krai) showed that the investment activity of private investors is far from high-tech priorities and is focused mainly on the branches of the industrial sector in Rostov region, and in the agricultural production sectors in Krasnodar Krai (Table 1).

As it is shown in the table, in conditions of poor quality of the institutional environment, the lack of a favorable business climate in Rostov region (according to the Support Index), investments have rushed into a comfortable geographic environment.

2. Research methodology

The following methodological approach was used in the work: regional asymmetry is interpreted by us as a certain state of regional development in the designated time interval, in which regions characterized by a relative advantage at a specific indicator at the beginning of the period subsequently increase it, and regions with a relative lag exacerbate this condition, thereby creating a peripheral effect. Considering the unevenness of regional development, we rely on the concept of territorial differentiation, construed as the quality and degree of unity of the space of economic, social, political and other life of society in the borders of a particular state, and interpreted as a process or as a result of the formation of differences between individual territories of the state. We examine the South-Russian regions as the territories of the state.

Russian and foreign scientists (Lavrovsky 1999; 2000, Drobyshevsky *et al.* 2005, Solanko 2003) have repeatedly addressed to the problem of empirical evidence of regional differentiation. In literature, much attention is paid to this kind of analysis and important results have been reached here. One of those results is the fact that regional differentiation in Russia has significantly increased in the last 12-13 years (Suspitsyn 2002). However, the problem of the growing peripheralization of Russian regions in the context of the crisis requires the transformation of methodological approaches. The consideration of this phenomenon in the interrelation between regional processes and macroeconomic constraints, the systemic economic crisis and regional imbalances seems methodologically justified.

The analysis of inter-regional economic comparisons is connected with the analysis of emerging resource markets as subsystems of a regional space with the potential for growth.

3. Results

We have examined the market of industrial products in the context of regional asymmetry in the regions of the South of Russia in the period from 2006 to 2012. The research was conducted on the basis of Rosstat data. Upon assessment of the dynamics of such indicators as the volume of industrial output and the level of regional asymmetry, the following results were obtained:

- *The first conclusion:* if the pace of development of the industrial market under the influence of macroeconomic factors is generally decreasing, but this decrease is progressive, regional asymmetry remains unchanged.
- *The second conclusion:* if in the regions with a large production volume the markets start to fall precipitously, and in regions with a smaller volume – the rate of decline slows down, we can say about reducing the asymmetry of the regions development.
- *The third conclusion:* in regions with a significant development potential, where the decline in industrial production markets is slower compared to the regions with less potential, regional asymmetry increases (Figure. 1).

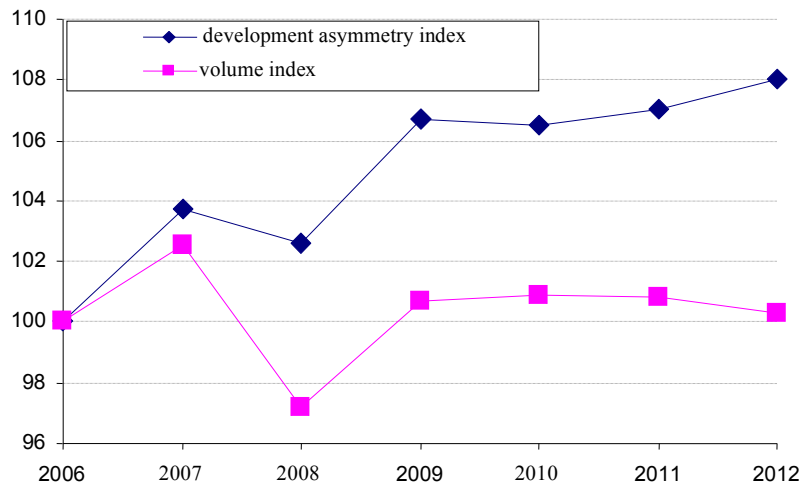


Figure 1. Dynamics of industrial production markets and regional asymmetry.

To assess these relationships, we used the differentiation indicator – the coefficient of variation (the development asymmetry index).

$$V = \sqrt{\frac{1}{N} \sum_{i=1}^N \left(\frac{x_i}{\tilde{x}} - 1 \right)^2}$$

where x_i – value of the indicator for the region i , \tilde{x} – the average value of the indicator for the system of the regions: in the case of the index of actual volume, this is the arithmetic mean by the regions, and in case of a specific index – weighted average of population by the regions, N – number of regions in the system.

This index was also used in analyzing the relationship between the development of investment markets and the asymmetry of regional development in the context of the regions in the South of Russia.

The resource opportunities of the investment market in modern conditions reveal the problem of an aggravating asymmetry in the regions of the South of Russia and affect the investment attractiveness of Russian regions. As noted above, investment redistribution in terms of the regions of the South of Russia is uneven.

Investments are often redistributed to regions with a dominant agricultural patterns and small-scale economy (Table 2).

Table 2. The share of territories in the gross fixed capital formation in the South of Russia, %.

Region	2005	2006	2007	2008	2009	2011
South of Russia	100	100	100	100	100	100
Krais and regions	85,78	79,62	76,74	78,77	77,83	78,8
Republics of the North Caucasus	9,31	19,36	22,28	20,40	21,21	19,6
Kalmykia	4,81	1,03	0,98	0,83	0,96	0,6

Thanks to the all-Russian system of redistribution of transfers, the financial opportunities of the South-Russian regions are 47% higher than its actual production output. Such redistribution promotes the revival of economic activity in peripheral regions, increases the investment attractiveness of the region. At the same time – it carries hidden risks, namely: inhibits the processes of modernization, increases peripherization, expands the volume of shadow business (Druzhinin, Kolesnikov & Ovchinnikov 2014).

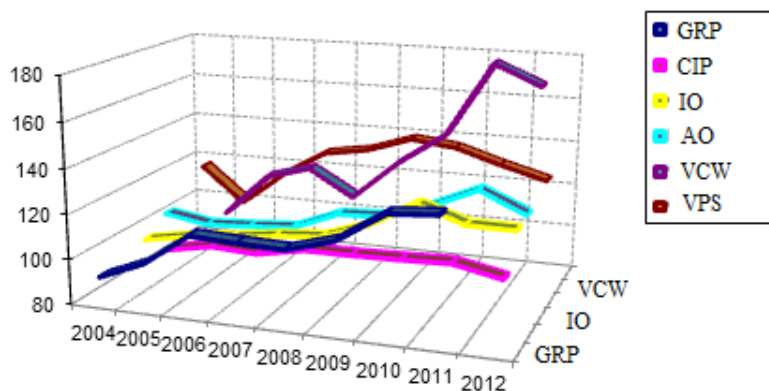
In the situation with the gross accumulation of fixed capital, a similar scenario occurs. In the second half of the 2000-s, the republics of the North Caucasus have increased their share in the scale of the regions of the South of Russia, however, not due to the real growth in investment attractiveness, but due to the relevant government decisions. Thus, according to the results of 2012, 60-65% of investments into fixed assets at those territories consist of budget (federal) sources. Meanwhile, for all regions of the Southern Federal District – 20%, for the whole Russian Federation – 18.9% (see Table 2) (Druzhinin, Kolesnikov & Ovchinnikov 2014).

Thus, the asymmetry of the development of the Russian regions reflects not only a quantitative but also a qualitative characteristic of the unity of the corresponding socio-economic space of the South Russian regions. By separate indicators, this aspect can be determined as a peripheralization structure.

Peripheralization structure of the regions is a complex characteristic of the differentiation of regions within a system, in contrast to a single numerical characteristic, involving the disclosure of features of the distribution of unevenness. Different cross-sections in the distribution of regions are possible here. Among the possible options, we can outline the study of the distribution of unevenness in the economic space, or the study of the distribution of unevenness by the regional administrative subsystems (Lavrovsky & Novikov 2002).

Analysis of the structure of possible directions of peripheralization becomes particularly relevant in the context of a systemic crisis. Figure 2 presents the possible directions of peripheralization for the period of 2006-2012 by several indicators: Gross Regional Product GRP, industrial output IO, agricultural output AO, volume of the paid services for population VPS, volume of work performed under construction contracts VCW, cash income of the population CIP, measured in current prices (Figure 2).

Figure 2. The asymmetry index of regional development in the period of 2004-2012



And, finally, it is necessary to note the role of the price factor as a macroeconomic constraint in the research of the impact of unevenness and asymmetry in the development of Russian regions on the resource opportunities of emerging markets.

Calculations and analysis were carried out taking the current prices, which is due to the content of the uneven economic space that is being formed at the current time and under the influence of current prices. Fixing these changes makes redistribution of cash flows, and is relevant only for the period of time when data measurements are made. The measurement of regional asymmetry was made in constant prices, and thus the release from the influence of current prices can be used in the analysis of technological changes.

Currently, a significant increase in asymmetry and regional differentiation in current prices is recorded, which confirms their crucial influence on the formation of regional asymmetry. For some regions of the South of Russia, a situation is typical when a territory that has a significant share of raw materials exported in its product receives a substantially (but unstable) advantage. Comparison of the measurement results of regional asymmetry in current and constant prices also confirms a significant dependence of dynamics of the differentiation indicator on the dynamics of a single indicator, which occupies a significant proportion of the total volume of the country.

Findings

Analysis of emerging resource markets and key indicators in the context of regional asymmetry allows to suggest that the most large-scale, significant and conditioned by the current phase of the economic cycle is the process of peripheralization of the regional space, taking place on the basis of unevenness and asymmetry of territorial development, integrating and adapting the territories to the territorial-economic structure being built by the center.

Spatial opportunities for the development of resource markets in the South of Russia are limited by fragmentation, multi-structure, small-scale of commodity systems. At the same time, the development of regional markets is subject to the impact of macroeconomic dynamics. This contradiction provokes regional asymmetry, general recession and stratification. Growth and development of markets become possible in conditions of regional alignment in given trajectories and in the absence of macroeconomic shocks.

The most important factor ensuring the smoothing of regional disproportions is the investment component. Current investment deficits exacerbate regional asymmetries, and the regional equalization transfer mechanism provokes dependent moods.

An analysis of regional imbalances and asymmetry of development in constant prices gives a significantly different trend in the variation of differentiation compared to analysis in current prices and characterizes the constancy of the technological structure of production. This indicates a significant impact of the price factor on regional disparities.

References

- [1] Bondarenko, L.V. 2009. Stabilization directions study of selected sectors of the services sphere. *Terra Economicus*, 7(4-2): 130-132.
- [2] Bondarenko, L.V. 2010. Formation market environment in selected service sectors. *Terra Economicus*, 8(3-2): 93-98.
- [3] Busygina, I.M. & Filippov, M.G. 2013. Competitiveness of Russian regions: good institutions or good geography? *Social Sciences and Modernity*, 6: 5-14.
- [4] Carrincazeaux, Ch., Lung, Y. & Vicente, J. 2008. The scientific trajectory of the French school of proximity: interaction- and institution- based approached to Regional System of Innovation. *European Planning Studies*, 16(5): 617-628.
- [5] Drobyshevsky, S., Lugovoi, O., Astafieva, E., Polevoy, D., Kozlovskaya, A., Trunin, P. & Lederman, L. 2005. *Factors of economic growth in the regions of the Russian Federation*. Moscow: IET.
- [6] Druzhinin, A.G. (ed.). 2011. *Investment atlas of the regions of the South of Russia*. Rostov-on-Don: Southern

Investment Agency.

- [7] Druzhinin, A.G., Kolesnikov, Yu.S. & Ovchinnikov, V.N. (eds.) 2014. *South of Russia: Institutions and Strategies for Modernization of the Economy*. Moscow: The University Book.
- [8] Fujita, M. & Thisse, J.-F. 2002. *Economics of Agglomeration. Cities, Industrial Location, and Regional Growth*. Cambridge: Cambridge University Press.
- [9] Fujita, M., Krugman, P. & Venables, A. 1999. *The Spatial Economy: Cities, Regions and International Trade*. Cambridge: MIT press.
- [10] Isard, W. 1960. *Methods of Regional Analysis: An Introduction to Regional Science by Walter Isard*. Cambridge: MIT press.
- [11] Krugman, P. 1991. Increasing returns and economic geography. *Journal of Political Economy*, 99(3): 483-499.
- [12] Lavrovsky, B.L. 1999. Measurement of regional asymmetry in the example of Russia. *Issues of Economics*, 3: 42-52.
- [13] Lavrovsky, B.L. 2000. Regional asymmetry in the Russian Federation: measurement and regulation. In: *Regional policy aimed at reducing socio-economic and legal asymmetry (272-306)*. Novosibirsk: Ekor, Siberian Agreement.
- [14] Lavrovsky, B.L. & Novikov, A.V. 2002. Regional equalization and interbudgetary relations: Lessons of the 1990s. *Economic Journal of the Higher School of Economics*, 1: 28-39.
- [15] Lucas, R.E. Jr. 2008. *The Current Financial Crisis*. Available at: <http://faculty.chicagobooth.edu/brian.barry/igm/ditella.pdf>
- [16] Solanko, L. 2003. An empirical note on growth and convergence across Russian regions. *Discussion Papers*, 9: 5-23.
- [17] Suspitsyn, S.A. (ed). 2002. *The SIREN project: methods for measuring and assessing regional asymmetry*. Novosibirsk: Institute of Ecology and Environmental Protection, Siberian Branch of the Russian Academy of Sciences.

*** Entrepreneurial climate in Russia. URL: <http://new.opora.ru/>

Mathematical Model of Technology Transition

Andrej GREBENC

Science, innovation, technology, Brussels, Belgium

andrej.grebenc@sit1.eu

Suggested Citation:

Grebenc A. 2017. Mathematical Model of Technology Transition. *Journal of Applied Economics Science*, Volume XII, Winter 7(53): 1888-1894.

Abstract:

Technology transition is an innovation macro process where new technologies replace older ones. The dynamic of technology transition distinguishes the rise, stagnation and fall of technologies. We have developed a mathematical model of technology transitions based on sigmoid functions that describe limited growth. We are first who extended the model with stagnation and fall phase of technology transition process, by multiplying sigmoid function with decay function. The model was verified on a specific case from a transport sector. The case was technology transition from gasoline to diesel engines in Slovenia. Newly developed generic model is a good tool for monitoring technology acceptance on regional, national or international level.

Keywords: mathematical model; technology transition; innovation; sigmoid function; rise and fall of technology

JEL Classification: O33; O47

Introduction

In recent years in different scientific fields it leads to the unification of research approaches. During this period, scientists from different scientific fields have found out that science has been increasingly dealing with complex problems and, in order to solve them various models are used. Modelling has become an integral part of quantitative observation of economic phenomena. Model development generally requires in depth analysis and understanding of the existing, not yet investigated or insufficiently investigated areas and phenomena. One of them is the area of technology transition, where reviewing literature on innovation we have not found general mathematical models in this domain. Said transitions deal with the competition between the existing old technologies and the emerging new ones, as well as with the time path of their transition.

In recent decades, attention has been devoted to economic growth research and modelling, dissemination of technology, inventions and innovations, knowledge creation and its dissemination – but attention was not given to their decline, with some rare exemptions. We have filled this gap with our theoretical research and its practical verification.

1. Research Background

Tarde (1890, pp. 128–130, 158–168, 267–279) is considered the pioneer of modern innovation research; he laid the foundation for modern innovation investigation. In his theory, he deals with three concepts: invention, imitation and opposition. Schumpeter (1911, pp. 108–189, 414–462) studied innovations with an emphasis on the economic aspect. In his book *The Theory of Economic Development*, he speaks about "creative destruction", and argues that new technologies destroy the old ones.

In 1950s and 1960s, Schmookler (1966, pp. 1–332) has shown that technological innovation is not only the result of technological development, but also of the demand for solutions to specific problems (demand-pull).

Carlsson & Stankiewicz (1991, pp. 93–118; 1995, pp. 15–27) put emphasis on technological innovation systems, which are one of our most important research frameworks. Technological innovation systems could be part of national innovation systems or, in particular technology segment; they could exceed national innovation systems in representing horizontal (crosscutting) innovation segment (Carlsson & Stankiewicz 1995, pp. 49–50). As an example of such technological innovation systems should be mentioned electronic and computer industry, which have in last fifty years significantly pushed the boundaries in many areas, e.g. data processing and storage,

telecommunications, micronization of electronics etc. Right this aspect is important in our paper: general role of technology transition and models describing transition also mathematically.

During last period can be noticed in the area of research in technology transition (Elzen, Geels, & Green 2004, pp. 19–96; Geels 2005, Ch. 3; Fagerberg & Verspagen 2006, Ch. 12). Elzen and Geels are representatives of the Netherlands school of system innovations, which involves researchers from the field of technology transition and system innovations. Thus, Geels & Schot (2007, pp. 206–212) in their paper on the improvement of Geels model of technology transition, talk about the transition paths of technologies.

Recent research focuses on mathematical models of technology transition. Hanson, Kryukov, Leyffer & Munson (2010) developed a mathematical model for optimal energy emissions transition. Dunn & Gallego (2010) made a research on multiple innovation diffusion in medical practice. They modelled the raise and decay of medical practice. However, the model is rather theoretical and was not verified on real data. Pasaoglu, Harrison, Jones, Hill, Beaudet, & Thiel (2016) presented a transition model of car aggregates, but is sector specific. Acemoglu, Akcigit, Hanley, & Kerr (2016) developed a model of transition of unclean into clean technologies. It is valid for two technologies. Park & Koh (2017) made a research on information technology transitions, where the convergence of telecommunication and information technologies was modelled.

All recent mathematical models are either numerical or use systems dynamic approach and model transitions of one or two technologies.

The quest of more general models with less numerical computations is needed. The best approach seem to be parametric models, where only model parameters are calculated.

2. Methodology

Based on conceptual model developed by induction, deduction and analysis we have formulated generic model of technology transition dynamic. The method of the model relays on parametric functions. Mathematical functions of the model were developed by analysis of processes. For a specific data series, the parameters that allow for sufficiently good approximation of the model to data series have been established. Values of parameters are calculated by least square method with modelling software package Maple. Input data for Maple are prepared in vector form, equations are entered with parameter symbols that are marked to be calculated. Maple than calculates the vector values of the parameters, that are than given back into equations. We plot these equations together with data as shown in Figure 2 and observe the trend of both.

For understanding of basic mechanisms and differences of raise and fall of technologies, we have performed functional time analysis of the phenomenon together with internal and external relations between the existing and new technologies. Without this analysis, it would be difficult to develop a model. One could only be able to find by trial and error to find an approximate a linear function that would statistically describe the phenomenon.

We know that the growth in nature and society is limited. Reason for that are limited resources (for example: population, food, raw materials) and maintenance of equilibriums. We have used the assumptions established after the time of Malthus. As basis for our upgrading of growth and decay models, we have used already known sigmoid functions and have extended them to model growth and decay. As well we have developed some new sigmoid functions, some of them with very interesting characteristics.

For the development of the formal notation of raise and fall of technologies, we have used analytical and empirical derivation of functions. Empirical derivation does not contribute more to understanding of the phenomenon as the analytical approach.

2.1 Foundations for mathematical model of technology transition

Our model is based on an approach that a new technology is considered as a competition to the existing technology. The new technology is expected to grow by its presence on the market. Since the adoption of the new technology has at the beginning no significant influence to the market, the existing technology takes over almost all increase in market demand. Acceptance of both technologies in the market increases. The greater is quantitative growth of

new technology, the larger market share it gains. If new technology is better, its acceptance is growing. New technology usually gets additional customers, which the old technology would not.

Since it is generally known that the growth is limited, we start our model of technology transition with this assumption. Furthermore, when new technology grows quantitatively more than the total growth in both technologies, the old technology necessarily declines. We take into account this fact in our model in a way that we multiply the increasing sigmoid function by the decreasing function. In this way, we achieve the universality of the model during the whole period from emergence of new technology to its decline.

For the model, we choose following variables and parameters:

- $y(t)$ = the quantity of units, available for use at any time. This variable is endogenous and measures the output of our model and is time dependent;
- t = time, an independent, exogenous variable. We are interested in time path of technology transition;
- t_0 = time lag parameter of sigmoid function;
- τ_0 = time lag in decline function;
- A, B = parameters determining the maximum number of technology units, available at market saturation;
- q = limited ascent function is an increasing function, which increases on the interval to a certain limited value. This function was chosen because it is already more than a century clear that there is no unlimited growth;
- r = function of technology decline, which is decreasing function in the interval and determines the timepath of technology, disappearing from the market;
- a = parameter of technology growth, and
- b = parameter of technology decline.

General form of mathematical model of technology transition is written as

$$y(t) = A \cdot q(a \cdot (t - t_0)) \cdot r(-b \cdot (t - \tau_0)) \quad (1)$$

For function q we have chosen one of from the realm of sigmoid functions and for r an exponential decay function. If parameter b is greater than zero, technology transition experiences decay, if it is zero, the model describes stagnation. With this mathematical apparatus we are able to describe the summary of items of all technologies and emerging technologies that usually exhibit growth. One of decaying technologies can be expressed as difference of all technologies minus new technologies minus all existing technologies but one.

Time path of an existing technology is described as:

$$y_L = A \cdot s_L^{\alpha_L} (a_L \cdot (t - t_L)) \cdot r_L(-b_L \cdot (t - \tau_L)), \quad (2)$$

and time path of a new technology by

$$y_N = B \cdot s_N^{\alpha_N} (a_N \cdot (t - t_N)) \cdot r_N(-b_N \cdot (t - \tau_N)). \quad (3)$$

With this approach we go into our specific modelling case to verify the assumptions of the model. We have chosen technology transition of personal cars from petrol to diesel and alternative fuels.

3. Case study: Technology transition of personal cars in Slovenia

Slovenia is a car manufacturing country but also many cars are imported. Characteristic of technology transition of personal cars in Slovenia is that there exist petrol fuelled cars but in last years the number of diesel fuelled cars are increasing. In the very last period the cars on alternative fuels are emerging (biodiesel, gas, electric). Slovenia faces two almost parallel technology transitions and three technologies are concurrently present. We wanted to see what kind of dynamic these two transitions demonstrate. Statistical data on the number of registered cars in each specific category are available at UNECE (United Nations Economic Commission for Europe). UNECE holds data on European countries.

Chronologically technologies follow in this order: petrol fuelled, diesel fuelled and alternative fuelled cars. Data of Slovenia are presented in Table 1. One can easily observe that alternative fuelled cars represent very small numbers, so we will not consider them in our model. The objective of our research is the analysis of trends and of dynamics of technology transition.

Table 1. Technology transition of personal cars – time series for Slovenia –number of cars

Year	Year No	Petrol	Diesel	Alternative	Sum
1993	1	57 851	2 004	23	59 878
1994	2	45 619	1 582	16	47 217
1995	3	59 748	1 909	43	61 700
1996	4	56 859	2 468	31	59 358
1997	5	59 421	4 856	80	64 357
1998	6	64 721	6 167	134	71 022
1999	7	73 437	8 134	298	81 869
2000	8	58 163	6 515	168	64 846
2001	9	46 149	9 061	222	55 432
2002	10	36 379	15 652	279	52 310
2003	11	34 016	26 497	18	60 531
2004	12	35 078	24 802	5	59 885
2005	13	38 584	29 199	8	67 791
2006	14	43 543	27 486	8	71 037
2007	15	37 442	19 945	4	57 391
2008	16	38 173	22 599	5	60 777
2009	17	34 042	25 770	1	59 813
2010	18	24 845	24 847	8	49 700
2011	19	23 942	28 016	10	51 968

Source: UNECE Transport Division (2016)

Figure 1 shows graphically the time series of petrol (dashed), diesel (dash dot) cars and the total number (solid) of cars. It can be seen that the trend of petrol cars is decreasing, while the trend of diesel cars is increasing. Neither decrease nor increase are monotone, dynamics is quite substantial.

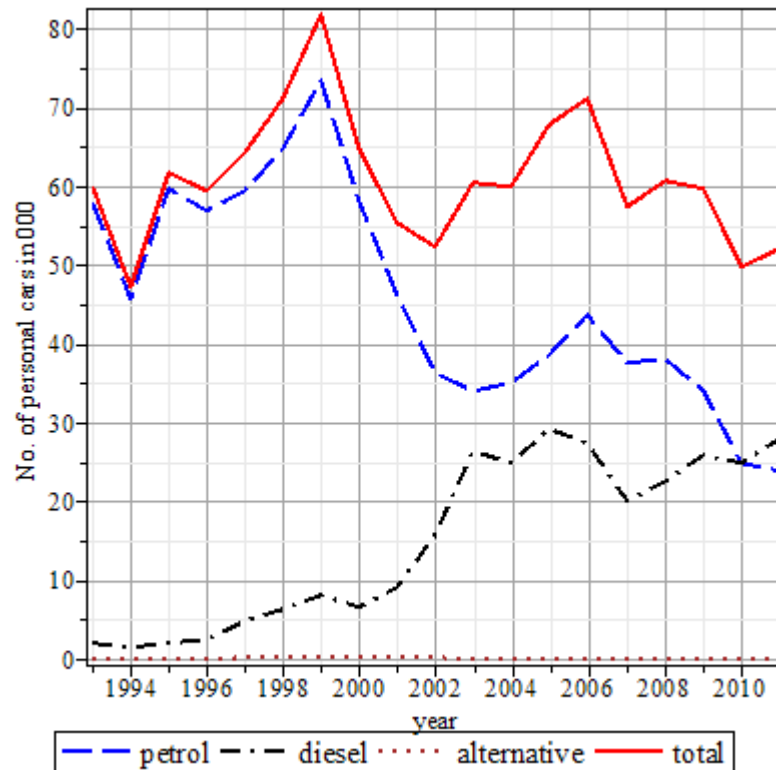
For modelling three curves: petrol, diesel and the sum of both we have selected among the multitude of functions an irrational sigmoid function that is multiplied with the exponential correction factor for modelling decay at the recent years. Irrational sigmoid function was chosen to verify that it is a valid one for modelling. Usually logistic function is used. Exponential part of the equation below was used to model the decay part. Sigmoid function expresses the growth, while exponential part models the decay.

Equation has the form:

$$y = \left(\frac{A}{2} \cdot \left(1 + \frac{a \cdot (x + b)}{\sqrt{1 + (a \cdot (x + b))^2}} \right) \cdot \exp(-c \cdot (x + b)) \right)^\alpha, \quad (4)$$

denoting: y dependent variable - number of personal cars, t independent variable – year no., A , a , b , c and α are parameters.

Figure 1. Technology transition of personal cars in Slovenia – graph of time series



This function will be used for petrol car modelling and for all personal cars. Diesel will be modelled as the difference of all cars and petrol fuelled cars. With the method of nonlinear curve fitting we obtained parameters A, a, b, c and α for all cars and petrol cars. Inserting them into equation (2) we yield the following equations:

- for all personal cars together:

$$y = 51.08 \cdot \left(1 - \frac{0.0049 \cdot (t - 51.08)}{\sqrt{1.06 + 0.000023 t^2 - 0.0024 t}} \right), \tag{5}$$

- for petrol cars:

$$y = 34.62 \cdot \left(1 - \frac{0.077 \cdot (t - 15.32)}{\sqrt{2.40 + 0.006 t^2 - 0.18 t}} \right) \tag{6}$$

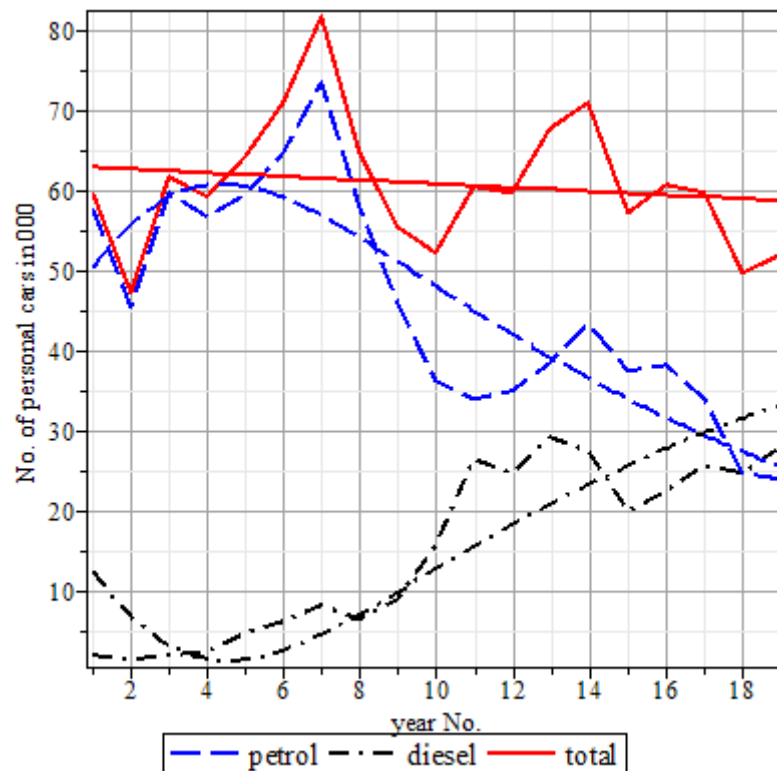
- and for diesel cars:

$$y = 51.08 \cdot \left(1 - \frac{0.0049 \cdot (t - 51.08)}{\sqrt{1.06 + 0.000023 t^2 - 0.0024 t}} \right) - 34.62 \cdot \left(1 - \frac{0.077 \cdot (t - 15.32)}{\sqrt{2.40 + 0.006 t^2 - 0.18 t}} \right) \tag{7}$$

The model renders the value of parameters $\alpha \approx 1$ in $c \approx 0$. This means that the actual model is even simpler than our theoretical assumption. This is the consequence of falling trend of petrol cars technology and the falling trend of a sum of all technologies. As a consequence parametric equations (5), (6) and (7) do not have neither exponent nor power term. Negative trend of all cars together is described with the delay parameters b and by the negative value of parameter a. Diesel cars have been established as the difference of all cars and petrol cars.

Graph of data and models are shown in Figure 2. Smooth curves represent model calculations while scattered curves represent data.

Figure 2. Technology transition of personal cars in Slovenia – graph of data time series and model



For mathematical rigour the deviations of model from the data are presented in Table 2. Data for petrol are scattered and establishing the parameters was computationally more demanding. One can observe that the percentage of deviation was in some data points greater than 10%. What is important is the fact that theoretical model represented by the equation (1) is theoretically adequate because the rising and falling trends were correct for both technologies and for all cars.

Description of the new studies/ software/ artwork and the process of production. What has been done, how was it achieved and what was the rationale? This can be, for example, a report on the design and execution of a set of experiments, the development of an innovative software system or the making of innovative art works. If so, this chapter will illuminate it by explaining, at the very least, what is important and new about it.

Table 2. Technology transition of personal cars in Slovenia – deviations of model from data

Year	Year no.	Deviation of cars			% of deviation		
		Petrol	Diesel	Sum	Petrol	Diesel	Sum
1993	1	2 428	834	3 238	3.853	2.778	5.140
1994	2	13 804	1 884	15 672	21.911	6.280	24.876
1995	3	-1 286	2 289	0 961	-2.041	7.632	1.525
1996	4	0 525	2 580	3 074	0.833	8.600	4.879
1997	5	-3 246	1 172	-2 155	-5.153	3.905	-3.420
1998	6	-9 900	984	-9 050	15.714	3.279	-14.365
1999	7	-20 126	296	-20 128	31.946	0.987	-31.949

Year	Year no.	Deviation of cars			% of deviation		
		Petrol	Diesel	Sum	Petrol	Diesel	Sum
2000	8	-6 529	3 361	-3 336	10.364	11.203	-5.296
2001	9	3 633	2 434	5 845	5.766	8.114	9.278
2002	10	11 375	-2 362	8 734	18.055	-7.872	13.864
2003	11	11 538	-11 241	280	18.315	-37.469	0.444
2004	12	8 120	-7 423	691	12.888	-24.744	1.097
2005	13	2 122	-9 564	-7 450	3.369	-31.880	-11.825
2006	14	-5 429	-5 494	-10 931	-8.618	-18.313	-17.351
2007	15	-1 982	4 464	2 479	-3.145	14.882	3.935
2008	16	-5 381	4 242	-1 144	-8.541	14.140	-1.815
2009	17	-3 886	3 470	-0 417	-6.168	11.567	-0.662
2010	18	2 751	6 715	9 458	4.367	22.383	15.013
2011	19	1 209	5 753	6 952	1.919	19.176	11.035

Conclusion

In economic and innovation literature, the role of technology is rarely mentioned. Technology is somewhat more in the domain of engineers and sociologists. With this paper, we take a step in the direction of mathematical modelling and understanding of technology transition. With technology transition a social process of replacing certain existing technology with the new ones is meant. Our interest was not only the process of technology replacement, but also the impact of new technologies on the growth and decay of demand.

On theoretical level, we have developed and described a mechanism of technology transition: rise and decay of technologies. We described possible time paths of legacy and new technologies and the total volume of technologies.

Based on theoretical narrative we developed a mathematical tool founded on sigmoid function describing bounded raise and decay of technology quantity. Based on the review of literature where we did not find any evidence we can very surely claim the first endogenous equilibrium mathematical model on raise and decay in technology transitions.

We have postulated that sigmoid functions may constitute a very good element of mathematical modelling of technology transition. Sigmoid function is not only one, a few functions are quite frequently used in general modelling. For our case we have selected one sigmoid function and showed that technology transition can be modelled with it.

Model of technology transition was verified on specific case of Slovenia's personal car technology transition, based on time series from reliable international institution.

It turned out that sigmoid function multiplied by corrective term for decay is qualified for modelling of raise and decay of technology transition.

Data were obtained from reliable sources. The model was verified for technology transition aimed at passenger cars in Slovenia. For the transition of cars, we worked out a basic model for replacing petrol-powered vehicles with vehicles powered by diesel or alternative fuel. We have found out that the car technology transition process in Slovenia is in progress and not yet completed.

The developed model was tested only on one sigmoid function. Model provides the framework for further investigations towards the use of other sigmoid functions and additional cases as well as towards the use of those sigmoid functions that enable the best fit of the model to the data.

References

- [1] Acemoglu, D., Akcigit, U., Hanley, D., Kerr, W. (2016) Transition to clean technology. *Journal of Political Economy*, 124(1): 52–104. DOI:10.1086/684511

- [2] Carlsson, B., Stankiewicz, R. (1991). On the nature, function, and composition of technological systems, *Journal of Evolutionary Economics*, 1: 93-118
- [3] Carlsson, B., Stankiewicz, R. (1995). *On the nature, function and composition of technological systems*, V B. Carlsson (Ed.) Technological systems and economic performance: The case of factory automation, 15-27. Dordrecht: Kluwer
- [4] Dunn, A. G., Gallego, B. (2010). Diffusion of competing innovations: The effects of network structure on the provision of healthcare. *Journal of Artificial Societies and Social Simulation*, 13(4), 1–11.
- [5] Elzen, B., Geels, F. W., Green, K. (2004). *System Innovation and the Transition to Sustainability: Theory, Evidence and Policy*. Edward Elgar Publishing.
- [6] Fagerberg, J., Verspagen, B. (2006). *Innovation studies - an emerging discipline (or what)? A study of the global network of innovation scholars*. The Future of Science, Technology and Innovation Policy SPRU, University of Sussex.
- [7] Geels, F.W. (2005). *Technological Transitions and System Innovations*. Cheltenham: Edward Elgar.
- [8] Geels, F.W., Schot, J. (2007). Typology of socio-technical transition pathways. *Research Policy*, 36: 399–417.
- [9] Hanson, D. A., Kryukov, Y., Leyffer, S., Munson, T. S. (2010). Optimal control model of technology transition. *International Journal of Global Energy Issues*, 33(3–4): 154–175.
- [10] Park, K., Koh, J. (2017). Exploring the relationship between perceived pace of technology change and adoption resistance to convergence products. *Computers in Human Behaviour*, 69: 142–150. DOI: 10.1016/j.chb.2016.12.017
- [11] Pasaoglu, G., Harrison, G., Jones, L., Hill, A., Beaudet, A., Thiel, C. (2016). A system dynamics based market agent model simulating future powertrain technology transition: Scenarios in the EU light duty vehicle road transport sector. *Technological Forecasting and Social Change*, 104: 133–146. DOI: 10.1016/j.techfore.2015.11.028
- [12] Schmookler, J. (1966). *Invention and Economic Growth*. Massachusetts: Harvard University Press.
- [13] Schumpeter, J. (1911). *Theorie der Wirtschaftlichen Entwicklung*. Leipzig: Dunkel und Humboldt.
- [14] Tarde, G. (1890). *Les Lois de L'imitation*. Paris: Seuil.
- *** UNECE Transport Division (2016) *data for Slovenia*. Accessed on http://w3.unece.org/PXWeb2015/pxweb/en/STAT/STAT_40-TRTRANS_02-TRRoadFleet

Analysis and Prospects of Infrastructure Development of Innovation Regional Clusters in Russia through the Example of Specific Economic Zones of Industrial Production and Technology Innovation Types

Juliya Sergeevna TSERTSEIL
Plekhanov Russian University of Economics
Financial Management Department, Moscow, Russian Federation
zerzeil8811@mail.ru

Viktoriya Vladimirovna KOOKUEVA
Plekhanov Russian University of Economics
Financial Management Department, Moscow, Russian Federation
kookueva.vv@gmail.com

Natalya Vladimirovna GRYZUNOVA
Plekhanov Russian University of Economics
Financial Management Department, Moscow, Russian Federation
nat-ann@yandex.ru

Chuluundorj KHASHCHULUUN
National University of Mongolia, Department of Economics, Ulaanbaatar, Mongolia
khashchuluun@gmail.com

Suggested Citation:

Tsertseil J.S., Kookueva, V.V., Gryzunova, N.V., Khashchuluun, C. 2017. Analysis and prospects of infrastructure development of innovation regional clusters in Russia through the example of specific economic zones of industrial production and technology innovation types. *Journal of Applied Economics Science*, Volume XII, Winter 7(53):1896-1905.

Abstract:

In general, the cluster approach presupposes the existence of special structuring of the economic system, the clustered one, which means that the economic system is a particular combination of elements, where the key one is the core, which contains prime competitive benefits, and supporting industries, realizing these benefits. Innovative activities of enterprises and organizations within the territory of regional clusters in the Russian Federation is carried out within the framework of innovative development programs with participation of the state in areas such as reconstruction and modernization of fixed assets (preferred funding stream), conduction of research and development activities, advancing of the share of innovative products in the total output. The presence of specific economic zones for industrial use contributes to increase of intensity of enterprises and innovative activities of organizations within the territory of clusters. The performance indicators of specific economic zones (SEZ) of industrial production and technology innovation type are analyzed throughout their functioning in this article. Statistical methods of research have been used, comparison and clustering methods have been applied. As a result of study, it was identified that it is impossible to define zones as effective or ineffective categorically, as they differ in the period of functioning, industry activities and have their own specific character. Alabuga and Lipetsk are working effectively among industrial SEZ's; and Saint Petersburg, Moscow and Moscow Oblast are those of technology innovation type. Such conclusions were made based on comparison of residents' investment volume, investment from federal and local budgets for creation of infrastructure, amount of implemented objects in infrastructure. Study results can be used by authorities in decision-making, management companies of specific economic zones. In general, it is possible to say that support and development of SEZ's is necessary, as they have development potential.

Keywords: economic development; innovation cluster; specific economic zone

JEL Classification: O3; O31

Introduction

The theoretical basis for appearance and development of modern concepts of economic development of the territories are scientific works of major researchers in the field of economics: Freeman (1982), Marshall (1890),

Menger (1976), Petty (1662), Schumpeter (1939). Further, the provisions of classical schools of the theory of value were reflected in works of national and foreign scientists, analysts and experts on formation of modern concepts of innovative development of territories, formation of the intellectual potential of the company in post-industrial economy.

The term knowledge based capital derives from the category of human capital, which was primarily used by classical political economists A. Smith, D. Mill, W. Petty asserting the existence of the quality effect of the human factor on the economy efficiency. Historically, mentioning of human capital for the first time takes place in the work of A. Smith, *Wealth of Nations*, where human capital is understood as a collective description of the quantity and quality of the human ability to work, which is an important source of income and a factor of labor efficiency growth. American economists, T. Schultz and G. Becker, are considered to be founders of the human capital theory. T. Schultz compares human with the material capital used in the production, noting that human capital has features of productive nature, and tends to accumulate and reproduce on the renewable basis. He notes the investment character of human nature improvement. G. Becker continued the study of T. Schultz in a broader context and goes to the macroeconomic level in studies. He gives the following definition: human capital is money invested in training of an employee or a family member, but not the man himself with his knowledge and skills; ... a functional element of the production process.

In foreign literature Aghion, Akcigit and Howitt (2014), Arrow (2013), Bhatti and Zaheer (2014), Dunn (2011), Dreger and Erber (2010), Elder and Cosgrove (2007), Feser and Bergman (2010), Gordon and McCann (2000), Ketels and Memedovic (2008), Porter (2007) look into problems and perspectives of innovation clusters development and their positive influence both on development of a certain region, and the whole country, considering development of cluster initiatives and infrastructure of cluster formation.

Problems and perspectives of innovative territorial clusters, tools for their support within the territory of Russia are reflected in works of Russian scientists Sibirskaya, Oveshnikova and Sosedov (2016), Tsertseil and Ordov (2016a, 2016b), Vershinina, Zhdanova, Maksimova and Perepelitsa (2015).

1. Case study

Efficiency of specific economic zones established in Russia is a quite acute issue today.

According to studies of authors, the specific economic zones, by virtue of their features, are closely related to local and regional businesses individually and to industrial clusters as a whole by means of supply and marketing channels, and value added chains.

The key features of the development of specific economic zones in the regions are:

- presence of a unified system of administration and control of economic entities in the territory of a specific economic zone, which allows to optimize overhead costs of a resident of a specific economic zone, including administrative and commercial expenses;
- presence of potential advantages for companies actually present in the territory of the specific economic zone, for example, by reducing transaction costs on the search for factors such as raw materials, production workers, information resource;
- preferential conditions of production and implementation process of business entities stimulating to optimize the cost structure of producers and improve the competitiveness of their products as a result of reduction of production and total unit costs;
- separate and secure regional borders allowing to ensure the security of business entities in the region (Sibirskaya, Oveshnikova and Sosedov 2016).

Table 1 summarizes the performance indicators of specific economic zones of industrial production type (Industrial Production SEZ) on an accrual basis from the beginning the functioning through 2015.

Table 1. Performance Indicators of Industrial Production SEZ in 2015 on an Accrual Basis

INDICATORS	Lipetsk Industrial Production SEZ	Alabuga Industrial Production SEZ, Tatarstan	Samara Oblast Industrial Production SEZ	Sverdlovsk Oblast Industrial Production SEZ	Pskov Oblast Industrial Production SEZ	Kaluga Oblast Industrial Production SEZ	TOTAL for all Industrial Production SEZ's
1. Accrued total of residents	42	48	16	8	3	4	122
1.1 including those with foreign participation	21	22	11	1	3	0	58
2. Accrued number of jobs created by the residents	3,070	5,434	284	81	5	443	9,317
3. Amount of residents' investment, mln RUB	29,839	97,827	7,131	521	14	4,415	139,747
4. Accrued revenue amount, mln RUB	35,025	168,136	888	0	0	620	204,669
5. Accrued funds of federal budget for establishment of infrastructure, mln RUB	7,334	17,078	4,892	1,000	2,881	2600	36,620
6. Accrued funds of regional and municipal budgets for establishment of infrastructure, mln RUB	1,841	8,626	471	1,792	358	600	13,688
7. Accrued amount of taxes paid by residents, mln RUB	3,102	6,595	228	0,21	1	22	9,949
8. Amount of customs duties paid by residents, mln RUB	1,268	17,191	197	0	0	0	18,657
9. Amount of used tax benefits to the federal budget, mln RUB	0	0	0	0	0	0	0
10. Amount of used benefits for customs duties, mln RUB	3,749	1,0569	807	0	0	22	15,147
11. Amount of used tax benefits to regional and municipal budgets, mln RUB	1,405	2,703	1	0	0	150	4,259
12. Number of engineering infrastructure facilities and put into operation	54	100	5	1	1	3	164
13. Amount of undrawn funds (balance) of the federal budget	12	869	1,129	388	2,037	1,078	6,348
13. Share of leased area	13	27	13	19	5	30	

Source: compiled by the authors based on Annual report of Alabuga SEZ 2015

We shall consider performance indicators associated with tax payments and tax preferences. Total for the period of zones existence, residents paid 9,949 million rubles of taxes to the budget, of which 6,595 million rubles, or 66%, were paid by residents of Alabuga zone; 3,101 million rubles (31%) were paid by residents of Lipetsk zone. The same situation is with customs duties payment: total for the period, 18,657 million rubles were paid, of which 17,191 million rubles were contributed by Alabuga residents. As for the tax benefits, customs payment benefits are primarily used. For the period, the amount of used tax benefits for customs payments made up 15,147 million rubles, of which 10,569 million rubles accrues to Alabuga. There is an indicator Amount of undrawn funds among the performance indicators. Thus, 6,348 million rubles are undrawn, of which 2,037 million rubles refer to the zone of Pskov Oblast, 1,129 million rubles to the zone of Samara Oblast, and 1,078 million rubles to the zone of Kaluga Oblast.

164 infrastructure facilities were built and put into operation during the Industrial Production SEZ operation, of which 100 facilities are in the Republic of Tatarstan, 54 in Lipetsk, 5 in Samara Oblast, 3 in Kaluga Oblast and one in each of others.

In general, the Ministry of Economic Development and Trade calculated the 2015 performance indicator of 68% for all Industrial Production SEZ, and 83% on an accrual basis (the highest performance indicator on zone groups). In general, it may be noted that only two industrial production zones, Alabuga and Lipetsk, comply with performance indicators (Vershina *et al.* 2015).

Alabuga SEZ and Lipetsk SEZ stand out from six operating zones of the industrial production type. They include the highest number of residents, including foreign participation, which can be generally explained by their operation period. In general, 9,317 workplaces were created for the period of Industrial Production SEZ existence, of which, 5,434 in Alabuga, 3,070 places in Lipetsk city. The largest accrued amount of residents' investments for the whole period of functioning has been noted in Alabuga – 97,827 million rubles (Aghion, Akcigit, and Howitt 2014), 29,839 million rubles in Lipetsk, 7,131 million rubles in Samara Oblast, 4,415 million rubles in Kaluga Oblast, 521 million rubles in Sverdlovsk Oblast, and 14 million rubles in Pskov Oblast.

We shall consider the performance indicators of specific economic zones of the technology innovation type (Technology Innovation SEZ). They include: Saint Petersburg SEZ, Zelenograd SEZ, Dubna SEZ, Tomsk SEZ, Innopolis SEZ (see Table 2).

Table 2. Performance Indicators of SEZ TIT in 2015 on an Accrual Basis

Indicators	St Petersburg Technology Innovation SEZ	Moscow Technology Innovation SEZ	Moscow Oblast Technology Innovation SEZ	Tomsk Technology Innovation SEZ	Republic Tatarstan Technology Innovation SEZ	TOTAL Technology Innovation SEZ
1. Accrued total of residents	36	37	100	67	15	255
1.1 including those with foreign participation	3	0	0	10	0	13
2. Accrued number of jobs created by the residents	1,649	3,076	2,328	1,623	37	8,713
3. Amount of residents' investment, mln RUB	15,652	7,300	8,472	7,437	10	38,871
4. Accrued revenue amount, mln RUB	12,811	12,986	10,798	8,277	3	44,875
5. Accrued funds of federal budget for establishment of infrastructure, mln RUB	4,588	8,774	9,534	8,405	15,000	46,301

Indicators	St Petersburg Technology Innovation SEZ	Moscow Technology Innovation SEZ	Moscow Oblast Technology Innovation SEZ	Tomsk Technology Innovation SEZ	Republic Tatarstan Technology Innovation SEZ	TOTAL Technology Innovation SEZ
6. Accrued funds of regional and municipal budgets for establishment of infrastructure, mln RUB	9,636	15,501	2,185	5,428	0	44,219
7. Accrued amount of taxes paid by residents, mln RUB	4,678	1,604	503	1,404	1	8,190
8. Amount of customs duties paid by residents, mln RUB	842	27	70	12	0	952
9. Amount of used tax benefits to the federal budget, mln RUB	0	414	18	300	0	732
10. Amount of used benefits for customs duties, mln RUB	486	28	527	371	0	1,441
11. Amount of used tax benefits to regional and municipal budgets, mln RUB	0	0	46	160	0	206
12. Number of engineering infrastructure facilities and put into operation	41	33	125	33	11	216
13. Amount of undrawn funds (balance) of the federal budget	900	1,348	0	500	5,208	7,956
13. Share of leased area	79	51	44	32	0	

Source: compiled by the authors based on Report on the results of operation of specific economic zones and for the period from the beginning of the operation of specific economic zones 2015

The performance indicators of Technology Innovation SEZ compared with Industrial Production SEZ are quite low and expensive for a state in relation to their returns. It is associated not only with the operation period of these zones, but also with specifics of activities, which do not suppose fast pay-back period and comes with high risks. It was possible to allocate only two leading zones among industry production zones, while 4 of 5 technology innovation zones have comparable indicators and demonstrate real activity. In total, 255 residents are registered, of which 100 residents are in Moscow Oblast, 67 in Moscow (Zelenograd), 36 in Saint Petersburg. The highest number of workplaces was created in Moscow – 3,076 places; 2,328 in Moscow Oblast, 1,649 in Saint Petersburg, 1,623 in Tomsk (Tsertseil 2015b).

At the same time, all abovementioned zones were created and are developing within implementation of the cluster policy in Russia. In Russia, creation and development of innovation regional clusters takes place with due regard to external conditions (location, historically established centers of goods production and sales), and support at federal and regional levels of the state budget system.

As we see from Table 3, the primary concentration of specific economic zones and innovation regional clusters takes place in the following federal districts: Central Federal District, Privolzhsky Federal District, Northwestern Federal District.

Within the territory of specific economic zones, research activities are carried out in innovations, mostly technological, which is facilitated by production processes of industrial enterprises located in the territory of a specific economic zone (Tsertseil 2014).

Table 3. Interrelation of specific economic zones of industrial production and technical innovation types of innovation regional clusters in Russia

Industrial Production SEZ and Technology Innovation SEZ	Federal District	Innovation regional cluster created within implementation of cluster policy in territory of RF, where SEZ is located	Innovative territorial cluster, formed by decision of municipal and local authorities, where SEZ is located	Types of industrial production
Lipetsk Industrial Production SEZ, Lipetsk Oblast	Central Federal District		Machine tool industry cluster, engineering industry cluster, composite cluster	Machine tool engineering industry
Alabuga Industrial Production SEZ, Tatarstan	Privolzhsky Federal District	Cluster of chemistry and petrochemistry		Chemistry and petrochemistry
Samara Oblast Industrial Production SEZ	Privolzhsky Federal District	Aerospace cluster		Manufacturing of air- and spacecraft, shipbuilding
Sverdlovsk Oblast Industrial Production SEZ	Ural Federal District	Cluster of "advanced materials"		Innovative production
Pskov Oblast Industrial Production SEZ	Northwestern Federal District		Electrical engineering cluster	Machine building, vehicles production and electrical machinery
Kaluga Oblast Industrial Production SEZ	Central Federal District	Cluster of pharmaceuticals industry, biotechnologies and biomedicine		Pharmaceuticals industry, biotechnologies and medical industry
Saint Petersburg Technology Innovation SEZ	Northwestern Federal District	Cluster of pharmaceuticals and medical industry; Cluster of information technology and electronic engineering		Pharmaceuticals industry, biotechnologies and medical industry
Moscow Technology Innovation SEZ	Central Federal District	Cluster of advanced materials; Cluster of information technology		Information technology and electronic engineering, innovative production
Moscow Oblast Technology Innovation SEZ	Central Federal District	Dubna; Biotechnological cluster; Cluster of advanced materials		Nuclear and radiation technologies, innovative production
Tomsk Technology Innovation SEZ, Tomsk Oblast	Siberian Federal District	Cluster of pharmaceutical and medical industry; Cluster of information technology and electronics		Pharmaceutical, biotechnology and medical industries
Republic of Tatarstan Technology Innovation SEZ	Privolzhsky Federal District	Innopolis cluster		Innovative production

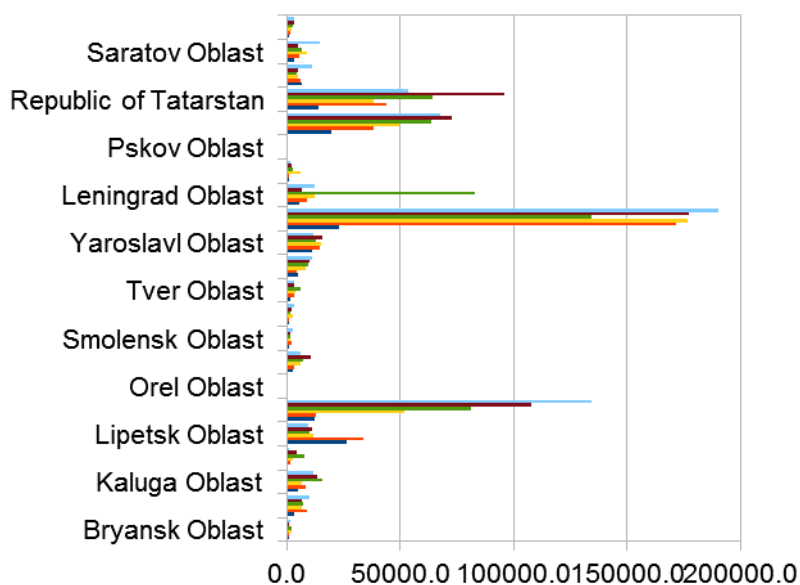
Source: compiled by the authors based on Annual reports on the activities of specific economic zones 2016

In the Figure 1, the cost profile is presented for technology innovations implemented in the territory of regions, where specific economic zones of industrial production and technology innovative types are located, for the period of 2010-2015. As we see, these territories show activities on research and development aimed at

optimization of production process in enterprises conducting their activities within the territories of specific economic zones, the implementation of technological developments in order to optimize production costs (material, labor, overhead cost) (Tsertseil 2015a).

Efficiency of developed and implemented technology innovations is shown in the Figure 2. We have examined innovative activity of the territories comprising specific economic zones and surrounding areas in selected federal districts: Bryansk Oblast, Voronezh Oblast, Kaluga Oblast, Kursk Oblast, Lipetsk Oblast, Moscow Oblast, Moscow, Orel Oblast, Ryazan Oblast, Smolensk Oblast, Tambov Oblast, Tver Oblast, Tula Oblast, Yaroslavl Oblast, Leningrad Oblast, Novgorod Oblast, Pskov Oblast, Saint Petersburg, Republic of Tatarstan, Orenburg Oblast, Saratov Oblast, Ulyanovsk Oblast, which made it possible to establish the following dependence:

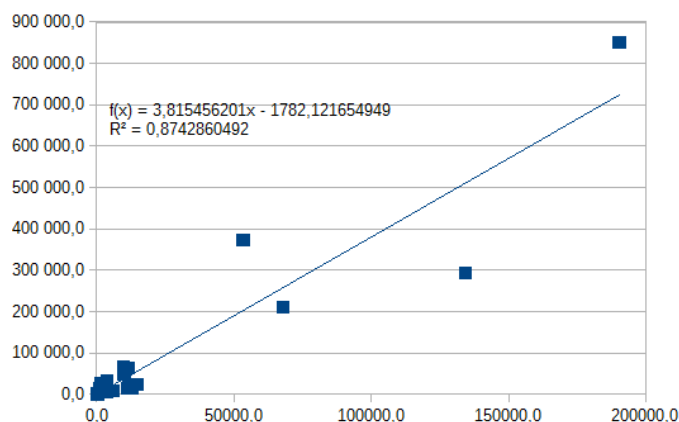
Figure 1. Volume of expenditures on technological innovations in 2010-2015, million rubles



As the result of correlation and regression analysis, it was revealed that there is a strong direct correlation between volume of expenditures for technological innovations (X) and volume of shipped innovative production. In this case, the coefficient of determination is 0.874, which confirms the adequacy of the calculations for 87,4%. The resulting linear regression equation is as follows:

$$y = 3,82 x - 1782,12 \tag{1}$$

Figure 2. Interrelation of costs for creation and implementation of technological innovations and volumes of produced and sold innovative goods in 2015, million rubles



2. Discussion

Total volume of investments contributed by residents of SEZ TIT for the whole period of operation came to 38,871 million rubles, the highest share of which accounts for Saint Petersburg city – 15,652 million rubles, that makes up 434.7 million rubles per resident at an average. In Moscow Oblast, 8,472 million rubles were invested, 84.7 million rubles per resident, which is lower than in Saint Petersburg.

Most funds of the federal budget allocated for infrastructure creation were directed to the Republic of Tatarstan – 15,000 million rubles, 32% of the total. At the same time, there are only 15 residents and 37 workplaces in Tatarstan, its residents invested only 10 million rubles. Innopolis SEZ was created relatively recently, the new city of Innopolis was built, together with Innopolis University, educational establishments, residential complexes, which required large investments. Saint Petersburg SEZ, contrary to Innopolis SEZ, required the least costs from federal budget – 4,588 million rubles, though there are the largest investments of residents and the highest returns there. It is also necessary to note that regional and municipal authorities have allocated twice more funds for development of infrastructure than it was invested from the federal budget. We consider this fact to be positive state innovative policy of Saint Petersburg authorities. 8,774 million rubles were allocated for development of Moscow SEZ from the federal budget, 15,501 million rubles were targeted from the regional budget, which is 1.7 times more than investment from the federal budget. In total, investments in Moscow zone are higher than in other zones, though the residents' investments volume is lower than in other working zones under survey, without regard for Innopolis zone. In SEZ of Moscow Oblast, there are other funding correlations (Tsertseil 2015c). Thus, 9,534 million rubles were allocated for creation of infrastructure from federal budget, 2,185 million rubles from regional budget. There is the highest number of social infrastructure facilities put into operation in SEZ of Moscow Oblast, which is very important – 125 of 216. This zone showed good performance indicators for investment volume and revenue volume during the whole period, in spite of quite low funding from regional budgets. Analysis of the performance indicators in terms of payment of taxes paid by residents showed that residents of the SEZ in Saint Petersburg paid 4,678 million rubles to the budget, or 57% of all taxes paid by SEZ of technical innovation type for the entire period of zones operation. There is the similar situation with customs payments. Organizations of SEZ in Saint Petersburg do not use the tax benefits in the federal and territorial budgets, but only privileges on customs payments. The amount of taxes paid in the SEZ in Moscow is 1,604 million rubles, 28 million rubles as customs duties. It should be noted that residents of Moscow actively use tax benefits on the payments to the federal budget – 414 million rubles. The residents of SEZ of Moscow Oblast paid few to the budget – only 503 million rubles for the period, while volume of used benefits for customs payments is 527 million rubles.

In total, the amount of undrawn funds on technology and innovation zones makes up 7,956 million rubles, of which 5,208 million rubles, or 65%, accrues to Innopolis SEZ of the Republic of Tatarstan, 1,348 million rubles to Moscow, 900 million rubles to Saint Petersburg, 500 million rubles to Tomsk, and there are no undrawn funds in Moscow Oblast.

Conclusion

Thus, analysis of the efficiency of the specific economic zones does not permit a definitive conclusion about the efficiency and inefficiency of their operation. It is difficult to draw conclusions about the efficiency of the zones that have different operation periods, that are at different stages of their development. Nevertheless, it can be stated that in each analyzed group of zones of certain type, leaders are zones that have been operating for a long time as compared with others. It is impossible to compare the indicators of zones, established by the decisions made in 2012 and in 2006. Among the specific zones of industrial production type, we pick out Alabuga and Lipetsk SEZ that have already been formed and demonstrate high level of efficiency. Relatively equal performance indicators are among the zones of technical innovation type, except for the Innopolis SEZ, which is just in the process of formation. Here we can single out the zone in Saint Petersburg, which gives positive indicators of residents' activities with lower funding from the federal budget compared with zones of Moscow and Moscow Oblast.

To conclude we may state that the analyzed zones of industrial production and technical innovation types in Russia need to be developed, taking into account their positive impact on the economy of regions and the country as a whole.

Reference

- [1] Aghion, P., Akcigit, U., and Howitt P. 2014. *What do we learn from Schumpeterian growth theory?* Handbook of economic growth. Working Paper 18824 <http://www.nber.org/papers/w18824>
- [2] Arrow, K. 2013. *The Nature and Importance of Innovation*. Princeton: Princeton University Press.
- [3] Bhatti, W. and Zaheer, A. 2014. The role of intellectual capital in creating and adding value to organizational performance: A Conceptual analysis. *The Electronic Journal of Knowledge Management*, 12(3): 187-194.
- [4] Dreger, C. and Erber, G. 2010. *The Design of Regional Innovation System*. The European Community's Seventh Framework Programme.
- [5] Dunn, S. P. 2011. *The Economics of John Kenneth Galbraith. Introduction, Persuasion and Rehabilitation*. Cambridge: Cambridge University Press.
- [6] Elder, L. and Cosgrove, R. 2007. *John Stuart Mill: On Instruction, Intellectual Development and Disciplined Learning*. Available at: www.criticalthinking.org/files/JohnStuartMill.pdf
- [7] Feser, E. and Bergman, E.M. 2010. National Industry Cluster Templates: A Framework for Applied Regional Cluster Analysis. *Journal of Regional Studies*, 34(1):1-19. DOI: <http://dx.doi.org/10.1080/00343400050005844>
- [8] Freeman, C. 1982. *Innovation and long cycle of economic development*. Camoinas: University of Camoinas.
- [9] Gordon, R.I. and McCann, Ph. 2000. Industrial clusters: Complex, Agglomeration and/or Social Networks. *Urban Studies*, 37(3): 513-532. DOI: <https://doi.org/10.1080/0042098002096>
- [10] Ketels, H.M., and Memedovic, O. 2008. From clusters to cluster-based economic development. *International Journal of Technological Learning, Innovation and Development*, 1(3): 375-393.
- [11] Marshall, A. 1890. *Principles of Economics*. The Online Library of Liberty. Available at: <http://eet.pixel-online.org/files/etranslation/original/Marshall,%20Principles%20of%20Economics.pdf>
- [12] Menger, C. 1976. *Principles of Economics*. Ludwig von Mises Institute. Available at: https://mises.org/sites/default/files/Principles%20of%20Economics_5.pdf
- [13] Petty, W. 1662. *The Economic Writings of Sir William Petty, together with The Observations upon Bills of Mortality*. Cambridge: Cambridge University Press. Available at: <http://oll.libertyfund.org/titles/1677>
- [14] Porter, M. 2007. *Clusters and Economic Policy: Aligning public policy with the New Economics of Competition*. ISC White Paper. Harvard Business School. November, 1-10. Available at: http://www.hbs.edu/faculty/Publication%20Files/Clusters_and_Economic_Policy_White_Paper_8e844243-aa23-449d-a7c1-5ef76c74236f.pdf
- [15] Schumpeter, J.A. 1939. *Business cycles. A Theoretical, Historical and Statistical Analysis of the Capitalist Process*. New-York: McGraw Hill Book Company. Available at: http://classiques.uqac.ca/classiques/Schumpeter_joseph/business_cycles/schumpeter_business_cycles.pdf.
- [16] Sibirskaya, E.V., Oveshnikova, L.V. and Sosedov G.A. 2016. Cluster typology of Russian regions based on their innovation and investment infrastructure evaluation. *Actual problems of economics*, 7(181): 231-240.
- [17] Tsertseil, J. 2014. The Way of Clustering Uprising and Development in the Region (by the Example of the Petrochemical Cluster in the Republic of Tatarstan. *Mediterranean Journal of Social Sciences*, 5(18): 125-128.

- [18] Tsertseil, J. 2015a. Innovation Economica Development of the Region within the Frames of Cluster. *Mediterranean Journal of Social Sciences*, 6 (1):183-187.
- [19] Tsertseil, J. 2015b. Implementation of the innovation development process for the certain region in the framework of clusters. *GSTF Journal on Business Review (GBR)*, 4(2):111-119.
- [20] Tsertseil, J. 2015c. The instruments to maintain cluster activities within the territory of the region. *GSTF Journal on Business Review (GBR)*, 4(2): 105-110.
- [21] Tsertseil, J. and Ordov, K. 2016a. Cluster's innovation development through the territory of the regions. Conference: 3rd International conference of political science, international relations and sociology. *Book Series: European Proceedings of Social and Behavioral Sciences*, (10): 50-62.
- [22] Tsertseil, J. and Ordov, K. 2016b. The impact of R&D organizations of the innovation development on the region's territory. *GSTF Journal on Business Review (GBR)*, 4(4): 16-17.
- [23] Vershinina, A.A., Zhdanova, O.A., Maksimova, T.P. and Perepelitsa D. G. 2015. The formation of indicator framework for effective assessment of investment attractiveness of the region. *International Journal of Economics and Financial Issues*, 5(3S): 136-141.
- *** *Annual report of Alabuga SEZ*. 2015. Available at: <http://alabuga.ru/upload/iblock/538/1.1.-godovoy-otchet-2015.pdf>
- *** *Annual reports on the activities of specific economic zones*. 2016. Available at: http://www.russez.ru/disclosure_information/oao_oez/godovie_otcheti/
- *** *Report on the results of operation of specific economic zones and for the period from the beginning of the operation of specific economic zones*. 2015. Available at: <http://economy.gov.ru/minec/about/structure/deposobeczona/20160930>

Net Assets Valuation in Transformations of Czech Companies

Jiří POSPÍŠIL

Department of Financial Accounting and Auditing, Faculty of Finance and Accounting
University of Economics Prague¹, Czech Republic
jiri.pospisil@vse.cz

Hana VOMÁČKOVÁ

Department of Financial Accounting and Auditing, Faculty of Finance and Accounting
University of Economics Prague, Czech Republic
hana.vomackova@vse.cz

Suggested Citation:

Pospíšil, J., Vomáčková, H. 2018. Net assets valuation in transformations of Czech companies. *Journal of Applied Economic Sciences*, Volume XII, Winter, 7(53): 1906-1917.

Abstract:

The paper analyses the company transformations which represent a specific group of mergers and acquisitions which took place in the Czech Republic in 2013. Based on the statistical sample containing detail data of 115 transformations, we analyzed important aspects of company transformations (M&A) such as accounting method applied, method of net asset valuation and the ownership structure of the participating companies. The research indicates that current regulation of accounting for company transformations in the Czech Republic (and possibly other Central and Eastern European countries) fails to respond to the fact that majority (96 %) of company transformations (M&A) which took place in 2013 in the Czech Republic were in fact corporate holdings reorganizations rather than business combinations as defined by IFRS 3. The option to increase the equity of the successor company from the excess of fair-value over the historical prices during the transformation leads to severe distortion in faithful representation of the financial position of the successor company. Based on these findings, we identify the main risks for the external users of financial statements and suggest potential ways of revision of Czech regulation for company transformations accounting.

Keywords: company transformations; net assets valuation; accounting for business combinations; accounting regulation

JEL Classification: G34

Introduction

Valuation methods applied in financial accounting have a crucial impact on financial position as well as on the other financial indicators. Inadequate measurement of net assets of entity acquired in business combination may distort not only the faithful representation of financial position of the group at acquisition, but also the post-acquisition performance. Despite this enormous importance, research devotes only low effort to investigate the determinants of selected measurement bases and their impact on financial statements. M&A literature analyses predominantly business transactions of firms listed in the USA or in the EU, resting on the data from financial statements. These statements are prepared in compliance with US GAAP or IFRS, both systems follow a single concept of measurement in acquisitions. Furthermore, both sets of standards are grounded on the substance over form principle ensuring that financial statements portray economic consequences of the M&A truthfully. However, the presumption of substance over form does not hold in the countries with code-law tradition. In these countries, accounting guidance of M&A is usually tightly aligned with local corporate law. Furthermore, the accounting treatment of business combinations is commonly influenced by tax motives of participating parties.

To address the identified gap in research, the objective of this paper is to analyse common accounting practices of Czech companies engaged in M&A especially in company transformations, which can be defined as a subset of M&A. The Czech Republic was selected, as (a) its accounting law is underdeveloped and under relatively strong influence of tax rules; (b) corporate law dealing with company transformations stressed the legal form of the

¹ nám. W. Churchilla 1938/4, 130 67 Praha 3, Czech Republic

transaction rather than its economic substance; (c) the Czech Republic is still a transition country with significant lacks in its institutional background, which intensifies the information risks of users working with misleading financial statements. Using a sample of 115 company transformation transactions, we analyzed important accounting aspects of company transformation and found out that while the respective regulation of accounting is designed primarily for business combinations taking place among independent parties (Czech accounting regulation stipulates application of modified acquisition method for M&A accounting), majority of the company transformations (approximately 96% in 2013) were in fact restructuring of current corporate holdings. The option to increase the equity of the successor company from the excess of fair-value over the historical prices during the transformation (this option is incorporated in the Czech legislation) leads to severe distortion in faithful representation of the financial position of the successor company and can be misused to damage company's capital facilities.

1. Literature review & research background

Valuation of assets and liabilities is one of the corner-stones of the accounting. It seems to be an unlimited source of disputes among scholars as well as practitioners, an everlasting topic for discussion. Valuation methods applied in financial accounting have a crucial impact on the financial position, as well as on the other financial indicators. Valuation concepts complement the underlying assumptions and principles of financial accounting, such as an assumption of going concern, reliability of measurement, verifiability and accrual accounting. Thus, the financial statements have desired qualitative characteristics to provide users with useful information for their economic decision-making. All the valuation concepts which financial accounting has developed over its long existence should be applied to specific cases/transactions with respect to its underlying suppositions and preconditions.

The concept of historical cost and concept of fair value are relevant for this paper, both having advantages and disadvantages (Abdel-Khalik 2008, Procházka 2011, Ryan 2008). Historical cost being the traditional valuation method of accounting has been subject to some criticism for its rigidity as this method maintains the information out past transactions in their former valuation and thus supposedly fails to meet the needs of users of the financial statements in current space economy. Fair value concept seems to be the solution for the conservatism of the historical cost concept. Unfortunately, as some points out, fair value lacks the reliability a verifiability of the historical cost model. As Procházka (2011, 72) points out it is *"a never-ending trade-off between reliability and relevance of accounting information"*.

Inadequate measurement of net assets of entity acquired in business combination may distort not only the faithful representation of financial position of the group at acquisition, but also the post-acquisition performance (King *et al.* 2004, Krishnaswami and Subramaniam 2015, Valouch and Králová 2012). Despite this enormous importance, research devotes only low effort to investigate the determinants of selected measurement bases and their impact on financial statements. This topic is addressed only indirectly through examining goodwill recognition in business combinations. Many studies emphasize that goodwill is recognized incorrectly, *e.g.* because of unverifiable fair-value accounting (Rammana 2008), requiring subsequent recognition of substantial impairment losses (Olanete 2013). There might be two reasons, why measurement issues of the M&A are overlooked by research. Firstly, the assessment of net assets measurement in business acquisition requires detail information from the M&A project (such as the reason for the transaction, identified net assets and their expected future pattern of usage, *etc.*). The projects are complex, and the details are no available to the public in many cases. Secondly, M&A literature analyses predominantly business transactions of firms listed in the USA or in the EU, resting on the data from the financial statements. These statements are prepared in compliance with US GAAP or IFRS, both systems following a single concept of measurement in acquisitions. Furthermore, both sets of standards are based on the substance over form principle ensuring that financial statements portray economic consequences of the M&A truthfully.

However, the presumption of substance over form does not hold in the countries with code-law tradition. In these countries accounting guidance of M&A is usually tightly aligned with local corporate law. Furthermore, the accounting treatment of business combinations is commonly influenced by tax motives of the parties involved. If local GAAP allow more options, how to measure net assets identified in business combination, the real combinations are structured in a way to reach predefined economic effect through unsuitable accounting treatment,

even at the expense of external users. Such purpose-built transactions increase the information risk of the users of financial statements, especially if M&A occur between related parties.

To address the identified gap in research, the objective of this paper is to analyze common accounting practices of Czech companies engaged in M&A, especially in company transformations, which can be defined as a subset of M&A. We provide the accurate definition of company transformations in the methodology chapter. The Czech Republic was selected, as (a) its accounting law is underdeveloped and is facing relatively strong influence of tax rules; (b) corporate law dealing with company transformations stressed the legal form of the transaction rather than its economic substance; (c) the Czech Republic is still a transition country with significant lack in its institutional background, which intensifies the information risks of users working with misleading financial statements. Using the sample of 115 company transformation transactions, we analyzed the important accounting aspects of company transformations. The research showed, that while the respective regulation of accounting is designed primarily for business combinations taking place among independent parties (Czech accounting regulation stipulates application of modified acquisition method for M&A accounting), majority of the company transformations (approximately 96% in 2013) were in fact restructuring of the current corporate holdings. The option to increase the equity of the successor company from the excess of fair-value over the historical prices during the transformation (this option is incorporated in the Czech legislation) leads to severe distortion in faithful representation of the financial position of the successor company and can be misused to damage company's capital facilities.

In terms of the financial accounting concepts and methods, the method prescribed for most company transformations in the Czech Republic is derived from the acquisition method. For a limited subset of company transformation, the national legislation prescribes methods which resemble pooling-of-interests' method or new-entity method (Pospíšil and Strojek-Filus 2017, Vomáčková 2012). A modified acquisition method is prescribed by Czech business and by the accounting law (Act no. 563/1991 and Act no. 500/2002 of the Czech Republic) with no regard to whether the participating companies are independent or not, or whether it is possible to identify the acquirer in such transaction. The lack of prerequisites (Nurnberg and Sweeney 1998) and requirements for the application of the acquisition method under Czech national accounting regulations and mass application of the accounting method on holding restructurings are troublesome and became the prime incentive for our research.

Unlike the pooling-of-interest method, the acquisition method stipulates valuation of the net assets transferred at acquirer balance sheet at their fair values (Ayers *et al.* 2000). According to Czech national regulation, the revaluation of net assets may occur in the case of business acquisition (asset deal) or the company transformation if the acquirer uses the net assets acquired to increase its registered capital and issues new shares. These are the only requirements for performing valuation of net assets transferred from one entity to another (Skálová 2015, Pospíšil 2015). Note the use of the word "transferred" instead of "acquired" as these transactions may constitute for example a merger of wholly owned subsidiary to its parent company rather than an actual acquisition between independent parties. This modified acquisition method allowed to be used in corporate reorganizations, where no true acquisition is taking place, results in recognition of new items in the equity (usually recorded as an increase in registered capital, retained earnings or a special equity item) and recognition of internally generated goodwill (*i.e.* goodwill created by the wholly owned subsidiary). Such accounting policy contradicts the economic substance of the reorganization and it is unacceptable from the IFRS point of view. It also causes numerous difficulties for the practitioners when converting financial statements prepared under CZ GAAP to the IFRS (Skálová and Podškubka 2009). Of course, there are other examples of similar contradictions in other countries – for example see (Aghimien *et al.* 2014, Křížová *et al.* 2014, Žárová and Skálová 2012, Strouhal *et al.* 2012, Skálová and Mejzlík 2015).

Let us concentrate on the above-mentioned issue and put aside business combinations that take place between independent parties and overall comply with the requirements of IFRS 3 thus focusing on the corporate restructurings.

What are the incentives for managers to opt for revaluation of net assets transferred in the company transformation? The valuation of all the assets and perhaps the liabilities by an expert is costly. Should the sole motive for the company transformation be a reorganization itself (Sedláček *et al.* 2014), managers could always choose not to reevaluate the net assets transferred and account for the net assets at their historical costs (more

precisely: adopt the valuation of the predecessor). The literature suggests that manager's (and/or owner's) motives might be the increase in equity (Gláserová 2016, Vomáčková 2011), which could be consequently distributed on dividends (Letaifa 2016, Kyriazopoulos 2017), or which could help the company to meet some bank covenants for debt financing, or a tax optimization (Skálová 2014, Žárová and Skálová 2014). There are even more papers available on the earnings management and earnings distribution in the corporate holdings (Chen and Wu 2010, Thomas *et al.* 2004, Young 2005). Using the revaluation of net assets in the corporate restructurings can thus be viewed as another tool for additional leveraging or distribution of the earnings (even unrealized earnings) through the holding.

To tackle this issue, we first perform an analysis of a sample of company transformations which took place in the Czech Republic in 2013 and discuss the results and possible consequences in the discussion part of this paper.

2. Methodology

The objects of our research are company transformations that meet the definitions of the Act no. 125/2008 and the Act no. 89/2012 of the Czech Republic which defines types of business combinations and company transformations that are available for companies in the Czech Republic.

Companies undergoing a transformation according to Act no. 125/2008 of the Czech Republic are required to announce that in the Business Bulletin which is an on-line register administrated by the Czech Ministry Interior. Moreover, companies are required to publish the transformation project and related statutory financial statements in the Corporate Register which is administrated by the Czech Ministry of Justice. These databases are key data sources for our research.

The Act no. 125/2008 of the Czech Republic lists the following transactions officially denoted as company transformations: acquisition merger ("fúze sloučením"), true merger ("fúze splynutím"), spin-off ("rozdělení odštěpením"), merger spin-off ("odštěpení sloučením"), split ("rozštěpení"), merger split ("rozštěpení sloučením"), net assets takeover ("převod jmění na společníka").

Net asset takeover is defined as a transaction in which a majority shareholder takes over all the net assets of the company acquired and incorporate acquired net assets into its own company structure while the original company ceases to exist. Act no. 125/2008 of the Czech Republic specifies the preconditions for this type of transactions in detail nevertheless we can conclude that at least 90% of voting power and 90% of share on equity is required for the majority shareholder to perform the net asset takeover. This transaction is sometimes referred to as "squeeze-out" but the definition of the squeeze-out in its original meaning is incorporated in the Act no. 90/2012 of the Czech Republic which defines squeeze-out as a mandatory transfer of a company shares from minority shareholders back to the company. Net asset takeover sometimes follows the squeeze-out.

Merger split is defined as a transaction in which a company ceases to exist and its net assets are transferred to at least two other existing companies which incorporate the net assets into their own structures. A similar transaction is a split transaction. Split is defined as a transaction in which a company ceases to exist and its net assets are used to form at least two new companies.

Merger spin-off is defined as a transaction in which an existing company detach a part of its business and transfer the respective net assets to another existing company which incorporate the net assets into its own structures, while the original company continues its existence. A similar transaction is a spin-off transaction. Spin-off is defined as a transaction where an existing company detach a part of its business which forms a new company while the original company continues its existence.

Acquisition merger is defined as a transaction in which one or more companies cease to exist and their net assets are transferred to another existing company, who absorbs the net assets transferred and continues its existence. A similar transaction is a true merger. True merger is defined as a transaction in which at least two companies cease to exist, and their net assets are transferred to at least one new company which emerges from the transaction as their successor. Mergers must not be mistaken for business acquisitions. Business acquisitions are transactions in which one company acquires either a business as a whole from another company (asset deal), or acquires majority of share on a company's equity (share deal). These "plain" Business acquisitions are not in the

scope of our research. It is important to note though that if the company transformation takes place among independent parties, the company transformation in fact comprises a business acquisition as the shareholders of one participating company “acquire” a share on the business of another participating company.

For the analysis purposes, we have downloaded all the company transformation announcements which were published in Business Bulletin during the year 2013. We decided to limit our analysis to transactions that took place in only one year as an analysis of transactions for a longer time period would result in great number of transactions to be analysed and it would not be possible to finish the analysis soon enough for the result to be still relevant. Moreover, one-year period is a suitable “unit” for comparison and time-line analysis. It will allow us to continue our research in the future and compare the results on year-to-year basis. Also, even though Czech companies are required by law to publish their financial statements in the Business Register shortly after these statements are approved by the investors, they do so only reluctantly. As a result, the financial statements are made publicly available usually with two or three-year delay, therefore we could not perform our research on more current data.

We created a list which contained the names of the companies undergoing a transformation and the date of the announcement of the transaction in the Business Bulletin. This yielded a list of 862 transactions. It is a list of all company transformations which were officially announced in the Business Bulletin during the year of 2013. Since our research required quite detailed information on every transaction and obtaining the detailed information requires an in-depth analysis of extensive project documentation (see below) for each transaction, we decided to analyse only a sample of transactions that were published in the Business Bulletin in 2013. To obtain a statistical sample we employed a methodology of Czech Ministry of Interior for creating statistical samples for auditing purposes. First, we calculate the extent of the sample using the following formula:

$$n = \frac{z^2 * N * r * (1-r)}{(d^2 * N) + [z^2 * r * (1-r)]} \quad (1)$$

Source: Czech Ministry of Interior (http://kontrola.mvcr.cz/min_fin/chj04_02.htm)

where: n - number of transactions in the statistical sample; N - number of transactions in the sample frame (*i.e.* 862); z - required level of reliability (95 %, *i.e.* 1.96); d - acceptable level of deviation (*i.e.* 8.5%); r - expected level of deviation (*i.e.* 50%).

Applying this formula, we obtain the necessary number of transactions for our statistical sample of 115 thus we have reached the coverage of the sampling frame by our statistical sample of 13.34%. Employing the random number generator, we have obtained a probability sample of 115 transactions for our detailed analysis.

For every transaction in the sample the following documents needed to be gathered and analysed: financial statements or annual reports for every participating company, opening balance sheet of the successor companies (in the case the opening balance sheet was not published, we have used the annual financial statements or annual reports for the period following the transaction, transformation project, transcript of records from the Business Register for every participating company, and expert's valuation report (if applicable). A complete documentation for one transaction consisted of approximately 150 pages of documents, if the expert's valuation report was included it was usually 100 pages more. Upon close examination of the transaction documentation we have gathered the data regarding type of transaction, type of the financial statements used, date of the transformation project, date of the financial statements, valuation date, effective date, amount of goodwill recognized, amount of deferred tax recognized, reasons for the transformation given and information about new equity items recognized in the opening balance sheet of the successor company (when applicable).

Additionally, for every transaction in our statistical sample we have gathered data on: total assets, profit or loss for the last period, sales, equity, registered capital (see Table 1), owners, date of registration of the company in the Corporate Register and information on statutory audit. For transaction where the net assets transferred, where valued by a court-appointed expert, we gathered data on: date of valuation, name of the expert, total value of the net assets transferred, valuation method used, deferred tax calculated in the valuation and information on valuation distribution of the total value to the equity items of the successor company.

Table 1. Descriptive statistics for companies included in the statistical sample (values in CZK)

Descriptive statistics	Total assets	Profit/Loss	Registered capital	Equity	Revenue
Minimum	43,000	-326,976,000	100,000	-109,316,000	-14,000
Maximum	808,795,000,000	15,562,000,000	15,200,000,000	87,593,000,000	48,651,000,000
Mean	3,987,761,221	78,448,748	143,299,365	579,360,778	678,527,478
Median	46,736,000	0	2,000,000	14,421,000	6,261,000
Standard Deviation	53,575,028,594	1,032,268,967	1,136,147,335	5,970,147,454	4,163,457,349

Source: Authors' research

3. Conducting research and results

In this chapter we present the results of our research. The evaluation and the discussion of the results is carried out in the last chapter of this paper.

First, we analysed the type of transactions in our sample. We found that majority of the transactions in our sample (56.5%) are acquisition mergers. Another numerous type of transaction were merger spin-offs (24.3%) and spin-offs (15.7%). The results are summarized in Table 22.

Table 2. Classification of transactions in the sample

Transactions type	Incidence	%
Merger acquisition	65	56.5%
Merger spin-off	28	24.3%
Spin-off	18	15.7%
Net assets takeover	2	1.7%
True merger	1	0.9%
Merger split	1	0.9%
Split	0	0.0%
TOTAL of transactions analysed (the statistical sample)	115	100%

Source: Authors' research

Secondly, we examined the incidence of valuation of net assets transferred, which for some transactions types under the Czech legislation is mandatory, while for other types is optional. We found that in 30 cases of 115 (*i.e.* 26.1%) transactions analysed the valuation of the net assets transferred was in fact employed. In 25 cases the valuation was mandatory, in 3 cases the valuation was optional and in 2 cases the companies undergoing the transaction did not publish the documents that allows verification of the net asset valuation. We have found no transaction in which the expert's valuation was required but was not carried out. Table 3 summarizes the results for analysis of the employment of net assets valuation.

Table 3. Employment of net assets valuation by expert

Transactions type	Incidence	%
Applied	30	26.1%
<i>mandatory valuation</i>	25	21.7%
<i>optional valuation</i>	3	2.6%
<i>not verifiable</i>	2	1.7%
Not applied	85	73.9%
TOTAL of transactions analysed (the statistical sample)	115	100%

Now we move to the analysis of the valuation of net assets transferred at the successor's balance sheet. In 94 cases of 115 (*i.e.* 81.7%) the successor company decided to adopt the valuation of net assets at their historical costs. In 13 cases, the successor company opted to utilize the valuation by the expert and book the net assets

transferred at their fair values, rather than historical costs. Table 4 summarizes the results for analysis of the employment of net assets valuation.

Table 4. Valuation of net assets transferred at the successor's balance sheet

	Incidence	%
	94	81.7%
Fair values	13	11.3%
Not verifiable	8	7.0%
TOTAL of transactions analysed (the statistical sample)	115	100%

Source: Authors' research

At this point the results of our research suggest that the parties undergoing the company transformation are well-aware of each other financial situation as in most cases they need no additional verification of the fair value of net assets transferred. This would suggest that the companies taking part in the transactions are not independent. Therefore, our research continues with analysis of interconnectedness of the parties. We discern three levels of interconnectedness: "common control - corporation" which stands for a group of companies organised under common control of one or more companies, "common control – investors" which stands for a group of companies organised under common control of one or more investors and "independent" which stands for transactions that occurred between independent or seemingly independent parties. We emphasize the term of "seemingly independent parties" as we were not able to verify the structure of corporate holdings outside of the Czech Republic. The results of this analysis are unambiguous. Only three transactions of 115 analysed (there was one transaction for which we could not make a reliable judgment on its ownership structure) were classified as transactions between independent parties. This means that 111 of 115 analysed transactions were in fact reorganisation transactions of the current corporate holdings rather than business combinations as defined by IFRS 3. Reorganisation transactions classified as common control – corporation occurred in 67.8% of the analysed cases and transactions classified as common control – investors occurred in 29.6% of the analysed cases.

We move on to a detailed view on the transactions, which proved to be reorganisations (*i.e.* a subsample of 111 transactions of our original sample) rather than business combinations in accordance with IFRS 3. We found out that reorganization transaction type with the highest incidence rate was a merger under common control which amounts to 57.7% of the total number of reorganisation transactions in the analysed sample. The other rather common types of reorganisation were merger spin-off (25.2%) and spin-offs (14.4%). These results are summarized in the Table 5.

Table 5. Typology of reorganisation transactions in the sample

	Incidence	%
Merger under common control	64	57.7%
Merger spin-off under common control	28	25.2%
Spin-off under common control	16	14.4%
Net assets takeover	2	1.8%
Merger split	1	0.9%
TOTAL number of reorganisation transactions (the subsample)	111	100.0%

Source: Authors' research

We break down the types of reorganisation transaction in the subsample per the ownership structure of those transactions. We found out that merger of a subsidiary to its parent company was the most common type of reorganisation (33.3%), other common types include: spin-off to a new company under common control of an investor (11.7%), merger of companies under common control of an investor (9.9%) and merger spin-off from one subsidiary to another (9.9%). These results are summarized in the Table 6.

Table 6. Ownership details on the reorganisation transactions in the sample

	Incidence	%
Merger of a subsidiary to its parent company	37	33.3%
Spin-off to a new company under the CCI	13	11.7%
Merger of companies under CCI	11	9.9%
Merger spin-off from one subsidiary to another (under CCC)	11	9.9%
Merger of subsidiaries under CCC	9	8.1%
Merger spin-off to company under CCI	9	8.1%
Merger spin-off from a subsidiary to its parent company	5	4.5%
Merger of a parent company to its subsidiary	3	2.7%
Spin-off to a new company (from a subsidiary to a new one) under the CCC	3	2.7%
Other reorganisation transactions	10	9.0%
TOTAL number of reorganisation transactions (the subsample)	111	100.0%

Source: Authors' research

Note: abbreviation used in the table "CCC" stands for "common control of a corporation"; "CCI" stands for "common control of an investor"

We continue our analysis with the calculation of total value available for the successor company to use for increasing its equity. According to the Czech legislation, the successor company is allowed to increase its equity by the value not exceeding the total of the value of net assets transferred calculated by the expert, which means, that the value may be equal to the expert's valuation or less. Table 7 shows the total value of net assets transferred as calculated by the experts for each transaction. The calculation takes into account only those transactions in our sample which employed the mandatory or voluntary valuation of net assets by the expert. Note how the total value of net assets are distributed between the transactions which represent business combinations as defined by IFRS 3 and transactions which represent reorganization of the corporate holdings. This calculation brings an interesting finding – the average value per one transaction in the case of business combination is 26 454 662 CZK, while in the case of reorganisation it is 109 086 281 CZK which is more than four times higher value.

Table 7. Total value of net assets in the sample according to expert valuation reports

	Count	Value (in CZK)
TOTAL value of net assets	30	2 806 521 013
in business combinations	3	79 363 985
in reorganisations	25	2 727 157 028
not verifiable transactions	2	n.a.

Source: Authors' research

Next, we perform a breakdown for the value we obtain in the calculation of total value of net assets in the sample according to the expert valuation reports. We break the total value in respect to the type of the transaction for which the valuation report was prepared. As depicted in the Table 6, the biggest portion of value is allocated in the spin-off transactions and acquisition mergers. As far as the total value of the transactions is concerned, both types of transactions are almost equal. Nevertheless, there is a significant difference in the count (incidence) of these transactions. Thus, the average value of one spin-off transaction is 69 780 725 CZK while in the case of acquisition mergers it is 202 249 079 CZK which is almost three times bigger value.

Table 8. Transaction type breakdown for total value of net assets in the sample according to expert valuation reports

Transaction type	Count	Value (in CZK)	Average (in CZK)
Spin-off	17	1 186 272 322	69 780 725
Acquisition merger	5	1 011 245 395	202 249 079
Merger spin-off	6	481 647 296	80 274 549
True merger	1	102 273 000	102 273 000
Net assets takeover	1	25 083 000	25 083 000
TOTAL	30	2 806 521 013	93 550 700

Source: Authors' research

The last step of our research was to analyse the distribution of the net assets value to the equity in the successor's opening balance sheet. We found that the biggest portion of the value is allocated to registered capital (approximately 75%) and the rest to retained earnings as the allocation to the other equity items is not significant – see Table 9.

Table 9. Distribution of the net asset value to the equity in the successor's opening balance sheet

	Value (in CZK)
Increase in registered capital	1 276 379 360
Increase in retained earnings	410 672 000
Effect on other equity items	-12 593 017
<i>Increase</i>	89 466 513
<i>Decrease</i>	-102 059 530
TOTAL increase in successor's equity	1 674 458 343

Source: Authors' research

Discussion & conclusion

Our research provided several interesting findings. The most crucial ones were related to the ownership structure of the transaction and valuation of net assets during these transactions. The research showed that only the minority of the transactions analyzed were classified as transactions between independent parties in fact we found that 111 of 115 analyzed transactions were reorganization transactions of the current corporate holdings rather than business combinations appropriate for acquisition method application. This finding alone seems to be compelling enough to suggest that the regulation of accounting for the company transformation in the Czech Republic is not suitable and the revision is needed.

The need for the revision is somehow lessened but certainly not eliminated by the finding that the revaluation of the net assets transferred took place only in 26% of the transactions analyzed. This means that only in 26% of the transactions new equity items arose (or were increased) and/or a goodwill was recognized in the successor's balance sheet. In the other 74% of transactions the revaluation did not take place thus no new equity items nor goodwill were recognized in the successor's balance sheets. Which brings us to the conclusion that only in 26% of transactions analyzed the modified version of acquisition method was applied, while the rest (74% applied to much extent principles of the pooling-interest method).

Consequently, we analyzed the method of valuing and accounting for the transferred assets at the successor's balance sheet. The successor is given a choice to either adopt the historical prices from the predecessor's balance sheet or to account for the transferred assets (not liabilities though) at their fair values. We found that for the 81.7% of transactions the concept of adopting the historical prices were employed, which is in line with the findings regarding the valuation of net assets transferred and further bolster our conclusions regarding the application accounting methods for company transformation in our sample, which was discussed in the previous paragraph.

We examined closely the forms of ownership structures for the analyzed transactions and found, that approximately 30% of the transactions were classified as transactions under common control of an investor. Czech accounting regulation does not provide special regulation for holdings under the common control of individuals – investors. There are no special disclosure requirements nor other specific regulation for holding structures under the common control of investors even as the regular financial reporting is concerned let alone such unique and rather complex transactions as the company transformations are.

Czech national regulation for accounting and company transformation (as well as other national regulations in the Central and Eastern Europe, as shown in literature review) needs to be re-viewed and re-designed to properly incorporate the requirements for the application of the generally accepted methods for accounting for business combinations, especially adopt the prerequisites for acquisition method application.

Current inadequate regulation, specifically the insufficient limitation for acquisition method application which leads to revaluation of the net assets transferred, inherently causes a breach of some of the core principles of financial accounting, such as faithful representation, prudence and verifiability which may cause a serious distortion in the true and fair representation of the financial situation of the company. Our study provides a robust empirical evidence to the content analysis of the regulation and its shortcomings identified by Lasák (2010), Vomáčková (2007), Vomáčková (2012) or Žárová and Skálová (2012), Skálová and Mejzlík (2015).

Moreover, the excessive and inadequate increase in the successor's equity may threaten the capital maintenance of the successor. In transactions like company transformations, the revaluation of net assets transferred leads to recognition of new equity items or increasing registered capital or retained earnings. We researched how the management deals with the option of distribution of the newly acquired equity value. We found that in most cases the value is allocated to registered capital and in some cases to the retained earnings. As the Czech legislation provides managers and owners with the choice on distribution of the "acquired" value, it is theoretically possible to put most of the "acquired" value to the retained earnings and distribute it through dividends later. Such action might not only lead to severe distortion of the faithful presentation of the company's financial position, damage company's capital facilities but even damage the company itself as it may siphon the company off its monetary assets.

Our study has also some limitations. Firstly, because of time-consuming data collection, only a random statistical sample of business combinations announced during one year was analyzed. Future research shall attempt at examining the entire population of transactions, as well as the development and changes in accounting practices adopted by companies over the time. Secondly, an international comparison, e.g. with other countries from the CEE region, would be vital as well. However, a thorough investigation of valuations in M&A requires substantial knowledge of each national background to control for any cross-country differences in accounting standards and law regulations, which might be a source of distinct incentives of companies to manage earnings and other figures in financial statements through inadequate accounting for M&A.

Acknowledgment

This paper has been prepared within the research project "Economic Impacts of the IFRS Adoption in Selected Transition Countries", supported by the Czech Science Foundation, No. 15-01280S.

References

- [1] Abdel-Khalik, R. A. 2008. *The Case against Fair Value Accounting*, Paper presented at the meeting of University of Illinois. Ottawa
- [2] Aghimien, P., Asiri, A. A. and Yamani, A. G. 2014. Accounting for business combinations: application of rules from IFRS, Saudi Arabia, and USA. *International Journal of Business, Accounting, and Finance*, 1: 63-78.
- [3] Ayers, B. C., Lefanowicz, C. E. and Robinson, J. R. 2000. The Financial Statement Effects of Eliminating the Pooling-of-Interests Method of Acquisition Accounting. *Accounting Horizons*, 14(1): 1-19.

- [4] Chen, C.-W. and Wu, C. 2010. *Related Party Transactions and Ownership Concentration: Theory and Evidence*. Paper presented at the meeting of E-Leader Singapore, 1-8.
- [5] Gláserová, J. 2016. Impacts of Newly Acquired Items within Business Combinations on the Items of the Financial Statements. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 46(1): 265-274.
- [6] King, D. R., Dalton, D. R., Daily, C. M., and Covin, J. G. 2004. Meta-analyses of post-acquisition performance: Indications of unidentified moderators. *Strategic Management Journal*, 25(2): 187-200.
- [7] Krishnaswami, S. and Subramaniam, V. 2015. Unlocking value by improving transparency: the case of spin-offs. *Corporate Ownership & Control*, 13(1): 701-711.
- [8] Křížová, Z., Sedláček, J. and Hýblová, E. 2014. *Mergers and Acquisitions in the Selected Countries of Central and Eastern Europe*. Paper presented at the meeting of Masaryk University, Lednice.
- [9] Kyriazopoulos, G. 2017. Corporate governance and capital structure in the periods of financial distress. Evidence from Greece. *Investment Management and Financial Innovations*, 1: 254-262.
- [10] Lasák, J. 2010. K některým důvodům nezbytné novelizace úpravy přeshraničních fúzí obchodních korporací. *Český finanční a účetní časopis*, 4: 28-41.
- [11] Letaifa, W. B. 2016. Study of Dividend Policies in Periods pre and post-merger. *Corporate Ownership & Control*, 2: 613-616.
- [12] Nurnberg, H. and Sweeney, J. 1998. Comparative Effects of Alternative Methods of Accounting for Business Combinations. *Journal of Financial Statement Analysis*, 4(1): 16-38.
- [13] Olante, M. E. 2013. Overpaid acquisitions and goodwill impairment losses—Evidence from the US. *Advances in Accounting*, 29(2): 243-254.
- [14] Pospíšil, J. 2015. *Valuation Date in the Process of M&A*. In: PROCHÁZKA, David (ed.). 16th Annual Conference on Finance and Accounting, ACFA Praha, Elsevier, Procedia Economics and Finance. 106-115.
- [15] Pospíšil, J. and Strojek-Filus, M. 2017. *Comparison of Accounting for Mergers in the Czech Republic and Poland*. Prague, Springer International Publishing, 419-431.
- [16] Procházka, D. 2011. The Role of Fair Value Measurement in the Recent Financial Crunch. *Prague Economic Papers*, 1: 71-88.
- [17] Ramanna, K. 2008. The implications of unverifiable fair-value accounting: Evidence from the political economy of goodwill accounting. *Journal of Accounting and Economics*, 45(2): 253-281.
- [18] Ryan, S. G. 2008. Accounting in and for the Subprime Crisis. *The Accounting Review*, 6: 1605-138.
- [19] Sedláček, J., Valouch, P., Hýblová, E. and Křížová, Z. 2014. Changes in Property and Ownership Structure of Companies as a Consequence of Mergers in the Czech Republic. *Engineering Economics*, 25(2): 152-159.
- [20] Skálová, J. 2014. Daňová a účetní úprava fúzí na Slovensku. *Český finanční a účetní časopis*, 2: 119-130.
- [21] Skálová, J. 2015. *Účetní a saňové souvislosti přeměn obchodních společností*. Praha: Wolters Kluwer.
- [22] Skálová, J. and Mejzlík, L. 2015. *The Harmonization of the Legal Regulation of Mergers: The Example of the (Dis)Harmony of Czech and Slovak Regulations*. Paper presented at the meeting of 16th Annual Conference on Finance and Accounting ACFA Prague.
- [23] Skálová, J. and Podškubka, T. 2009. Accounting Interpretation of Cross-border Mergers in the Czech Republic Base on Czech Accounting Standards. *European Financial and Accounting Journal*, 4(3): 19-39.

- [24] Strouhal, J., Bonaci, C. and Sklenár, R. 2012. Impact of International Harmonization on Czech Accounting Legislature (Focused on Mergers). *International Journal of Mathematical Models and Methods in Applied Sciences*, 6(2): 289-296.
- [25] Thomas, W. B., Herrmann, D. R. and Inoue, T. 2004. Earnings Management through Affiliated Transactions. *Journal of International Accounting Research*, 2: 1-25.
- [26] Valouch, P. and Králová, M., 2012. *Influence of a merger on the value of assets of merged companies in the Czech Republic*. Paper presented at the meeting of Masaryk University, Brno.
- [27] Vomáčková, H. 2007. Aktuální problémy účetního řešení fúzí obchodních společností v kontextu s vývojem harmonizačních norem EU. *Český finanční a účetní časopis*, 4: 30-35.
- [28] Vomáčková, H. 2011. Measurement Bases for Acquisitions and Mergers in Financial Accounting and in Commercial Law. *European Financial and Accounting Journal*, 3: 21-37.
- [29] Vomáčková, H. 2012. Changes in Accounting Solutions for Transformations of Business Companies and Cooperatives since the Beginning of 2012. *European Financial and Accounting Journal*, 4: 33-62.
- [30] Young, B. 2005. Related-Party Transactions: Why They Matter and What Is Disclosed. *The Corporate Governance Advisor*, 4: 1-7.
- [31] Žárová, M. and Skálová, J. 2012. Překážky při realizaci přeshraničních fúzí v Evropské unii. *Současná Evropa*, 2: 83-104.
- [32] Žárová, M. and Skálová, J. 2014. Tax Aspects of Mergers and Cross-Border Mergers. *European Financial and Accounting Journal*, 3: 25-49.
- *** Czech Republic. 1991. Zákon č. 563 o účetnictví. In: Sbíрка zákonů České republiky, Edition 107: 2802-2876.
- *** Czech Republic. 2002. Vyhláška č. 500 k provedení zákona o účetnictví. In: Sbíрка zákonů České republiky, Edition 174: 9690 – 9768.
- *** Czech Republic. 2008. Zákon č. 125 o přeměnách obchodních společností a družstev. In: Sbíрка zákonů České republiky, Edition 25: 714-811.
- *** Czech Republic. 2012. Zákon č. 89 občanský zákoník. In: Sbíрка zákonů České republiky, Edition 33: 1026-1365.
- *** Czech Republic. 2012. Zákon č. 90 o obchodních společnostech a družstvech. In: Sbíрка zákonů České republiky, Edition 34: 1370-1482.
- *** International Accounting Standards Board. 2008. IFRS 3 Business Combinations. Available at: <http://www.ifrs.org/issued-standards/list-of-standards/ifrs-3-business-combinations/>
- *** Ministry of Interior of the Czech Republic. 2017. *Příklady možného postupu výpočtu velikosti vzorku*. Retrieved November 1, 2016, from http://kontrola.mvcr.cz/min_fin/chj04_02.htm

Impact of Selected Factors on the Formation of Regional Disparities in Slovakia

Tomáš VALENTÍNÝ

Department of Environmental Management, Faculty of Management
University of Prešov in Prešov, Slovakia
tomas.valentiny@smail.unipo.sk

Jaroslav GONOS

Department of Economics and Economy, Faculty of Management
University of Prešov in Prešov, Slovakia
jaroslav.gonos@unipo.sk

Veronika TIMKOVÁ

Department of Management, Faculty of Management
University of Prešov in Prešov, Slovakia
veronika.timkova@smail.unipo.sk

Martina KOŠÍKOVÁ

Department of Mathematical Methods and Managerial Informatics, Faculty of Management
University of Prešov in Prešov, Slovakia
martina.kosikova@smail.unipo.sk

Suggested Citation:

Valentiny, T., Gonos, J., Timková, V., Košíková, M. 2017. Impact of selected factors on the formation of regional disparities in Slovakia. *Journal of Applied Economic Sciences*, Volume XII, Winter, 7(53): 1918-1931.

Abstract:

The purpose of this study is to perform the evaluation and quantification of the impact of factors contributing to the formation of regional disparities in Slovakia. The article discusses the impact of factors such as nominal wages, unemployment rate, variability of job vacancies, labour productivity, or foreign direct investment on the amount of household disposable income and generated savings within the period of eleven years, as well as the impact of these factors on the wealth distribution among the households which was identified while applying the Gini coefficient for each region. With regard to the data structure, the panel data regression was applied in the paper (a pooled regression model, a random effects model, and a fixed effect model). Analysis results confirmed significance of five hypotheses, *i.e.* a decrease in unemployment rates in regions with higher wages will result in lower increase in wages than in the remaining region groups; in regions with lower unemployment rates, an increase in job vacancies is associated with a higher increase in offered wages and an increase in the labour productivity in regions with lower incomes causes more uneven income distribution, whereas in the case of foreign direct investment, the effect is opposite.

Keywords: regional disparities; panel data regression; Gini coefficient; nominal wages; labour productivity; unemployment; income, foreign direct investment

JEL Classification: E24; R11; C33; J30

Introduction

The period of growing globalisation and mutual interconnection of economies of individual countries generate a growing pressure aimed at using accessible resources in a more efficient manner. Efficient and competitive economy contributes to achieving a higher quality of regional development which is related to various aspects, such as the infrastructure in a region and provided services, potential innovations and development, and, above all, the human capital. Therefore, not only companies but also individuals more and more often, and with less and less problems, tend to gather at places offering them certain benefits. Nevertheless, it is not merely a question of the amount of disposable income but also the structure of available jobs, infrastructure in a region, etc. Such uneven

distribution of available resources in the country often results in regional disparities that may lead to even bigger problems between individual regions.

The present paper is therefore primarily focused on the identification of the relationship between selected economic indicators with the assumed impact on the formation of regional disparities between the counties in Slovakia. The objective of the present paper is to verify eight significant hypotheses focused on the identification of the impact of selected economic factors (unemployment rate, variability of job vacancies, foreign direct investment, labour productivity, inescapable expenditures) on the amount and distribution of income and savings and thus their impact on the formation of disparities in Slovakia.

1. Literature review

1.1 Basic theoretical premises regarding regional disparities

Unequal distribution of available resources in the country often results in regional disparities that may lead to various problems between individual regions. The differences exist in many areas, whether designated as differences between the regions, or differences in the levels of advancement of individual countries, differences in their economy levels, differences in the amounts of generated GDP, differences in unemployment rates, and in many other spheres.

Regional disparities are a serious social problem (Gajdoš 2008). According to Cuaresma, Doppelhofer, Feldkircher (2012) the key factors of regional disparities are differences in human capital between the regions which contribute to higher growth rates in the major cities. Authors Matlovič, Matlovičová (2011), dealing with regional disparities in Slovakia, understand the notion of regional disparities as certain differences in the levels of social and economic development of individual regions, *i.e.* counties regarded as administrative units of the SR. They claim that regional disparities in Slovakia are determined by regional consequences of the post-communist economic transformation after 1989. This economic transformation increased the dynamics of regional development, accompanied with the beginnings of differentiation tendencies as a result of competitive mechanisms.

Výrostová (2010) claims that regional disparities may be caused by several factors of economic as well as non-economic nature. The reasons thereof may include, for example, differences in the presence of production facilities, lack thereof, or irrational use of production facilities, differences in the economic structure of individual regions, in the social capital, in low workforce and capital mobility, the differences may also exist in the demand for regional products, in customers' habits, or in different ability to bring innovations. Natural, geographic, or historical conditions in a particular region, differences in culture, traditions, demographic characteristics, or the levels of education among the inhabitants also represent the reasons that cause disparities between the regions.

The causes of regional differences are always varied; however, it is important to assist with gradual elimination thereof. Each country has its own regional policy comprising individual tools aimed at mitigation, elimination, or complete removal of individual disparities and declining the existing divergences. Assistance with the removal or elimination of regional disparities is carried out while applying various methods, using various tools, state support, projects focused on regional development, *etc.* Gajdoš (2008) claims that the removal of regional differences represents a long-term and complex process that requires the application of appropriate strategies and an optimal combination of exogenous and endogenous approaches aimed at elimination of such disparities.

1.2 Results of previous research focused on regional disparities

The issues related to regional disparities represent a very extensive and frequently discussed topic. In Slovakia, there are evident and marked differences between individual regions; therefore, this topic is dealt with by many authors who analyse and examine it from various perspectives. The following section contains the review of such studies.

Habanik, Hostak, Kutik (2013) discuss the disparities in Slovakia in the article titled "Economic and Social Disparity Development within Regional Development of the Slovak Republic". The purpose of the study was to employ different measures of regional disparity in order to empirically analyse the set of chosen socio-economic indicators that provide insights about the current situation in individual Slovak regions. The study confirms the

negative trends in terms of growing regional development disparities across Slovakia and discusses the determinants of regional disparities in the Slovak Republic, most notably the foreign direct investment inflow, demographics and the flow of funds into research and development activities.

The development of regional disparities in Slovakia was studied in years 2001 – 2013 by Havierníková, Jansky (2014) who strived to evaluate the development of regional disparities between the Slovak regions in the context of selected social and economic indicators: unemployment rate, regional GDP, average nominal monthly wages, number of business partnerships per 1,000 economically active inhabitants, density of highways, and costs of research and development.

In their article titled “Analysis of Income Polarisation in Slovak Regions“, Pauhofová, Stehlíková, Martinák, Páleník (2016) discuss the identification of the development in the field of wage distribution and disparities at regional and industry levels. They observed the highest percentage of the total disparities in gross wages during the examined period in Bratislava, the capital of Slovakia, where the average wages were much higher than in the remaining regions of the SR. They also observed that in the examined period of years 2010 – 2014, the average wages in Bratislava were 55% higher than the average wages in the SR, whereas in the capital city alone there was the highest income inequality from among the remaining regions of the SR. The article was also dealing with the minimum wages and the problem of low wages. The regions with a long-term persisting high percentage of employees with low wages include the regions of Prešov and Nitra. The worst results, in terms of low wages, were observed in the segment of services. Issues regarding the minimum wages, having a provable effect on the amounts of wages paid to employees with low qualification (increases the wage inequality) were also discussed by Nedomlelová, Staňková, Vavrek (2017). They studied how the minimum wage amount affects selected indicators, such as employment and GDP.

Foreign direct investment (FDI) is studied by various authors who strive to identify their positive impact on the elimination of regional disparities. Ivanová (2013) was dealing with the analysis of the impact of foreign direct investment on the economic growth in Slovak regions. Her article proved that FDI affects economic growth in these regions and their key benefit is the fact that they affect the employment rate in regions; this fact is synergically reflected in the income of inhabitants and the growth of regional demand. The author claims that the inflows of foreign direct investment is an important indicator of the innovation ability (or a prerequisite for a technological transfer), especially in newly developing economies. FDI inflow may be regarded as an important factor of economy growth and production rate in a region due to increasing export rate, a positive effect on the employment rate, or also increasing its technological level. Moreover, FDI inflow indicates the rate of incorporation of a particular economy in the international labour distribution and its attractiveness for the international capital.

The studies listed above were dealing with disparities in Slovakia; however, the topic of regional disparities as such is studied by many other authors, such as Okabe, Kam (2017), Obradovic, Lojanica, Jankovic (2016), Fendel (2016). Authors Dusek, Lukács and Rácz (2014) study regional disparities as well; they analyse and quantify regional disparities in seven regions of Hungary. Indicators frequently discussed within the study of disparities include also GDP per capita (*e.g.*, in the article by Fan, Kanbur, Zhang 2011) or FDI (Nistor 2012).

Disparities in the EU are frequently subject to various studies. Authors Borsi, Metiu (2015) dealt with the development of economic convergence in the European Union. This contribution investigated per capita real income convergence in the European Union (EU) within a non-linear latent factor framework. Their findings suggest no overall income convergence in the EU.

The same problem was dealt with by Bližkovský (2012) in his article titled “Regional Disparities and Convergences in the European Union“. This contribution analysed the disparities and convergences between 97 regions of the European Union in the period from 2000 to 2008. The study tests the hypothesis that the EU regions are converging economically. The study concludes that the level of disparities among the EU regions is relatively low.

2. Methodology

2.1 Main objective

The main purpose of this paper is to evaluate and, above all, quantify the factors directly affecting regional disparities. In our opinion, the key factors include income (in this case the average household disposable income) and savings (representing the difference between the income and the expenditures) of households. This is a primary reason for the evaluation of created sets of indicators within the effort to identify the relationships between the income and the savings.

2.2 Hypotheses

We assume that in regions with low unemployment rate and high income the number of job vacancies has a significantly lower impact than the number of unemployed persons; in such regions it is associated with a relatively high saturation of the labour market and with the labour force fluctuation. Also, we regard the foreign direct investment as one of the carriers of nominal wage growth in regions, which relates to increasing the production capacities, *i.e.* also higher labour market saturation. We also assume that with a growing average disposable wages, the income distribution inequality will increase as well. The aforesaid indicates that the growth of income distribution inequality is also affected by the growth of labour productivity and the registered unemployment rate, or by a decreased inflow of foreign direct investment in the region and a decreased number of job vacancies on a regional labour market. When analysing the disparities between the regions, we carried out, in addition to examination of the impact of selected components on the income amount and distribution, also the evaluation of the impact of so-called inescapable expenditures (costs of meals, accommodation, transport, and clothes) within the creation of savings in households. In the long run they create investments, *i.e.* yet another factor inducing the growth of economic performance in regions, and for households they also represent a sort of collateral for hard times to come. Working hypotheses are then as follows:

- H1: In regions with lower household income the unemployment rate fluctuations have a stronger impact on the nominal wages amount than in regions with higher income.
- H2: In regions with higher income of households, variability of job vacancies has a stronger impact on the nominal wages amount than in regions with lower income.
- H3: Foreign direct investment affects the growth of nominal wages.
- H4: Increase in the labour productivity affects regional disparities in form of more marked income distribution inequality, whereas such effect is stronger in regions with lower income.
- H5: Increase in the official unemployment rate is contributed to by unequal disposable income distribution to a greater extent in regions with higher income.
- H6: Increase in the inflow of foreign direct investment reduces regional disparities, understood within the meaning of income distribution among the population in the region, to a greater extent in regions with lower income.
- H7: Increase in number of job vacancies stimulates the equal income distribution within the population to a greater extent in low-income regions.
- H8: In poorer regions, inescapable expenses have a stronger effect on the amount of generated household savings.

2.3 The research methods and data

On the basis of the above listed assumptions, we evaluated the impact of productivity, situation on the labour market on the demand and supply sides, and the inflowing foreign direct investment on the amount of the disposable nominal income, or the impact of the expenditure structure on the amount of generated savings. The relevant functions are thus follows:

$$GINI = f(AV, LMS, FDI) \quad (1)$$

$$INC = f(AV, LMS, FDI) \quad (2)$$

$$SAV = f(IE), \quad (3)$$

where *GINI* represents the value of the Gini coefficient of income distribution, *INC* represents the income, *AV* means the added value understood as productivity, *LMS* is a variable representing the changes on the labour market, as assessed in terms of two primary aspects, the supply and the demand, *FDI* expresses the inflow of foreign direct investment into the region, *SAV* expresses the household ability to generate savings, and *IE* is understood as inescapable expenditures in households, including the costs of food, accommodation, clothes, and transport.

The list of variables is summarised in Table 1.

Table 1. List of variables used in regression models

Variable	Description	Source	Use
<i>INC</i>	Income of households (in EUR). This variable is expressed by a natural logarithm of average disposable household income, as the impact of the growth is stronger with lower wages and decreases with growing wages. (dependent variable)	Statistical Office of the Slovak Republic	Panel A Panel B
<i>GINI</i>	Gini coefficient (dimensionless parameter). This variable consists of the Gini coefficient value that corresponds to the diversity or to unequal income distribution in a region. (dependent variable)	Statistical Office of the Slovak Republic	Panel C Panel D
<i>SAV</i>	Savings of households (in EUR). This variable is expressed by a natural logarithm of the difference between the household income and the expenditures. The logarithm was applied for reasons similar to those in the case of the income. (dependent variable)	Statistical Office of the Slovak Republic	Panel E
<i>AV</i>	Added value per household (in EUR per household). It is expressed by the ratio of added value in a region to the number of households in that region. (independent variable)	Statistical Office of the Slovak Republic	Panel A Panel B Panel C Panel D
<i>UNE</i>	Official unemployment rate (as percentage). It is expressed by the ratio of disposable job applicants to the economically active population. (independent variable)	Ministry of Labour, Social Affairs and Family of the Slovak Republic	Panel A Panel C
<i>NVJ</i>	Number of job vacancies per applicant (as percentage). It is expressed by the ratio of number of job vacancies to disposable job applicants. (independent variable)	Ministry of Labour, Social Affairs and Family of Slovakia	Panel B Panel D
<i>FDI</i>	Foreign direct investment per household (in EUR per household). It is expressed by the ratio of all foreign investment in a region to the number of households. (independent variable)	National Bank of Slovakia	Panel A Panel B Panel C Panel D
<i>FOD</i>	Costs of food (as percentage). It is expressed by the ratio of costs of food to total costs in households. (independent variable)	Statistical Office of the Slovak Republic	Panel E
<i>ACC</i>	Costs of accommodation (as percentage). It is expressed by the ratio of costs of accommodation, water, electricity, gas, and other fuels to the total costs in households. (independent variable)	Statistical Office of the Slovak Republic	Panel E
<i>CLO</i>	Costs of clothes (as percentage). It is expressed by the ratio of costs of clothes and shoes to the total costs in households. (independent variable)	Statistical Office of the Slovak Republic	Panel E
<i>TRA</i>	Costs of transport (as percentage). It is expressed by the ratio of costs of transport to the total costs in households. (independent variable)	Statistical Office of the Slovak Republic	Panel E

As mentioned above, the situation on the labour market is studied from two points of view; a separate analysis was carried out for each one of them. In the first case, *i.e.* in the analysis of the supply side of the labour market, we used the unemployment rate indicator, whereas on the demand side we analysed the number of job vacancies. The indicator of added value per household in the region represents the labour productivity, the impact of which on the wage amount has already been proved, for example in the study by authors Sharpe, Arsenault, Harrison (2008), or in the article by Vašaničová (2016). A double effect of the investment on the wage amount relates to the investment characteristics. Whereas the investment in production extension usually does not affect the wage amount directly but only through changes in the balance on the labour market, investment in new technologies not only increases the labour productivity but also increases the requirements with regard to new or existing labour force, and increasing requirements are associated with higher remuneration rates.

The analysis is focused on 8 regions, as classified in the NUTS 3, whereas the examined development covers 11 periods. The panel data were used, while applying regression models primarily intended for the analysis of such structured data, *i.e.* the pooled regression model (PRM), the random effects model (REM), and the fixed effects model (FEM). These methods are constructed as follows:

$$\text{PRM: GINI}_{tc} = \alpha + \beta_1 \cdot \text{AV}_{tci} + \beta_2 \cdot \text{LMS}_{tci} + \beta_3 \cdot \text{FDI}_{tci} + \varepsilon_{tc} \quad (4)$$

$$\text{REM: GINI}_{tc} = \beta_1 \cdot \text{AV}_{tci} + \beta_2 \cdot \text{LMS}_{tci} + \beta_3 \cdot \text{FDI}_{tci} + (\alpha + u_c) + \varepsilon_{tc} \quad (5)$$

$$\text{FEM: GINI}_{tc} = \alpha_t + \beta_1 \cdot \text{AV}_{tci} + \beta_2 \cdot \text{LMS}_{tci} + \beta_3 \cdot \text{FDI}_{tci} + \varepsilon_{tc}; \alpha_t = \alpha_{t1} + \alpha_{t2} + \dots + \alpha_{te} \quad (6)$$

$$\text{PRM: INC}_{tc} = \alpha + \beta_1 \cdot \text{AV}_{tci} + \beta_2 \cdot \text{LMS}_{tci} + \beta_3 \cdot \text{FDI}_{tci} + \varepsilon_{tc} \quad (7)$$

$$\text{REM: INC}_{tc} = \beta_1 \cdot \text{AV}_{tci} + \beta_2 \cdot \text{LMS}_{tci} + \beta_3 \cdot \text{FDI}_{tci} + (\alpha + u_c) + \varepsilon_{tc} \quad (8)$$

$$\text{FEM: INC}_{tc} = \alpha_t + \beta_1 \cdot \text{AV}_{tci} + \beta_2 \cdot \text{LMS}_{tci} + \beta_3 \cdot \text{FDI}_{tci} + \varepsilon_{tc}; \alpha_t = \alpha_{t1} + \alpha_{t2} + \dots + \alpha_{te} \quad (9)$$

$$\text{and PRM: SAV}_{tc} = \alpha + \beta_1 \cdot \text{FOD}_{tci} + \beta_2 \cdot \text{ACC}_{tci} + \beta_3 \cdot \text{CLO}_{tci} + \beta_4 \cdot \text{TRA}_{tci} + \varepsilon_{tc} \quad (10)$$

$$\text{REM: SAV}_{tc} = \beta_1 \cdot \text{FOD}_{tci} + \beta_2 \cdot \text{ACC}_{tci} + \beta_3 \cdot \text{CLO}_{tci} + \beta_4 \cdot \text{TRA}_{tci} + (\alpha + u_c) + \varepsilon_{tc} \quad (11)$$

$$\text{FEM: SAV}_{tc} = \alpha_t + \beta_1 \cdot \text{FOD}_{tci} + \beta_2 \cdot \text{ACC}_{tci} + \beta_3 \cdot \text{CLO}_{tci} + \beta_4 \cdot \text{TRA}_{tci} + \varepsilon_{tc}; \alpha_t = \alpha_{t1} + \alpha_{t2} + \dots + \alpha_{te} \quad (12)$$

The dataset was divided into five panel groups. Panel A evaluates the impact of a combination of indicators, while considering the demand side of the labour market, on the amount of disposable household income. Panel B evaluates a similar relationship, while considering the supply side of the labour market. Panel C is allied to Panel A because they cover the same combination of indicators, whereas in one case the evaluation is focused on the impact on the amount of the average disposable income and in the second case its distribution among the population. The same relationship exists also between the Panel B and Panel D. Panel E evaluates the relationship between the expenditure structure and the amount of generated savings. Moreover, each data panel is subjected to a partial analysis of region groups, whereas the combinations thereof depend on a region's economic performance. The first group comprises the regions with higher disposable income, *i.e.* BA, TT, and TN regions. The second group comprises the regions with lower disposable income, *i.e.* BB, PO, and KE regions. Remaining regions (ZA and NR) form the third group. Prior to each separate regression analysis, we assessed the stationarity of dependent and independent variables by verifying the presence of unit roots by the ADF test. Prior to the formation of regression models, we carried out the correlation analysis. We identified the appropriateness of one of the three above mentioned regression models while applying the Breusch-Pagan test statistics or the Hausman test statistics. All three methods were only used for the analysis of the complete dataset for the purpose of visualisation and comparison.

3. Results

On the basis of examination of existence of individual unit roots by the ADF test, we can confirm stationarity for all the used indicators; it means that no correction (difference) of indicators was required. Subsequently, we carried out the correlation analysis; results thereof are summarised in Table 2.

Table 2. Correlation analysis

	GINI	INC	SAV	AV	UNE	NVJ	FDI	FOD	ACC	CLO	TRA
GINI	1	0.7213 (0.520274) [3.7e-17] ***	0.7297 (0.532462) [1.1e-17] ***	0.7297 (0.532462) [1.1e-17] ***	0.1303 (0.016978) [0.1988]	-0.1219 (0.01486) [0.2293]	0.1841 (0.033893) [0.0681] *	-0.6940 (0.481636) [0.0070] ***	-0.3322 (0.110357) [0.0008] ***	-0.3770 (0.142129) [0.0001] ***	0.1958 (0.038338) [0.0521] *
INC		1	0.9522 (0.906647) [9.5e-52] ***	0.7146 (0.510602) [9.9e-17] ***	-0.0936 (0.008759) [0.356837]	0.0091 (0.000083) [0.928630]	0.4761 (0.218721) [6.32e-07] ***	-0.4705 (0.221335) [8.9e-07] ***	-0.3689 (0.136112) [0.000171] ***	-0.2897 (0.083954) [0.003626] **	0.1055 (0.011132) [0.298628]
SAV			1	0.5424 (0.294153) [6.7e-09] ***	0.113 (0.012776) [0.265301]	-0.1633 (0.026656) [0.106376]	0.3022 (0.091354) [0.002361] ***	-0.2807 (0.078816) [0.00488] ***	-0.2853 (0.081422) [0.004198] ***	-0.304 (0.092399) [0.002222] ***	0.0274 (0.000752) [0.787590]
AV				1	-0.5185 (0.268835) [3.86e-08] ***	0.3853 (0.148488) [0.000082] ***	0.9251 (0.855897) [1.4e-042] ***	-0.5893 (0.347245) [1.4e-10] ***	-0.3319 (0.110175) [0.0008] ***	-0.1588 (0.025208) [0.116498]	0.1066 (0.011368) [0.293532]
UNE					1	-0.6645 (0.441526) [6.44e-14]	-0.5324 (0.283491) [1.41e-08] ***	0.2045 (0.041837) [0.0423] **	0.3308 (0.109421) [0.0008] ***	-0.3215 (0.103372) [0.001174] ***	-0.1162 (0.013502) [0.252061]
NVJ						1	0.4761 (0.226662) [6.34e-07] ***	-0.327 (0.106908) [0.00096] ***	-0.2002 (0.040085) [0.0469] **	0.258 (0.066585) [0.0099] ***	0.0791 (0.006256) [0.436435]
FDI							1	-0.5001 (0.250061) [1.4e-07] ***	-0.1717 (0.029466) [0.0893] *	-0.1003 (0.010067) [0.323084]	-0.0042 (0.000017) [0.967242]
FOD								1	0.3358 (0.112771) [0.000679] ***	0.2015 (0.040621) [0.0454] **	-0.4144 (0.171704) [2.0e-05] ***
ACC									1	-0.2337 (0.054615) [0.019908] **	-0.491 (0.241071) [2.47e-07] ***
CLO										1	-0.1404 (0.019713) [0.165703]
TRA											1

Note: the first value represents the Pearson correlation coefficient, the value in round brackets is the coefficient of determination, and the square brackets contain the p-value of the t-test or the F-test; *, **, *** represent the statistical importance of 1%, 5%, or 10%

Source: Own processing

A directly proportional relationship between the amount of average household income and the Gini coefficient value means that within the monitored period the wage increase was associated with the growth of inequality of the distribution thereof, i.e. the growth of low wages was significantly lower than the growth of higher and average wages. Wages of low-income workers, amounting to approximately the minimum wage, as observed in the monitored period, showed a relatively slow increase (compared to the economy growth), whereas the wages of high-income workers depended on the economy development. Within the results of the correlation matrix, assumptions regarding a positive correlation between the disposable income and the combination of indicators, consisting of the added value (productivity), foreign direct investment, and job vacancies, were confirmed. An inversely proportional relationship was observed for the unemployment rate and the household income. However, it is necessary to point out that none of the two labour market indicators is statistically important. Therefore, we incline to the opinion that the most important factors affecting the amount of disposable income is the added value generated in a particular region or the inflow of investments which are directly associated with the added value growth. The analysis of the impact of household expenditure items brought a surprising conclusion assuming a

directly proportional relationship between the costs of transport and the amount of generated savings. We assume that it relates to the fact that the costs of transport are usually associated with travelling for jobs with higher wages (than those earned near one's place of residence), which increases the income. However, as they represent the expenditures, the evident negative impact on savings contributed to the fact that this relationship is statistically insignificant. With regard to the fact that the growth of wages in Slovak regions within the monitored period caused the increase in the income distribution variability, then the remaining indicators, such as added value and foreign direct investment, affected the growth as well. Again, labour market factors were statistically insignificant in this case as well.

Table 3. Test statistics of panels

	Panel A		Panel B		Panel C		Panel D		Panel E	
	F / LM / H	P-value	F / LM / H	P-value	F / LM / H	P-value	F / LM / H	P-value	F / LM / H	P-value
<i>Test of joint significance of the means</i>	5.14018	7.88E-05	3.51870	0.0024984	1.57601	0.14370	3.01021	4.97E-03	0.80254	0.58770
<i>Breuch-Pagan test statistics</i>	5.76759	0.01632	4.29383	0.0382509	0.01318	0.90859	4.98342	0.02559	0.33788	0.56105
<i>Hausman test statistics</i>	24.78360	1.71E-05	16.6746	0.0008244	3.61087	0.30666	12.0076	7.36E-03	0.53557	0.96995

Source: Own processing

On the basis of the test of joint significance of the means of different groups and of the Breuch-Pagan test statistics, applied within the analysis of the impact of labour productivity and the inflow of foreign direct investment, while considering the supply or the demand sides of the labour market, on the amount of the average disposable income (Panels A and B), and within the analysis of the impact of labour productivity and the inflow of foreign direct investment, while considering the demand side of the labour market, (Panel D), we prefer the model of fixed effects. The panel diagnostics indicates the appropriateness of the use of the pooled regression model for Panel C and E.

Table 4. Regression models for Panel A

	Comparison of regression models for panel data			Comparison of various datasets			
	PRM ●	REM ●	FEM Δ		Regions with higher income	Regions near the average	Regions with lower income
<i>constant</i>	5.60612 [4.93e-093] ***	5.55499 [0.0000] ***	5.58862 [8.66e-080] ***	<i>constant</i>	5.83324 [5.07e-027] ***	5.49322 [8.80e-023] ***	5.31939 [4.38e-032] ***
<i>AV</i>	26.214 [4.77e-021] ***	29.7153 [1.96e-046] ***	30.1371 [5.97e-023] ***	<i>AV</i>	21.4935 [7.83e-07] ***	19.1824 [0.0117] **	39.8482 [2.86e-014] ***
<i>UNE</i>	-0.330534 [0.0209] **	-0.334770 [0.0231] **	-0.446119 [0.0110] **	<i>UNE</i>	-0.438202 [0.0416] **	-1.55466 [0.0008] ***	-2.14316 [0.0012] ***
<i>FDI</i>	-0.00809735 [3.99e-011] ***	-0.0111247 [4.02e-013] ***	-0.0131517 [1.24e-08] ***	<i>FDI</i>	-0.00868027 [0.0020] ***	0.0369602 [0.0928] *	-0.00164386 [0.9231]
<i>Adjusted R² / corr (y,y)²</i>	0.747521	0.703811	0.763612	<i>Adjusted R²</i>	0.717420	0.917202	0.919352

Note: ● only the indicative value (for purpose of comparison); Δ constants of individual regions are listed in Table 9 in annexes

The question of foreign direct investment is described in more details after the analysis of Panel B, as in both cases the correlations were identical. The question of the relationship between the added value and the unemployment rate on one side and the growth of household income on the other side confirms that regions with higher wages are closer to the full employment it means that any additional reduction of unemployment rate will result in higher wages than in other region groups; a quantitative expressions of the comparison of the above listed regions and the lower-income regions represents only a 11.7% increase. On the basis of the aforesaid, we can confirm the *H1* hypothesis. The same situation is in terms of the added value, as the only variable production factor

in the short run (labour) is exhausted to a greater extent in regions with higher income than in the remaining regions. In particular, when comparing regions with income other than the average (higher and lower), it is only a 45.8% increase in regions with higher income.

Table 5. Regression models for Panel B

Comparison of regression models for panel data				Comparison of various datasets			
	PRM ●	REM ●	FEM Δ		Regions with higher income	Regions near the average	Regions with lower income
<i>constant</i>	5.3853 [2.24e-086] ***	5.29066 [0.0000] ***	5.28044 [6.24e-081] ***	<i>constant</i>	5.55685 [1.96e-032] ***	5.23524 [1.25e-020] ***	4.92101 [3.91e-030] ***
<i>AV</i>	28.0476 [1.92e-025] ***	27.6095 [6.07e-050] ***	27.5629 [1.27e-023] ***	<i>AV</i>	18.2484 [5.41e-07] ***	22.4036 [0.0114] **	37.0590 [1.69e-015] ***
<i>NVJ</i>	1.28368 [3.06e-06] ***	2.50144 [5.44e-09] ***	2.809 [5.25e-08] ***	<i>NVJ</i>	4.51506 [5.23e-05] ***	2.14449 [0.0169] **	2.24107 [3.22e-06] ***
<i>FDI</i>	-0.00833478 [4.16e-014] ***	-0.00984933 [1.95e-011] ***	-0.0110403 [3.92e-09] ***	<i>FDI</i>	-0.00715385 [0.0010] ***	0.0215890 [0.3840]	0.00697201 [0.6137]
<i>Adjusted R² / corr (y,y)²</i>	0.799786	0.633639	0.825356	<i>Adjusted R²</i>	0.821643	0.884319	0.947225

Note: ● only the indicative value (for purpose of comparison); Δ constants of individual regions are listed in Table 9 in annexes

In the synergy of several effects, the foreign direct investment indicator appears to be inversely proportional, as compared to a positive correlation in the case of special evaluation in both examined panels, A and B. This may relate to the above mentioned double effect of the investments. Moreover, a connection between the investment and the added value growth, or with changes on the labour market, could have been manifested. This fact has also contributed to the disproval of the *H3* hypothesis. The job vacancies factor is the strongest in regions with the highest income; *H2* hypothesis is thus confirmed. In regions where the labour market is with almost full employment, any increase in offered jobs is associated with a higher increase in the offered wage (than in other regions) because employers strive to compete. During the monitored period, this effect caused that an increase in a single additional job vacancy will have approximately 1.5-fold higher effect in regions with higher income than in regions with lower income, or a 1.7-fold higher effect than in regions with more-less average income. This evident disproportion is caused by the effect associated with foreign direct investment that is directly proportional to the household income only in NR and ZA regions. The effect of added value is opposite in this case, as the labour market is now studied from the “opposite” side, i.e. from the supply side.

Table 6. Regression models for Panel C

Comparison of regression models for panel data				Comparison of different datasets			
	PRM	REM ●	FEM Δ●		Regions with higher income	Regions near the average	Regions with lower income
<i>constant</i>	0.17112 [5.29e-023] ***	0.17313 [1.15e-029] ***	0.17226 [4.71e-020] ***	<i>constant</i>	0.19805 [1.19e-08] ***	0.16218 [2.31e-012] ***	0.12746 [5.86e-08] ***
<i>AV</i>	4.12208 [2.64e-016] ***	4.13438 [5.08e-021] ***	4.16585 [1.79e-013] ***	<i>AV</i>	2.77248 [0.0036] ***	3.80283 [4.05e-07] ***	5.93387 [2.72e-012] ***
<i>UNE</i>	0.26309 [8.72e-06] ***	0.27384 [0.0033] ***	0.33025 [0.0049] ***	<i>UNE</i>	0.35481 [0.1988]	0.14703 [0.0927] *	0.26723 [0.0091] ***
<i>FDI</i>	-0.00146 [1.12e-010] ***	-0.00165 [5.97e-08] ***	-0.00198 [5.75e-06] ***	<i>FDI</i>	-0.00087 [0.0476] **	0.00244 [0.0215] **	-0.00108 [0.1645]
<i>Adjusted R² / corr (y,y)²</i>	0.595289	0.56224	0.60823	<i>Adjusted R²</i>	0.40806	0.94022	0.86552

Note: ● only the indicative value (for purpose of comparison); Δ constants of individual regions are listed in Table 9 in annexes

Increase in the value added factor, perceived as productivity in a region, increases the income distribution inequality. This finding is related to the fact that the productivity growth is usually associated with the use of more advanced approaches, methods, materials, or processes, whereas the application thereof is often subject to increasing requirements with regard to employees who apply them. As the requirements increase, the compensation for employees (understood as the sum of employee's income and employer's contributions to the social and healthcare funds) increases as well. A growth of certain, a relatively small group of employees in a region increases the Gini coefficient value. Unemployment has shown the same impact on the income distribution as the added value; it relates to the supply on the labour market being higher than the demand, leading to the pressure on the available job applicants to accept a lower compensation and also creating the preconditions for reducing wages paid to currently employed people, *i.e.* to reducing the average wage. The impact of unemployment in regions with higher income did not reach the statistical significance; we therefore cannot prove its impact on the change in the Gini coefficient, whereas in the case of KE, PO, and BB regions such impact was confirmed and a positive relationship was observed. Therefore, we cannot confirm the *H5* hypothesis. Foreign direct investment was inversely proportionate to the Gini coefficient value, except for the average-income regions. This situation relates to the nature of investment flowing into regions during the monitored period, as described above.

Table 7. Regression models for Panel D

Comparison of regression models for panel data				Comparison of various datasets			
	PRM ●	REM ●	FEM Δ		Regions with higher income	Regions near the average	Regions with lower income
<i>constant</i>	0.21470 [3.96e-033] ***	0.20173 [7.32e-054] ***	0.20400 [2.29e-024] ***	<i>Constant</i>	0.23530 [7.87e-07] ***	0.17731 [1.03e-013] ***	0.21300 [2.61e-015] ***
<i>AV</i>	3.78950 [1.06e-012] ***	4.37093 [6.19e-022] ***	4.50761 [1.21e-014] ***	<i>AV</i>	3.05829 [0.0038] ***	5.30103 [2.25e-06] ***	7.10295 [1.90e-014] ***
<i>NVJ</i>	-0.04983 [0.1062]	-0.02132 [0.4855]	-0.03065 [0.4202]	<i>NVJ</i>	-0.03896 [0.5129]	-0.07237 [0.1091]	-0.27272 [0.0143] **
<i>FDI</i>	-0.00146 [1.32e-08] ***	-0.00184 [1.18e-010] ***	-0.00214 [1.12e-05] ***	<i>FDI</i>	-0.00139 [0.0674] *	-0.00227 [0.3412]	-0.01359 [9.02e-05] ***
<i>Adjusted R² / corr (y,ŷ)²</i>	0.50295	0.49091	0.56926	<i>Adjusted R²</i>	0.33567	0.94572	0.89905

A surprising finding is the absence of significance of the demand side of the labour market in all the cases. It means that the number of job vacancies in a region had no effect on the variability of the income of its inhabitants. Employers were not offering a significantly higher compensation (in aggregate) at more intensive pressure on their ability to ensure the labour factor, whereas in the opposite case such situation did not occur. The facts mentioned above do not allow us to confirm the *H7* hypothesis. A directly proportionate relationship between the labour productivity and the income distribution inequality in both panels (C and D) was observed to be more intensive in regions with a lower average wage. This indicates the assumption of insufficiently used capacities of production factors related to the transformation of inputs into outputs. The productivity factor, however, is more significantly affected by the extent of modern technologies used by local companies, which is also related to lower productivity. Therefore, the *H4* hypothesis related to the relationship between the productivity and the income distribution in different regions can be confirmed.

Table 8. Regression models for Panel E

Comparison of regression models for panel data				Comparison of various datasets		
	PRM	REM ●	FEM Δ●		Regions with higher income	Regions with lower income
<i>constant</i>	11.4815 [1.19e-016] ***	11.4859 [1.58e-023] ***	11.5008 [9.62e-014] ***	<i>constant</i>	9.81425 [5.19e-06] ***	12.5926 [1.85e-09] ***
<i>FOD</i>	-4.23273 [0.1120]	-4.42754 [0.1347]	-5.09659 [0.1759]	<i>FOD</i>	-2.30834 [0.5795]	-5.60906 [0.1821]
<i>ACC</i>	-14.3835 [6.63e-05] ***	-13.9481 [5.44e-09] ***	-12.7899 [0.0052] ***	<i>ACC</i>	-11.3196 [0.0899] *	-16.1239 [0.0003] ***
<i>CLO</i>	-30.0448 [0.0001] ***	-30.8398 [4.60e-05] ***	-32.2739 [0.0002] ***	<i>CLO</i>	-27.6085 [0.0253] **	-35.3677 [0.0012] ***
<i>TRA</i>	-9.03797 [0.0045] ***	-9.12408 [0.0040] ***	-9.42252 [0.0088] ***	<i>TRA</i>	-2.37956 [0.7064]	-11.5031 [0.0027] ***
<i>Adjusted R² / corr (y,y)²</i>	0.293333	0.292871	0.279217	<i>Adjusted R²</i>	0.248103	0.376646

Note: ● only the indicative value (for the purpose of comparison); Δ constants of individual regions are listed in Table 9 in annexes

Source: Own processing

The relationship between the productivity and foreign direct investment was observed in this case as well. If an increase in productivity results in a more significant reduction of disparities in low-income regions and if the investment inflow increases the productivity, then an increase in the inflow of investment into regions with lower income affects more markedly the income distribution irregularities, which confirms the *H6* hypothesis.

The most surprising finding of the regression analysis of the effects of the structure of inescapable expenditures on the generated savings is the non-existence of statistical significance of the costs of food and non-alcoholic drinks, despite the fact that the correlation indicates that such situation should be expected for the costs of transport. It means that the synergic effect transferred statistical significance from the costs of food to the costs of transport which show a relatively strong relationship (compared to other studied costs). The comparison of datasets for regions with higher and lower amounts of savings results in the confirmation of *H8* hypothesis for the costs of accommodation and transport; in the case of costs of accommodation the effect is 1.27-fold higher, and for the costs of transport it is 16.69-fold higher. While the costs of clothes have a stronger effect on the amount of savings generated in households in regions with lower income (1.5-fold higher), the costs of food are not considered due to absence of significance thereof.

Conclusion

Regional disparities in economic growth of various degrees can be observed in many countries. The present paper is focused on the examination of determinants which directly affect the formation of disparities. The objective of this study was to quantify the impact of selected economic factors, including the unemployment rate, number of job vacancies, inflow of foreign investment, and labour productivity, on the amounts of income and savings and their impact on the distribution of wealth among the households, leading to the formation of regional disparities. For the purpose of confirmation or refutation of the defined eight hypotheses, the panel data regression was applied. As expected, a relationship between the income and the unemployment rate or job vacancies was confirmed; it was observed that a decrease in the unemployment rate in regions with higher wages will result in lower increase in wages than in other groups of regions and an increase in job vacancies in regions with lower unemployment rate is associated with a higher increase in the offered wages. However, it must be pointed out that our study does not consider voluntary unemployment; this provides a potential for further research in this area.

The impact of selected factors on the wealth distribution among the households was evaluated while applying the Gini coefficient in individual regions. In all three cases, directly proportional relationships were

observed between the amount of disposable income and the value of this coefficient. Also, the analysis of the Gini coefficient confirmed the impact of the labour productivity and the foreign direct investment in regions with lower income on the formation of regional disparities. As for the productivity, there is a directly proportional relationship (increased productivity increases the disparities), whereas the FDI has the opposite (inversely proportional) effect.

Even though it was not statistically confirmed (due to the double effect) that the foreign direct investment affects the increase in wages, the study did not consider addition of domestic investments which might contribute to different findings. Also, in our study we were not able to verify the impact of an increase in job vacancies or unemployment rate on the formation or the elimination of disparities in low-income regions.

A partial objective of the study was also to outline the problem of disparities as such and potential reasons thereof. In the theoretical introductory section hereof we presented a relatively high interest in this topic and in finding a solution for regional disparities in the expert literature, not only in Slovakia but also in other countries. This interest is expected to persist, as despite the quantification of various factors affecting the formation of differences within the country and its countries, none of the analysed parties has managed to eliminate this problem. Another reason is also outlining potential directions for future research in this area, as mentioned in the present paper.

Acknowledgments

The article was elaborated with the support by the KEGA 020PU-4/2015 project "Creation of Multimedial Web Documents for e-learning Education and Increasing the Quality of Knowledge among Managers and Students" and the KEGA 035PU-4/2016 "Macroeconomics for managers - innovation structures, contents and methods of teaching the subject" and the VEGA 1/0139/16 "The analysis of the determinants and factors affecting the efficiency and competitiveness of entities working the soil in Slovakia"

References

- [1] Blížkovský, J. 2012. Regional disparities and convergences in the European Union. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 60(4): 59-70. Available at: https://acta.mendelu.cz/media/pdf/actaun_2012060040059.pdf
- [2] Borsi, M. T., and Metiu, N. 2015. The evolution of economic convergence in the European Union. *Empirical Economics. Journal of the Institute for Advanced Studies*, 48(2): 657-681.
- [3] Cuaresma, J. C., Doppelhofer, G., and Feldkircher, M. 2012. The Determinants of Economic Growth in European Regions. *Regional Studies*, 48 (1): 44-67. DOI: <http://dx.doi.org/10.1080/00343404.2012.678824>
- [4] Dusek, T., Lukács, R., and Rácz, I. 2014. Development Differences among the Regions of Hungary. *Procedia Economics and Finance*, 9: 264-277. DOI: [https://doi.org/10.1016/S2212-5671\(14\)00028-8](https://doi.org/10.1016/S2212-5671(14)00028-8)
- [5] Fan, S., Kanbur, R., and Zhang, X. 2011. China's regional disparities: Experience and policy. *Review of Development Finance*, 1(1): 47-56. DOI: <https://doi.org/10.1016/j.rdf.2010.10.001>
- [6] Fendel, T. 2016. Migration and Regional Wage Disparities in Germany. *Journal of Economics and Statistics*, 236(1): 3-35. DOI: <https://doi.org/10.1515/jbnst-2015-1001>
- [7] Gajdoš, P. 2008. Regional disparities in Central Europe. Bratislava: Sociologický ústav Slovenská academia vied. ISBN: 978-80-85544-56-5.
- [8] Habanik, J., Hostak, P., and Kutik, J. 2013. Economic and social disparity development within regional development of the Slovak Republic. *Economics and Management*, 18(3): 457-464. DOI: www.ecoman.ktu.lt/index.php/Ekv/article/view/4203
- [9] Havierniková, K., and Jansky, B. 2014. The evolution of regional disparities in the Slovak Republic. *VADYBA Journal*, 25/2014 (2): 133-138. Available at: <https://www.cceol.com/search/article-detail?id=246094>

- [10] Ivanová, E. 2013. Priame zahraničné investície a ekonomický rast v regiónoch SR. *Social and Economic Revue Scientific Journal*. 01-2013: 26-34. Available at: http://fsev.tnuni.sk/fileadmin/veda_a_vyskum/SER/2013/Socialno_ekonomicka_revue_volume_1_2013.pdf#page=26
- [11] Matlovič, R., and Matlovičová, K. 2011. Regionálne disparity a ich riešenie na Slovensku v rozličných kontextoch. *Folia Geographica*, 53(18): 8-87.
- [12] Nedomeľová, I., Stařková, L., Vavrek, R. 2017. Impact of minimum wage in V4 countries. *Journal of Applied Economic Sciences*, Volume XII, Spring, 2(48): 332 – 341.
- [13] Nistor, P. 2012. FDI and Regional Disparities Growth in Romania. *Procedia Economics and Finance*, 3: 740-745. DOI: [https://doi.org/10.1016/S2212-5671\(12\)00223-7](https://doi.org/10.1016/S2212-5671(12)00223-7)
- [14] Obradovic, S., Lojanica, N., and Jankovic, O. 2016. The influence of economic growth on regional disparities: Empirical evidence from OECD countries. *Zbornik Radova Ekonomskog Fakultet au Rijeci*. pp. 161-186.
- [15] Okabe, T., and Kam, T. 2017. Regional economic growth disparities: A political economy perspective. *European Journal of Political Economy*, 46: 26-39.
- [16] Pauhofová, I., Stehlíková, B., Martinák, D., and Páleník, M. 2016. Analýza príjmovej polarizácie v regiónoch Slovenska. Ekonomický ústav SAV. *Institute of Economic Research SAV*. pp. 1-77. Available at: http://www.ekonom.sav.sk/uploads/journals/330_wp_83_pauhofova_stehlikova_martinak_palenik_2016.pdf
- [17] Sharpe, A., Arsenault, J.F., and Harrison, P. 2008. The relationship between labour productivity and real wage growth in Canada and OECD countries. Centre for the Study of Living Standards, Research Report No. 2008-8. Available at: <http://www.csls.ca/reports/csls2008-8.pdf>
- [18] Vařaničová, P. 2016. Relationship between wages and labour productivity in Slovak industry. *Journal of Management and Business: Research and Practice*, 8(1): 35-45.
- [19] Výrostová, E. 2010. *Regionálna ekonomika a rozvoj*. Bratislava: Iura Edition. ISBN 978-80-8078-361-7.

Annex

Table 9. Constants of models of fixed effects for all panels

	Panel A				Panel B				Panel C	Panel D				Panel E
	Whole dataset	Higher income	Average income	Lower income	Whole dataset	Higher income	Average income	Lower income	Whole dataset	Whole dataset	Higher income	Average income	Lower income	Whole dataset
<i>Bratislava Region</i>	5.90157	6.02786			5.64119	5.80218			0.21998	0.23368	0.25638			7.71831
<i>Tmava Region</i>	5.44595	5.6823			5.26834	5.41269			0.17045	0.18707	0.22736			7.63282
<i>Trenčín Region</i>	5.59173	5.78957			5.37319	5.45568			0.16633	0.18814	0.22215			7.60129
<i>Nitra Region</i>	5.51532		5.55992		5.24601		5.2664		0.15642	0.18566		0.16789		7.58825
<i>Žilina Region</i>	5.56529		5.42652		5.32135		5.20408		0.18000	0.20558		0.18674		7.61222
<i>Banská-Bystrica Region</i>	5.60752			5.39601	5.15631			4.99258	0.15667	0.20814			0.19608	7.55587
<i>Prešov Region</i>	5.52249			5.34422	5.09484			4.95546	0.15455	0.20322			0.17615	7.43357
<i>Košice Region</i>	5.55912			5.21795	5.1423			4.815	0.17370	0.22053			0.26677	7.55722

Source: Own processing

Development of Human Resources of Agro-Industrial Complex

Alexey A. NEDELKIN
Plekhanov Russian University of Economics, Russia
aa@nedelk.in

Sergey V. NOVIKOV
Moscow Aviation Institute (National Research University), Russia
ncsrm@mail.ru

Valery A. TITOV
Plekhanov Russian University of Economics, Russia
vtitov213@yandex.ru

Dmytro V. SANNIKOV
Yaroslav Mudryi National Law University, Ukraine
d.v.sannikov@gmail.com

Anna V. Mikhailova
Federal State Autonomous Educational Institution of Higher Education
"M. K. Ammosov North-Eastern Federal University", Sakha (Yakutia) Republic
Mikanya23@mail.ru

Lyudmila N. Popova
Federal State Autonomous Educational Institution of Higher Education
"M. K. Ammosov North-Eastern Federal University", Sakha (Yakutia) Republic
ludaykt@rambler.ru

Suggested Citation:

Nedelkin, A.A. *et al.* 2017. Development of human resources of agro-industrial complex. *Journal of Applied Economic Sciences*, Volume XII, Winter, 7(53): 1932-1942.

Abstract

The article investigates the distinctive features of the development of human resources of agro-industrial complex (AIC). The study determined the categorical nature of human resources, as a whole, and the author's vision of the resource capacity of AIC was offered, in particular. The detailed analysis of the development of human resources of AIC in Ukraine, Kazakhstan, Russia and Belarus through the prism of the study of the features of life, well-being and safety of the rural population was carried out. Particular attention is paid to the problems of staffing of AIC of the leading countries of the world, including EU countries. The results obtained allowed to establish the fact of the indirect identity of the main factors of reduction of the rural population in the considered post-Soviet republics and the depopulation of rural areas in the EU. On this basis, at the conceptual level the key tasks were identified, which resolution, as for Russia, Kazakhstan, Ukraine and Belarus, and for Europe, make prospects of development of human resources of AIC. Taking into consideration peculiarities of AIC of Russia, as well as specific, national problems of rural development, the article developed the concept of development of human resources of AIC of Russia. Apart, within the concept, measures for training and retraining of workers for agricultural enterprises of Russia were allocated, as well as a model of balancing supply and demand in the labor market in order to determine the number of specialists of specific specialties necessary for the development of AIC in the region was offered.

Keywords: agro-industrial complex; human resources; development; Russia; Kazakhstan; Ukraine; Belarus; EU

JEL Classification: R 13; R 23

Introduction

The current state of development of the society which is characterized by the crisis phenomena in economy, social contradictions requires close attention to a question of reproduction and development of personnel potential, especially

in agrarian and industrial complex. In the conditions of the market relations, the agrarian sector is considered as a key in the processes of revival of all national economy, as well as in rising the standard of living and welfare of the population (Rockstram 2017).

World experience surely proves that today there is no alternative to the innovative and intensively way of development of agricultural industry which predetermines essential growth of requirements to skill level, professional skills, intelligence of specialists-landowners (Ruan 2017). In this context it is important to consider dynamics of changes in the needs of a human capital in agrarian production which is characterized by its reducing in developed countries as a result of implementation of intensive technologies based on the high-productive equipment.

Thus, the number of able-bodied rural population in the leading countries of the world since 1950 to 2015 has decreased from 137 to 32.5 million people or more than by 4 times, and in France and Germany practically by 8 times (Skinner, Hanlon 2015). Besides each able-bodied person, occupied in the village, in the developed countries has developed in 2015, on average 28.6 t of grain, nearly 3.3 t of meat and 12 t of milk against respectively 995,123 and 217 kg in developing countries (Agriculture, Rural Development, Food and Drug Administration, and related agencies appropriations bill, 2016).

At the same time, it should be noted that, despite such essential gap, modern practice of work with personnel of AIC in the states with transformational economy, which inefficiency is obvious, did not undergo radical changes. Thus, for example, after the collapse of the USSR in the conditions of insufficiently reasonable, quite often spontaneous reforming of AIC, a significant amount of the most qualified specialists of agricultural industry in the CIS countries passed to work in other industries, or emigrated abroad. Today in the post-Soviet republics against the background of reducing number of a rural population there is deterioration in high-quality composition of human resources, qualification and educational and cultural level of the population, performance of social labor. Those specialists, who remained in the village, lost substantially their qualification level; only their small part undergoes retraining in these or those forms.

Thus, in view of the foregoing, there is no doubt that for development of the main directions of agricultural policy it is necessary to develop new approaches to issues of staffing and development of human resources of AIC. Especially this question is urgent for CIS countries and other developing countries, as in conditions of scarcity of financial resources and impossibility in short terms to restore material and technical base, human resources becomes one of the main and most effective factors of stabilization and development of AIC.

Thus, the above facts cause the choice of the topic for research, confirm its theoretical and practical significance, as well as define the conceptual basis of the conducted research and appropriate tools of scientific knowledge.

2. Materials and methods

Research of numerous publications of scientists-economists demonstrates that the problem of forming, development and improvement of quality of use of human resources of AIC enterprises has its specifics which should be considered in the conditions of market economy. From among the most significant works devoted to theoretical and economical and organizational aspects of forming and development of human resources of AIC the works of S. Bohdanov, N. Zabelina, D. Kaplin, P. Mansurov, D. Andrews, A. Caldera Sanchez, And. Johansson, *etc.* shall be noted.

At the same time, despite rather high level of scientific study of a perspective of development of human resources of agrarian sector, especially within the economic thought, questions of managerial impact on processes of forming, distribution and use of labour opportunities of employees of AIC are researched in insufficient degree. For developing countries, the factor of time provides need of carrying out profound studying and justification of new approaches to forming and use of human resources of AIC due to the need of adaptation of this resource to new social and economic conditions which are created in the course of enhancement of market mechanisms of management and development of national economies.

Thus, the purpose of article consists in a research of the categorical device of human resources, in general, and AIC, in particular, carrying out the analysis of features of forming and development of human resources in CIS countries and in other countries of the world, development of the concept of development of human resources of AIC for developing countries.

In a general view human resources is considered as the social and economic category reflecting quantity

characteristics of workers, their available and unrealized opportunities and capabilities which in the course of interaction with other production factors and in case of acceptance of optimal management decisions provide goal achievement of the individual, entity, industry, territory and society, in general (Lisunov 2017).

According to the author, forming of the practical recommendations concerning ways of development of human resources of AIC, as well as the specifics of the industry cause need for addition of the categorical device with a concrete concept "human resources of agricultural industry" which seems appropriate to understand totality of labor opportunities of a rural population in the context of social and economic conditions of its reproduction and relations of production creating in general a productive labor power on the basis of use of natural resources.

The main source of forming of human resources of AIC is the rural population living in the rural territories. But according to official data and numerous studies, accomplishment of key national functions of the rural territories developing countries is complicated because of structural crisis which is connected with transformation of forms of ownership and transition of all spheres of activity to the market principles (Strategy of sustainable development of rural territories of the Russian Federation for the period till 2030, 2015). All this aggravates a number of the problems requiring the fastest solution among which there is a continuation of deterioration in quantitative and high-quality parameters of demographic processes owing to difficult social and ecological conditions of accommodation in the village, the low level of income of a rural population.

Let us consider in more detail the specifics of development of human resources of AIC in developing countries, with the example of Russia, Kazakhstan, Ukraine and Belarus, which have great possibilities and potential for the development of agriculture, food and processing industries.

According to the data in Table 1, rural population in the countries in question has a steady dynamic towards decrease, while the total number and number of the urban population are increasing.

Table 1. Population dynamics in some CIS countries (Resident population).

Indicator	Unit of measurement	2011	2012	2013	2014	2015	2016
Republic of Belarus							
Total population	thousand people	9465.2	9463.8	9468.1	9471.5	9472.3	9463.1
including urban		7175.0	7220.9	7274.9	7321.5	7456.5	7471.4
Rural		2290.2	2242.9	2193.2	2150	2015.8	1991.7
proportion of rural population in the whole population	%	24.2	23.7	23.2	22.6	21.2	21
Republic of Kazakhstan							
Total population	thousand people	16673.1	16909.8	17160.8	17172.1	17179.4	17187.3
including urban		9127.1	9277.5	9433.5	9532.4	9627.1	9678.5
rural		7545.9	7632.2	7727.3	7639.7	7552.3	7508.8
proportion of rural population in the whole population	%	45.3	45.1	45	44.4	43.9	43.6
Russian Federation							
Total population	thousand people	142865	143056	143347	143756	146328	146534
including urban		105421	105742	106118	106613	108346	108623
rural		37444	37314	37229	37143	37982	37911
proportion of rural population in the whole population	%	26213	26154	26004	25854	25923	25815
Ukraine							
Total population	thousand people	45598	45453	44318	41123	40867	40532
including urban		31186	31125	30100	27058	26884	26819
rural		14412	14328	14218	14065	13983	13713
proportion of rural population in the whole population	%	31.6	31.5	32	34.2	34	33.8

The highest proportion of the rural population is observed in Kazakhstan, almost half of the inhabitants of

the Republic live in villages, and within the five years under review this ratio has not changed. Special attention should be paid to the number of inhabitants of villages in Russia, which from 2011 to 2016 has decreased by almost 0.4 million people, despite the fact that the number of urban population remained at the same level and since 2014 Crimea, in which 32% are rural inhabitants, has become part of Russia. The largest decrease in the number of rural population is in Ukraine, during the period under review, the decline made 699 thousand people.

Depopulation of rural areas is not exclusively a problem of the developing countries. World Bank data shows - the tendency of reduction of specific weight of the rural population is relevant for the countries of Europe and the United States (see Table 2).

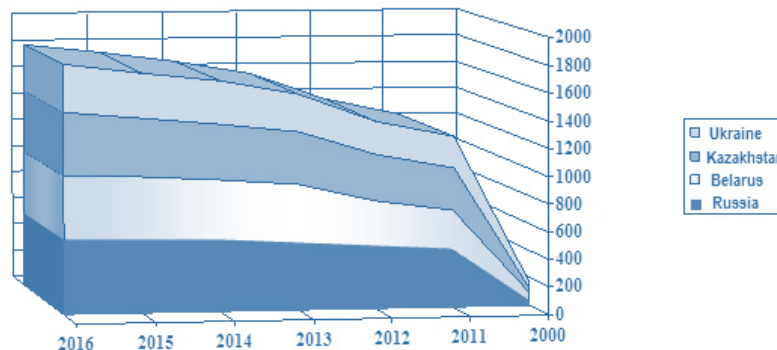
Table 2. Proportion of rural population in the total number of population (Trofimova 2016)

Country	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015
China	80.64	73.56	64.12	57.48	50.77	49.43	48.11	46.83	45.59	44.39
Russia	30.25	26.61	26.65	26.54	26.31	26.27	26.21	26.15	26.08	25.99
Germany	27.16	26.88	26.93	26.65	25.71	25.51	25.31	25.11	24.91	24.70
France	26.72	25.94	24.13	22.87	21.66	21.42	21.18	20.95	20.71	20.48
Norway	29.46	28.04	23.92	22.51	20.90	20.62	20.34	20.06	19.79	19.53
USA	26.26	24.70	20.94	20.07	19.23	19.06	18.89	18.72	18.55	18.38
Canada	24.34	23.42	20.52	19.88	19.06	18.89	18.71	18.53	18.35	18.17
Sweden	16.91	16.90	15.97	15.68	14.94	14.79	14.64	14.49	14.34	14.19
Australia	14.24	14.60	12.84	12.00	11.27	11.13	10.99	10.85	10.71	10.58
Netherlands	35.26	31.32	23.21	17.37	12.94	12.16	11.43	10.73	10.09	9.50
Argentina	17.11	13.02	10.86	9.92	9.03	8.87	8.71	8.55	8.40	8.25

Considering data of the Figure 1 and Table 2, it should be noted that their direct comparison is incorrect since, as it was already noted earlier, reduction of number of population of rural areas in the developed countries happens due to introduction of new technologies in agricultural branch, in Russia due to unregulated mass outflow of able-bodied population to the cities, deterioration in living conditions in village, increase in mortality as will be discussed in more detail in the following discussion, etc.

So, comparison of wage indicators in rural areas and poverty of rural inhabitants, quite eloquent shows condition and tendency in development of human resources of AIC in the countries surveyed. Thus, according to Figure 1 wages of the population in rural areas in Ukraine, Russia, Belarus and Kazakhstan are steadily increasing from year to year, with growth themes reaching 25% per year.

Figure 1. Dynamics of average monthly wages in AIC (US \$) (Basic figures on the European neighbourhood policy, 2016)



At the same time, the level of poverty among the rural population of the countries in question, despite the growth in incomes, is at a sufficiently high level and far exceeds the level of poverty among urban residents. For example, monitoring which is carried out by the research staff of the Institute of Social Policy of Higher School of Economics of the National Research University demonstrates that in 2016 the material situation was negatively estimated by 26% of respondents residing in rural areas, on average for 2016 difficulties upon purchase of food or clothes were experienced by 45% of respondents (Ovcharova 2017). More detailed information about level and profiles of poverty of the population of the Russian Federation are presented in table 3.

Table 3. Level and profile of poverty in Russian villages in 2014-2016 (Ovcharova 2017)

	Subjective assessment of the material situation as bad or very bad			Subjective assessment of poverty: extremely poor (not enough money even for food) or poor (not enough money for clothes)			In particular, extremely poor (not enough money even for food)		
	% in the category								
	2014	2015	2016	2014	2015	2016	2014	2015	2016
Urban area	20.8	21.2	21.4	37.4	38.5	39.0	9.6	9.8	10.2
Rural area	24.3	25.5	25.9	43.1	45.9	46.6	10.3	10.6	11.8

Situation in Russia is the most critical in comparison with other countries. Against the background of general impoverishment and depopulation of villages in Ukraine, Kazakhstan and Belarus, the level of poverty of the rural population still tends to decrease (see Table 4).

Table 4. Poverty level of the population depending on the place of residence (in % to the population living in the relevant locality) (Cojocaru *et al.* 2016)

	2013	2014	2015	2016
Belarus				
In cities	4.2	3.7	3.5	3.2
In rural area	9.0	7.9	7.8	7.7
Kazakhstan				
In cities	1.3	1.3	1.3	1.3
In rural area	4.9	4.7	4.4	4.3
Ukraine				
In cities	7.1	8.3	8.2	8.3
In rural area	10.8	9.3	9.5	9.7

Extremely negative effect on development of human resources of AIC in the countries under consideration have low reproduction rates of the rural population, which is connected with the difficulties of the demographic development of rural areas, such as low life expectancy and increasing migration outflow, as well as high mortality and low birth rates (see Figure 2.3). According to Figures 2 and 3, in all countries except Kazakhstan, and especially in Belarus, reproduction of the rural population has a negative dynamic, which, in addition to the above-mentioned reasons, is associated with the older age structure of rural inhabitants.

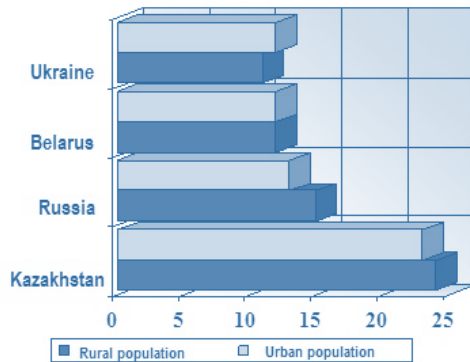


Figure 2. Total birth rate per 1000 people in 2015 (Lombardi and Banik 2016)

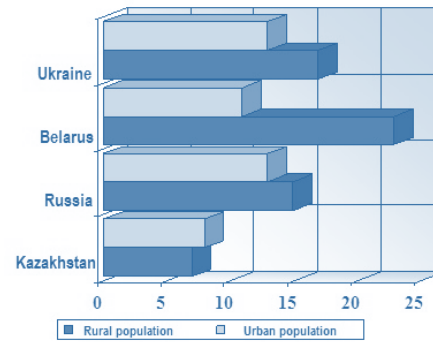
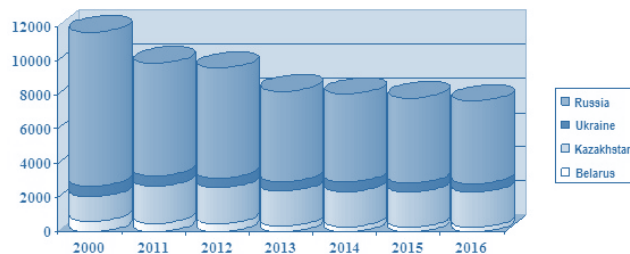


Figure 3. Total mortality rate per 1000 people in 2015 (Lombardi and Banik 2016)

Proportion of employed in the main branches of AIC (plant growing, hunting, livestock, fishing) from 2000 to 2016 by all analyzed countries has a stable tendency to reduce (see Figure 4).

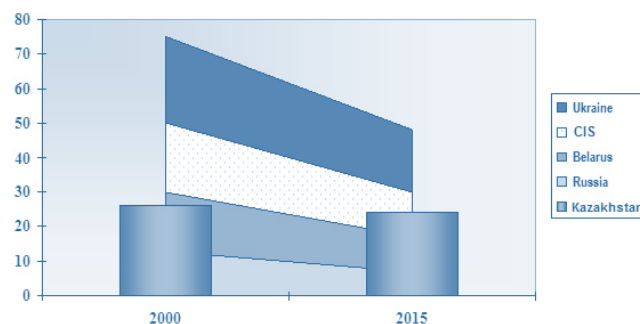
Figure 4. Population employed in agriculture, thousand people (On the modernization of engineering systems in the farming industries of Russia, Belarus and Kazakhstan, 2016)



According to Figure 4, the greatest reduction in number of employed in AIC is in Belarus, during the period under review, the indicator decreased by almost 2.5 times. In second place is Russia - the importance of agriculture for 16 years has decreased from 12.3% to 9.2% of the average annual number of the entire employed population of the country. Against the background of this negative dynamics, Kazakhstan positively stands out, despite the demographic shifts and migration processes, the number of people employed in agriculture in 2016 is 45% more than in 2000.

Also powerful determining factors influencing forming of human resources of AIC are high rates of movement of human resources and low motivating role of work. In figures 2, 3 dynamics of economic activity, employment and unemployment of a rural population of Russia is provided. Figure 5 shows dynamics of economic activity and employment of the rural population

Figure 5. Employment of the population in agriculture, % of the total number of economically active population in the country (On the modernization of engineering systems in the farming industries of Russia, Belarus and Kazakhstan, 2016)



Special attention should be paid to two factors that distort real data on employment in agriculture and development of human resources of AIC, in general. The first factor is administrative and territorial transformations when some residential locations were given the status of rural which is formally slowing down reducing a rural population and positively affecting its employment.

And second, no less important factor is the informal employment of rural residents, according to the statistics of the CIS Statistical Committee, employment in the informal sector among rural residents in 2015 was 35% of the total number of people employed in rural areas and 16% of the total number of people employed in urban area (Level of employment in the world, 2015).

As well general level of education of workers of the agrarian sector does not contribute to the development of human resources of AIC, in general. The specific weight of the employees having necessary education, at rather low level, has a steady tendency to reducing (see Figure 6 and Figure 7).

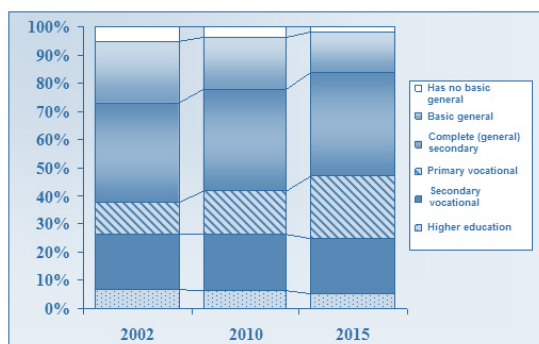


Figure 6. Employed in agriculture of Russian Federation by the level of education, in % from total (Resident population).

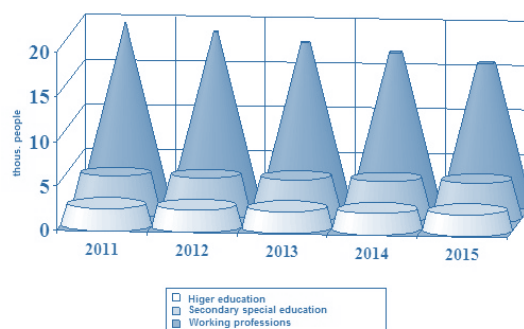


Figure 7. Level of education employed in agriculture of Belarus (Belstat 2015).

Even in a deeper crisis, compared with Russia and Belarus, there is a situation in Ukraine with the quality of education and the qualifications of the specialists AIC. Since 2009 training of workers for agriculture has decreased almost threefold - from 8.6 thousand people to 2.9 (Population of Ukraine, 2015).

The most progressive dynamics in this sphere is demonstrated by Kazakhstan (see Table 5). At the same time, it should be noted that the republic is only at the beginning of the path to form the necessary professional and qualifying staff of AIC. The measures taken and programs developed are lack of a systematic and clear formalization; most of them are situational and point-like, having a very indirect connection with the general concept of development of the agricultural sector of the country.

Table 5. Indicators of increasing the economic accessibility of educational services, the results of agrarian science and consulting services (Kazakhstan in figures, 2015)

Indicators	2013	2014	2015	2016
Number of AIC subjects covered by the educational and advisory services of the results of agrarian science, units.	2,375	10,193	11,567	12,891

3. Results and discussion

Thus, results of the carried-out analysis demonstrate that now human resources of AIC in such countries as Ukraine, Russia and Belarus is in many respects dissipated, and that functioning, does not correspond to tasks of innovative and intensive development of agricultural industry. The situation in Kazakhstan is in a more favorable condition, which is due to its natural and geographical features and the specifics of the country's economic complex; however, the general tendencies hindering development of human resources of AIC and preventing its effective reproduction are identical across all analyzed countries.

Thus, the reason of so deplorable condition of human resources of AIC is number of the factors connected with: deterioration in quantitative and qualitative parameters of demographic processes in the village; low level of

income of rural population; high level of unemployment; deficit of workplaces and low level of education of residents of the village, etc.

In turn, it should be noted that in researches of the European scientists the following reasons of depopulation of rural areas in EU countries are given, in addition to already noted factors of technology development: aging of population; unemployment; adverse conditions of life in the village; lack of access to social and state services; poverty and low income level in rural area; lack of opportunities to obtain qualitative education, ecological situation (Rockstram 2017).

Summarizing the data given above, it should be noted that major factors of decrease in number of rural population both in Russia, Ukraine, Belarus, Kazakhstan and in EU countries, to a certain extent, are identical, with that difference that in the European countries the results of scientific and technological revolution allowing to release a considerable part of residents of villages are actively used; this in turn causes reduction in human resources of AIC and predetermines its subsequent development in a narrowly targeted direction.

The above facts give all grounds to claim that at the conceptual level, both for developing countries and for developed countries of the EU, the prospects for development of human resources of AIC depend on complex solution of the following tasks:

- Creation of organizational and methodical, methodological, legal and economic basis of work with a personnel and implementation of investment policy in AIC; development of practical recommendations on determination of the demand for personnel, enhancement of techniques of their assessment; creation of forecasts of demographic base of reproduction of human resources of agricultural industry and labor market; development of models of long-term demands for staffing.
- Assessment of a condition of system of use of human resources; development of human resources on the basis of sociological and social and psychological researches of staff of agricultural enterprises; studying of dynamics of shifts of demographic structure, analysis of personal budgets of the population of villages, target orientation of rural youth.
- Development of recommendations concerning assessment of efficiency of the system of training, advanced training and retraining of personnel of agricultural industry and offers on its enhancement; organization of continuous training of human resources and development of the program for creation of working positions; assessment and analysis of solutions of a problem of reproduction of human resources with attraction of non-budgetary sources of financing; development of innovative programs for training of human resources for new specialties.

It is obvious that concretizing the directions of development of human resources of AIC in Russia, Ukraine, Kazakhstan, Belarus it is necessary to consider from the critical point of view experience of already undertaken reforms on recovery of the rural territories, to take into account geographical and climatic features of the country, the current social and economic situation in the state, and also tendencies of development of AIC in the world and challenges of the modern markets.

In this context the fact that development of the concept of development of human resources of AIC requires careful study of structure of personnel policy of the enterprises of AIC, for the purpose of development and enhancement of each its direction, coordination of strategic planning of development of an industry with motivation of a labor activity and social relations; coordination on a fixed basis of processes of implementation of modern scientific and methodical approaches to staff management and results of a scientific and technological revolution; enhancement of the system of retraining and advanced training of inhabitants of the rural territories, does not raise any doubts.

The general concept of development of human resources of AIC of the analyzed post-Soviet republics developed by the author is provided on Figure 8. It is obvious that consideration of each element of the concept provided in figure 8 demands a separate in-depth study and the special analysis that is beyond this article.

Considering that in modern agricultural industry on the way of innovative and intensive development the “technocentric” model which substantially provides replacement of a manual work with automated means and requires presence of the highly skilled, specially trained workers with new skills actively takes root; it is advisable

within the developed concept to pay special attention to its educational component. Namely: to determination of accurate actions for training and advanced training of workers for agricultural enterprises of Russia (see Figure 9), and also development of the model allowing to balance the demand and supply in the labor market for the purpose of determination of number of specialists of the specific specialties necessary for development of AIC of the region.

Figure 8. Concept of development of human resources of agro-industrial complex of Russia

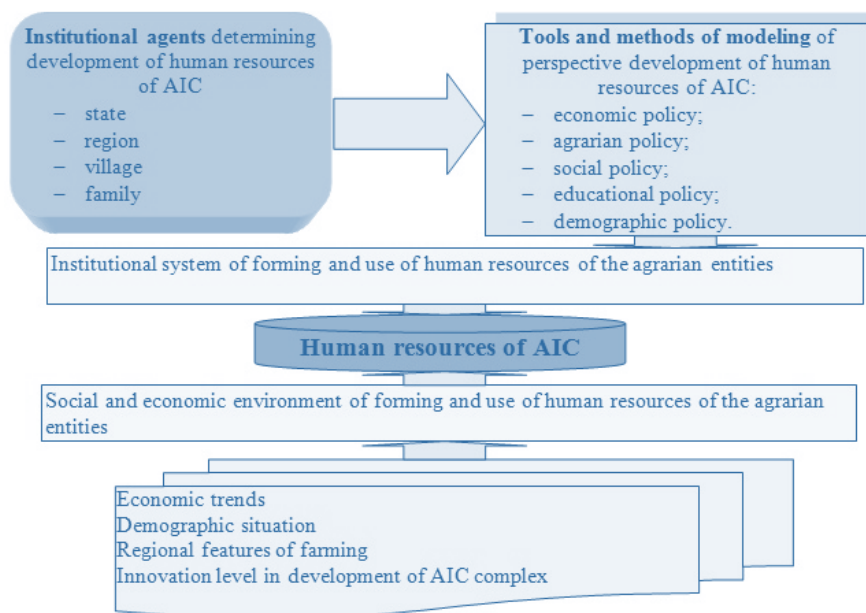
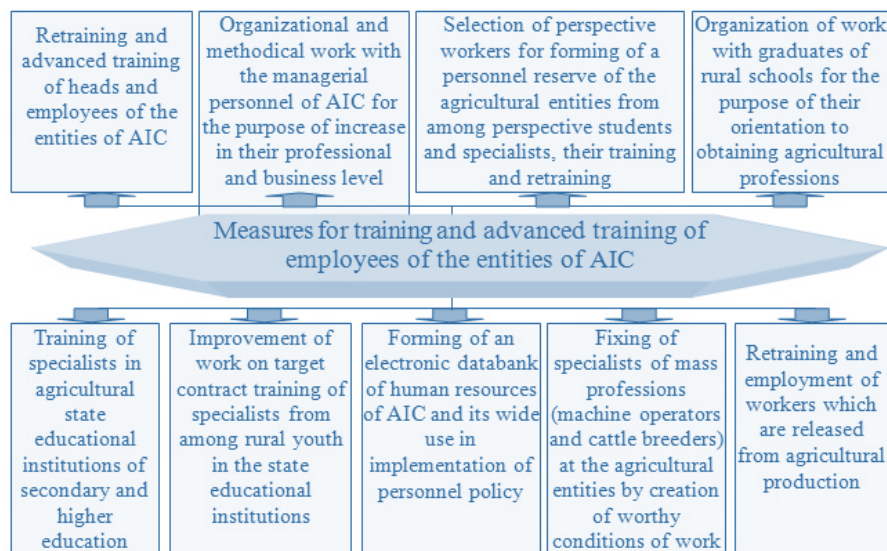


Figure 9. Measures for training and advanced training of workers for agricultural enterprises of Russia



Modeling of the supply and demand balance in the labor market of the agrarian region provides determination, firstly, of the primary key branches of AIC of the region - M_1 (for example, cattle breeding, crop production, etc.), secondly, the choice of main types of economic and productive activity in the specified areas - M^2 . The subsequent analysis of these industries and types of activity will allow allocating M_3 - the directions of the specialties providing functioning and development of AIC of the region.

At the following stage we will designate tuples of demand of AIC of the region for specialists $Lt(i)$:

- $Lt_V(i) \in N^{1 \times k}$ – tuple of demand of AIC of the region for specialists with higher education per year $t(i)$, where k – number of specialties;
- $Lt_M(i) \in N^{1 \times k}$ – tuples of demand of AIC of the region for specialists with primary education per year $t(i)$, where k - number of specialties;
- $Lt_S(i) \in N^{1 \times k}$ – tuple of demand of AIC of the region for specialists with secondary education per year $t(i)$, where k - number of specialties;

Satisfaction of demand of the region for human resources consists in training of necessary groups of specialties with the set level of education corresponding to the expected quantity of the required working positions.

Number of specialists graduates of the region per year $t(i)$ is defined by three tuples:

- $K_V(i) \in N^{1 \times k}$ – tuple of graduation in $t(i)$ year of specialists with higher education for k - \tilde{u} specialty;
- $K_S(i) \in N^{1 \times k}$ – tuple of graduation in $t(i)$ year of specialists with secondary education for k - \tilde{u} specialty;
- $K_N(i) \in N^{1 \times k}$ - tuple of graduation in $t(i)$ year of specialists with primary education for k - \tilde{u} specialty.

where $K_{\Sigma} = K_V(i) + K_S(i) + K_N(i)$.

The task of the supply and demand balance in the labor market in the region in $t(i)$ year is determined by the solution of the following system of the equations:

$$\begin{cases} K_V(i) = Lt_V(i) \\ K_S(i) = Lt_S(i) \\ K_N(i) = Lt_N(i) \end{cases}$$

The above-mentioned system of the equations shows the number of specialists who are trained in the region, for satisfaction of demands of its AIC. Solution of the task comes down to the following task of optimization. To define a minimum of functionality which would balance graduations from educational institutions with demands by specialties and education level (would level graduations of specialists from educational institutions and demand of the region for human resources necessary for AIC):

$$\sum_{k=1}^X (K_V(i)_k - Lt_V(i)_k) + \sum_{k=1}^X (K_S(i)_k - Lt_S(i)_k) + \sum_{k=1}^X (K_N(i)_k - Lt_N(i)_k) \rightarrow \min$$

where: k - index of specialty; X - number of specialties.

The perspective directions of development of the specified model is accounting of natural staff rotation in the market of human resources of AIC (resignation of employees due to reaching of retirement age and coming from schools and higher educational institutions).

Conclusion

Thus, summarizing the received results it is possible to draw the following conclusions. In the conditions of forming of the market relations and during an era of transformational transformations in the social and economic sphere qualitative staffing and corresponding development of human resources of agricultural enterprises is of particular importance that predetermines intensification of researches in the direction of development of human resources of AIC.

Taking into consideration target objectives and tasks the article has studied the categorical nature of human resources, as a whole, and the author's vision of the resource capacity of AIC was offered, in particular. The detailed analysis of the development of human resources of AIC of Russia, Kazakhstan, Ukraine and Belarus through the prism of the study of the features of life, well-being and safety of the rural population was carried out. Particular attention is paid to the problems of staffing of AIC of the leading countries of the world, including EU countries. The results obtained allowed to establish the fact of the indirect identity of the main factors of reduction of the rural population in the considered post-Soviet republics and the depopulation of rural areas in the EU. On this basis, at the conceptual level the key tasks were identified, which resolution, as for Russia, Kazakhstan, Ukraine and

Belarus, and for Europe, make prospects of development of human resources of AIC.

Taking into consideration peculiarities of AIC of Russia, as well as specific, national problems of rural development, the article developed the concept of development of human resources of AIC of Russia. Apart, within the concept, measures for training and retraining of workers for agricultural enterprises of Russia were allocated, as well as a model of balancing supply and demand in the labor market in order to determine the number of specialists of specific specialties necessary for the development of AIC in the region was offered.

References

- [1] Belstat. 2015. Social and economic situation of households in the Republic of Belarus, National Statistical Committee of the Republic of Belarus, Minsk.
 - [2] Cojocar, L., Falaris, E.M., Hoffman, S.D., and Miller, J.B. 2016. Financial System Development and Economic Growth in Transition Economies: New Empirical Evidence from the CEE and CIS Countries. *Emerging Markets Finance & Trade*, 52(1): 223-236.
 - [3] Lisunov, S.A. 2017. Main directions of enhancement of forming and development of human resources. *NovalInfo.Ru*, 58: 353-357.
 - [4] Lombardi, E., Banik, S. 2016. The Utility of the Two-Step Gender Measure Within Trans and CIS Populations. *Sexuality Research & Social Policy Journal of NSRC: SR & SP*, 3: 288-296.
 - [5] Ovcharova, L. N. 2017. *Population of Russia in 2016: income, expenses and social well-being*. Monitoring of Higher School of Economics National Research University. Results of year/under editorship of. Higher School of Economics National Research University. Moscow.
 - [6] Rockstram, J. 2017. Sustainable intensification of agriculture for human prosperity and global sustainability. *Journal of the Human Environment, Research and Management*, 1: 4-17.
 - [7] Ruan, J. 2017. Development Economics: The Role of Agriculture in Development. *China Agricultural Economic Review*, 9(1): 156-158.
 - [8] Skinner, M., Hanlon, N. (Eds.). 2015. *Ageing Resource Communities: New Frontiers of Rural Population Change, Community Development and Voluntarism*. Routledge. London.
 - [9] Trofimova, V.I. 2016. Rural employment and development of alternative activities in the village. *Scientific Review: Theory and Practice*, 5: 35-44.
- *** Agriculture, Rural Development, Food and Drug Administration, and related agencies appropriations bill, 2017. 2016. US Government Printing Office. Washington, D.C. Available at: <https://www.congress.gov/congressional-report/114th-congress/senate-report/259/1>
- *** Basic figures on the European neighbourhood policy - South countries: 2016 edition. 2016. Publications Office of the European Union. Luxembourg.
- *** Kazakhstan in figures. 2015. Statistics Agency of the Republic of Kazakhstan. Astana.
- *** Level of employment in the world. 2015. CIS statistics. *Statistical Bulletin*, 12 (543).
- *** On the modernization of engineering systems in the farming industries of Russia, Belarus and Kazakhstan. 2016. *Studies on Russian Economic Development*, 1: 114-117.
- *** Resident population. Interstate Statistical Committee CIS. Available at: <http://www.cisstat.com/eng/index.htm>
- *** Population of Ukraine. Social and demographic problems of the Ukrainian village. 2015. Institute of Demography and Social Researches of the National Academy of Science of Ukraine, Kyiv.

The Profile of an Expatriate in South Korea: Evidence from The Korean TNC's Employee's Survey

Olga SHVETSOVA

Korea University of Technology and Education (KOREATECH)
School of Industrial Management², Republic of Korea (South Korea)
Shvetsova@koreatech.ac.kr

Suggested Citation:

Shvetsova, O. 2017. The Profile of an expatriate in South Korea: Evidence from the Korean TNC's employee's survey. *Journal of Applied Economics Science*, Volume XII, Winter 7(53): 1943-1955.

Abstract:

The purpose of this paper is to investigate the modern trends in managing expatriates in South Korea, explore new tendencies and perspectives, and create expatriate profile. Specifically, this study discusses "status-certainty-autonomy-relatedness-fairness" (further – SCARF) model of David Rock and seeks answers for two questions: What kind of factors influence managing expats? What is the profile of expatriate in South Korea according to the Fourth Industrial Revolution?

This paper employs a single research design based on field survey to gain an in-depth understanding. The findings reveal that South Korean companies use a specific human resource management (further – HRM) approach to managing expatriates, which is based on core competences and very close to the tasks of the Fourth Industrial Revolution.

The single country (South Korea) and two Korean companies are research limitations. Findings of this paper include labor migration survey, in-depth interview of expatriates, new approach to managing expatriates in South Korea. Future research is needed to study more cases of foreign countries for comparative analysis.

Keywords: human resource management; "status-certainty-autonomy-relatedness-fairness" model; labor force mobility; expatriates; South Korea; the Fourth Industrial Revolution

JEL Classification: F 22; F 23; O15; O53; R23

Introduction

The globalization of the world economy requires more professional employees cross over the world, create new competitive competencies and build strong leadership (Deirdre and Bruning 2005). The success of transnational companies now largely depends on their ability to organize the flow of information, capital, labor and other resources at the global level (Adams 2003).

In today's global economy, having a mobile workforce in the global world is a competitive necessity (Cerdin and Selmer 2014). No wonder nearly 80% of midsize and large companies currently send professionals abroad - and 45% plan to increase the number they have on assignment (Figure 1).

Labor mobility strategies need to be comprehensive, flexible, adaptive and constantly evolving to meet specific business needs, cope with the growing demands for staff involvement while managing the different needs and expectations of different generations of employees from one side and competitive business strategy from another side (Schwartz *et al.* 2014, Vinogradova 2015).

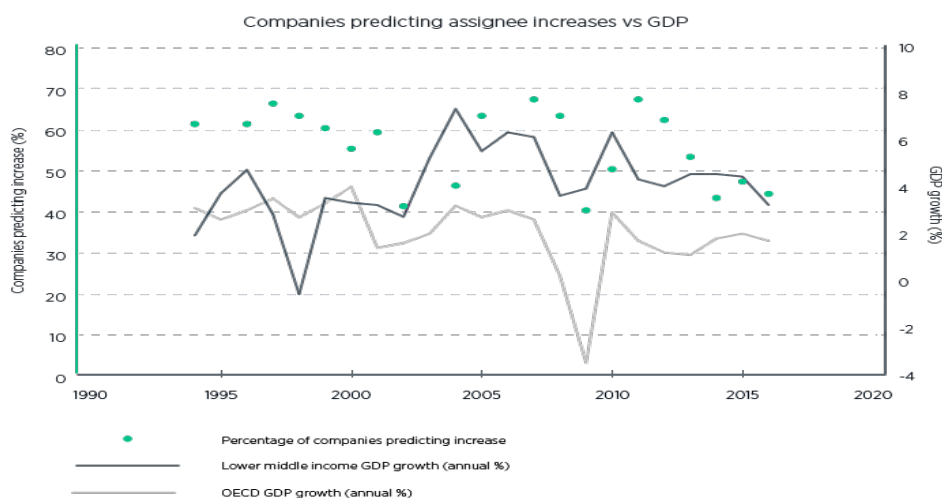
The gap between the supply and demand of personnel is determined by the deficit in different regions of the world and the acute shortage of experts in specific markets and in specific areas (Anderson 2005, Morozova and Torgashev 2014). The explosive growth in emerging markets creates a tangible increase the number of specialists working outside the country (Belderbos and Heijltjes 2005).

Managing expatriation becomes more important due to increasing global labor mobility (Cohen and Soto 2001). Managers of global companies have to prepare special programs of managing expatriates, including a candidate's assessment, adaptation, managing cross-cultural shock, stimulation, learning procedure, and self-

² 1600 Chungjeol-ro, Byeongcheon-myeon, Dongnam-gu, Cheonan City, Chungnam Province, 31254, Republic of Korea (South Korea).

management, and helping investigate the core competencies of foreign employees and improve competitive business strategy (Hays 1974, Myloni *et al.* 2004).

Figure 1. Companies Predicting Assignee Increases vs. GDP



Source: World Bank national accounts data 2017.

South Korean companies have raised their international business activity by more than 25% for the last fifteen years (Doudeijns and Dumont 2003). Nowadays Korean companies reach new global markets and try not only to achieve financial assets and benefits, but they are looking for core competencies, knowledge and best practices of management. In this case, the amount of invited expatriates strongly increases in South Korea, especially in industries where high-skilled workers are required. Nowadays the leading global Korean companies, for example Samsung and Hyundai corporations, declare that it is very important to create special strategies in managing expatriates.

1. Theoretical aspects of global employees' mobility

1.1. Definitions and models of labor migration process

Among the key theories and concepts in the study of migration processes of personnel a neoclassical concept can be distinguished. This concept places the emphasis on country differences in wage levels. Hicks in his *"The theory of wages"* (Flatau 2002) considers labor migration as a decision of a rational individual, capable of full and reliable information correctly assesses their prospects. Dowling, Festing, and Engle (2008) singled out a level of incomes of associates and aspiration to occupy a higher position in a particular social group as factors provoking moving of workers. In the context of the globalization of the world economy, migration continues in the concept of the global migration system.

The researcher Wallerstein (1976, 229–233) considers the world system as multicultural territorial division of labor, based on methods and production conditions and leading to the allocation of three regional zones: the core, semi periphery and periphery.

Punccino's model of human capital lies at the heart of most studies on migration and mobility of workers (Punccino 2007). Researcher Adams (2003) started considering investment in human capital in the context of the decision to migration.

The age parameter specifies the period during which the employee will be able to benefit from investment in his personal human capital, implemented in the form of migration. Age is a major restriction on the movement of labor, both nationally and internationally. According to Ehrenberg and Smith (2013, 56–97), the most people at the

age of 20-24 are inclined to move; about 13% of representatives of this age group make a decision on migration, both internal and external, every year.

According to the above provisions, an assumption can be made that the presence of a flexible (environment-oriented) HR strategy in a transnational corporation, including expatriates, significantly enhances staff stability and the sustainability of the management system as a whole.

H1: Labor mobility strategies need to be comprehensive, flexible, adaptive and constantly evolving to meet specific business needs in the South Korean labor market.

1.2. Importance of “Expat” mobility. Forms of expatriation

Expatriation has long been identified as a coordination and control mechanism used by multinational corporations (Arisset *et al.* 2015). As global competition continues to intensify, it becomes increasingly important for multinational corporations (MNCs) to maintain control over their international operations (Carlson 2005), since appropriate control will ensure that the MNCs' strategic goals are met and deviations from standards are corrected to enable subsidiaries act in accordance with the headquarters' policies (Vaiman and Brewster 2015).

Numerous definitions of expatriates exist. Several researchers define an expatriate as someone who is assigned to a single foreign country and able to hold a leadership role (Forstenlechner and Rutledge 2010), has high technical skill levels relative to personnel in the host location and has a limited role or time for his or her assignment in the overseas location (Adler and Bartholomew 1992).

Managing expatriates' mobility can be used as a tool to improve competitiveness of global corporations (Gergen 2012). Kang and Shen (2014) indicate that the process of personnel management in the South Korean companies is based on a competency-based approach; however, the expatriate management processes are not systemic, but individual, including in the matters of motivation.

H2: Competence-based approach is not used as a major strategy basis in managing expatriates in the South Korean companies.

In the context of the rapid development of international business, regional specificity plays a key role in global labor migration, since awareness of it motivates a specialist in mobility, and geographical boundaries does not have any obstacles (Belderbos and Heijltjes 2005). Nowadays expatriates participate in one of modern types of mobility:

- Short-term assignments (less than 1-year contract) have become more popular; 20% of assignments now last less than 12 months, compared with 10% in 2015 (OECD 2017).
- Project-based assignments. Organizations are bringing selected employees from different parts of the organization together for a specific project, requiring some to relocate temporarily, or travel frequently while the work is carried out (Peltokorpi and Froese 2012).
- Commotion and extended business travel allows assignees to work in a specific location without relocating and has become a viable alternative to relocation for employees with family commitments, and in roles that require extensive travel by their nature (Kim 2013).
- Intra-country mobility is on the rise as organizations look to maximize their investment in mobility. It may be easier and more effective, for example, for a company to transfer skilled workers from Shenzhen to Huangshan or from Mumbai to Ahmadabad, than to move workers from the US or other mature markets (OECD 2001).
- Rotational employee programs, often used in the development of high potential employees and in specific industries, are becoming increasingly internationalized (Froese 2012).
- Global nomads. Regional leaders often find that their role requires extensive business travel and, as a result, they are constantly on the move. Similarly, some specialists move from project to project to the extent that they effectively have no 'home' country (Self *et al.* 2011).

- One-way relocation when organizations move their regional or global headquarters in order to be closer to business interests and the fastest-growing markets, meaning the permanent relocation of key managers and their families (Froese 2012).
- Contingent labor is increasingly being used by organizations to meet short-term and specialist demand (Peltokorpi and Froese 2012).

Kraeh, Froese and Park (2015) compare the management of skilled expatriates in various Korean companies in their recent study and conclude that the motivation system is individual and the adaptation processes are similar.

H3: Motivation is one of the basic mobility indicators in the structure of expatriation in South Korea.

Virtual mobility is the final piece in the jigsaw (Punnett 2004). Technological innovation has allowed employers to bring the best people, wherever they may be, to work and train together (Salamin and Davoine 2015).

There are fiscal incentives for highly skilled immigrants in South Korea: since January 2003, tax-free allowances of up 40% of salary to cover cost of living, housing, home leave and education. Tax-exempt salary period makes up to 5 years if the individual is (i) employed under a tax-exempt technology-inducement contract or (ii) a foreign technician with experience in certain industries (World of Work Report 2014, 191).

The amount of foreign employment rose during last years in South Korea and a positive trend can be seen in the Table 1.

Table 1. 2016 Foreigner Labor Force Survey (South Korea)

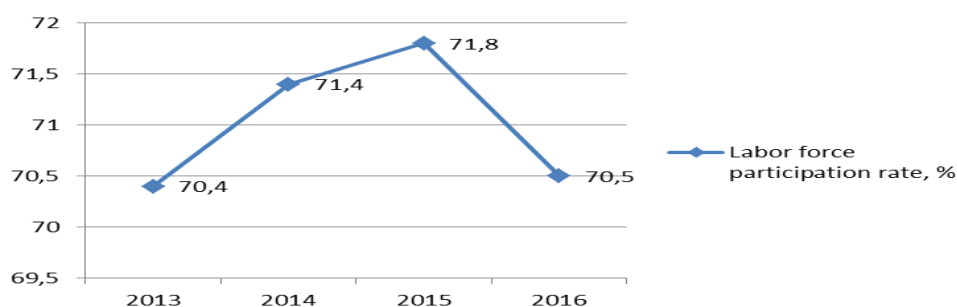
Year	Foreign employment population, thousand people	Trend	Trend, %
2016	1421	+51	+3.7
2015	1370	+85	+5.2
2014	1285		

Source: KOSTAT (Statistics Korea) 2017.

In May 2016, there were 1,425 thousand foreign persons employed. This number increased by 51 thousand persons (3.7%) as compared to the previous year:

- the employed foreigners amounted to 962 thousand persons, which grew by 25 thousand persons (2.6%) against 2015;
- the employment-population ratio for foreigners stood at 67.6%, being by 0.7% lower against 2015. The unemployment rate of foreigners stood at 4.2%, being by 0.7% lower against 2015 (Figure 2).

Figure 2. Labor Force Participation Rate for Foreigners in South Korea, % of total participation



Source: KOSTAT (Statistics of Korea) 2017.

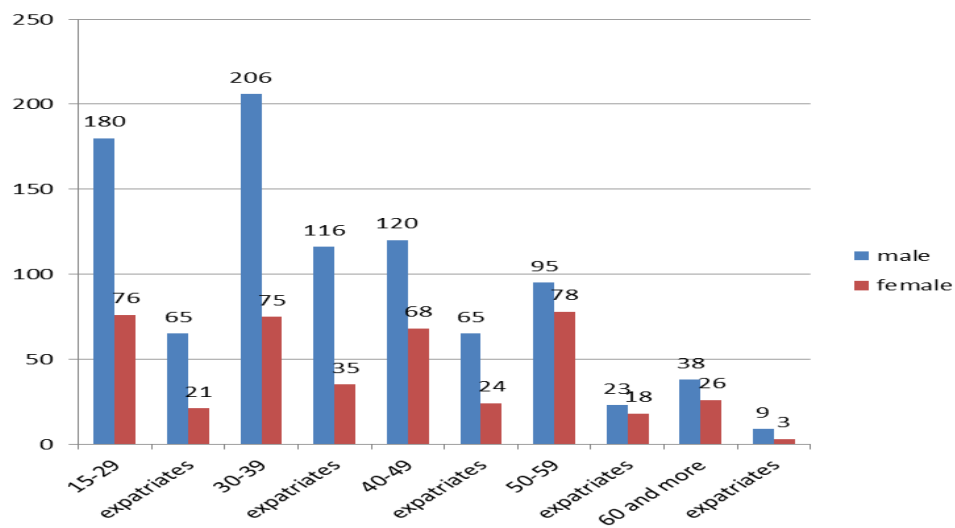
The rate of foreign labor force participation in South Korea has constant level during past four years because of long-term contracts with high-skilled employees. The figure shows that male expatriates exceed female ones in number, the most popular age level is 30-39 (Table 2, Figure 3, Figure 4).

Table 2. Employed Foreigners in South Korea by Industry and Skills

Type of Industry	2016			2015			2014		
	thousand persons	high-skilled employees, %	% of total	thousand persons	high-skilled employees, %	% of total	thousand persons	high-skilled employees, %	% of total
Agriculture, Forestry and Fisheries	49	15	5.09%	53	18	5.92%	57	20	6.68%
Mining and manufacturing	437	69	45.38%	417	66	46.59%	407	65	47.71%
Construction	85	56	8.83%	75	50	8.38%	81	53	9.50%
Whole sales, Retail trade, Hotels and restaurants	190	47	19.73%	170	41	18.99%	160	40	18.76%
Electricity, Transportation, Communications and Financial activities	15	68	1.56%	13	61	1.45%	11	58	1.29%
Business, Personal and Public services	187	74	19.42%	167	64	18.66%	137	56	16.06%
Total	963		100%	895		100%		853	100%

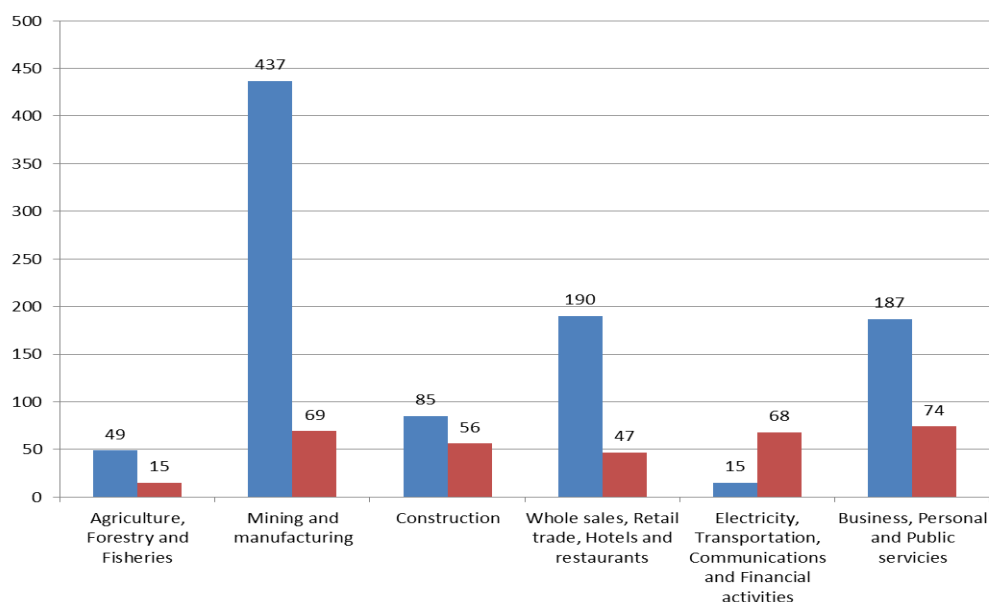
Source: KOSTAT (Statistics of Korea) 2017.

Figure 3. Employed Foreign Persons (Including Expatriates) in South Korea by Age and Sex, 2016



Source: KOSTAT (Statistics of Korea) 2017.

Figure 4. Employed Foreigners in South Korea by Industry and Skills



Source: KOSTAT (Statistics of Korea) 2017

The above data support hypothesis 1 that Korean companies should use a more flexible and adaptive expatriate management system, taking into account the environmental impacts.

2. Survey. Operations with primary and secondary data

2.1. Data and method

This study uses statistical data from open sources, theoretical sources, data obtained by the authors while questioning the staff of international corporations in South Korea., Quantitative (statistical data processing, survey) and qualitative (deduction and induction) methods were chosen as the methods of research.

This research discusses the SCARF model (Rock 2008). The SCARF model is a summary of important discoveries from neuroscience about the way people interact socially. The use of this model allows determining the degree of influence of expatriate motivation on the competitiveness of an international company. Based on this model, it is possible to identify differences in the motivation of different groups of personnel of an international company.

The model is made up of the following domains: Status, Certainty, Autonomy, Relatedness and Fairness. These five domains have been shown in many studies to activate the same reward circuitry that physical rewards activate, like money, and the same threat circuitry that physical threats, like pain, activate (Rock 2009).

Unlike many other motivational theories, the SCARF model is quite modern – it was first published in 2008 by David Rock. SCARF is an acronym, where the letters are taken from the first letters of the words:

- *Status*, which is about relative importance to others,
- *Certainty*, which concerns being able to predict the future,
- *Autonomy*, which provides people a sense of control over events,
- *Relatedness*, which is a sense of safety with others,
- *Fairness*, which is a perception of fair exchanges between people.

Understanding that these five domains are primary needs helps individuals and leaders better navigate the social world in the workplace (Rock 2009). The stages of the research:

- 1) To analyze the labor mobility market in South Korea, collect and analyze statistical data, define the trends;

- 2) To select an international company and an audience for conducting research;
- 3) To develop procedures for conducting a survey, and analyze the results;
- 4) To develop an expatriate profile and recommendations for improving the management of foreign employees in South Korean companies.

The advantage and novelty of the chosen methods is in the synthesis of theoretical and practical approaches, the adaptation of methods to specific conditions, and the possibility of open use of the results in further studies.

The questionnaire survey was conducted on the basis of the largest international Korean corporations Samsung and Hyundai, having a comprehensive personnel management system and the largest expatriate staff in the country.

2.2. Managing expatriates in South Korean companies. Framework of survey (research procedure)

Survey was done by the author during 2015-2016 and covered two fields.

Field 1: The author interviewed 24 persons from different departments and job positions, who are expatriates in Samsung and Hyundai companies located in South Korea. They were asked about their individual characteristics and skills (Table 3). All answers were divided in 3 levels according to the importance of each skill for the workplace (1 – low level of importance, 2 – medium level, 3 – high level).

Table 3. Structure of Questionnaire (for Expats)

Question	Answer		
General information			
Job position			
Age			
Sex			
Work responsibilities			
Work experience (on this position)			
Contract validity period			
Mismatch in expectations			
Nationality			
Specific information (competencies)	3	2	1
Perception			
Cultural			
Professional			
Communication			
Self-management			
Strategic			
Cognitive			

Source: Compiled by the author.

Field 2: The author interviewed eight managers of different departments, who are managing in Samsung and Hyundai companies located in South Korea. They were asked about core competencies of expatriates (Table 4). All answers were divided in 3 levels according to the importance of each competence for the company's strategic goals (1 – low level of importance, 2 – medium level, 3 – high level).

Table 4. Structure of Questionnaire (for Managers)

Question	Answer		
	3	2	1
Specific information (competencies)			
Perception			
Cultural			
Professional			
Communication			
Self-management			
Strategic			
Cognitive			
Mismatch in expectations			

Source: Compiled by the author.

3. Results and future research

3.1. Results

According to the survey, the following results were received: 1. Trends in workforce migration in South Korea were analyzed. 2. Modern theoretical approaches in expatriate’s management were discussed. 3. Based on the respondents’ answers the profile of an expatriate in South Korean companies was investigated.

It can be seen that the typical profile of an expatriate in South Korea refers to a young man aged 35-45, usually without family, but with good experience and professional skills, motivated for managing global operation and interested in career development (Table 5).

Table 5. Typical profile of an expatriate in South Korea

Indicator	Result
Sex	Male
Contract validity period	Long-term (2 years and more)
Job position	Specialist (different industries, high skilled)
Home country (region)	EU/USA
Age	35-45
Main responsibility	Managing a global operation/career development

Source: Compiled by the author.

This proves hypothesis 3 that the expatriates’ motivation plays a key role in the formation of a stable system for foreign personnel management in South Korean companies. According to the second field of research the most important competencies of expatriates were found (Table 6).

It is interesting to find out that the level of competence importance is different from the viewpoint of managers and expatriates. *For example*, for the manager it is important to meet strategic and professional competencies of the expatriate first of all, and for the expatriate himself it is most important to provide cultural and communication skills in South Korean companies.

Parameters have different perceptions among different groups of personnel in the presence of the same groups of key competencies.

Table 6. Importance of an Expatriate's Skills by Levels

Competencies	Importance for expat, level 1-lowest, 7- highest	Importance for manager, level 1-lowest, 7- highest
Perception	7	7
Cultural	1	3
Professional	4	2
Communication	2	4
Self-management	3	6
Strategic	5	1
Cognitive	6	5

Source: Compiled by the author.

Also mismatches in expectations of manager and expatriates were found (Table 7 and Table 8). This proves hypothesis 2 that at present South Korean companies do not use actively a competency-based approach in the management of expatriates, therefore it is possible to make recommendations for improving the expatriate management system, including with the use of the SCARF model.

Table 7. Mismatch in expectations managing expatriation

Indicator	Expatriate, %	Company, %
Candidate concerns	54	17
Organizational improvements	50	20
On assignment	48	57

Note: All participant responses are from ECA's Managing Mobility

Source: Author's survey 2016

Table 8. Mismatch in Expectations Managing Expatriation in South Korea

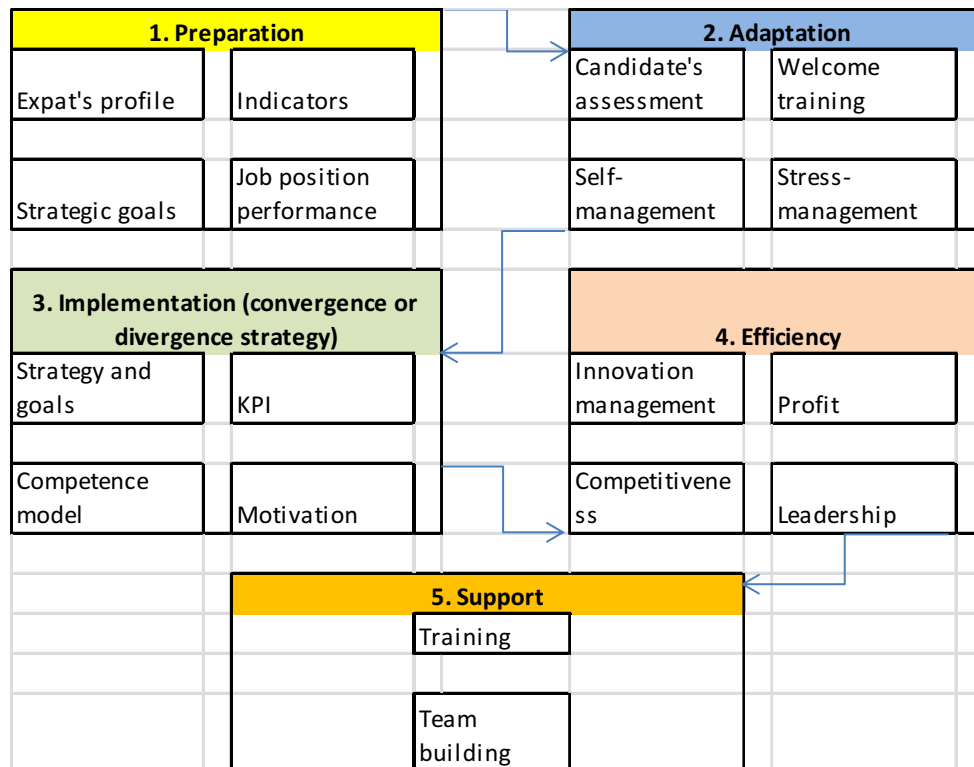
Indicator	Expatriate, %	Company, %
Candidate concerns	48	22
Organizational improvements	45	25
On assignment	41	45

Note: All participant responses are from Samsung and Hyundai companies, located in South Korea

Source: Author's survey 2016

In this case, it is necessary to provide improvement of the of expats' management model in South Korea. This model consists of several steps in different business areas of the company (Figure 5).

Figure 5. System of expats' management in South Korea



Source: Compiled by the author

3.2. Discussion

Modern studies on the managing expatriates are of interest to many companies in various countries around the world. However, the questions of assessing the impact of external and internal factors on the processes of global labor migration remain the main issue and subject of discussion. It is possible to analyze migration processes in the international markets from the position of influence of such external factors as the development of branch technologies, the transformation of international operations, the expansion of companies' activity into the international markets. Among the internal factors affecting the processes of labor migration the flexibility of the strategy, and key competencies can be identified as factors of the competitiveness in the global market.

The question of motivation and adaptation of expatriates in the international companies is controversial, since it is impossible to apply a universal model of expatriate management in different countries, taking into account the peculiarities of national management and culture (McCaughey and Bruning 2005). In this regard, it is necessary to further study the motivational mechanisms for managing expatriates.

Most modern international companies build the expatriate management policy without taking into account global labor processes, in this connection the issues of studying models and approaches to improving the internal processes of personnel management of global corporations become topical, including the development of their system of expatriates' motivation and adaptation, with regard to the trends of the world market labor resources. This study suggests new approaches to the study of the above processes.

Future research will concern each field in the new expatriates' management model with estimating indicators.

Conclusion

This study presents the results of labor migration processes analysis in South Korea, including mobility indicators and the structure of expatriation. The importance and relevance of the issues of expatriate management in the

international companies are examined and analyzed based on the industry field of South Korean companies. Static information was used to obtain the results, and questionnaire survey was conducted on the basis of a competency-based approach to the management of the international companies.

The research results confirm the hypotheses suggested, and develop the theoretical and practical provisions of earlier studies conducted by Kraeh, Froese, and Park (2015), Dowling, Festing, and Engle (2008), Kim (2013), Self, Self and Bell-Haynes (2011).

Interesting results were found in the research field reflecting the different levels of importance of competences in Korean companies on the part of managers and expatriates. The modern theoretical concepts of global human resources management, labor mobility and expatriation are analyzed, and the conducted study reflects the possibility of applying a competency-based approach to managing labor mobility. Various forms of expatriation, as well as strategies for managing human resources in an international company, and their impact on the processes of managing labor mobility have been discussed. Trends in the development of labor mobility in South Korea have been analyzed, tendencies of increasing the number of expatriates in Korean companies and the growing interest of Korean managers in shaping new strategies for expatriate management have been revealed.

This research has several limitations: first, the data for the last 2 years were used; secondly, two major international corporations of South Korea were chosen as the object of research; thirdly, two groups of personnel – expatriates and local managers – were chosen as the target group for the questionnaire survey. These limitations allow for further research on this subject, and the results obtained are possible for theoretical and practical application in the territory of other countries.

The result of the study is a new approach to expatriate management in the South Korean companies, which is provided by author. Further research will be devoted to the motivation of expatriates and a comparative analysis of the factors influencing the trends of expatriation in different countries.

References

- [1] Adams, R.H. 2003. *International Migration, Remittances, and the Brain Drain. A Study of 24 Labor Exporting Countries. Policy Research Working Paper 3 069*. The World Bank, Poverty Reduction and Economic Management Network, Poverty Reduction Group. Available at: <https://openknowledge.worldbank.org/bitstream/handle/10986/18161/multi0page.pdf> (accessed June 7, 2017).
- [2] Adler, N.J., and Bartholomew, S. 1992. Managing globally competent people. *Academy of Management Executive*, 6: 52–65.
- [3] Al Ariss, A., Cerdin, J.L., and Brewster, C. 2015. International migration and international human resource management. M. Dickmann, C. Brewster and P.R. Sparrow, *Contemporary HRM Issues in Europe, 3rd Edition*. London: Routledge.
- [4] Anderson, B.A. 2010. Expatriate selection: Good management or good luck? *International Journal of Human Resource Management*, 16(4): 567–583.
- [5] Belderbos, R.A., and Heijltjes, M.G. 2005. The determinants of expatriate staffing by Japanese multinationals in Asia: Control, learning and vertical business groups. *Journal of Internal Business Studies*, 36(3): 341–354.
- [6] Carlson, L. 2005. Complications abound in managing expatriate benefits. *Employee Benefit News*, 19(1): 28–39.
- [7] Cerdin, J.L., and Selmer, J. 2014. Who is a self-initiated expatriate? Towards conceptual clarity of a common notion. *International Journal of Human Resource Management*, 25(9): 1281–1301.
- [8] Cohen, D., and Soto M. 2001. Growth and Human Capital: good data, good results. OECD Development Centre WP (179). Available at: <http://www.oecd.org/dataoecd/33/13/2669521.xls> (accessed March 1, 2017).
- [9] Doudeijns, M., and Dumont J.C. 2003. Immigration and labor shortages: evaluation of needs and limits of selection policies in the recruitment of foreign labor. OECD-EU conference on “The Economic and Social

- Aspects of Migration”, January 21–22, in Brussels, Belgium. Available at: <http://www.oecd.org/dataoecd/13/59/15474016.pdf> (accessed March 12, 2017).
- [10] Dowling, P.J., Festing, M., and Engle, A.D. 2008. *International Human Resource Management: Managing People in a Multinational Context. 5th Edition*. London: Engage Learning EMEA.
- [11] Ehrenberg, R.G., and Smith, R.S. 2013. *Modern Labor Economics: Theory and Public Policy: 12th Edition*. Pearson Education.
- [12] Flatau, P. 2002. Hicks' The Theory of Wages: Its place in the history of neo-classical distribution theory. *Journal of Economic Literature Classifications*, 23–39.
- [13] Forstenlechner, I. and Rutledge, E. 2010. Unemployment in the Gulf: time to update the “social contract”. *Middle East Policy*, 17(2): 38–51.
- [14] Froese, F.J. 2012. Motivation and adjustment of self-initiated expatriates: the case of expatriate academics in South Korea. *The International Journal of Human Resource Management*, 23: 1095–1112.
- [15] Giles, C., and Allen, K. 2013. *Southeastern shift: The new leaders of global economic growth*. Financial Times.
- [16] Kang, H., and Shen, J. 2014. International human resource management policies and practices of South Korean MNEs: a review of the literature. *Asia Pacific Business Review*, 20(1): 42–58. DOI: <http://dx.doi.org/10.1080/13602381.2012.711670> (accessed May 5, 2017).
- [17] Kim, E. 2013. Corporate Korea's hot import: foreign professionals. *White Papers*, Available at: <http://www.dhrinternational.com/insights/corporate-koreas-hot-import-foreign-professionals/> (accessed May 3, 2017).
- [18] Kraeh, A., Froese, F.J., and Park, H. 2015. Foreign professionals in South Korea: Integration or alienation? In D'Costa, A. (Ed.), *After Development Dynamics*. Oxford University Press.
- [19] McCaughey, D., and Bruning, N.S. 2005. Enhancing opportunities for expatriate job satisfaction: HR strategies for foreign assignment success. *Human Resource Planning Society*, 28(2): 21–29.
- [20] Morozova, O.I., and Torgashev, D.N. 2014. Organization and management monitoring of socio-labor relations in the system of Russian management. *Contemporary Economic Issues*, 1, DOI: [10.24194/11402: http://economic-journal.net/index.php/CEI/article/view/94/81](http://economic-journal.net/index.php/CEI/article/view/94/81) (accessed July 1, 2017).
- [21] Myloni, B., Harzing, A.W.K., and Mirza, H. 2004. Host country specific factors and the transfer of human resource management practices in multinational companies. *International Journal of Manpower*, 25(1): 518–534.
- [22] Peltokorpi, V., and Froese, F.J. 2012. Differences in Self-Initiated- and Organizational Expatriates' Cross-Cultural Adjustment, In Andresen, M., Al Ariss, A., Walther, M., Wolff, K. (Eds.), *Self-Initiated Expatriation: Individual, Organizational, and National Perspectives*, 90–104. Routledge.
- [23] Puccino, S. 2007. Worldwide practices and trends in expatriate compensation and benefits. *Benefits & Compensation Digest*, 44(1): 34–38.
- [24] Punnett, B.J. 2004. *International Perspectives of Organizational Behavior and Human Resource Management*. Armonk, New York: M.E. Sharpe.
- [25] Richard, H.D. 1974. Expatriate selection: Insuring success and avoiding failure. *Journal of International Business Studies*, 5(1): 25–37.
- [26] Rock, D. (2009). Your Brain at Work: Strategies for Overcoming Distraction, Regaining Focus, and Working Smarter All Day Long. *Harvard Business Review*, 79–99.

- [27] Salamin, X., and Davoine, E. 2015. International adjustment of female vs male business expatriates. A replication study in Switzerland. *Journal of Global Mobility*, 3(2): 183–212.
- [28] Schwartz, J., Bersin, J., and Pelster, B. 2014. Global Human Capital Trends 2014 survey. Deloitte University Press. Available at: <https://dupress.deloitte.com/dup-us-en/focus/human-capital-trends/2014/human-capital-trends-2014-survey-top-10-findings.html> (accessed May 15, 2017).
- [29] Self, R., Self, D.R., and Bell-Haynes, J. 2011. Intercultural Human Resource Management: South Korea and The United States. *International Journal of Management & Information Systems*, 15(1): 41–48.
- [30] Vaiman, V., and Brewster, C. 2015. How far do cultural differences explain the differences between nations? Implications for HRM. *International Journal of Human Resource Management*, 26(2): 151–164.
- [31] Vinogradova, N.A. 2015. Methods of evaluation of social development. *Contemporary Economic Issues*, 1, DOI: [10.24194/11506](https://doi.org/10.24194/11506). Available at: <http://economic-journal.net/index.php/CEI/article/view/123/106> (accessed July 5, 2017).
- [32] Wallerstein, I. 1976. *The Modern World-System: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century*. New York: Academic Press.
- *** KOSTAT. 2017. Available at: <http://kostat.go.kr/portal/eng/pressReleases/> (accessed March 2, 2017).
- *** OECD. 2001. *The Well-being of Nations: The Role of Human and Social Capital*. Paris: OECD Centre for Educational Research and Innovation.
- *** OECD. 2017. Labor productivity forecast (indicator). DOI: 10.1787/cb12b189-en (accessed March 12, 2017)
- *** World Bank national accounts data. 2017. Available at: <http://databank.worldbank.org/data/reports> (accessed March 2, 2017).
- *** *World of Work Report 2014: Developing with jobs. 2nd Ed. rev.* Geneva: International Labour Office, 2014.

Small Business Owners' Optimism on the Economy: Are Certain Owners More Optimistic than the Others?

Halil Dincer KAYA

Department of Accounting and Finance, College of Business and Technology
Northeastern State University, Oklahoma, United States
kaya@nsuok.edu and halildkaya@yahoo.com

Suggested Citation:

Kaya, H.D. 2017. Small business owners' optimism on the economy: are certain owners more optimistic than the others? *Journal of Applied Economic Sciences*, Volume XII, Winter, 7(53): 1956-1966.

Abstract:

In this study, we examine the relation between small business owners' views on the economy and their characteristics like experience, gender, age, political view, education, and race. Our main question is this: "Do business owners with certain characteristics hold a more positive view on the economy?" Our nonparametric tests show that, in the states where business owners have a more positive view on the national economy, there are more female owners, owners tend to be younger, and they tend to support "other political" views (i.e. they are not independent, conservative, or liberal). At the same time, in these states, there are fewer middle-aged owners and fewer "strong conservatives" when compared to the other states. In these states, owners' experience, education, and race are not significantly different from firms in other states. On the other hand, in the states where business owners have more a positive view on the state economy, there are fewer Hispanic owners and fewer middle-aged owners. In these states, the owners are less-experienced and there are fewer owners that are in the "Lean liberal" group. We also find that, in these states, there are more white owners and older owners, and there are more owners in the "Lean conservative" group.

Keywords: entrepreneurship; small business; state economy; national economy

JEL Classification: L26

Introduction

In this study, we examine the relation between small business owners' views on the economy and their characteristics like experience, gender, age, political view, education, and race. Our main question is this: "Do business owners with certain characteristics hold a more positive view on the economy?"

Previous research shows that the state of the economy has a significant impact on entrepreneurship. There are two hypotheses that relate the state of the economy and entrepreneurship. The first hypothesis, the "Recession Push" hypothesis, states that entrepreneurship is countercyclical. According to this hypothesis, when the economy is doing well, increased employment opportunities in "salaried" sector leads to a decrease in entrepreneurial activity (because people prefer to work in wage employment and thus refrain from starting risky businesses). Congregado *et al.* (2012) discuss the "Recession Push" and the "Prosperity Pull" hypotheses as well as numerous studies supporting these concepts. Evans and Leighton (1989) and Constant and Zimmermann (2004) support this view and argue that during recessions, people are pushed into self-employment because of weak labor market opportunities. Moore and Mueller (2002) also support this hypothesis. In addition to these papers, Fairlie (2013) supports the "Recession Push" hypothesis in the context of the 2008-2009 "Great Recession".

The second hypothesis, the "Prosperity Pull" hypothesis, on the other hand, states that entrepreneurship is countercyclical. This hypothesis states that during good economic times, the risks are lower for the entrepreneur, therefore entrepreneurial activity increases during these periods. First, if the business fails, the entrepreneur can easily find a paid job. Second, as Kim and Cho (2009) and Parker (2009) explain, during these times, new business opportunities will increase because market demand will be higher and venture capital will be more easily available. Cagetti and De Nardi (2006), Holtz-Eakin *et al.* (1994), and Blanchflower and Oswald (1998) also discuss about the relation between financing constraints in bad economic times and entrepreneurship. In fact, most of the papers on entrepreneurs' access to finance support the "Prosperity Pull" hypothesis. These papers argue that, when the

economy is doing well, entrepreneurs have better access to finance, meaning that “entrepreneurship” is pro-cyclical.

In this current study, we examine the issue from a different perspective. While the above mentioned papers examine the relation between the state of the economy and entrepreneurial activity, in this current study, we examine the relation between entrepreneurs’ perception on the economy and their characteristics. What kind of entrepreneurs are more optimistic on the economy? Knowing the answer to this question is important because knowing which groups are generally more pessimistic would help policymakers to devise strategies that support these groups first, in case of an economic recession. If certain business owners are generally more pessimistic on the economy, in case of an economic downturn, they would be the first to give up.

Our second contribution in this study is differentiating between entrepreneurs’ perception on the national economy and their perception on the state economy. What kind of entrepreneurs are more optimistic on the national economy? What kind of entrepreneurs are more optimistic on the state economy? Again, knowing the answers to these questions is important because both state policymakers and federal policymakers would benefit from this research.

Our paper proceeds as follows: Section 1 goes over the previous literature. Section 2 explains the data and the methodology. Section 3 shows the results. Section 4 concludes.

1. Research background

There are several studies that support the “Recession Push” hypothesis. Constant and Zimmermann (2004) study transitions between the states of employment, unemployment and self-employment. They provide a link between these transitions and the business cycle, and contend that self-employment is an important channel back to regular employment. According to the authors, “business cycle effects strongly impact the employment transition matrix”.

Evans and Leighton (1989) contend that, during recessions, unemployed laid-off workers or the unemployed are pushed into self-employment because of weak labor market opportunities. According to Evans and Leighton (1989), self-employment is pro-cyclical, although not strongly so. The authors argue that increases in effective federal income during the late 1970s increased self-employment rates while decreases during the Reagan years decreased self-employment rates.

Moore and Mueller (2002) also partially supports the “Recession Push” hypothesis. The authors explain that some workers may be ‘pushed’ into self-employment as a response to inadequate opportunities in the paid sector.

Fairlie (2013) also supports the “Recession Push” hypothesis. The author examines how the “Great Recession” affected business formation. He finds that local labor market conditions are a major determinant of entrepreneurship. He also finds that higher local unemployment rates increase the probability that individuals start businesses. Fairlie (2013) concludes that “the positive influences of slack labor markets outweigh the negative influences resulting in higher levels of business creation”.

While all of these studies support the “Recession Push” hypothesis, several other papers support the “Prosperity Pull” hypothesis. Shane (2011) states that the Great Recession had a negative impact on U.S. entrepreneurship. According to Shane (2011), at the end of the recession, the United States had fewer businesses and self-employed people than it had before the downturn began.

Another study that supports the “Prosperity Pull” hypothesis is Koellinger and Thurik (2012). The authors show that entrepreneurship Granger-causes the cycles of the world economy. They also show that the entrepreneurial cycle is positively affected by the national unemployment cycle. They contend that an upswing in the unemployment cycle leads to a subsequent upswing in the entrepreneurship cycle.

Brünjes and Diez (2013) partially supports the “Prosperity Pull” hypothesis. Their results show that better access to non-farm wage employment increases the likelihood of becoming an opportunity entrepreneur but has no effect on necessity entrepreneurship. The authors support the “Prosperity Pull” hypothesis for opportunity-driven entrepreneurship but not for necessity-driven entrepreneurship.

Rampini (2004) also supports the “Prosperity Pull” hypothesis. Rampini (2004) contends that entrepreneurship is pro-cyclical, even if agents have access to financial intermediaries.

A literature survey by Parker (2009) discusses evidence from the U.S. that new firm formation is pro-cyclical. He also points to the effect of falling wages in recessions, which may lower the opportunity costs for starting a business and encourage marginal types of entrepreneurship. According to Parker (2009), low-quality businesses may be removed in recessions, exerting a countervailing force on the total number of business owners.

Figueroa-Armijos, Dabson and Johnson (2012) partially supports the “Prosperity Pull” hypothesis. The authors state that “economic recessions increase costs, risk, stress, uncertainty, and business failures while decreasing the availability of employment. They find that, due to the “Great Recession”, there is a clear decline in opportunity entrepreneurship and an increase in necessity entrepreneurship.

Yu, Orazem, and Jolly (2014) also support the “Prosperity Pull” hypothesis. They discuss the research supporting the “Recession Push” and the “Prosperity Pull” hypotheses, plus the research that shows no correlation between self-employment and unemployment rate. They show that, graduates entering the labor market during adverse economic conditions lowers the probability of starting a business for eleven years after graduation.

Blanchflower (2000) reports a negative relationship between the self-employment rate and the unemployment rate in most OECD countries. The author could find “no evidence that increases in the self-employment rate increased the real growth rate of the economy; in fact, there was even evidence of the opposite”.

2. Data

In this study, we use the “United States Small Business Friendliness Survey” by Kauffman Foundation and Thumpstack.com in 2013. This survey asks small business owners their opinions on different issues including the national economy and the state economy. The survey also collects data on owner characteristics like owner’s position in the company, owner’s experience, whether or not the job is the primary job for the owner, owner’s gender, age, political view, education, and race.

All of the variables in this current study are explained below. These variables for each state are computed using the individuals’ responses. The two “economy rating” variables are:

- “Ratingofnationaleconomy”: “How would you rate the situation of the national economy over the past 12 months?” (very bad: 0, somewhat bad: 1, neither good nor bad: 2, somewhat good: 3, very good: 4)
- “Ratingofstateeconomy”: How would you rate the situation of your state economy in comparison to the national economy? (substantially worse: 0, a little worse: 1, the same: 2, a little better: 3, substantially better: 4)

The owner characteristic variables are:

- “Managerbutnotowner”: the percentage of respondents who are the manager but not the owner;
- “Nonmanageremployee”: the percentage of respondents who are an employee but not the manager;
- “Ownerandmanager”: the percentage of respondents who are the owner and the manager;
- “Ownerbutnotmanager”: the percentage of respondents who are the owner but not the manager;
- “Previousentre”: The percentage of owners who has previous entrepreneurship experience;
- “Previousstartups1”: The percentage of owners who started one previous business;
- “Previousstartups2”: The percentage of owners who started two previous businesses;
- “Previousstartups3”: The percentage of owners who started three previous businesses;
- “Previousstartups4”: The percentage of owners who started four previous businesses;
- “Previousstartups>4”: The percentage of owners who started more than four previous businesses;
- “Percentageofprimaryemp”: the percentage of small business owners that have their business as their primary job.

The other owner characteristic variables are self-explanatory. *For example:*

- “Female”: the percentage of small business owners in a state that are female;
- “Age<25”: the percentage of small business owners in a state that are less than 25 years of age;
- “Independent”: the percentage of small business owners who are “Independent” in their political view;
- “No Highschool”: the percentage of small business owners in a state who did not attend high school;
- “Asian”: the percentage of small business owners in a state that are “Asian”.

For each owner characteristic variable, I compute the percentage values for each state. For example, in California, what percentage of owners are female? If thirty percent of the small business owners are female, California's "Female" score is 30. Therefore, each state in the survey has a percentage value for each of these variables.

The original dataset includes states with only a few observations. Therefore, I eliminate the states with insufficient data. In the final sample, I am left with 41 US states. These states are Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Virginia, Washington, and Wisconsin. Table 1 shows the summary statistics for our variables (for 41 states).

In my empirical analyses, first I divide these states into two groups based on the business owners' rating on the "national economy". Using the average value of the rating across the 41 states, I create two groups of states: The states where business owners have a more positive view on the "national economy" and the states where owners have a less positive view on the "national economy". Then, I run nonparametric tests that compare the owner characteristics across the two groups of states.

Then, I divide the 41 states into two groups based on the business owners' rating on the "state economy". Again, using the average value of this rating across the 41 states, I create two groups of states: The states where business owners have a more positive view on the "state economy" and the states where owners have a less positive view on the "state economy". Then, I run nonparametric tests that compare the owner characteristics across these two groups of states.

Table 1. Summary Statistics (All Variables in %)

Variable	Mean	Median	Stdev	Min	Max
Rating of national economy	1.34	1.34	0.14	1.06	1.65
Rating of national economy	2.05	2.04	0.44	1.13	3.00
Manager but not owner	3.39	3.25	1.87	0.00	8.33
Non manager employee	0.53	0.41	0.72	0.00	3.23
Owner and manager	94.02	94.59	2.80	86.11	100.00
Owner but not manager	2.05	2.01	1.80	0.00	8.33
Previous entre	43.84	43.33	6.78	29.49	57.14
Previous startups1	44.74	44.64	12.08	16.67	100.00
Previous startups2	30.53	31.51	8.03	0.00	41.67
Previous startups3	15.10	14.68	7.42	0.00	33.33
Previous startups4	4.18	4.42	3.63	0.00	14.29
Previous startups>4	5.45	4.76	4.54	0.00	21.43
Primary employment	71.96	72.83	6.44	52.63	84.21
Female	37.00	36.96	5.96	21.05	52.94
Age<25	2.09	2.18	1.67	0.00	8.70
Age25-34	18.72	19.21	5.14	5.26	35.48
Age35-44	24.27	25.32	3.98	14.29	31.82
Age45-54	28.18	28.46	5.88	10.00	46.67
Age55-64	21.38	20.45	6.32	8.70	42.11
Age>64	5.36	5.71	2.61	0.00	11.43
Independent	30.52	28.85	6.62	21.05	52.63
Other political	17.43	16.67	4.80	8.33	34.78

Variable	Mean	Median	Stdev	Min	Max
Lean conservative	14.51	14.17	4.54	0.00	26.32
Lean liberal	12.84	11.79	5.14	5.06	26.47
Strong conservative	14.86	14.71	6.70	0.00	26.09
Strong liberal	9.84	9.89	3.92	0.00	19.05
No High school	0.66	0.00	1.06	0.00	4.35
High school	17.18	17.09	4.73	4.76	34.09
Community College	17.99	17.28	6.67	5.26	35.00
Technical College	16.00	14.67	5.09	4.35	26.32
Undergrad	31.51	31.58	8.11	10.00	61.70
Masters	12.88	13.27	4.35	4.26	24.05
Doctoral	3.79	3.64	2.59	0.00	15.79
Asian	1.67	1.12	2.73	0.00	16.67
Other race	5.38	4.21	5.34	0.00	26.67
Black	7.36	4.84	7.72	0.00	34.71
Hispanic	4.95	3.85	4.26	0.00	16.16
White	80.63	81.82	11.33	53.33	100.00

3. Results

Table 2 shows the results of the comparisons between the states where business owners have a high rating of the national economy and the states where business owners have a low rating of the national economy. Panel A compares owner’s position in the firm across the two groups, Panel B compares owner’s experience across the two groups, and Panel C compares the percentage of owner’s who have their business as their primary job across the two groups.

Panel A shows that there is no significant difference between the two groups in terms of any of the “Position” variables. In other words, the two groups of states do not differ significantly in terms of the percentage of owners who are “Managerbutnotowner”, “Nonmanageremployee”, “Ownerandmanager”, or “Ownerbutnotmanager”.

Panel B shows that there is no significant difference between the two groups in terms of any of the “Experience” variables. The two groups of states do not differ significantly in terms of “Previousentre”, “Previousstartups1”, “Previousstartups2”, “Previousstartups3”, “Previousstartups4”, or “Previousstartups>4”.

Panel C shows that there is no significant difference between the two groups in terms of the percentage of owners who have their business as their primary job. While the mean percentage of owners who have their business as their primary job is 71.27% in the states where owners have a more positive view on the national economy, the corresponding percentage is 72.77% in the other states (p-value of the difference=0.1171).

Table 2. Position and experience (High/Low national economy rating)

Variable	High-Score		Low-Score		Mann-W.
	Mean	Med.	Mean	Med.	p-value
Panel A. Position					
Managerbutnotowner	3.35	3.27	3.45	2.85	0.4948
Nonmanageremployee	0.43	0.21	0.65	0.46	0.1413
Ownerandmanager	94.38	94.74	93.62	94.30	0.2164
Ownerbutnotmanager	1.84	1.63	2.29	2.29	0.1264
Panel B. Experience					
Previousentre	45.06	45.20	42.43	42.11	0.1071

Previousstartups1	44.51	45.19	45.01	43.84	0.3050
Previousstartups2	30.52	32.22	30.53	31.51	0.3818
Previousstartups3	15.61	15.16	14.52	13.70	0.2241
Previousstartups4	4.60	4.86	3.69	3.05	0.1770
Previousstartups>4	4.76	4.00	6.25	5.88	0.1631
Panel C. Job is Primary Employment					
Primaryemployment	71.27	72.06	72.77	74.13	0.1171

Table 3 shows the results of the comparisons between the two groups of states in terms of gender, age, political view, education, and race. Panel A shows that the two groups of states are significantly different in terms of owners' gender. While 37.87% of the owners are female in the states where owners have a more positive view on the national economy, the corresponding percentage is 36.00% in the other states (p-value of the difference = 0.0734). We conclude that, in the states where business owners have a more positive view on the national economy, there are more female owners.

Table 3. Owner characteristics (High/Low national economy rating)

Variable	High-Score		Low-Score		Mann-W.
	Mean	Med.	Mean	Med.	p-value
Panel A. Gender					
Female	37.87	38.83	36.00	36.10	*0.0734
Panel B. Age					
Age<25	2.47	2.31	1.66	2.07	*0.0621
Age25-34	19.89	19.58	17.37	18.13	0.1448
Age35-44	22.67	23.32	26.11	25.93	***0.0063
Age45-54	28.54	28.71	27.77	27.97	0.3475
Age55-64	21.23	19.83	21.55	20.55	0.3621
Age>64	5.20	4.75	5.54	6.02	0.1249
Panel C. Political View					
Independent	30.60	28.04	30.43	29.41	0.367
Otherpolitical	19.04	19.00	15.57	15.45	***0.0087
Leanconservative	13.77	14.32	15.36	14.06	0.2242
Leanliberal	13.46	11.31	12.12	12.03	0.4223
Strongconservative	13.15	12.25	16.85	16.92	**0.0388
Strongliberal	9.98	10.18	9.67	9.89	0.4019
Panel D. Education					
No High school	0.85	0.13	0.45	0.00	0.2456
High school	17.38	17.04	16.96	17.28	0.4791
Community College	18.53	16.98	17.36	20.10	0.4532
Technical College	15.53	14.48	16.54	15.04	0.3621
Undergrad	30.90	32.60	32.21	30.81	0.3005
Masters	13.33	13.92	12.34	12.27	0.1801
Doctoral	3.49	3.61	4.13	3.80	0.2651
Panel E. Race					

Variable	High-Score		Low-Score		Mann-W.
	Mean	Med.	Mean	Med.	p-value
Asian	2.08	1.63	1.21	0.92	0.1966
Other race	6.52	4.44	4.06	4.07	0.1219
Black	7.04	4.34	7.73	5.05	0.2398
Hispanic	4.68	3.49	5.27	4.03	0.4531
White	79.68	82.02	81.73	79.01	0.3719

Panel B shows the comparisons for the age groups. We are seeing that the two groups of states are significantly different in terms of two “Age” variables. These are “Age<25” and “Age35-44”. The results show that there are more business owners who are under the age of 25 in the states where owners have a more positive view on the national economy. While the mean percentage of owners who are under the age of 25 is 2.47% in the states where owners have a more positive view on the national economy, the corresponding percentage is 1.66% in the other states (p-value of the difference=0.0621). On the other hand, the results show that there are fewer business owners who are between 35 and 44 years of age in the states where owners have a more positive view on the national economy. While the mean percentage of owners who are between 35 and 44 years of age is 22.67% in the states where owners have a more positive view on the national economy, the corresponding percentage is 26.11% in the other states (p-value of the difference=0.0063). We conclude that, in the states where owners have a more positive view on the national economy, there are more “young” owners and fewer “middle-aged” owners when compared to the other states.

Panel C shows the comparisons for the groups’ political views. We are seeing that the two groups of states are significantly different in terms of two “Political View” variables. These are “Other political” and “Strongconservative”. The results show that there are more business owners who are in the “Otherpolitical” group in the states where owners have a more positive view on the national economy. While the mean percentage of owners who are in the “Other political” group is 19.04% in the states where owners have a more positive view on the national economy, the corresponding percentage is 15.57% in the other states (p-value of the difference=0.0087). On the other hand, the results show that there are fewer business owners who define themselves as “Strong conservative” in the states where owners have a more positive view on the national economy. While the mean percentage of owners who define themselves as “Strongconservative” is 13.15% in the states where owners have a more positive view on the national economy, the corresponding percentage is 16.85% in the other states (p-value of the difference=0.0388). We conclude that, in the states where owners have a more positive view on the national economy, there are fewer people who define themselves as strong conservatives and more people who define themselves as having other political views.

Panel D shows that there is no significant difference between the two groups in terms of any of the “Education” variables. The two groups of states do not differ significantly in terms of the owners who did not go to high school, who attended high school, who attended community or technical college, or who have undergrad, master’s, or doctoral degrees.

Panel E shows that there is no significant difference between the two groups in terms of any of the “Race” variables. The two groups of states are similar in terms of the percentage of owners who are Asian, Black, Hispanic, White, or from Other races.

Table 4 shows the results of the comparisons between the states where business owners have a high rating of the state economy and the states where business owners have a low rating of the state economy. Panel A compares owner’s position in the firm across the two groups, Panel B compares owner’s experience across the two groups, and Panel C compares the percentage of owner’s who have their business as their primary job across the two groups.

Table 4. Position and experience (High/Low state economy rating)

Variable	High-Score		Low-Score		Mann-W.
	Mean	Med.	Mean	Med.	p-value
Panel A. Position					
Managerbutnotowner	3.45	3.31	3.34	3.25	0.4636
Nonmanageremployee	0.57	0.00	0.50	0.46	0.3202
Ownerandmanager	93.95	93.97	94.09	94.67	0.2875
Ownerbutnotmanager	2.03	2.06	2.07	2.01	0.4323
Panel B. Experience					
Previousentre	44.19	45.03	43.51	43.01	0.3821
Previousstartups1	46.77	47.81	42.81	41.18	**0.0142
Previousstartups2	29.83	30.48	31.19	32.91	0.1672
Previousstartups3	15.45	14.71	14.77	14.68	0.4021
Previousstartups4	4.23	4.86	4.12	3.37	0.3958
Previousstartups>4	3.72	3.53	7.10	6.11	***0.0090
Panel C. Job as Primary Employment					
Primaryemployment	71.25	72.95	72.64	72.83	0.2614

Panel A shows that there is no significant difference between the two groups in terms of any of the “Position” variables. In other words, the two groups of states do not differ significantly in terms of the percentage of owners who are “Managerbutnotowner”, “Nonmanageremployee”, “Ownerandmanager”, or “Ownerbutnotmanager”.

Panel B shows that there is a significant difference between the two groups in terms of two “Experience” variables. The two groups of states differ significantly in terms of “Previousstartups1” and “Previousstartups>4”. Our results show that, in the states where owners have a more positive view on the state economy, small business owners are less experienced. Compared to the other states, in these states, there are more owners with only a single previous entrepreneurship experience and fewer owners that previously started more than four businesses. While 46.77% of the owners previously started only a single business in these states, the corresponding percentage is 42.81% in the other states (p-value of the difference=0.0142). While only 3.72% of the owners previously started more than four businesses in these states, the corresponding percentage is 7.10% in the other states (p-value of the difference=0.0090). We conclude that, in these states, owners are less experienced when compared to the other states.

Panel C shows that there is no significant difference between the two groups in terms of the percentage of owners who have their business as their primary job. While the mean percentage of owners who have their business as their primary job is 71.25% in the states where owners have a more positive view on the state economy, the corresponding percentage is 72.64% in the other states (p-value of the difference=0.2614).

Table 5 shows the results of the comparisons between the two groups of states in terms of gender, age, political view, education, and race.

Table 5. Owner characteristics (High/Low state economy rating)

Variable	High-Score		Low-Score		Mann-W.
	Mean	Med.	Mean	Med.	p-value
Panel A. Gender					
Female	38.09	37.49	35.97	36.10	0.1151
Panel B. Age					
Age<25	2.08	2.21	2.11	2.07	0.4118
Age25-34	19.16	19.44	18.31	18.48	0.343
Age35-44	23.60	24.63	24.90	25.81	*0.0703

Variable	High-Score		Low-Score		Mann-W.
	Mean	Med.	Mean	Med.	p-value
Age45-54	28.04	29.20	28.31	28.31	0.343
Age55-64	21.10	20.23	21.64	20.55	0.4948
Age>64	6.01	6.09	4.73	5.14	*0.0834
Panel C. Political View					
Independent	29.52	28.14	31.47	29.41	0.1395
Otherpolitical	16.70	17.61	18.13	16.58	0.2919
Leanconservative	16.31	15.00	12.80	13.19	**0.0120
Leanliberal	11.79	10.68	13.84	12.50	*0.0961
Strongconservative	15.88	14.89	13.89	12.60	0.1608
Strongliberal	9.81	10.74	9.86	9.52	0.4072
Panel D. Education					
No Highschool	0.67	0.00	0.66	0.26	0.4832
Highschool	17.86	17.47	16.54	16.67	0.2447
Community College	16.91	16.77	19.02	20.16	0.1177
Technical College	16.76	14.88	15.27	14.18	0.1672
Undergrad	31.83	31.83	31.20	30.81	0.3287
Masters	12.01	11.34	13.70	13.57	0.1876
Doctoral	3.97	3.61	3.62	3.64	0.4533
Panel E. Race					
Asian	1.11	1.14	2.21	1.12	0.2046
Otherrace	4.83	3.48	5.91	4.40	0.1122
Black	6.98	4.25	7.73	5.88	0.372
Hispanic	3.60	3.05	6.24	4.07	**0.0229
White	83.48	82.63	77.91	78.60	*0.0635

Panel A shows that the two groups of states are not significantly different in terms of owners' gender. While 38.09% of the owners are female in the states where owners have a more positive view on the state economy, the corresponding percentage is 35.97% in the other states (p-value of the difference=0.1151).

Panel B shows the comparisons for the age groups. We are seeing that the two groups of states are significantly different in terms of two "Age" variables. These are "Age35-44" and "Age>64". The results show that there are fewer business owners who are between 35 and 44 years of age in the states where owners have a more positive view on the state economy. While the mean percentage of owners who are between 35 and 44 years of age is 23.60% in the states where owners have a more positive view on the state economy, the corresponding percentage is 24.90% in the other states (p-value of the difference=0.0703). The results also show that there are more business owners who are older than 64 years of age in the states where owners have a more positive view on the state economy. While the mean percentage of owners who are older than 64 years of age is 6.01% in the states where owners have a more positive view on the state economy, the corresponding percentage is 4.73% in the other states (p-value of the difference=0.0834). We conclude that, in the states where owners have a more positive view on the state economy, there are more "older" owners and fewer "middle-aged" owners when compared to the other states.

Panel C shows the comparisons for the groups' political views. We are seeing that the two groups of states are significantly different in terms of two "Political View" variables. These are "Leanconservative" and "Leanliberal". The results show that there are more business owners who are in the "Leanconservative" group in the states where owners have a more positive view on the state economy. While the mean percentage of owners who are in the "Leanconservative" group is 16.31% in the states where owners have a more positive view on the state economy, the corresponding percentage is 12.80% in the other states (p-value of the difference = 0.0120). On the other hand, the results show that there are fewer business owners who define themselves as "Leanliberal" in the states where owners have a more positive view on the state economy. While the mean percentage of owners who define themselves as "Leanliberal" is 11.79% in the states where owners have a more positive view on the state economy,

the corresponding percentage is 13.84% in the other states (p -value of the difference=0.0961). We conclude that, in the states where owners have a more positive view on the state economy, there are more people who define themselves as “Leanconservative” and fewer people who define themselves as “Leanliberal”.

Panel D shows that there is no significant difference between the two groups in terms of any of the “Education” variables. The two groups of states do not differ significantly in terms of the owners who did not go to high school, who attended high school, who attended community or technical college, or who have undergrad, master’s, or doctoral degrees.

Panel E shows the comparisons for the groups’ “Race” variables. We are seeing that the two groups of states are significantly different in terms of two “Race” variables. These are “Hispanic” and “White”. The results show that there are fewer business owners who are in the “Hispanic” group in the states where owners have a more positive view on the state economy. While the mean percentage of owners who are in the “Hispanic” group is 3.60% in the states where owners have a more positive view on the state economy, the corresponding percentage is 6.24% in the other states (p -value of the difference=0.0229). On the other hand, the results show that there are more business owners who are “White” in the states where owners have a more positive view on the state economy. While the mean percentage of owners who are “White” is 83.48% in the states where owners have a more positive view on the state economy, the corresponding percentage is 77.91% in the other states (p -value of the difference=0.0635). We conclude that, in the states where owners have a more positive view on the state economy, there are fewer Hispanic owners and more white owners.

Conclusion

In this study, we examine the relation between small business owners’ views on the economy and their characteristics like experience, gender, age, political view, education, and race. Our main question is this: Do business owners with certain characteristics hold a more positive view on the economy? In other words, how are owner characteristics different in states where small business owners have a more positive view on the economy versus in other states? As we know, optimism on economy is related to firm growth, therefore knowing which groups hold a more positive view on the economy is important for policymakers. In case of an economic downturn, policymakers should know which groups to support more.

In our analysis, we use the “United States Small Business Friendliness Survey” done by Kauffman Foundation and Thumtack.com in 2013. This survey asks small business owners about their views on the national and the state economy. It also asks them questions about their experience, gender, age, political view, education, and race.

First, we divide the US states into two groups according to small business owners’ views on the national economy. The first group includes the states that have a high rating of the national economy. The second group includes the states that have a low rating of the national economy. Then, we do the same for business owners’ views on the state economy. Here, the first group includes the states that have a high rating of the state economy. The second group includes the states that have a low rating of the state economy.

Our nonparametric tests show that, in the states where business owners have a more positive view on the national economy, there are more female owners, owners tend to be younger, and they tend to support “other political” views (*i.e.* they are not independent, conservative, or liberal). At the same time, in these states, there are fewer middle-aged owners and fewer “strong conservatives” when compared to the other states. In these states, owners’ experience, education, and race are not significantly different from firms in other states.

On the other hand, our nonparametric tests show that, in the states where business owners have more a positive view on the state economy, there are fewer Hispanic owners and fewer middle-aged owners. In these states, the owners are less-experienced and there are fewer owners that are in the “Lean liberal” group. We also find that, in these states, there are more white owners and old owners, and there are more owners in the “Lean conservative” group.

We advise policymakers to take precautions before troubling times by formulating policies that will support certain groups of business owners. The governments will need to use their resources more efficiently and this study will help them allocate their resources more efficiently. Our study shows that, when formulating their policies,

policymakers need to differentiate between the health of the national economy and the health of the state economy (because they have differing correlations with owner characteristics).

References

- [1] Blanchflower, D. G., 2000. Self-employment in OECD countries. *Labour economics*, 7(5): 471-505.
- [2] Blanchflower, D. G., and Oswald, A.J., 1998. *Entrepreneurship and the youth labour market problem: A report for the OECD*. Report to OECD, Paris.
- [3] Brünjes, J., and Revilla Diez, J. 2013. 'Recession push' and 'prosperity pull' entrepreneurship in a rural developing context. *Entrepreneurship & Regional Development*, 25(3-4): 251-271.
- [4] Cagetti, Marco, and De Nardi, M. 2006. Entrepreneurship, frictions, and wealth. *Journal of political Economy*, 114(5): 835-870.
- [5] Congregado, E., Golpe, A. A., and Parker, S. C. 2012. The dynamics of entrepreneurship: hysteresis, business cycles and government policy. *Empirical Economics*, 43(3): 1239-1261.
- [6] Constant, A. F., and Zimmermann, K. F. 2004. Self-employment dynamics across the business cycle: Migrants versus natives.
- [7] Evans, D.S., and Leighton, L. S. 1989. The determinants of changes in US self-employment, 1968–1987. *Small Business Economics*, 1(2): 111-119.
- [8] Fairlie, R.W. 2013. Entrepreneurship, economic conditions, and the great recession. *Journal of Economics & Management Strategy*, 22(2): 207-231.
- [9] Figueroa-Armijos, M., Dabson, B. and Johnson, T. G. 2012. *Entrepreneurship Research Journal*.
- [10] Holtz-Eakin, D., Joulfaian, D. and Rosen, H. S. 1994. Sticking it out: Entrepreneurial survival and liquidity constraints. *Journal of Political economy*, 102(1): 53-75.
- [11] GiSeung, K. and Joonmo C. 2009. Entry dynamics of self-employment in South Korea. *Entrepreneurship and regional development*, 21(3): 303-323.
- [12] Koellinger, P. D., and Thurik, A. R. 2012. Entrepreneurship and the business cycle. *Review of Economics and Statistics*, 94(4): 1143-1156.
- [13] Moore, C. S., and Mueller, R. E. 2002. The transition from paid to self-employment in Canada: The importance of push factors. *Applied Economics*, 34(6): 791-801.
- [14] Parker, S. C. 2009. *The economics of entrepreneurship*. Cambridge University Press.
- [15] Rampini, A. A. 2004. Entrepreneurial activity, risk, and the business cycle. *Journal of Monetary Economics*, 51(3): 555-573.
- [16] Shane, S. 2011. The great recession's effect on entrepreneurship. *Economic Commentary*.
- [17] Yu, L., Orazem, P. F., and Jolly, R. W. 2014. Entrepreneurship over the business cycle. *Economics Letters*, 122(2): 105-110.

Business Environment in Russia and its Stimulating Influence on Innovation Activity of Domestic Companies

Mikhail Yakovlevich VESELOVSKY
University of Technology, Moscow, Russia
consult46@bk.ru

Marina Alekseevna IZMAILOVA
Financial University under the Government of the Russian Federation, Moscow, Russia
m.a.izmailova@mail.ru

Alexey Valentinovich BOGOVIZ
Federal State Budgetary Scientific Institution
Federal Research Center of Agrarian Economy and Social Development of Rural Areas
All Russian Research Institute of Agricultural Economics, Moscow, Russia
aleksei.bogoviz@hse.ru

Svetlana Vladislavlievna LOBOVA
Altai State University, Barnaul, Russia
barnaulhome@mail.ru

Alexander Nikolaevich ALEKSEEV
Plekhanov Russian Economic University, Moscow, Russia
alekseev.alexan@mail.ru

Suggested Citation:

Veselovsky, M.Y. Izmailova, M.A., Bogoviz, A.V., Lobova, S.V., Alekseev, A.N. 2017. Business environment in Russia and its stimulating influence on innovation activity of domestic companies. *Journal of Applied Economics Science*, Volume XII, Winter 7(53): 1967-1981.

Abstract:

The article shows the results of analyzing the business environment formed in the Russian economy during the period of 2011-2016 and worsened by the anti-Russian sanctions. It reveals the impact of macroeconomic factors on the state of the entrepreneurial environment in Russia that has features of stagnation, and basic geopolitical and economic events as a determinant of negative tendencies in the economic environment of the country. It gives the analysis of the dynamics of the entrepreneurial environment and the comparative analysis of the main problems of the Russian business, taking into account the temporal factor in the context of their dominating impact on Russian companies in terms of a region and a sector, as well as depending on the business size. The article considers the innovation environment of the Russian entrepreneurship, reveals basic barriers of the innovation activity of domestic companies. It shows basic areas of forming a new innovation reality of the Russian economy and makes the conclusion about the need of Russia to move to a new technological mode and existence of prerequisites of the Russian economy innovative development. It defines economic changes as a real implementation of the model of the country's innovative development that takes into account the leading trends of the economic development on the national and global markets.

Key words: business environment; Russian economy; Russian entrepreneurship; macroeconomic factors; microeconomic factors; innovative development; stagnation; turbulence

JEL classification: O30; O31; O32

Introduction

Taking into account the high level of indefiniteness of the economic environment globally and nationally (Henley 2010), numerous interrelations in economy and political life (Szreter 2007), increasing role of the human factor in the scientific and technical progress (Šikýř 2015), in the nearest future Russian enterprises must, on the one hand,

analyze the global tendencies of developing new highly technological markets of goods and services, estimate and build up their potential opportunities on occupying leading positions on them, and, on the other hand, take into account a new geopolitical situation, changing benchmarks in the international economic integration, which has a direct impact on the uniqueness of the forming business environment in Russia.

The goal of this article is to research the business environment of the modern Russia, and to analyze the factors that determine its turbulent state. In the context of the indefiniteness of the environment and permanent crisis, many Russian companies do not merely “survive”, they continue developing, investing, implementing innovation projects, and tapping into new markets. This fact makes the research of the business climate in Russia urgent, taking into account the impact of macro- and microeconomic factors. The results of the research will be taken as a basis of offers on developing innovative entrepreneurship under the modern economic conditions.

1. Methods

When making the research, theoretical and methodological approaches of foreign (Dollar D, Hallward-Driemeier M., Henley D., Malesky E., Mengistae T., Moore M., Šafránková J. M., Schmitz H., Šikýř, M., Szreter S., Twiss B.C.) and national (Glaziev S.Yu., Dolgopiatova T.G., Ivanter V.V., Medynskiy V.G., Nekipelov A.D., Skamay L.G.) researchers whose scientific interests are found within the social and economic and innovative development were generalized. To formalize and generalize the results of the research, methods of comparative and abstract and logical analysis, as well as the general logical, formalization, inductive and deductive, and statistical methods were used.

Results of the World Bank’s research of the business activeness in countries of the world, data of polling heads of Russian companies about the Russian business climate conducted by the Russian Union of Industrialists and Entrepreneurs for the period of 2011-2016 (On Business Climate in 2014, 2015, 2016. Reports of the Russian Union of Industrialists and Entrepreneurs), as well as the results of polling representatives of international business working in Russia conducted by Fleishman Hillard Vanguard (Estimation of Business Environment in Russia for 2015 Made by Foreign Business) were analyzed.

Along with this, the agenda of research discussions and economic forums of Russia carried out by all parties in interest still contains top priority issues that require theoretical consideration and clarification and are related to innovative development of Russian economy in the context of continuing sanction wars, establishing new integration relations in the changing economic reality, and searching for internal reserves for economic breakthrough in the forefront of innovative transformations.

2. Results

2.1 Impact of macroeconomic factors on the state of Russian entrepreneurial environment

The period after the crisis of 2008 did not become for Russia the stage of economic breakthrough. As early as in 2013 the tempos of the economy growth considerably slowed down, and in 2014 they were less than 1% (Table 1). In 2015 there was the full fall, and in 2016 there were the minimum tempos of fall. The resources nature of economy and rather inertial improvement of business environment continued their full impact. Sanctions and counter-measures of the Russian government as a whole worsened the already difficult situation in the economy, in spite of rather considerable growth of some sectors of economy that strengthened in the context of sanctions.

Table 1. Tempos of the Russian economy growth, %

Indicators	2010	2011	2012	2013	2014	2015
GDP growth rate	4.03	4.3	3.4	1.3	0.7	-3.7
Industrial production index	8.2	4.7	2.6	0.3	1.7	-3.4
Growth index in processing industry	11.8	6.5	4.1	0.1	2.1	-5.4

Source: Official Website of the Federal Service of State Statistics

Along with this, in the context of the economy stagnation there were rather high tempos of growth of revenues from collecting taxes in the federal budget (On State of Business Climate in 2016: Report of the Russian Union of Industrialists and Entrepreneurs, 2017), see Table 2.

In the context of the growing cost of loans, the growth of fiscal loading creates additional risks for the investment activity of companies (Dollar, Hallward-Driemeier, Mengistae 2005), which has negative dynamics. During 2010-2012 the tempos of growth of investments in the basic capital did not fall lower than 6%.

However, in December 2012 investments in the basic capital decreased, while as to December 2011 they were 99.3% (Table 3). During 2014-2015 investments in basic capital continued decreasing and stopped in January – September 2016. However, its weak growth could not create conditions for the long-term economic development. The most considerable growth of investments as compared to 2015 was observed in fishing – by 58%, wood processing – by 29.7%, and publishing and printing – by 2 times.

Table 2. Income by types of taxes in the consolidated budget of the Russian Federation for January – November 2015-2016

Types of taxes	January - November, bln. RUR		
	2015	2016	rate, %
Royalty	2,995.0	2,660.6	88.8
Withholding tax	2,401.9	2,591.0	107.9
Income tax	2,416.2	2,576.1	106.6
VAT	2,150.5	2,366.1	110.0
Property taxes	1,034.4	1,056.8	102.2
Excise taxes	922.7	1,177.1	127.6

Source: Official Website of the Federal Service of State Statistics

In the structure of resources to finance investments in basic capital (Figure 1), the share of own funds stably grows. In January-September 2016 it reached 53.6%, although in 2010 it was 41%. The Russian financial market is not ready to meet the demand for “long-term and cheap” money. However, in the context of still high cost of loans, the increase in own funds in investments in the basic capital is not strange.

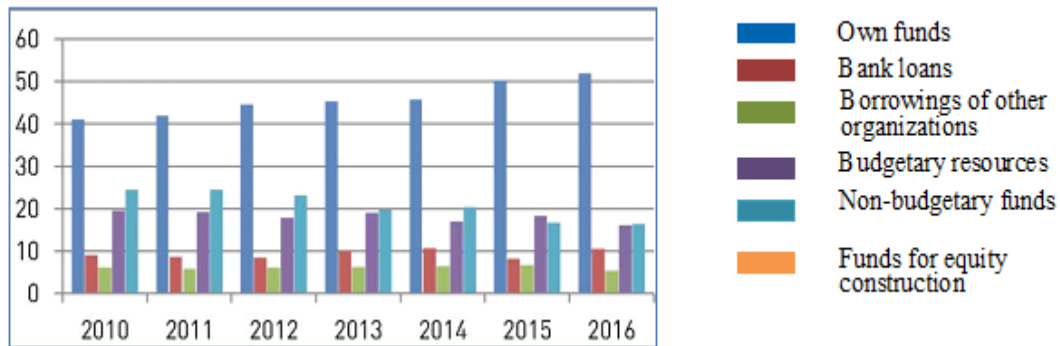
Table 3. Tempos of growth of investments in basic capital, %

	2010	2011	2012	2013	2014	2015	2016
Dynamics of investments in basic capital, in % as to previous year	6.0	6.2	6.7	-0.3	-2.5	-8.4	+0.8

Source: Official Website of the Federal Service of State Statistics

The analysis of the most important indicator for the entrepreneurial community – the inflation level – shows that the outlined unstable tendency to decreasing its tempos during 2010-2012 (from 8.8% in 2010 down to 6.5% in 2012) acutely changed in 2014. It was the first time during the last 5 years, when it returned to its bidigitate values: in 2014 the tempos of inflation reached 11.4%, and in 2015 they increased up to 12.9%. However, in 2016 the inflation decreased to the level of 5.4%, which makes the plans of the government to reach the 4% level rather real.

Figure 1. Structure of investments in the basic capital

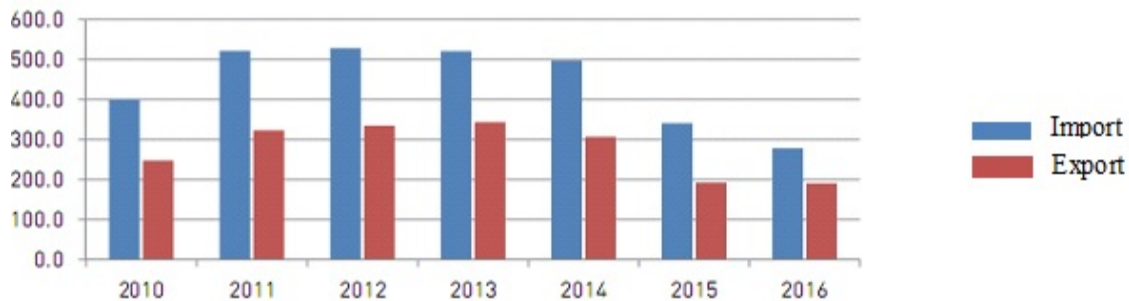


Source: Official Website of the Federal Service of State Statistics

The consolidated index of prices for investment products (expenses, services) also considerably decreased. In 2016 it was 103.2%, while in 2015 it had been 110.3%, and in 2014 - 107.2%.

The fall of prices for oil observed in 2014-2016 could but not have an impact on values of the external economic indicators. In January-November 2016 the export of goods decreased by 19.2% as compared to the same period in 2015 down to USD 254.1 bln., import - by 1.4% down to USD 163.9 bln., while in January-December 2015 the external turnover decreased by 33.0% as compared to January-December 2014 and reached USD 525.8 bln. (Figure 2).

Figure 2. External turnover of Russia



Source: Official Website of the Ministry for Economic Development of the Russian Federation

In January-December 2015 three principle product groups of the Russian export (fuel and energy goods, metals and metal products, products of chemical industry and rubber) accounted for 79.9% of the total value of the Russian export, in 2016 - 76.1%. The negative dynamics was substantiated by the decrease in the export of the most considerable group – fuel and energy goods - by 26.1%, down to USD 148.3 bln.

Estimating the state of currency markets, it is necessary to note sensitive fluctuations of the EUR and USD rate during 2010-2013 that moved to the turbulent state in 2014-2015. Three peaks of the RUR fall – late 2014 – early 2015, August 2015 and early 2016 – were replaced by its quick strengthening with the perspective of further decrease (Figure 3).

Figure 3. Dynamics of EUR and USD Rate to RUR



Source: Official Website of the Central Bank of the Russian Federation

Thus, as the official statistics shows, the macroeconomic component of the business climate in Russia is rather disturbing.

The above results of the stagnating state of the Russian economy, especially sensed in 2014-2015, are the consequence of the negative impact of geopolitical and economic events that took place during the respective period of time. Thus, in 2014 it was possible to distinguish the following events that had a considerable impact on the Russian economy (On State of Business Climate in 2014: Report of the Russian Union of Industrialists and Entrepreneurs, 2015):

- introduction of the anti-Russian sanctions by the USA, the European Union and other states that caused the justified counter-measures of Russia;
- weakening RUR to its historical minimum;
- increasing the key rate of the Central Bank to 17%;
- fall of the price of the oil barrel on the global market lower than the five years' minimum;
- annexing the Crimea by the Russian Federation;
- political conflict and economic crisis in Ukraine;
- maintaining high tempos of the capital outflow;
- course for activating economic relations with countries of the Asian and Pacific Region, including the creation of specialized structures;
- olympic and Paralympic Games in Sochi, and
- signing the agreement about the Eurasian Economic Union.

Difficult economic situation in Russia in 2015 was a natural consequence of the continuing negative impact of factors from the previous year and new events such as (On State of Business Climate in 2015, Report of the Russian Union of Industrialists and Entrepreneurs 2016):

- unstable rate of RUR to EUR and USD during the whole year, fall of RUR in the late 2015;
- fall of prices for oil below \$40 per barrel;
- prolongation of the sanctions introduced by the USA, the EU and other countries against Russia;
- decrease in the key rate of the Central Bank from 17 down to 11%;
- economic crisis in the Russian Federation, implementing the plan of top priority measures focused on sustainable development of economy and achieving social stability;
- implementing the import substitution policy (approving sectorial plans of import substitution, establishing the Governmental Committee on Import Substitution, *etc.*);
- bankruptcy or ceasing the activity of some large companies (SU-155, Svyaznoy Bank, Transaero, *etc.*);
- continuing mass revocations of licenses from banks;
- military strikes on groups of Islamic radicals in Syria with the direct participation of the Military Forces of the Russian Federation, and
- sanctions against Turkey (including economic).

The most important events of 2016 that had an impact on the state of the Russia economy were the following (On State of Business Climate in 2016: Report of the Russian Union of Industrialists and Entrepreneurs 2017):

- decreasing oil production after the OPEC meeting;
- prolonging the sanctions against Russia by the European Union;
- taxation initiatives that increase the taxation burden on business;
- continuing stagnation in the Russian economy;
- presidential elections in the USA;
- improving interrelations with Turkey;
- signing the Customs Code of EEU by Russia, Kazakhstan, and Armenia;
- parliament elections to the State Duma of the Russian Federation;
- preparing basic provisions of the strategy of developing the Russian Federation for 2018-2024, and
- distributing tax incentives for regional investment projects on the whole territory of the country.

3.2 Estimating state and basic problems of the Russian entrepreneurship

Public regulation of small and medium-sized entrepreneurship (SME) can be considered to be an important tool for the Russian economy to exit the state of stagnation, achieve high tempos of economic growth, and come to sustainable social and economic development of the society (Dolgopyatova 2012). Now in Russia there are 5.6 mln. of small enterprises which make up about 95% of the total number of commercial enterprises. The small business provides about 20% of the Russian GDP, and 25% of employment. Thereby the contribution of SME in general economic indicators of the country as compared to developed and developing economies of other states (Moore and Schmitz 2008) is considerably lower. The level of SME provision with fixed assets which makes up 5-6% is still low. Popular areas for small business are trading and services. The medium-sized business is more represented in processing industry, construction and agriculture. It is necessary to note that over the recent years as a consequence of the crisis, the dynamics of the SME development has been negative.

According to the majority of companies that are members of the Russian Union of Industrialists and Entrepreneurs, national realities that make up the environment of the SME and large business development were estimated as tending to decrease (Figure 4).

Figure 4. Dynamics of estimating the business environment state

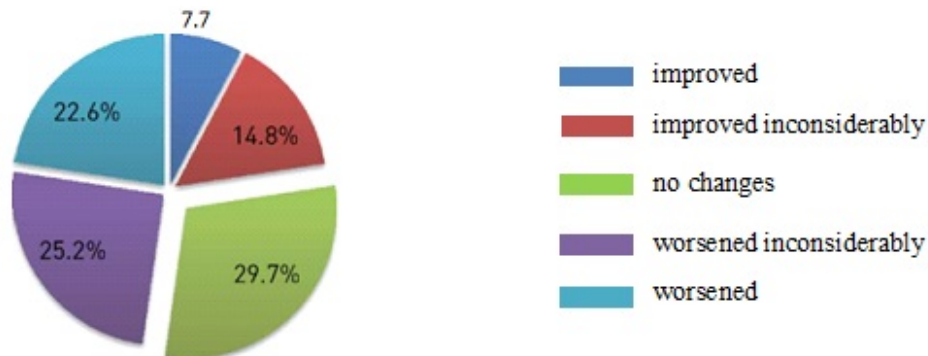


Source: Russian Union of Industrialists and Entrepreneurs

While in the long-term temporal interval positive estimates of the state of entrepreneurial climate prevail over negative ones, in the short-term interval – when gradually comparing the two – the estimates are negative. The comparison of estimates – “the business environment worsened” and “the business environment improved” for 2014-2015 – shows the 10 times difference: the share of extremely negative estimates was 32.5%, and that of the positive ones – 3.2%. In 2014 the difference was smaller – shares of the extreme estimates differed six times. Representatives of foreign business in Russia also agreed with this estimate: 77% of respondents thought that in 2015 business climate in the country worsened, and only 6% noted inconsiderable improvement of business climate.

According to the results, the year of 2016 was the most difficult for small business: two thirds of the small business representatives noted worsening of the business climate. The share of negative answers was higher than the average share by 15% (Figure 5). In terms of the regions, companies from the Ural Federal District had the greatest number of negative estimates – 58.9%. The sectorial analysis showed that construction and trading companies estimated the dynamics of business environment for the previous year more negatively than companies from other sectors. A half of the companies form the construction sector chose an extremely negative variant, while in general its share did not exceed one fourth.

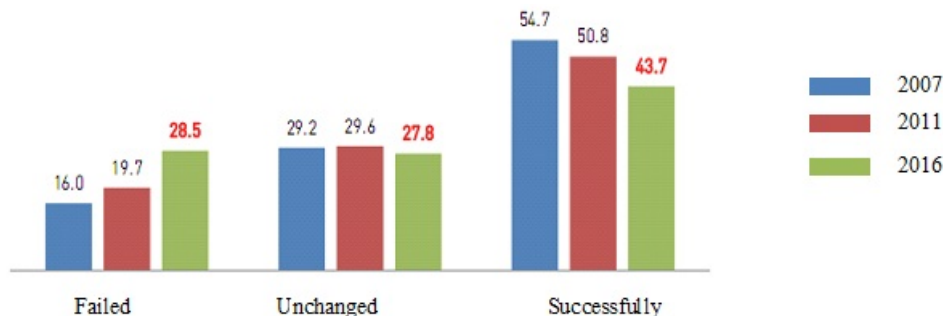
Figure 5. Estimating dynamics of entrepreneurial climate for 2016, %



Source: Russian Union of Industrialists and Entrepreneurs

The estimation of success of the company development for a long period of time showed the tendency to decrease: the share of the estimates “the company development was not successful” almost doubled during the last 10 years – from 16% to 28.5% through the intermediate value of 19.7% in 2011. At the same time the number of companies, the development of which had happened to be successful during the last year, decreased (Figure 6). The analysis of the investment activity as one of the main indicators of the general state of business environment in the country (Malesky 2008) showed positive dynamics: during the period since 2007 to 2016 the number of companies that make large investments increased from 30.3% to 41.4%. Thereby the main changes took place during the period of 2007-2011. The number of such companies increased by 8%, and only by 3% during the next 5 years. Besides, it is important to note that during the last decade the number of organizations with little volume of investments, and the companies that did not perform any investment activity at all, had decreased by 5.6%.

Figure 6. Dynamics of estimating companies' development



Source: Russian Union of Industrialists and Entrepreneurs

In 2016 the highest investment activity was observed in the Southern and North-Western Federal Districts. Above 95% of the companies invested various amounts. In the Privolzhskiy Federal District the number of companies that invested a large amount in the basic capital was higher than the average indicator by 10%. Almost one third of the companies from the Far-Eastern Federal District did not make investments in 2016.

According to the volume of investments in the basic capital, companies working in the area of “producing and distributing power, gas and water” were leaders. Above 50% of the companies made large investments, and 38.1% of companies made inconsiderable investments. Companies of the processing sector became the second by the investment activity. The least investment activity was noted among small business companies. Above 50% of the companies did not invest funds in the basic capital.

In 2016 the main areas for investments became modernization of the current production (53.2% of companies), re-equipment of production, purchasing new equipment (37.2%), construction of new buildings and structures (27%), capital repair of buildings and constructions (26.3%), research and development (18.3%), training employees (16.8%), power saving, investment programs on improving power efficiency of enterprises (14.6%), and non-material assets (11%).

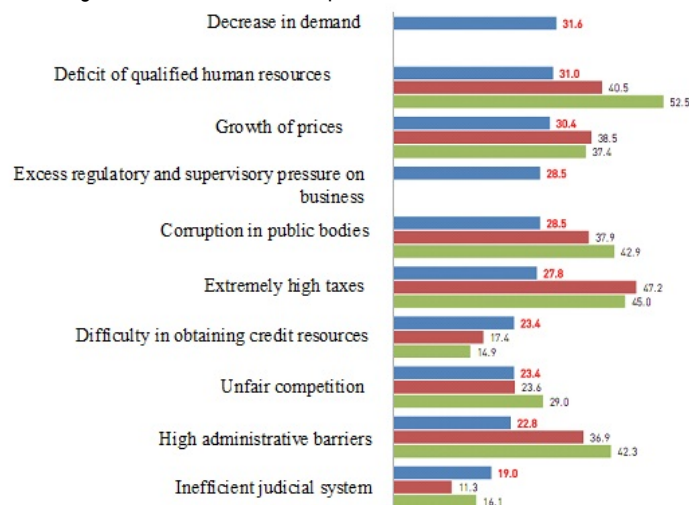
The analysis of problems that prevent entrepreneurial activity in Russia in 2016 (Figure 7) allowed singling out 3 most urgent ones – decrease in the demand, deficit in qualified human resources, and growth of prices/tariffs. In 2015 the key problems included the increase in prices, unreasonably high taxes, deficit of qualified staff, difficulty in accessing credit resources, and extremely high insurance payments, in 2007 – deficit of qualified human resources, and in 2011 – extremely high taxes.

As it goes from Figure 7, in 2016 the key problems included the decrease in demand, deficit of human resources, and growth of prices. All of them prevent adequate functioning of companies. These problems are followed by “corruption in public bodies”, and “excess regulatory pressure on business” that firstly occurred in the list of problems. The importance of a corruption component in the interrelations of business and power gradually decreased. During the period of 2007-2016 this problem was mentioned more rarely. The share of the variant decreased by 14.5% (in 2007 it was 42.9%, and in 2011 – 38%).

In 2016 27.9% of the responders mentioned extremely high taxes as the main problem for business. This answer took position 6 in the list of main problems for the Russian business and had lost its initial meaning during the last ten years: in 2007 it was the second in the top three with the share of 45.1%, and in 2011 it headed the list.

Approximately one fourth of companies noted that, first of all, the Russian business had difficulties in accessing credit resources and unfair competition (as compared to the 2007 and 2011 data, the share of the first variant increased by 6%, and the share of the second one remained unchanged for all years). High administrative barriers were the main problem for business according to 22.8% of the poll participants. This variant took position 9 in the list of problems and as compared to 2007 its share was 19.5%, and 14.1% over the last 5 years. The list of the most urgent problems that prevented the companies’ activity was rounded out by inefficient judicial system with the share of 19%. In 2007 this answer took position nine with the share of 16.1%, and in 2011 – position 10 with the share of 11.3%.

Figure 7. The most serious problems for business in 2016, %



Source: Russian Union of Industrialists and Entrepreneurs

Besides, the development of companies is restricted by the following:

- insufficient protection of property and contractual rights (compared to 2007 the share of the variant decreased by 7.9%, and compared to 2001 - by 5.6%),
- extremely high insurance payments (the answer was added to the questionnaire in 2013, the share of the variant was 22.8%),
- low quality of public management (the share has decreased by 6.2% over the recent 10 years),
- difficulties in connecting to engineering, transportation and other networks (the answer was added in the questionnaire in 2011, the share of the variant was 7.7%), and
- excess share of the public sector in economy (share of variant increased by 6.6% as compared to 2007).

The analysis of the problems in terms of regions showed that the low level of demand was a common problem for all federal districts while there were considerable differences as for other problems. Thus, in the Southern, North-Western and Ural Federal Districts companies mentioned the problem of the deficit of qualified human resources three times more rarely. This problem was the most urgent one in the Far-Eastern and Privolzhskiy Federal Districts. In the Central Federal District, the problem related to prices growth became secondary and gave way to the problems caused by excess regulatory pressure and corruption of the government. At the same time the problem of prices growth dominated in the Privolzhskiy Federal District with the share of 39.1% (+8.7% to the average value). The main problems for business were the following: in the Southern Federal District – high administrative barriers (37.9% of respondents), in the Uralskiy Federal District – corruption in public bodies (40% against the average value of 28.5%) and excess regulatory pressure and impact of unfair competition, in the Siberian Federal District – unfair competition, in the North-Western and Far-Eastern Federal Districts – inefficient judicial system (26.5% of respondents against the average 34%).

The sectorial analysis of the problems urgency allowed revealing the sensibility of the trading and mineral production sectors to demand decrease. All sectors except for “wholesaling and retailing” (-10% as to the average value) suffered deficit of qualified human resources. The main problems for companies were the following: in the construction sector – growth of prices and difficulty in obtaining credit resources (+10% to the average value), in “transportation and communication” – corruption of public bodies, in “production and allocation of power, gas and water” sector – high administrative barriers, insufficient protection of the property right (+20% to the average value).

Excess regulatory pressure on business was the most urgent problem for large business. The majority (60%) of medium business companies noted that the decrease in demand became the main problem for their business in 2016 (the share was almost twice higher than the average value). More important problems for small companies included those caused by the extremely high taxes, corruption of public bodies, and difficulty in obtaining credit resources.

International companies that run their business in Russia mentioned the following most urgent problems in 2015: growth of prices and tariffs (55%), deficit of qualified human resources (49%), high administrative barriers (41%), difficulty to access credit resources (35%), corruption in public bodies (34%), political indefiniteness (29%), insufficient level of property and contractual rights (29%), underdevelopment of infrastructure (24%), and inefficiency of the judicial system (23%) (Estimation of Business Environment in Russia for 2015 by Foreign Business).

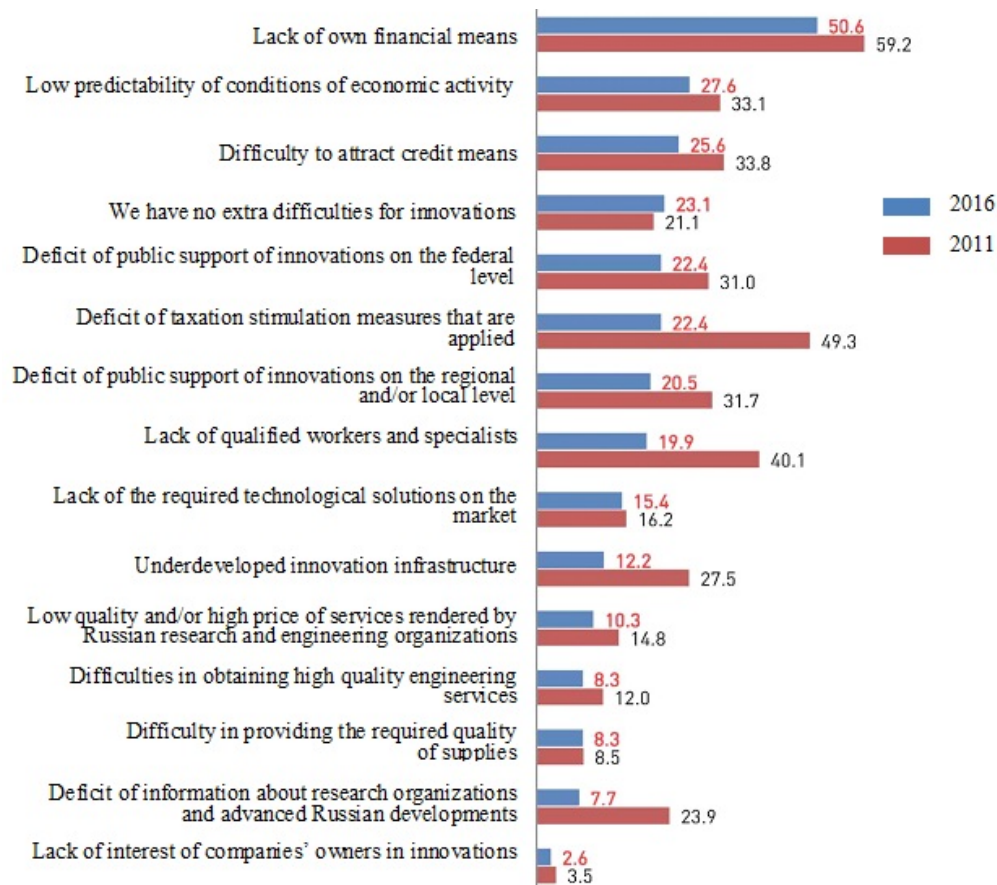
3.3 State of innovation activity of russian business

According to the poll (On State of the Investment Climate in 2016: Report of the Russian Union of Industrialists and Entrepreneurs, 2017), during the recent 5 years the main barrier on the way to the companies' innovation activity has been the deficit of own funds for financing innovation projects. At the same time, it is necessary to note the decrease in this factor effect. In 2016 50.6% of the respondents against 59.2% in 2011 mentioned this factor.

It is important to emphasize the positive tendency in relation to other factors restraining innovation activity of companies (Figure 8), such as insufficiency of the applied tax incentives measures (-26.9%), deficit of qualified employees and specialists (-20.2%), lack of information about scientific organizations and Russian advanced developments (-16.2%), underdeveloped innovation infrastructure (-15.3%), insufficiency of support of innovations

on the regional and/or local level (-11.2%), insufficiency of public support of innovations on the federal level (-8.6%), difficulty in attracting credit resources (-8.2%), low predictability of conditions of the economic activity (-5.5%), low quality and/or high price of services rendered by Russian research and engineering organizations (-4.5%), difficulties in obtaining high quality engineering services (-3.7%), lack of interest of companies' owners in innovations (-0.9%), and difficulty in providing the required quality of supplies (-0.8%). In 2016 the share of answer "no special obstacles for innovations" increased by 2% (up to 23.1% from 21.1% in 2011).

Figure 8. Basic difficulties for companies' innovation activity, %



Source: Russian Union of Industrialists and Entrepreneurs

In terms of the regions, there is the following situation related to factors restraining development of innovations. The main restraint of innovation activity for companies of the Siberian Federal District was low predictability of conditions of the economic activity. Companies from the Far-Eastern Federal District more often mentioned the answer "difficulty in attracting credit resources", while in the Uralskiy Federal District this answer was given only by 6.2% of companies. The majority of respondents from the Privolzhskiy Federal District stated the insufficiency of the applied tax incentives to stimulate innovations. About one third of the companies from the North-Western Federal District did not see special difficulties for innovation activity.

The analysis of the sectorial innovation activity allowed defining that the main barriers for innovation activity of companies functioning in the sector "production and allocation of power, gas and water" were the insufficiency of tax incentives' measures and low predictability of conditions of economic activity. Only in 10% of cases these organizations chose the variant "we have no special obstacles for innovations". On the contrary, more than one third of the respondents involved in the "wholesaling and retailing" sector did not have barriers for innovation activity.

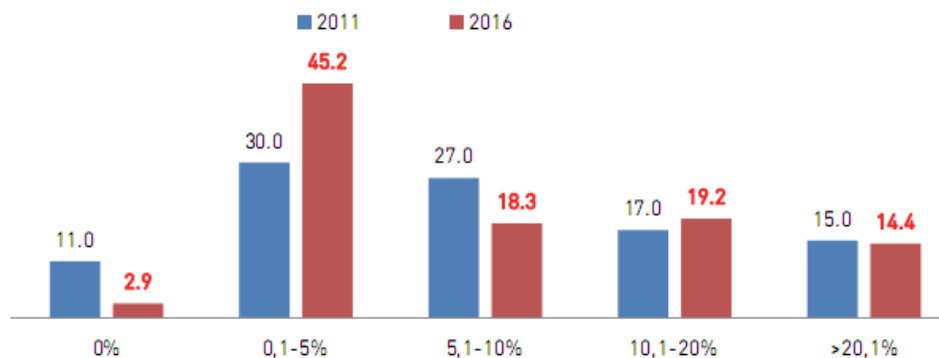
Construction and production companies responded that they had difficulties in attracting loans for innovation projects.

For small business the share of the answer “difficulty in attracting credit resources for innovations” was twice higher compared to the medium-sized business: only 9% of representatives of small business agreed with the statement “we have not special obstacles for innovations”.

The medial value of the companies’ expenses for innovations (investments in new machines and equipment, expenses for research and development, technological preparation of production, acquiring patents and licenses) was 6% in 2016. The average value was 12%. The maximum value reached 85%.

In 2016 the majority of companies (45.2%) spent from 0.1% to 5% of the income for innovations. As compared to 2013 the growth was 15.2%. 18.3% of the respondents noted that during the reported period their expenses had been from 5.1% to 10% of the income. The indicator decrease was 8.7%. The number of companies that included from 10.1% to 20% of the income into budget increased by 2.2%. The number of companies, where the level of expenses was above 20.1% of the income, decreased inconsiderably (0.6%). Only 2.9% of the polled companies did not spend the funds for technological innovations in 2016. The indicator improved by 8.1% (see Figure 9).

Figure 9. Level of expenses for technological innovations (% from Income)

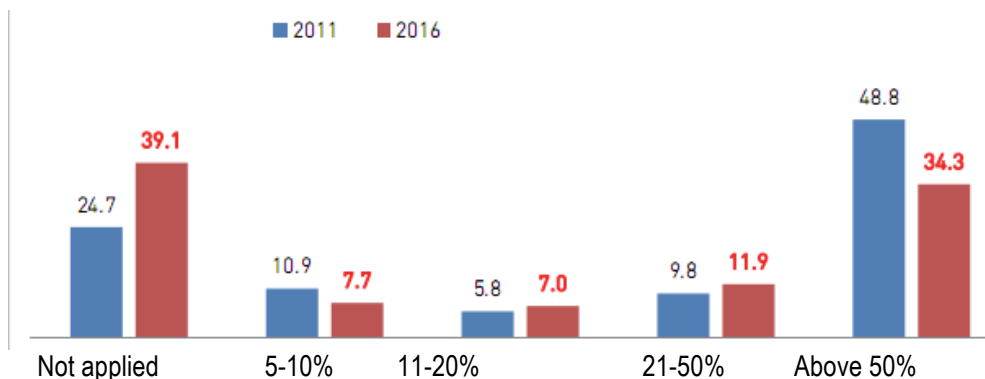


Source: Russian Union of industrialists and entrepreneurs

The companies from the Uralskiy Federal District were the least active in terms of innovations. Here the medial and average values were minimal. Processing companies spent more funds for innovations than companies from other sectors. The medial value in case of power companies and public utilities was only 1.1%.

In the context of the restrictions caused by the sanctions, it is important to analyze the impact of international standardization on the technical level and competitiveness of production. Thus, during the period of 2011-2016 the share of the companies that did not use European or other international technical standards increased from 24.7% to 39.1%, and the share of the companies, where above 50% of production used international standards, decreased (Figure 10).

Figure 10. Share of the company production according to European or other International Technical Standards, %



Source: Russian Union of Industrialists and Entrepreneurs

Above 50% of the companies that are small entrepreneurship subjects answered that they had not applied technical standards in their activity. The use of these standards is more peculiar of large and medium-sized companies.

3.4 Ways of forming innovation reality in Russia

The exit of the Russian economy from stagnation is possible through large-scale implementation of innovations (Twiss 2002) that are a determining factor of economic growth and social development that comply with high standards (Strategy of Innovational Development of the Russian Federation for the Period of up to 2020. Approved by Order of the Government of the Russian Federation no. 2227-r dated December 8, 2011). The following factors determine the need and importance of innovative development of the economy of Russia:

- Formation of the information and computer industry that makes it practically possible to acquire new technologies and use them in the context of moving to production by applying new materials, informational and communicational technologies that integrate the virtual reality in the production, and to create an efficient system to manage processes in the social and economic and financial areas,
- Involving material resources, regenerative and inexhaustible sources of energy in the economic turnover to change the existing production and economic allocation of labor,
- Market resources of investment activity and formation of priorities of innovative development, and
- High level of the research and educational system, technical skills of specialists and basic researches, definite experience in managing and planning economic process.

Now the leading tendencies in the national innovation area include the creation of the sector of highly technological productions and science-driven sectors with the possibility to develop products by new method of production in selective basic critical areas, optimization of the existing innovation economic systems, continuous improvement of the mechanism to implement innovations, and progressing internationalization of innovation processes. Inter-sectorial nature of interrelation in the area of innovation development becomes more and more noticeable trend.

Besides, the research and technological potential of Russia makes it possible to carry out scientific developments according to a rather wide range of research and technical problems in the area of nanotechnologies, gene engineering, robototronics, electronics, etc. Russian scientists continue occupying the leading positions in such areas of science as Physics, Chemistry, Psychology, science about the Earth and space. Publishing activity of Russian authors in these areas considerably exceeds the average global indicator. The unique scientific, experimental and testing base, which in a number of cases complies with the level of the best world analogues or is exceptional, has been formed for some areas. Scientific researches require considerable investments. In this context it is promising to develop the mechanism of public and private partnership. Besides, it is necessary to consider the creation of long-term programs of developing the innovation area focused on increasing the economic efficiency of investing by taking certain measures on creating stimuli to activate innovation activity of public enterprises, small and medium-sized entrepreneurship as a perspective trend. It is necessary to develop the concept of the "innovation lift", which is an institute (structures) to support the development of the idea at the every stage of its life cycle: fundamental and applied researches, development, and commercialization.

Real implementation of the model of innovation development requirements will cause the following economic changes (Medynskiy and Skamay 2002):

- Restructuring enterprises according to technical and economic criteria obliges to improve its organizational structure and economic relations,
- Innovation processes develop the labor allocation, production specialization, and contribute to developing integrational relations and forming interregional economic structures,
- Innovations change the market filled with various new products (commodities, services) including those of nonmaterial nature (ideas, qualification, projects, information),
- Market competition obtains new characteristics: cooperation occurs, roles of competing parties in implementing innovation projects and organizing innovation processes are determined,

- Market of innovations acquires the predictable and regulated nature, and
- Modern innovation processes consolidate the technological base and strengthen inter-dependences of sectorial and intersectorial economic systems, and the whole national economy.

Estimating the real state of the Russian economy, it is necessary to note that it is suffering one of the most difficult and responsible periods of its history complicated by the consequences of the global economic crisis, difficult geopolitical situation occurring in relation to our country, instability of the military situation, and policy of sanction wars. It initiates searches for a new vector of political and economic development of the country.

4. Discussion

Today in the context of the complicated geopolitical situation, increasing turbulence of economy, the Russian business community worries how Russian enterprises will search for ways to get out of the crisis and what actions the government will take under the pressure of global challenges in import substitution, declaimed innovative development, attracting investments and industrial modernization.

The Russian government took numerous law making and other initiatives to stimulate modernization and substitute import, increase competitiveness of Russian entrepreneurship. Institutes are established, and programs focused on supporting investment projects implemented in Russia are developed, the Fund of Industry Development performs its active work. In other words, the pursued sanction policy related to Russia and the need to implement import substitution programs as a counter-move catalyzed the movement of the country's economy from the one focused on resources export defined earlier towards the economy based on highly technological sectors and innovations. However, experts also note that in addition to internal stimuli for creating special conditions, Russia strives for modernization of industry and diversification of economy through extremely required international cooperation in new integration formats.

Under the current conditions, competent planning of the development trajectory that complies with the regional situation and the tendencies of national and global markets is the guarantee of stable development of domestic companies. Besides, companies must be ready for finding adequate and quick answers for the indignation of the economic environment, choosing the conduct strategy in the context of indefiniteness and permanent changes of their surroundings.

Conclusion

Today Russia is under the conditions of forming a new economic reality caused by a number of processes:

- Instability of the global economic system as a consequence of a number of determinants, including geopolitical and geoeconomic,
- Increase in the global competition that goes beyond the limits of traditional markets of labor, capitals, technologies and covers the system of national management,
- Increase in the role of innovation processes in the social and economic development on the background of weakening impact of some traditional factors of economic growth,
- Formation of the human capital as the main factor of economic development (Šafránková and Šikýř, 2016), and
- Exigent need to move from the raw materials export model of the economic development to the model of sustainable development based on the innovative development, a new technological mode, and humanization of economy (Russia on Its Way to Modern Dynamic and Efficient Economy: Report/Edt. by Nekipelov, Ivanter, and Glaziev (2013).

The factor that deepens this situation and at the same time gives Russia a chance to solve the whole range of the problems set by the reality is the placement of the Russian economy into the mode of sanctions by Western countries. Today in the context of a complicated geopolitical situation increasing the turbulence of the economy, the Russian business community worries how Russian enterprises will search for ways to get out of crisis and what actions the government will take under the pressure of global challenges in import substitution, declaimed innovative development, attracting investments and industrial modernization.

Analyzing possible scenarios of the innovative development in Russia and taking into account the current situation in the country and in the world that is characterized by the geopolitical and economic instability, the scenario of the leading development of the country is considered to be the most adequate. It includes a number of promising areas:

- increasing the power of the industrial and technological potential, first of all at the expense of developing the current and creating new highly technological productions,
- moving to the non-resources specialization of economy, including by creating highly technological processing productions on producing competitive products,
- implementing programs on import substitution supporting domestic producers, increasing the efficiency of export on the background of decreasing import, motivating the growth of internal consumer demand of the population for domestic products,
- increasing power and resources efficiency, efficiency of managing property, developing infrastructure that can minimize transaction expenses in all sectors of economy,
- creating zones of advanced development where it is possible to implement mega- and infrastructural projects,
- attracting internal and external investments on the basis of taking balanced decisions, implementing investment projects according to the principles of public and private partnership,
- creating stimuli for innovation activity of enterprises, decreasing polarization of regions based on developing the system of strategic management of region, increasing the potential of dotation regions,
- increasing the stability of the financial system, forming a flexible tariff, customs, and taxation policy, budgetary support for small and medium-sized business, and
- providing guarantees of the population's social protection, solving demographic problems.

Thus, the set results in innovative development can be achieved subject to creating a favorable business environment to run business and innovation activity, increase in the prestige of science and attractiveness of highly technological sectors, increase in the Russian competitiveness through forming its innovation power, creating the economic environment that sets demand for innovations, and successful pursuing of innovation policy on the national and regional levels. In the context of risk and the environment turbulence, the implementation of the whole complex of measures that can move the Russian economy to the innovational way of development must be based on taking balanced management decisions.

References

- [1] Dolgopyatova, T. G. 2012. Russian Firms: Business Environment, Internal Organization and Behavior. In *"Russia e Europa dell'Est: Progetti e prospettive di crescita"*. University of Verona: Polo Scientifico Diddattico "Studi sull' impresa" and Center for International Studies. Series "Serie di Studi Scientifici", 3, 42
- [2] Dollar, D, Hallward-Driemeier, M. and Mengistae, T. 2005. Investment Climate and Firm Performance in Developing Economies. *Economic Development and Cultural Change*, 54(1): 1-31.
- [3] Henley, D. 2010. *Three Principles of Successful Development Strategy: Outreach, Urgency, Expediency* paper prepared for the 3rd plenary Tracking Development Conference, Kuala Lumpur, Malaysia, 11 – 14 May.
- [4] Malesky, E. 2008. Straight Ahead on Red: How Foreign Direct Investment Empowers Subnational Leaders. *Journal of Politics*, 70.1: 1–23.
- [5] Medynskiy, V.G. and Skamay, L.G. 2002. *Innovatsionnoe predprinimatelstvo* [Innovational Entrepreneurship]. Moscow: Yuniti-Dana, pp. 592.
- [6] Moore M. and Schmitz H. (2008). Idealism, Realism and the Investment Climate in Developing Countries. *Centre for the Future State, Institute of Development Studies, Working Paper*, 307, 67.

- [7] Nekipelov, A.D., Ivanter, V.V. and Glazev, S.Yu. (2013). *Rossiya na puti k sovremennoy dinamichnoy i effektivnoy ekonomike: Doklad* [Russia on Its Way to Modern Dynamic and Efficient Economy: Report]. Moscow: Russian Academy of Sciences, pp. 93
- [8] Šafránková J. M., and Šikyř, M. 2016. Society, Higher Education and Labour Market. *Montenegrin Journal of Economics*, 12(3): 167-177.
- [9] Šikyř, M. 2015. *Best Practice Approach to Human Resource Management*. The 9th International Days of Statistics and Economics, pp. 1405-1414.
- [10] *Strategiya innovatsionnogo razvitiya Rossiyskoy Federatsii na period do 2020 goda* [Strategy of Innovational Development of the Russian Federation for the Period of up to 2020]. Approved by Order of the Government of the Russian Federation No. 2227-r dated December 8, 2011.
- [11] Szreter, S. 2007. The Right of Registration; Development, Identity Registration, and Social Security – A Historical Perspective. *World Development*, 35(1): 67–86.
- [12] Twiss, B.C. 2002. *Managing Technological Innovation*, 7th Edition. London: Pitman Publishing, pp. 309.
- *** *Doing Business 2017: Equal Opportunity for All (14th Edition)*. Retrieved from <http://www.doingbusiness.org/>. (accessed June 1, 2017).
- *** *Ofitsialniy sayt Federalnoy nalogovoy sluzhby* [Official Website of the Federal Taxation Service]. Available at: <https://www.nalog.ru/rn77/>. (accessed June 1, 2017).
- *** *Ofitsialniy sayt Federalnoy sluzhby gosudarstvennoy statistiki* [Official Website of the Federal Service of State Statistics]. Available at: <http://www.gks.ru/>. (accessed June 1, 2017).
- *** *Ofitsialniy sayt Ministerstva ekonomicheskogo razvitiya Rossiyskoy Federatsii* [Official Website of the Ministry for Economic Development of the Russian Federation]. Available at: <http://economy.gov.ru/minec/main>. (accessed June 1, 2017).
- *** *Ofitsialniy sayt Tsentralnogo Banka Rossiyskoy Federatsii* [Official Website of the Central Bank of the Russian Federation]. Available at: <http://www.cbr.ru/> (accessed June 1, 2017).
- *** *Otsenka inostrannym biznesom delovoy sredy v Rossii za 2015 god* [Estimation of Business Environment in Russia for 2015 by Foreign Business]. Available at: <http://fhv.ru/2016/03/otsenka-inostrannym-biznesom-delovoy-3/>. (accessed June 1, 2017).
- *** *Sostoyanii delovogo klimata v 2014 godu: doklad* [On State of Business Climate in 2014: report]. (2015). Russian Union of Industrialists and Entrepreneurs. Available at: <http://media.rspp.ru/document/1/a/e/aeef84d30097f6e457871ae66f34ab7f.pdf>. (accessed June 1, 2017).
- *** *Sostoyanii delovogo klimata v 2015 godu: doklad* [On State of Business Climate in 2015: report]. (2016). Russian Union of Industrialists and Entrepreneurs. Available at: <http://media.rspp.ru/document/1/4/9/49a7e7582a6770fb770f8ea535b63a6c.pdf>. (accessed June 1, 2017).
- *** *Sostoyanii delovogo klimata v 2016 godu: doklad* [On State of Business Climate in 2016: report]. (2017). Russian Union of Industrialists and Entrepreneurs. Available at: <http://media.rspp.ru/document/1/f/9/f9c2ca5f8cd104f8d5d40f2a7b50fced.pdf>. (accessed June 1, 2017).

Entrepreneurship, Unemployment and Economic Growth: Evidence from Egypt

Marwa BILTAGY

Associate Professor of Economics

Faculty of Economics and Political Science (FEPS), Cairo University, Egypt

bilmarwa@feeps.edu.eg

Mariam MAHROUS

FEPS Graduates

Faculty of Economics and Political Science, Cairo University, Egypt

mariamkirolos.mm@gmail.com

Mayar SAID

FEPS Graduates

Faculty of Economics and Political Science, Cairo University, Egypt

mayar.said2013@feeps.edu.eg

Menna KAMEL

FEPS Graduates

Faculty of Economics and Political Science, Cairo University, Egypt

menna.mohamed2013@feeps.edu.eg

Suggested Citation:

Biltagy, M., Mahrous, M., Said, M., Kamel, M. 2017 Entrepreneurship, unemployment and economic growth: Evidence from Egypt. *Journal of Applied Economic Sciences*, Volume XII, Winter, 7(53): 1982-1995.

Abstract:

This paper focuses on studying whether entrepreneurship affects or is affected by unemployment, economic growth, and inflation in Egypt during the period 1993-2013. In the empirical analysis, an econometric time series model is presented by applying the Vector Autocorrelation (VAR) modelling approach in order to estimate the desired relationship and capture the short run dynamics. Self-employment rate is used as a proxy for entrepreneurship, and real GDP growth rate is used as a proxy for economic growth. Empirical results suggest that entrepreneurship has a significant positive effect on both economic growth and inflation, while it has a significant negative effect on unemployment; which supports the Schumpeter effect, but not vice versa.

Keywords: entrepreneurship; economic growth; unemployment; Egypt

JEL Classification: L26; J64; O43; O47

Introduction

Entrepreneurship is considered now one of the most important dynamics of the economy and is regarded as a substantial source of new job opportunities, innovation and economic growth (Morales-Gualdrón and Roig 2005). Moreover, it is linked to the entrepreneurial activities which are the enterprising human actions done by entrepreneurs who are the business owners who target generating profit through the expansion of economic activities, and by identifying new products and markets (Ahmed and Seymour 2008).

The word “entrepreneur” is taken from the French verb “entreprendre” which means “to undertake” the risk of new firms and enterprises (Schumpeter 2011). A firm is created by an entrepreneur thus the operation of creation is called “entrepreneurship”. Modern economists evaluated entrepreneurship as a process and a journey that all successful entrepreneurs like Bill Gates (the founder of Microsoft), Steve Jobs (the inventor and CEO of the multinational technology company “Apple”) and others went through (Joshi 2016). Entrepreneurship is a

multidimensional concept measured by different ways in all studies selected such as; start-ups, TEA¹, self-employment, *etc.*

It is important to mention that models of entrepreneurship are considered labor market theories of occupational choice; where individuals' risk preferences, skills, entrepreneurial abilities and initial wealth differs from one person to another (Plehn-Dujowich 2012).

Entrepreneurship, economic growth, and unemployment affect each other in different ways, yet the literature has tackled two components only in most of the studies, without taking into consideration the third. So, this study has combined the three components together along with inflation, since they are considered the most important macroeconomic indicators in any economy. A model is formulated for Egypt, during the period 1993-2013, in order to know whether entrepreneurship affects or is affected by the other components.

This paper is organized as follows; the second section tackles a theoretical review of the relationship between entrepreneurship, unemployment and economic growth followed by an overview on entrepreneurship, economic growth, unemployment and inflation in Egypt. Section four presents the description of data and the empirical analysis using the VAP model and section five concludes.

2. Literature review

Unemployment is a macroeconomic problem that hinders societies all over the World, and which every responsible government is likely regulate and detect. Higher unemployment causes high level of poverty, higher opportunity cost and several growth challenges. Seeing entrepreneurship as a solution for unemployment researchers developed many studies that witness a strong relation between entrepreneurship and unemployment. Audretsch and Fritsch (2002), Asad *et al.* (2014), Gănescu (2014), Azer Dilanchiev (2014), and Dvoutely and Mareš (2016) used regression models to find a relation between entrepreneurship and unemployment. Thurik *et al.* (2008) and Kheiravar and Qazvini (2012) estimated an econometric model to derive a relation between both variables. Most of the studies that tackled entrepreneurship and unemployment together, agreed that there is a negative relationship between them.

Audretsch and Fritsch (2002) presented a study on start-ups of new firms in West Germany. They utilized the number of firm births divided by the number of persons employed as a proxy for entrepreneurship in the 74 planning region over the period 1983-1998. They applied regression analysis to establish the relationship between new-firm startups and net change unemployment. Their study found that the rate of newly established firms is negatively related to the rate of unemployment. Thus the newer firms that are established the lower is the unemployment rates. Also, Asad *et al.* (2014) applied a multiple regression analysis in Pakistan but they used industrial production index as a proxy for entrepreneurship leading to the same results that high rate of unemployment has been associated with low level of entrepreneurial development in any economy. This justifies the need entrepreneurial activities should increase in order to reduce high rate of unemployment. Gănescu (2014) study's purpose was to identify the degree of association between the index of entrepreneurial activity and youth unemployment in the European Union Member States by using the Pearson correlation coefficient. In this study different indexes were used which are GEDI (Global Entrepreneurship and Development Index) and YUR (Youth Unemployment Rate). A negative strong link was found between² GEDI and YUR. Therefore, the study hypothesis that there was a negative correlation between the level of development of the entrepreneurial ecosystem and the level of youth unemployment is validated.

Azer Dilanchiev (2014) studied the relation between entrepreneurship and unemployment rate from year 2000 to 2013. OLS regression method was used based on data from 2014 national statistics of Georgia. The results showed that, the change in entrepreneurship has a positive effect on job creation by reducing unemployment level.

¹ Total Entrepreneurial Activity index is the main indicator of GEM (Global Entrepreneurship Monitor).

² The Global Entrepreneurship and Development Index (GEDI) was created to provide a more complete understanding of economic development by capturing the contextual nature of business formation, expansion and growth. It is based on analysis of comprehensive data sets from more than 120 countries that marshal information about the "3A's" of development: entrepreneurial attitudes, aspirations and activity.

A similar study conducted by Dvouletý and Mareš (2016) in Visegrad countries covering period of years 1998-2014. Data were collected from national statistical offices of Visegrad countries. They used both regressions and econometric models with dependent variable registered businesses per economically active inhabitant that were estimated to fulfil research aim. Higher unemployment rate was associated with higher level of entrepreneurial activity in V4 countries during analyzed period. Meanwhile Kheiravar and Qazvini (2012) used an econometric vector auto-regression model (VAR) to resolve and clarify the dubiety surrounding the relationship between entrepreneurship and unemployment in Azarbayjan East of Iran. Research results indicated that as entrepreneurship boosts, *i.e.*, the number of new businesses, unemployment rate declines.

Aubry, Bonnet and Renou-Maissant (2015) reached that there are two relationships between entrepreneurship and unemployment: The refugee effect which indicates that unemployment may cause increased entrepreneurial activities, in addition to the Schumpeter/entrepreneurial effect which indicates that the entrepreneurial activity itself may lead to a reduction in unemployment rates; the more entrepreneurial activities, the more unemployed people find jobs, resulting in less unemployment rates and greater economic growth.

Estimating a two-equation vector auto regression (VAR) model, Thurik *et al.* (2007 and 2008) made three studies in Portugal, OECD countries and in Japan to examine which is more dominant the Schumpeter effect or the refugee effect. In Portugal business ownership rate was used as a proxy for entrepreneurship over the period 1972 -2002. While in OECD it used self-employment as a proxy for entrepreneurship and the model was tested using a data panel of 23 OECD countries between 1974 and 2002. It was concluded that entrepreneurship significantly lowers unemployment which supports that Schumpeter effect as it is the dominant. In Japan fluctuations in the business ownership rate used as a proxy for entrepreneurship for the period between 1972 and 2002. Although Japan's unemployment rate has been influenced by specific exogenous shocks, the effects of entrepreneurship on unemployment are not different when compared to other OECD countries.

Entrepreneurship is related to the individual activities. The concept of economic growth is related to the levels of firms, industries, and nations. Thus, linking entrepreneurship to economic growth means linking between the individual level and the macro level (Carree and Thurik 2010).

Many studies have pointed out that not all new businesses will have similar effects on the economic growth, and this may result since the fast growing firms, which represent only a small percentage of all new firms that are formed, are the ones that mostly provide job opportunities (Henrekson and Johansson 2010). There could be a positive, negative, or even an undefined relationship between entrepreneurship and economic growth.

The results of the studies that are obtained may differ depending on two main things. First, how entrepreneurship is defined, Second, the level of economic development, since there are two types of entrepreneurship either necessity entrepreneurship or opportunity entrepreneurship³ that are discussed by GEM in 2001, (Block and Sandner 2009). Empirical studies found that such necessity entrepreneurship has a negative or zero effect on economic growth, where Wong *et al.* (2005) use an augmented Cobb–Douglas production on a cross-sectional data for 37 countries that participated in GEM 2002 and use the TEA rate, which defines entrepreneurship in broad terms, where the results show that high rate of necessity entrepreneurship doesn't necessarily enhance economic performance as their marginal productivity maybe equal zero or negative, also high growth potential entrepreneurship only affects economic growth positively. While, opportunity entrepreneurs has a positive effect on economic growth Peterson and Valliere (2009) extended the economic growth model introduced by Wong *et al.* (2005) on 44 countries for the period 2004-2005, in order to investigate the effects of opportunity and necessity-based entrepreneurship on economic growth in both developing and developed countries. The results conclude that from developed countries perspective, a considerable fraction of economic growth is due to the role of entrepreneurs. However, in developing countries role of entrepreneurs had an insignificant effect.

³ Necessity entrepreneurship is like the refugee effect as entrepreneurship is the only available job (Zaki and Rashid 2016), while opportunity entrepreneurship is when entrepreneurs pursue an opportunity in the market.

Lepojević *et al.* (2016) examine the impact of different types of entrepreneurship OEA, NEA and HEA⁴ on economic growth through comparative analysis of developed and developing countries, by using a multiple linear regression model. The analysis is carried out by SPSS software on a sample of 22 countries in three years. The study finds out that the contribution of entrepreneurship to economic growth is higher in developed countries than in developing countries; also, the relationship between entrepreneurship and GDP growth rate in developed countries is statistically significant, but in developing countries, this is not the case. That is because HEA and OEA entrepreneurship that are more important for GDP growth than NEA are more powerful in developed countries than in developing countries. Another reason is that markets in developed countries use a higher level of national knowledge development as well as a high level of freedom from government's influence to generate and achieve rapid growth in business, while developing countries are characterized by a limited access to capital, technological innovation which limits the growth; adding the presence of gray economy which creates unfair competition and hinders the development of entrepreneurial activity which restrict business.

Plehn-Dujowich (2012) estimates a panel vector autoregressions (VAR) model of three equations for entrepreneurship, growth, and unemployment to look at their dynamic relationship across 10 sectors of the US using quarterly data for the period 2000-2009; the net entry rate of establishments is used as a proxy for entrepreneurship. The empirical results indicate that entrepreneurship and economic growth affects each other positively; where the former increases economic growth in 4 from the 10 sectors, and the latter increases entrepreneurship in 4 from the 10 sectors. Also Kostantinos Dellis, Sotiris Karkalakos, and Costantina Kottaridi (2015) used the vector auto-regressions (VAR) with panel data across 30 OECD countries during the period 1970-2011 in order to elaborate the interrelationship between entrepreneurship, unemployment and economic growth in a dynamic context, by using data from the Compendia dataset.

By contrast, Through conducting a regression analysis, Zaki and Rashid (2016) found a significant negative relationship between entrepreneurship and economic growth based on a cross sectional data on seven emerging countries reflecting a regional perspective (Egypt, Hungary, India, Mexico, Indonesia, Turkey and Romania) during the period 2004-2014; using new establishments as a proxy for entrepreneurship, and their result indicates that not only entrepreneurship affects this relationship but also other factors such as tax regimes, human capital, and the level of economic development that play an important role.

While other studies have argued that the impact of entrepreneurship on economic growth would be defined if and only if certain conditions exist in the economy (Urbano and Aparicio 2015). Entrepreneurship could increase the economic growth in developing countries but through four development strategies which create the incentives for productive, innovative entrepreneurship, which are: eliminating the distortions in their markets, encouraging human capital development, use market processes in order to allocate the scarce resources efficiently, and creating employment alternatives to the public sector (Acs and Virgill 2010). Also, Wennekers *et al.* (2005) mention that developing countries may be better off by seeking to develop the economies of scale, encouraging foreign direct investment, and promoting management education, this is concluded by regressing global entrepreneurship (GEM) 2002 data for nascent entrepreneurship across 36 countries on the level of economic development.

3. Unemployment, gross product development growth rate, inflation and entrepreneurship in Egypt: An overview

▪ Unemployment

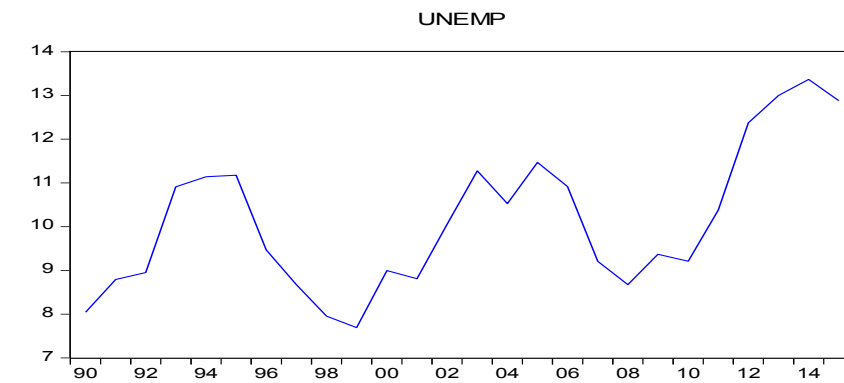
Job creation is one of the most important challenges facing Egypt as the job content of growth has not been strong enough to absorb all the new and accumulated entrants to the labor market. The Egyptian economy has witnessed major structural changes, number of external shocks, and various government employment promotions that affected the unemployment rate in Egypt. Egypt started its Economic Reform and Structural Adjustment Program

⁴ OEA – Opportunity Entrepreneurial Activity, HEA – High-Expectation Entrepreneurship and NEA – Necessity Entrepreneurial Activity.

(ERSAP)⁵ in 1991 with the support of the International Monetary Fund (IMF) and the World Bank. It aims to reduce the large budget and balance of payments deficits by addressing the macro-economic stabilization policies.

In January 1996, efforts were increased to include the structural reforms in the economy which decreased the unemployment rate from 11.176% in 1995 reaching 9.46% in 1996 which is the lowest rate that Egypt has reached since 1993. However, many studies agree that Egypt's Economic Reform and Structural Adjustment Program was successful in its stabilization objectives, the unemployment rate has been worsened in the early 19th century by reaching 11.275% in 2003. Afterward, the concept of entrepreneurship increased in Egypt and developed, encouraging a lot of youth to establish their own entrepreneurial activity which create job opportunities; hence, the unemployment rate decreased to 8.676% in 2008. Then the global financial crisis occurred leading to an increase the unemployment rate once more but not with a high rate because Egypt was not greatly affected by the crisis recording 9.367% in 2009. Consequently, the 25th January revolution in 2011 was a transformative event in the political and economic fields. The revolution increased the unemployment rate because a lot of firms, companies and industries closed and Egypt became a risky country to invest in, so the unemployment rate increased by an increasing rate reaching 10.37%, 12.372%, 13% in the years 2011, 2012, 2013 respectively. And up till now the policy makers and the economists work together to build new policies to decrease the unemployment rate reaching 13.366% in 2014 but decreased once more in 2015 reaching 12.881%. Also, the policy makers work with the scholars and the government to improve the entrepreneurship ecosystem.

Figure 1. Unemployment rate in Egypt (1990-2015)



Source: Done by the authors based on (IMF data).

■ Gross Domestic Product Growth Rate

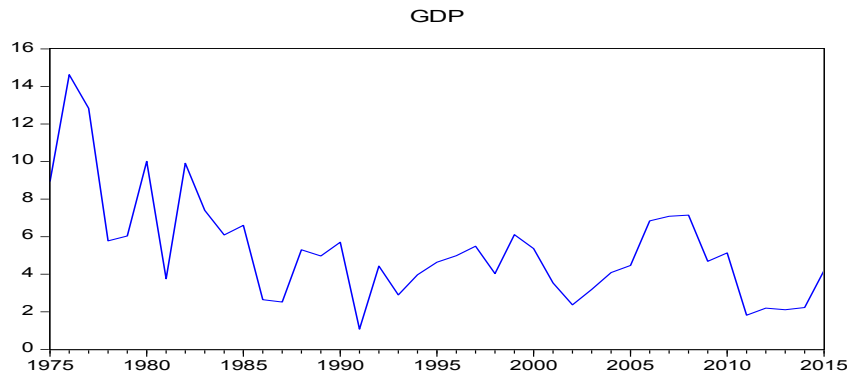
Egypt's main target is to generate an economic growth and to move toward the global economy. Nassar (2011) declared that during the period 1973-1986 the Egyptian economy appreciated remarkable high general development rates. They achieved an increase of 10% in the late of the 70s and the beginning of the 80s after the adoption of the open entryway arrangement and the expansion in oil costs. Several factors contributed to the deteriorating record of growth, the most important of them were the external shocks as the decline in oil prices, coupled with the contraction of the investment activities and the deflationary measures adopted by the government. During the 1990s the country pursued successful macroeconomic stabilization policies and begun the structural reform programs needed, which leads to an increase in the country's GDP growth rate from 2.901% in the year 1993 reaching 4.989% in the year 1996.

After that, that in the late nineties there was a great encouraging for the internal and external developments that led to an extraordinary growth of the economy resulting in increasing the GDP growth rate to 6.105% in the year 1999. This record of growth was due to the ERSAP and the sharp increase in capital inflows. Next the Asian

⁵ ERSAP is an agreement between Egypt, the IMF and the World Bank which was implemented in 1991, aiming to rectify the imbalances between the demand and supply sides of the economy. The main symptoms of these imbalances are the chronic deficits in the balance of payments and the government budget, and high inflation.

Crisis, the fall in oil prices, the regional conflicts and wars, have worsened the economic situation gradually affecting the Egyptian economic growth negatively resulting in severe recessionary movements at the beginning of the new millennium by recording 5.368% and 2.37% in the years 2000 and 2002 respectively. Furthermore, the external shocks represented by the events of September 11th in 2001 reduced the GDP growth rate to 3.535%. The GDP growth rose once more to reach 3.193% in the year 2003 and 7.152% in 2008. Consequently, the GDP growth rate dropped dramatically due to the global financial crisis in 2009 to reach 4.685%, then to 1.817% due to the 25th January revolution in year 2011. Again the GDP reached 4.2% by 2015 due to the gradual improvement in the economic activity, moreover there are a number of challenges the government is aware of and working on.

Figure 2. GDP Growth Rate in Egypt (1975-2015)



Source: Done by the authors based on the World Bank data

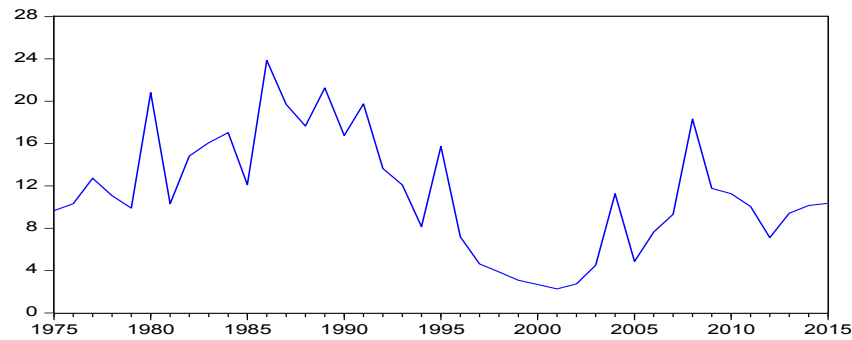
■ Inflation

Keeping inflation low, stable and predictable is an objective of the macroeconomic policy in Egypt. However, data shows that this is only an objective. Despite, some governmental belt tightening in 1975, the total deficit was not reduced and the inflation rate expanded reaching 9.97% and in the year 1977 it increased more and reached 12.732%. Three years later, the inflation reached 20.819% in 1980 which is one of the highest percentages that Egypt reached from the year 1975 till the year 2015; resulting in increasing the governmental borrowing from the banking system. The eighties of the last century were characterized by the government control on the economic activity and the lack of efficiency in the distribution of the economic resources. These circumstances had led to many internal and external economic imbalances and a continuous decrease in the inflation rate to 12.107% in the year 1985 accompanied by an increase in the liquidity. Consequently, the inflation rate increased again in 1986 reaching the highest percentage since 1975 which is 23.864% due to mentioned circumstances in this phase including the inefficiency of allocating the resources and borrowing from the banking system. Hence, the government started to overcome this high inflation rate and was slightly significant by recording 21.262% in 1989.

On the contrary, inflation rates had witnessed the lowest levels during the 90s period as a result of the many economic reforms that have been adopted in line with the ERSAP with the cooperation of the Central bank of Egypt which undertakes series of successful improvements since 2000. And succeeded in decreasing the inflation rate from 15.742% in 1995 reaching its lowest level 2.27% in the year 2001, yet the inflation rates in Egypt are increasing significantly, reaching 18.317% in 2008, after a period of low rates at the beginning of the new millennium having a rate of 2.684% in 2000. This increase in inflation rates was associated with an increase in inflation volatility; given the substantial economic costs of inflation. In 2003, a managed floating exchange rate system had been adopted that pegs the Egyptian pound against the US dollar as the Egyptian pound depreciated by around 25%, resulted in increasing the inflation rate to 11.271% in 2004. Then the Central bank of Egypt applied the second phase of the Financial Sector Reform Program (FSRP) which has a time frame from year 2009 till 2011 aiming to increase access to financing, modernize prudential oversight and spurring more competition; under the main goal to decrease the inflation rate. Thus, this program succeeded as the inflation rate decreased slightly from 11.763% to 11.265%, 10.0525%, in the years 2009, 2010, 2011 respectively. Consequently, the inflation rate became 7.118% in 2012

but, later in 2013 and 2015 the inflation rate increased reaching 9.42% and 10.357% respectively due to the political and economic instability from the 25th January revolution in 2011.

Figure 3. Inflation Rate in Egypt (1975-2015)

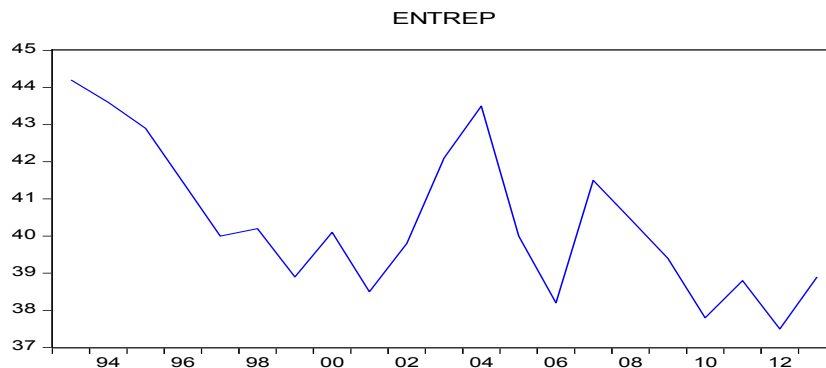


Source: Done by the authors based on the World Bank data.

▪ Entrepreneurship

The above mentioned reasons that caused fluctuations in GDP, unemployment, and inflation also affected entrepreneurship. This paper measures entrepreneurship by self-employment rate which remained on average 40% over the period 1993 till 1998. Between years 1999 to 2009, there was no certain trend as it kept increasing and decreasing within the range of 38% and 42%. It reached 38.4% in 2009 due to the global financial crisis and dropped to 37.8% by 2010. In the 2011 revolution, Egyptians displayed an increased interest in starting their own businesses reaching 38.8%. However, the role of the government and initiatives helped in encouraging self-employment to grow again starting from 2013.

Figure 4. Self-Employment Rate in Egypt (1993-2013)



Source: Done by the authors based on (ILO data).

4. Empirical analysis using VAR model

To examine whether entrepreneurship affects or is affected by unemployment, economic growth, and inflation in Egypt, a VAR model is used. The study employs a secondary annual time series data from year 1993 to 2013 with 21 observations collected from international macro database of World Bank, International Monetary Fund (IMF), and International Labor Organization (ILO). Entrepreneurship has been relatively difficult to measure as many studies have depended on self-employment data, surveys, and interviews to measure entrepreneurship empirically. Among the various alternatives of the proxy of entrepreneurship, this paper will rely on self-employment rate as a proxy of entrepreneurship. The annual percentage growth rate of real GDP is based on 2010 prices and the inflation rate was measured by the Consumer Price Index (CPI).

The model is based on the one of Chen (2013) who used the VAR model in order to investigate the inter-relationship between entrepreneurship, economic growth and employment in Taiwan during the period 1987-2012, where the number of new company formation is used as a proxy for entrepreneurship. His empirical results show that there is positive relationship between entrepreneurship and both economic growth as well as employment rate. The inflation rate is added in order to assure the accuracy of the model, in addition to using self-employment rate as a proxy for entrepreneurship.

The structure of the VAR equations is that each variable is a linear function of past lags of itself and past lags of the other variables. It is important to mention that one of the advantages of using the VAR is that it is considered a type of non-structural models, due to its minimal theoretical requirements.

Four equations are estimated, one each for entrepreneurship, GDP growth rate, unemployment, and inflation as dependent variable.

$$ENTRP_t = a_{10} + \sum_{j=1}^p a_{11j} ENTRP_{t-j} + \sum_{j=1}^p a_{12j} GDP_{t-j} + \sum_{j=1}^p a_{13j} UNEMP_{t-j} + \sum_{j=1}^p a_{14j} INFL_{t-j} + \varepsilon_{1t}$$

$$GDP_t = a_{20} + \sum_{j=1}^p a_{21j} ENTRP_{t-j} + \sum_{j=1}^p a_{22j} GDP_{t-j} + \sum_{j=1}^p a_{23j} UNEMP_{t-j} + \sum_{j=1}^p a_{24j} INFL_{t-j} + \varepsilon_{2t}$$

$$UNEMP_t = a_{30} + \sum_{j=1}^p a_{31j} ENTRP_{t-j} + \sum_{j=1}^p a_{32j} GDP_{t-j} + \sum_{j=1}^p a_{33j} UNEMP_{t-j} + \sum_{j=1}^p a_{34j} INFL_{t-j} + \varepsilon_{3t}$$

$$INFL_t = a_{40} + \sum_{j=1}^p a_{41j} ENTRP_{t-j} + \sum_{j=1}^p a_{42j} GDP_{t-j} + \sum_{j=1}^p a_{43j} UNEMP_{t-j} + \sum_{j=1}^p a_{44j} INFL_{t-j} + \varepsilon_{4t}$$

Source: International Labor Organization. World Bank. International Monetary Fund

where, (t) denotes time, and (p) is specified for the whole system and is the same for each x; a_{no} : intercept; a_{nj} : are parameters to be estimated. ENTRP: Entrepreneurship which is measured by the self-employment as a percentage from the total employment; D(ERP): First difference of entrepreneurship. GDP: Annual percentage growth rate of real GDP based on 2010 US dollar prices; UNEMP: Unemployment rate as the percentage of labor force. INFL: Inflation as measured by the consumer price index reflects the annual percent change in the cost to the average consumer of goods and services.

The modeling strategy adopted in this study includes three steps:

- univariate analysis by applying Augmented Dicky Fuller (ADF) unit root test (to test stationarity and the order of integration of the variables)
- VAR is estimated twice once at level another in the stationary form.
- the analysis tools for interpretation: Impulse Response Functions (IRFs) and Variance Decomposition (VD)

■ The empirical results of VAR

Descriptive statistics

Table 1. Descriptive statistics of the variables

	ENTREP	GDP	UNEMP	INFL
Mean	40.37143	4.390048	10.06014	7.999667
Median	40.00000	4.47100	10.0500	7.64500
Maximum	44.20000	7.15200	13.0000	18.31700
Minimum	37.50000	1.81700	7.692000	2.270000
Standard deviation	1.97759	1.621975	1.42327	4.425030
Observations	21	21	21	21

Source: Calculations are done by the authors.

Means and standard deviations of ENTREP, GDP, UNEMP, and INFL are shown in table (1), where the annual average percentage of entrepreneurship, real GDP, unemployment rate, and inflation rate is about 40.4%, 4.4%, 10.1%, and 7.9% respectively.

Unit-Root Test

First, a univariate analysis is applied to check the stationarity of the variables through using Augmented Dicky Fuller (ADF) unit root test⁶ for ENTREP, GDP, UNEMP, and INFL in their level form. According to the ADF output for all the variables at level, the absolute values of the ADF t-statistic of GDP and UNEMP are greater than the Mackinnon critical values at 5% significance level, so H_0 is rejected, thus GDP and UNEMP are stationary at level and integrated of order Zero. [UNEMP, GDP~I(0)]. While the absolute values of the ADF t-statistic of ENTREP and INFL are smaller than the Mackinnon critical values at 5% significance level. Therefore, H_0 is not rejected, thus ENTREP and INFL have unit root (non-stationary) at level. After that the ADF is conducted for the first difference for these two variables (ENTREP and INFL) to determine their order of integration , finding out that their absolute values of the ADF t-statistic became larger than the Mackinnon critical values at 5% significance level, therefore H_0 is rejected and the first difference of them is stationary⁷. [ENTREP, INFL ~I(1)].

Estimation of VAR Model

The results in Table 2 indicate that Schwarz criterion (SBC)⁸ is at minimum at lag 3. Then the VAR was re-estimated with all the variables in the stationary form with 3 lags; since it's the optimal lag length as shown in Table (2).

Table 2. Schwarz Criterion

	VAR at level Lag 1	VAR at level Lag 2	VAR at level Lag 3
Schwarz criterion	16.2833	17.2397	14.2519

Source: Calculations are done by the authors.

Form of VAR equations after Estimation and choosing the lag length

$$\begin{aligned} \Delta ENTREP_t &= a_{10} + \sum_{j=1}^3 a_{11j} \Delta ENTREP_{t-j} + \sum_{j=1}^3 a_{12j} GDP_{t-j} + \sum_{j=1}^3 a_{13j} UNEMP_{t-j} + \sum_{j=1}^3 a_{14j} \Delta INFL_{t-j} \\ GDP_t &= a_{20} + \sum_{j=1}^3 a_{21j} \Delta ENTREP_{t-j} + \sum_{j=1}^3 a_{22j} GDP_{t-j} + \sum_{j=1}^3 a_{23j} UNEMP_{t-j} + \sum_{j=1}^3 a_{24j} \Delta INFL_{t-j} \\ UNEMP_t &= a_{30} + \sum_{j=1}^3 a_{31j} \Delta ENTREP_{t-j} + \sum_{j=1}^3 a_{32j} GDP_{t-j} + \sum_{j=1}^3 a_{33j} UNEMP_{t-j} + \sum_{j=1}^3 a_{34j} \Delta INFL_{t-j} \\ \Delta INFL_t &= a_{40} + \sum_{j=1}^3 a_{41j} \Delta ENTREP_{t-j} + \sum_{j=1}^3 a_{42j} GDP_{t-j} + \sum_{j=1}^3 a_{43j} UNEMP_{t-j} + \sum_{j=1}^3 a_{44j} \Delta INFL_{t-j} \end{aligned}$$

Impulse response function

By recalling the aim of the paper which is testing whether entrepreneurship affects or is affected by GDP, unemployment, and inflation. A more insightful way to capture the relation under study is to use the impulse response function⁹. This was shown by applying two different impulses as shown in Figures (5) and (6),

⁶ ADF test: It is the most formal detection method of non-stationarity than the graphical inspection, the autocorrelation function, and correlogram.

⁷ It's worth noting that the coefficient of the trend and the constant are not significant in the ADF of D (ENTREP) and D(INFL) and removing them will not affect the decision that they are stationary after the first difference.

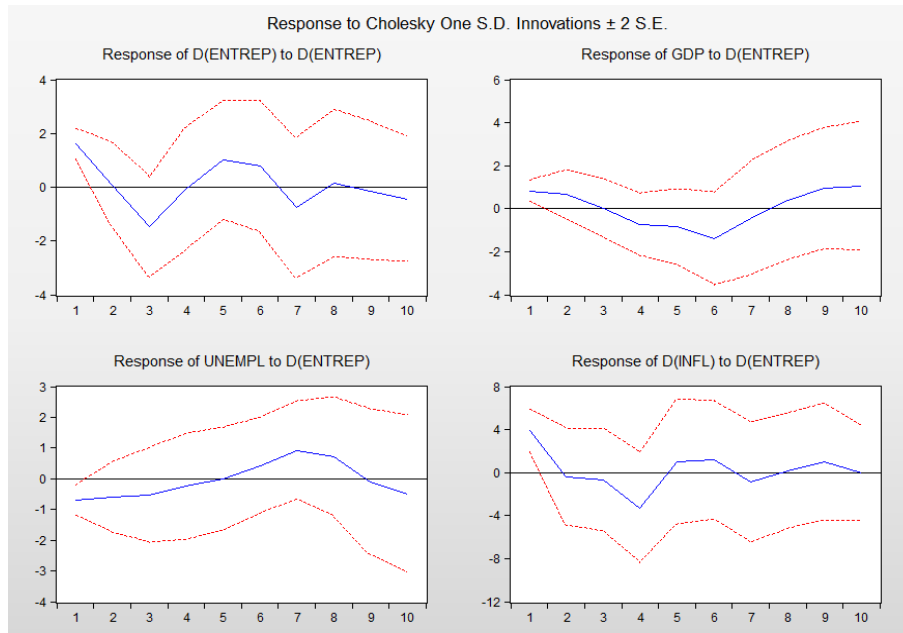
⁸ SBC: A criterion for model selection among a finite set of model the lowest value is preferred.

⁹ "Impulse response: capture and compute the impact over time of an exogenous shock in either on the dependent variables, taking into account the interrelationships reflected by the system of equations." (Thurik *et al.* 2007).

respectively, where the first impulse was done on entrepreneurship only to capture the response of all variables under study, while the second impulse was done on all variables under study to know the response of entrepreneurship.

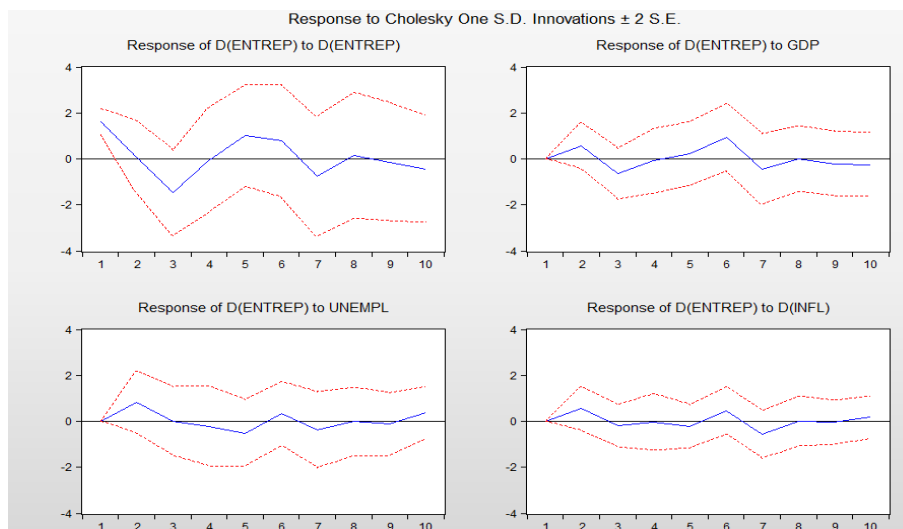
In Figure (5) by shocking entrepreneurship, it is shown that there are positive significant responses from itself, GDP and inflation during the first 18 months, while there is a negative significant response from unemployment during the first period. While, in Figure (6) by shocking all variables, it is shown that there is only a positive significant response from entrepreneurship itself.

Figure 5. Graphs of impulse response functions (1) for a unit shock to the first difference of Entrepreneurship, capturing the response of all variables with a confidence interval.



Source: Done by the authors.

Figure 6. Graphs of impulse response functions (2) for shocking all variables and capturing the response of the first difference of entrepreneurship with a confidence interval.



Source: Done by the authors.

Variance decomposition

Another way of characterizing the dynamic behavior of the model is through variance decomposition. Table 3 shows the variance decomposition for the first difference of entrepreneurship. The second column in the table gives the standard errors of forecast for horizons for 1 year, 2years, etc. The standard error for the 1-year forecast is just 1.62, the standard deviation of ε_1 . For the 2-year forecast, the standard error is 1.979, because it includes the effects of uncertainty over the 1-year forecasts of GDP, unemployment and inflation.

Third column of Table 3 shows the percentage of the first difference of entrepreneurship forecast variances that can be attributed to shocks in the first difference of entrepreneurship alone, as opposed to GDP, unemployment and inflation. The fourth column shows the percentage of the first difference of entrepreneurship forecast the variances that can be attributed to shocks in GDP, while the fifth column shows the percentage attributable to unemployment, and the sixth column shows the percentage attributable to the first difference of inflation.

Accordingly, interpreting the first three periods only is reflecting the short run dynamics of the annual frequency. By making a 1-year forecast of the first difference of entrepreneurship, 100% of the forecast variance will be attributable to the first difference of entrepreneurship shocks only, while a 2-year forecast of the first difference of entrepreneurship, 67.2% of the forecast variance will be attributable to first difference of entrepreneurship shocks, 8.24% to GDP shocks, 16.78% to unemployment shocks, and 7.76% to first difference of inflation shocks. Moreover, a 3-year forecast of the first difference of the entrepreneurship leads to 73.54% of the forecast variance to be attributable to the first difference of entrepreneurship shocks, 11.18% to GDP shocks, 10.04% to unemployment shocks, and 5.22% shocks to first difference of inflation shocks. Concluding that in the second period unemployment is affected more by shocking entrepreneurship than GDP while, in the third period GDP is affected more.

Table 3. Variance decomposition of D(ENTREP)

Period	S.E	D(ENTREP)	GDP	UNEMPL	D(INFL)
1	1.620339	100.0000	0.000000	0.000000	0.000000
2	1.979425	67.20948	8.246579	16.78356	7.760422
3	2.558459	73.54663	11.18356	10.04741	5.222403
4	2.569648	72.97088	11.20591	10.63490	5.188308
5	2.830421	73.05943	9.854966	12.21042	4.875192
6	3.139209	65.45450	17.27422	11.11647	6.154809
7	3.333791	63.28432	17.03312	11.17716	8.505411
8	3.337024	63.35490	17.00020	11.15595	8.488949
9	3.348958	63.07570	17.26776	11.20249	8.454045
10	3.411186	62.48310	17.17275	11.93655	8.407606
Cholesky Ordering: D(ENTREP) GDP UNEMPL D(INFL)					

Source: Calculations are done by the authors

It can be said that, the Model has included some limitations that should be taken into consideration. *First*, the lack of a long comprehensive data for entrepreneurship in Egypt was a significant obstacle that resulted in limiting the scope of the analysis to only 20 years and the sample size with 21 observations; since most quantitative researches normally requires a large sample size to be representative and to get accurate results. Also missing data in some years was another obstacle that was solved by taking the average¹⁰. *Second*, the self-employment rate is used as a proxy for entrepreneurship. However, this proxy may not accurately reflect the actual level of entrepreneurship. It would be better if Total early-stage Entrepreneurial Activity rates (TEA), which is introduced by the Global Entrepreneurship Monitor (GEM) is used as a proxy for entrepreneurship,

¹⁰ Missing 2 years in self-employment rate:1996 & 2008, average $=y_{t-1}+y_{t+1}/2$

as it focuses on the emerging entrepreneurs versus young business owners in various sectors. In Egypt there was not enough data to use the TEA (data were only available from 2008 to 2012).

Third, using an annual data to analyze whether entrepreneurship affects or is affected by GDP, unemployment and inflation, can't capture the detailed variation in a year, that's why it's better to use quarterly data for using the short run dynamic VAR to get more accurate and precise results.

Fourth, using the VAR model is only about the short run and it is recommended to carry out the Vector Error Correction Model (VECM) which includes both economic theory relating to the long run relationship between the variables as well as the short run disequilibrium behavior. But it has not been used in this paper, as the conditions of the co-integration were not satisfied.

Finally, if the sample tackled the regional perspective as well as the gender classification, this may reflect better and more accurate results.

Conclusion

In a regime of increased globalization, where the comparative advantage of modern economies is shifting towards knowledge based economic activity, entrepreneurship doesn't only play an important role as being the core engine of a virtuous cycle that develops any economy and serves as a vehicle for innovation, but it also generates economic growth. That leads Holcombe (1998) to claim that "the incorporation of entrepreneurship into the framework of economic growth not only fills in the institutional details to help make the growth process more understandable, but also points toward more promising economic policy recommendations for fostering economic growth". Hence, The development and sustainability of SMEs is of critical importance for both developing and developed economies (Hanadi and Busler 2010). Also, entrepreneurship affects the unemployment negatively as it creates new job opportunities not only for the entrepreneurs themselves but also for the unemployed in general. King and McGrath (1999) mentioned that "With small businesses increasingly becoming a major feature of economic development policy in both developed and developing countries due to their labor-absorptive capacity and their contribution to poverty alleviation and employment creation".

Egypt's young population gives it a strong entrepreneurial advantage; as it is considered a large market and the largest in the MENA region, thus there is a large opportunity for growth and innovation. Additionally, Egypt faces a lot of challenges that can be overcome with numerous of entrepreneurial ideas and activities. This paper studies the entrepreneurship in Egypt during the period 1993-2013 to know whether entrepreneurship affects or is affected by unemployment, economic growth, and inflation, As well as being aware of the obstacles and the difficulties that face entrepreneurs in Egypt and try to solve them by giving some recommendations; with knowing the applied policies and how Egypt tried to embrace and support the entrepreneurship, by The business incubators that provide a good platform for the convergence mechanisms for supporting knowledge-based enterprises (Olawale and Garwe 2010), the role of non-profitable organizations and others is mentioned in section (3.4) in chapter 3. These recommendations should mainly focus on the entrepreneurship ecosystem that is needed to foster the growth of entrepreneurs, but unfortunately the burden is heavy on the policy makers to understand the key factors that help entrepreneurs to thrive and leverage the human capital and empower more people to participate in the unleashing potential.

The empirical results show a significant positive relationship between entrepreneurship and GDP growth rate and a significant negative relationship between entrepreneurship and unemployment. But there is an exotic positive relation between entrepreneurship and inflation which may be due to the limitations. On the other hand, GDP growth, unemployment, and inflation don't affect entrepreneurship in the short run; which means that in the Egyptian case through the period mentioned above, entrepreneurship only affects the other variables but not the vice versa. Finally, quantifying these results will help policy makers and scholars in determining and taking the right economic decisions regarding the entrepreneurship sector in Egypt, knowing the great importance of this sector and how it develops the economic growth and enlarges the availability of job opportunities.

References

- [1] Acs, Z. J., and Virgill, N. 2010. *Entrepreneurship in Developing Countries*. In Handbook of Entrepreneurship Research, 485-515. New York, NY: Springer. DOI: <http://dx.doi.org/10.1007/978-1-4419-1191-9>
- [2] Ahmad, N., and Seymour, R. G. 2008. Defining Entrepreneurial Activity: Definitions Supporting. Frameworks for Data Collection. OECD statistics working Paper.
- [3] Asad, A., Ali, M., and Islam, U. 2014. The Relationship between Entrepreneurship Development and Unemployment Reduction in Pakistan. *Global Journal of Management and Business Research: An Administration and Management*, 14(10): 75-79.
- [4] Aubry, M., Bonnet, J., and Renou-Maissant, P. 2015. Entrepreneurship and the business cycle: The “Schumpeter” effect versus the “refugee” effect—a French appraisal based on regional data. *The Annals of Regional Science*, 54(1): 23-55. DOI: <http://hdl.handle.net/10.1007/s00168-014-0645-x>
- [5] Audretsch, D. and Fritsch, M. 2002. Growth Regimes over Time and Space. *Regional Studies*, 36 (2): 113-124. DOI: <http://dx.doi.org/10.1080/00343400220121909>
- [6] Carree, M. A., and Thurik, A. R. (n.d.). 2010. The Impact of Entrepreneurship on Economic Growth. *International Handbook Series on Entrepreneurship*, 557-588. DOI: http://dx.doi.org/10.1007/978-1-4419-1191-9_20
- [7] Chen, C. C. 2013. Entrepreneurship, Economic growth, and Employment: A case study of Taiwan. *Hitotsubashi Journal of Economics*, 55(1): 71-88. DOI: <http://dx.doi.org/10.15057/26817>
- [8] Dellis, K., and Karkalakos, S. 2015. Entrepreneurship, growth and unemployment: A panel VAR approach. *Munich Personal RePEc Archive. Paper No. 74660*.
- [9] Dilanchiev, A. 2014. Relationship between Entrepreneurship and Unemployment: The Case of Georgia. *Journal of Social Sciences*, 3(2): 5-9.
- [10] Dvoutely, O., and Mareš, J. 2016. Relationship between unemployment and entrepreneurial activity. *Innovation Management, Entrepreneurship and Corporate Sustainability*, 14(3): 146-156.
- [11] Gănescu, M.-C. 2014. Entrepreneurship, a solution to improve youth employment in the European Union. *Management Strategies Journal*, 26(4): 580-588.
- [12] Hanadi, M. A. M. and Busler, M. 2010. Business Incubators: Findings from a Worldwide Survey, and Guidance for the GCC States. *Global Business Review*, 11(1): 1-20. DOI: <https://doi.org/10.1177/097215090901100101>
- [13] Henrekson, M., and Johansson, D. 2010. Gazelles as job creators: a survey and interpretation of the evidence. *Small Business Economics*, 35(2), 227–244. DOI: <https://doi.org/10.1007/s11187-009-9172-z>
- [14] Holcombe, RG. 1998. Entrepreneurship and Economic Growth. *The Quarterly Journal of Austrian Economics*, 1(2): 45-62.
- [15] Joshi, C. A. 2016. An Empirical Study on Entrepreneurial Perception among Students in Oman. RSEP. paper presented at International Conferences on Social Issues and Economic Studies, November 2-4, in Madrid, Spain .142-149. DOI: <http://dx.doi.org/10.19275/RSEPCONFERENCES027,,>
- [16] Kheiravar and Qazvini. 2012. Exploring the Relationship between Entrepreneurship and Unemployment Rate in Industrial Sector of Azerbaijan. *International Journal of Organizational Leadership*, 1(2): 45-59
- [17] King, K. and McGrath, S. 1999. Enterprise in Africa between Poverty and Growth. Working paper no. 42.
- [18] Morales-Gualdrón, S.T. and Roig, S. 2005. The New Venture Decision: An Analysis based on the GEM Project Data Base. *International Entrepreneurship and Management Journal*, 1(4): 479-499. DOI: <https://doi.org/10.1007/s11365-005-4774-7>
- [19] Nassar, H. 2011. Growth Employment Policies and Economic Linkages: Egypt. *International Labor Office*, Working paper no.85

- [20] Olawale, F. and Garwe, D. 2010. Obstacles to the growth of new SMEs in South Africa: A Principal component analysis approach. *African Journal of Business Management*, 4(5): 729-738.
- [21] Plehn-Dujowich, J. M. 2012. *The Dynamic Relationship between Entrepreneurship, Unemployment, and Growth: Evidence from U.S. Industries*. The United States Small Business Administration.
- [22] Schumpeter, J. 2011. *The Entrepreneur: Classic text by Joseph A. Schumpeter*. In M.C. Becker, et al., editors. (3rd ed.). *Stanford: Stanford university press*, 100-180.
- [23] Thurik, R. and Baptista, R. 2007. The relationship between entrepreneurship and unemployment: Is Portugal an outlier? *Technological forecasting and social change*, 23(4): 75-89. DOI: <https://doi.org/10.1016/j.techfore.2006.04.003>
- [24] Thurik, R., Carree, M., Stel, A., and Audretsch, D. 2008. Does self-employment reduce unemployment? *Journal of Business Venturing*, 23(6): 673-686. DOI: <https://doi.org/10.1016/j.jbusvent.2008.01.007>
- [25] Valliere, D., Peterson, R. 2009. Entrepreneurship and economic growth: Evidence from emerging and developed countries. *Entrepreneurship & Regional Development*, 21(5): 459-480. DOI: <http://dx.doi.org/10.1080/08985620802332723>
- [26] Wong, P. K., Ho, Y. P., and Autio, E. 2005. Entrepreneurship, Innovation and Economic Growth: Evidence from GEM data. *Small Business Economics*, 24(3): 335-350. DOI: <https://doi.org/10.1007/s11187-005-2000-1>
- [27] Zaki, I. M., and Rashid, N. H. 2016. Entrepreneurship Impact on Economic Growth in Emerging Countries. *The Business and Management Review*, 7(2): 31-39. DOI: <http://dx.doi.org/10.1787/243164686763>
- *** OECD 1998. "Fostering Entrepreneurship: The OECD Jobs Strategy," OECD, Paris. Available at: http://www.oecd-ilibrary.org/urban-rural-and-regional-development/fostering-entrepreneurship_9789264163713-en. DOI: <http://dx.doi.org/10.1787/9789264163713-en> (Accessed on 16 February, 2017)
- *** OECD 2017. "Unemployment rate (indicator), 1990-2015." Available at: http://www.oecd-ilibrary.org/employment/unemployment-rate/indicator/english_997c8750-en. doi: <http://dx.doi.org/10.1787/997c8750-en> (Accessed on 16 February, 2017)
- *** OECD. 2008. Defining Entrepreneurial Activity: Definitions Supporting Frameworks for Data Collection OECD Statistics Working Paper, (database). DOI: <http://dx.doi.org/10.1787/243164686763> (Accessed on 24 January 2008).

The Formation Prospects of the Command Culture of the Organization Management Thinking in the New Paradigm of Social and Economic Development of the Society

Sergei Aleksandrovich NOVOSADOV
National Research Nuclear University MEPhI, Obninsk, Russia
ser-novosadov@yandex.ru

Tatiana Aleksandrovna BURTSEVA
Kaluga State University by K.E. Tsiolkovsky, Kaluga, Russia
tbur69@mail.ru

Natalia Victorovna REPETSKAIA
National Research Nuclear University MEPhI, Obninsk, Russia
nataliavr2005@ya.ru

Sergey Vyacheslavovich NOVIKOV
Moscow Aviation Institute (National Research University), Moscow, Russia
ncsrn@mail.ru

Suggested Citation:

Novosadov, S.A., Burtseva, T.A., Repetskaia, N.V., and Novikov, S.V. 2017. The formation prospects of the command culture of the organization management thinking in the new paradigm of social and economic development of the society. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 1996-2002.

Abstract:

In spite of many theoretical and methodological approaches and methods set forth by both domestic and Western scientists, issues of formation of an effective team are still quite challenging in terms of organizational efficiency improvement. The paper critically examines existing concepts and terms of formation of a new structure of management of an enterprise (organization), based on a hierarchical team approach. The main methods of the study of this problem are the abstract and logic, dialectic, intuitive and prophetic, deductive, based on religious and philosophical, and socio-economic, system-situational approaches, making it possible to holistically consider the processes of formation and establishment of the system of one-level team management, based on a team culture of thinking. The authors made a conclusion about the narrowness of all works on the team culture of organization management in the tideway of the Western liberal market economy, and their low efficiency in the context of Russian cultural identity and self-determination. The paper reveals the reasons of insufficient efficiency of existing hierarchical team system. Article information may be of practical value to a new generation of managers who will build a new socio-economic culture of thinking, based on a new type of economy: person-oriented one.

Keywords: team building; management; person-oriented economy; justice

JEL Classification: M10; M12; M15

Introduction

Considering and studying the works of Russian and Western academic economists and sociologists who study the issues of the concept and meaning of the team (Argyris 1985; Belbin 1981), team feeling (Blake and Mouton 1969), team spirit (McGregor 1960), team structure (Maximov and Khalikov 2016; Shaytura *et al.* 2016), it is determinately possible to say that in their methodology they do not go out of the framework of capitalist (liberal market) understanding of development of economics and management. Despite this, in general, in terms of the structural and functional components of the team activity of each division, department and particularly organization, it is quite obvious that the goals and objectives, personnel selection, distribution of roles and monitoring are necessary and constituent elements of formation of an effective team.

1. Concept headings

In the situation of crisis tendencies existing in micro- and macroeconomics, the weakness and failures of the existing models of the Western system of government become apparent. In turn, modern Russia, in our opinion, is building the economic model of the social market economy, based on the model of “ordoliberal state” in order to maintain competitive conditions for the implementation of the social advantages of the market, together with the functions of “neoclassical” state to eliminate “market failures” and aiming at active social policy of “neo-Keynesian welfare state”. However, all these models are basically trying to reconcile two opposite targets: how to achieve the general welfare of society on the basis of Pareto justice, and not to reduce, but to increase the overall income of major financial and oligarchic structures. This task is practically impossible, and this will cause the economy short- and long-wavelength industrial and financial crises. It is necessary to review the basics of economic theory and the role of man in this system of socio-economic relations. Based on this, the authors of this article attempted to reframe this process, in particular by the example of the formation of a new concept of organization and development of the organization's management, relying primarily on understanding without hierarchical vision of the future management structure later shifting to the unstructured informal organization based on a *team culture of thinking*¹.

This context has determined the hypothesis, the purpose and the main objective of the study.

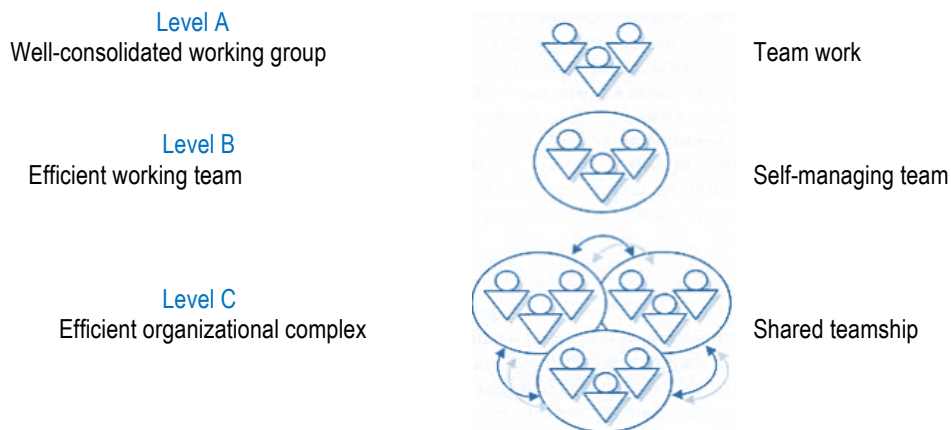
Analysis of team building model

For a general understanding of the trends of the development of team paradigms, we will briefly describe some aspects. Today, the efficiency of team work is regarded as a distinct hierarchical management structure, *i.e.* the structural organization. In simplified form, it can be understood as a management team: executive (working) team.

For clarity of understanding of the existing “Team” term, we will mean the following frequently used definition: “*Team is a group of people sharing common goals, having complementary skills, a high level of interdependence, and sharing the responsibility for achieving the end results*” (Galkina 2011).

To analyze the existing typologies and forms of team building, we will use, for example, a three-level model by D. McIntosh-Fletcher (1996) see Figure 1.

Figure 1. Three-level model of team building



It is represented by a coherent transition from the individual-group interaction of personnel, level “A” (a well-consolidated working team), to the level “B” (an efficient working team) and ends at the level “C” (an efficient organizational complex). If the first two levels are quite understandable, the last one is not well described and, in our view, is confusable. In particular, the level “C”: effective organizational complex consisting of a large number of people includes sub-teams that have different purposes or carry out different stages of work. It focuses on the

¹ This term is proposed as a new paradigm of understanding of the team staff performance (or better likeminded people) of the organization (author's note).

needs of the organization as a whole. This level has features of both a well-consolidated group and efficient working team, and in addition:

- each team is associated with other teams of the organization or with functions for implementation of various projects;
- team resources (human and material) are shared with the other teams of the organization or with their functions;
- team influences the strategy and policy of the organization;
- people can join and leave the team in accordance with the needs, progress of work and time factor.

Efficient organizational complex integrates the activities of individual teams of a large organization, establishes cooperation between them, relying on universally shared principles of teamwork.

In terms of this interpretation, some questions arose, namely:

- who carry out integrating activities of the organizational complex, in particular, what team?
- who defines and creates the needs (market, financial, human, material, strategic) of the organization as a whole?
- who formulates the vision and mission of the organization?

Based on the above, if we talk about subteams (subsystems of the organization' system), then we mean the hierarchy of subordination again, but only with certain functional allowances or assumptions (e. g., the impact on the development strategy of the organization, although it is related, in some cases, with participatory structures as well (Mayorova *et al.* 2011). In large organizations, there are usually not one, but several teams, both management and executive.

Speaking of the management structure, the management teams include: the *strategic team* consisting of senior managers, which defines the mission, objectives and tasks of the organization; *business teams*, which, based on the developed strategy, make their own decisions on the various activities of the organization; *functional* (operational) and *technical and production* (executive) *teams*, which are directly involved in the production in structural units of the organization; *target* (project) *teams*, which are designed to solve some specific problems.

It is quite obvious that the fundamental worldview ground, based on an understanding and vision of the mission of capitalism, remains in fact unchanged and is still based on the *exploitation of man by man*. And this is directly reflected in the forms of organization's personnel management (human resources), and the team management, as the most efficient of its components.

Based on this concept, taking into account the management practices of the Russian economy, we will note the negative, in our view, aspects of the results of team formation in the current liberal market economy:

- preservation of the principle of hierarchy in the management and availability of levels of management in the teamwork, ultimately, will lead to increased exploitation (the capitalist calls it the efficient management, which leads to an increase in company profits) of management and production labor of the personnel together with physical staffing reduction (which is happening now in the Russian economy);
- ability to skillfully create teams by selecting the required candidates for certain purposes and for a certain project term (e.g., research project teams or partially corporate ones) may not always be efficient enough, because for some of the participants, the question of their role after the project closing remains pending. In practice, these professionals are (although not always) dismissed to work independently, if there was no place in the new project for them;
- as shown by the practice, the majority of implemented innovative projects are aimed exclusively at maximizing the profit for the company (institute). At the same time, socially important projects, being not very profitable, but able to significantly improve the quality of life of the population or being useful for the science, are often put aside. This leads to the fact that some members of the team due to their moral determination and understanding of this reality will be less motivated to efficiently fulfill their duties, being not able to implement their scientific and intellectual potential, which would be fully implemented in one of such rejected projects;

- society building system based on liberal market economy, which is built on the ideology of enrichment and the theory of hedonism, distorts the worldview of the general population, especially young people, who choose their way of living. As shown by the practice, 80% of chosen professions do not unlock their initial development potential. This greatly affects the efficiency of their activities and, in particular, teamwork.

The general conclusion is that together with the apparent usefulness and efficiency of the system of team management by various institutions, in liberal market economy system there is no possibility for every individual to fulfill his initial potential, and consequently to increase his professional and creative activity.

2. Methodology of a new concept of team building

To understand the proposed paradigm of new teamwork of organization's employees, it is necessary to shift the focus from the purely economic understanding of the issue of team management to the worldview aspect based on the philosophically-historical and sociologically-economic outlook of the processes taking place in Russian society. It is necessary, first of all, to note that in the Rus civilization's hereditary code, in the process of historical development since the tribal system, especially before its Christianization, there were always *community (collectivist)* relationships between people. This was many times confirmed by various historical events, such as the resolving of countrywide issues in the Novgorod Veche at the Polish intervention (the Times of Troubles of 1612), deliberately created peasant partisan detachments during the Napoleonic War of 1812, etc. This was also particularly apparent in the time of Russian transition from capitalism (of course, compared to Europe of the time, it was weakly developed in Russia) to a new form of living arrangement: socialism. In that period, especially during the ruling of J. V. Stalin, the ordinary citizen felt (though it was often nominally) like the master of his life and could, if desired, realize his inherent genetically determined abilities. The mere fact that in a short time the illiteracy was managed and the people were given a proper education, speaks for itself. Now, even in the most developed capitalist countries, up to 30% of population is illiterate, who can neither read, nor write.

Another significant feature of world outlook of the Russian² people, in addition to the communalism, is its relation to the understanding of the *meaning of life on earth*.

Despite the Western liberal-democratic propaganda of the Western lifestyle in the modern Russian society, especially among the young people, the majority of Russian citizens consciously or subconsciously want to *live in truth and justice*. And what is it to live in justice? All dictionaries define the concept of justice in philosophical and social terms as a ratio of legal and economic processes. In legal terms, it is a relation between the committed act and its legal assessment, as well as the possibility to run for office at all levels of government based on the principle of equality of opportunities. In economic terms, this is expressed in an equal distribution of wealth among all those in need, for their comfortable living and development. In fact, this can be regarded as the correct interpretation. However, this does not cover the philosophical and religious issue, which is the support moment that will give us the answer to the question of possibility of building in the near future of an efficient *team culture of thinking* that can persistently develop the state and the economy.

If we consider the category of justice from the perspective of morality and conscience, it can be stated that it is essentially a metaphysical concept. In other words, it has no equality equivalent, which can be expressed in the material or legal pricelist invariant. They say the sense of justice is a transcendent notion, based on the highest ideals which man relates with his religious feeling. And if so, then all the scriptures talk about the same, if we disregard all the corrections and amendments. Namely: how to build a paradise on earth! ("*...Thy will be done in earth, as it is in heaven*" (Gospel, Matt. 6:10), "*...Be a community that calls for what is good, urges what is right, and forbids what is wrong: those who do this are the successful ones*" (Qur'an 3:100).

It is important in this context to understand the role of each individual in a large global historical process. And this parallel can be made, if we consider the matter in the context of human physiology. From the "Human

² Herein, the word "Russian" is used as a civilization umbrella term. Every nationality, which lives in the territory of present-day Russia-Rus and uses Russian as a language of interethnic communication, based on the ideals of justice, conscience and morality, is Russian (author's note).

Anatomy” school course we know that each individual is different. Namely, being physiologically similar, each of us has different fingerprints, ear conches, retinas, nose tips, etc.

This points to the fact, that being physiologically similar, at the same time we are “qualitatively” different from each other, and this affects not only the function of internal organs. Most importantly, this fact influences the intellectual activity of the human brain. The conclusion is that every person has certain (defined by God) mission in the world: to make his personal contribution to the general order of things. In other words, each of us has at the genetic level the ability to do something a little better than the others in any field of activity, existing or entirely new, unexplored one. And the main task of man on earth during his lifetime, or terrestrial biological life cycle, is to identify these inherent abilities and extend or modify existing knowledge (to improve the lives of all people in the right way).

Addressing the issue of social justice from such a philosophical position, it is obvious that: *based on an equivalent contribution to each person according to his morality and conscience to the development of the global historical process (whether he is janitor, laborer, engineer, manager, director, governor, deputy, president), the distribution and receipt of financial (cash), tangible, cultural and social benefits shall be fairly proportionate (ideally equal), and differ only by the infrastructure component (place of business).*

Now let us ask ourselves, can the existing socio-economic model of the West, East or Russia-Rus offer an opportunity for such a development of the individual? The answer is obvious! Of course not! Moreover, everything is done so that the person does not even think about these things, and channels his whole life energy to better his lot in life.

3. Results

On the basis of religious, philosophical and historical, and socio-economic context of our research, let us consider the basic prerequisites for the development of a new approach for building an effective team culture of thinking, any organizational system.

However, in the framework of the topic, the need to build a team culture of thinking is determined primarily by the state of the economy. As we have previously mentioned, the existing economic models do not ensure (and they are not intended to) a comfortable existence of the entire population of the state. It is necessary to reorganize the economic mechanisms of production and distribution of wealth, namely on the basis of a new type of economy: person-oriented one. We only propose to consider this direction and, from the standpoint of the existing worldview, provide a definition of this term.

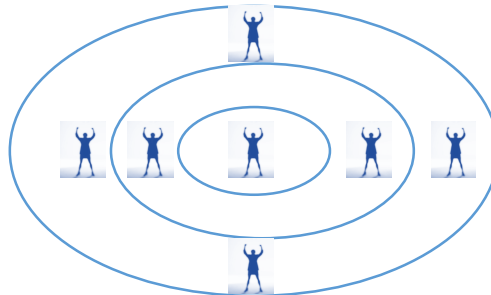
“Person-oriented economy is a type of economic, moral and social order of society in which every individual is guaranteed the possibility to become a person (averagely by 14-15 years) who reveals his genetically given abilities and implements his development potential to achieve the earthy heaven and fulfil his mission (the life purpose)”.

Based on this, one of the first conditions for the appearance of such a team thinking culture should be the changes in the following areas:

- Implementation in the education system due to the achievements of science and technology, innovative breakthroughs in the field of mechanical engineering, robotics industry, *etc.*, of a single-level standard of education: *higher education*, combining technology-specific vocational schools and higher education institutions into a single educational complex. In other words, any expert is a person who has obtained a higher education and possesses a full set of professional competences and wide worldview;
- Formation of such a socio-economic policy of the state in which every citizen would be given the opportunity to unlock his genetically given potential in the course of his life. For this purpose, the following activities need to be carried out:
 - reformation of the banking and financial system based on the lending rate, allowing funds to flow without the great efforts, in the process of monetary manipulation, by control mechanisms of stock and commodity exchanges, regulation of pricing of consumer prices, *etc.*, from the majority population (80%) into the pockets (deposits) of big capital (banks, oligarchic clans);

- transfer of the state economy from market control mechanisms to the reasonable planning and consumer economy (Novosadov, 2013) based on a fair system of production and distribution of wealth with a proper system of payment for labor (creativity);
- change of the existing investment priority: regional - social - commercial (in practice: commercial - regional - social), for the other priority: *social* (level of wages in the region corresponds to the food price parity + possibility to purchase items for a comfortable living of people + possibility for the improvement of the cultural level of population and possibility to purchase residential property without any financial difficulties) - *regional* (taxes spent for the development of regional infrastructure) - *commercial* (fixed profitability of launched production allowing the enterprise to develop effectively, without focusing on profit maximization).
- formation of social ideology of morality and humanity, based on the concept of understanding the essence of the meaning of life on earth and the destiny of man as a co-worker of God acting on His behalf and in harmony with the biosphere, and taking care of his offspring;
- implementation of the territorial division of the Russian Federation not on a national basis (this is a time bomb), but on the economic and geographic grounds. The basic principle is the ability of the specific territory to exist as an autonomous (at best) socio-economic unit, or the ability to provide to a greater extend the population of the territory with all the necessary goods and services;
- building a public administration system that allows every citizen to occupy any state (at the first stage) or non-state post (management level) on the basis of the elaborated candidate selection methodology solely on the basis of personal knowledge, skills, abilities and competencies. Moreover, entire enterprise management system should be built on a single-level principle of communication relations, powers and responsibilities based on intuitive and rational decision-making methods based on the team culture of thinking (Figure 2);

Figure 2. One-level principle of the company's organizational structure based on the team culture of thinking.



The main criterion for choosing a candidate should be the individual's ability to *make decisions based on morality and conscience, in accordance with his intuition and insight, according to the measure of understanding of Divine Disposal* (Novosadov 2013).

Conclusion

Let us consider, through the example of microeconomy, how these preconditions will improve the operation of the team. We will be based at that on egegorial-matrix approach based on the foundation of the collective mentality, which expresses the human type of psyche, sets of personalities of which is ensured by the construction of the internal unstrained systems of social activities, operating on the basis of the free will of all of its members.

We will mention only the main components of the formation of the *team culture of thinking*, in the case of this type of economy:

- recruitment for the company is carried out not on the basis of competency requirements for staff, but based on the desire of the person to work in this area, provided that he has necessary education chosen according to his genetically determined abilities and his creative development potential;

- there is no strictly fixed enterprise management structure. It consists only of the teams ensuring the carrying out of the activities (manufacturing, functional, etc.); each team has a leader, elected solely by the decision of the members of the team carrying out the selection of team decision, correlating it with the moral, sensitive-intuitive and intuitive-insight mindsets, according to the measure of understanding of Divine Disposal;
- the company's team system of management does not have formal and informal structures; everything is covered by one concept of team culture of thinking;
- in the company, each member of the team has the possibility to move freely, according to his own volition and common sense, from one team to another, up to the main leader, if approved by all the team members. The person is not only allowed, but even encouraged to do this, but only if he aspires to build the earthy heaven, and according to the members of the team, makes right decisions and does his best;
- when necessary, in case of new changes in the internal and external environment of the enterprise, a new team is formed to resolve the issue or to get a new opportunity for further development. In the case of the fulfilment by the team of its task, it is either disbanded for the sake of resource saving, and its members get transferred to other teams, or it receives the other tasks and objectives;
- this formulation of the issue of forming an effective team culture of thinking completely solves the problem (it is not even touched) of motivational component, as each member of the team is initially *self-motivated* on the basis of his worldview understanding of meaning of life;
- any team (project) initiative on the introduction of innovations (goods and services) is accepted for consideration and upon its approval is to be implemented according to the priority of achieving the existing objectives.

In conclusion, it should be mentioned that to achieve this team effect, a large complex of state measures needs to be implemented in the social, economic and political spheres. But first of all, it is necessary to carry out targeted awareness raising and trainings in the whole chain of educational services, starting from school education, in order to implant basic philosophical concepts to form a human type of mentality based on the personal rule of conscience and the moral and ethical principle of human behavior in society.

References

- [1] Argyris, C. 1985. *Strategy, Change and Defensive Routines*. Boston: Pitman.
- [2] Belbin, R.M. 1981. *Management teams*. New York: Hamemann.
- [3] Blake, R., and Mouton, J. 1969. *Building a Dynamic Corporation through Grid Organization Development*. Reading, Massachusetts: Addison-Wesley Publishing Company.
- [4] Galkina, T.P. 2011. *Management sociology: From group to team. Study guide*. Moscow: Finance and Statistics.
- [5] Likert, R. 1961. *New Patterns of Management*. New York: McGraw-Hill.
- [6] Maximov, D.A. and Khalikov, M.A. 2016. Prospects of institutional approach to production corporation assets assessment. *Actual Problems of Economics*, 183(9): 16-25.
- [7] Mayorova, N.V., Barkalov S.A., Polovinkina A.I., and Polovinkin I.S. 2011. *Sociology of management: Study guide*. Voronezh: Scientific Book.
- [8] McGregor, D. 1960. *The Human Side of Enterprise*. New York: McGraw-Hill.
- [9] McIntosh-Fletcher, D. 1996. *Teaming by Design: Real Team for Real People*. New York: VcGraw-Hill.
- [10] Novosadov, S.A. 2013. *Basic principles of the conceptual theory of fundamental development and management of the new type economy: Monograph*. Moskow: RSSU Publishing House.
- [11] Shaytura, S.V., Stepanova, M.G., Shaytura, A.S., Ordov, K.V., Galkin, N.A. 2016. Application of information-analytical systems in management. *Journal of Theoretical and Applied Information Technology*, 90(2): 10-22.

The Driving Factors, Risks and Barriers of the Industry 4.0 Concept

Pavla MACUROVÁ

Faculty of Economics, VŠB -Technical University of Ostrava¹, Czech Republic
pavla.macurova@vsb.cz

Ladislav LUDVÍK

Faculty of Economics, VŠB - Technical University of Ostrava, Czech Republic
ladislav.ludvik@vsb.cz

Martina ŽWAKOVÁ

Faculty of Economics, VŠB -Technical University of Ostrava, Czech Republic
martina.zwakova@vsb.cz

Suggested Citation:

Macurová, P., Ludvík, L. and Žwaková, M. 2017. The driving factors, risks and barriers of the industry 4.0 concept. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 2003 - 2011.

Abstract:

The authors of this article were dealing with the questions of which features of today's business environment may become the driving factors in the implementation of Industry 4.0, and what risks and barriers are emerging on this way. The chosen method of research was a combination of the study of specialized reference sources with a research questionnaire probe conducted mainly in the conditions of industrial enterprises in the Czech Republic. The probe has shown that the significant factors influencing the company activity and thus the form and pace of the implementation of breakthrough technologies include the shortage of workers in the required qualification structure, unstable demand from customers, increasing requirements for product individualization, and increasing competitive pressure. In the next three to five years, the companies under examination are going to prefer the implementation of partial elements of digitization and automation rather than integrated systems. The risks of this implementation according to them include especially the shortage of skilled workers who will prepare, implement and use the new technologies. The companies do not want to act too quickly with implementation, while taking into account the financial demandingness of these measures. At the end of this article, the authors ask questions for further investigation, namely to what extent the pace of the replacement of people by new technologies will be influenced by the fact that the cost of labour in the Czech Republic is relatively low.

Keywords advanced technologies; digitization; questionnaire survey; Industry 4.0; risks

JEL Classification: L26; M15; M21; O13; O33

Introduction

The term Industry 4.0 has become a fashionable word among the professionals as well as the public. From the information and thoughts presented by the media, it may appear that we will soon live in a fully digitized world. They create an image of the technological future where the supply, production and distribution processes in a high-tech company will be controlled automatically, without any human intervention. The main motive of the implementation of Industry 4.0 elements presented nowadays is the labour force downsizing, because people are expensive and their resources are limited. In addition, everything should happen quickly and on a mass scale.

The question is what does the real situation in specific company conditions, with regards to the determination and readiness to take just the road of the new technologies based on automation and digitization, looks like? This is also definitely related to the issue of human and financial resources necessary to design and implement the concept of Industry 4.0, as well as the ability to select the right technological variants for specific business conditions in order to ensure compatibility within the complex production and control systems, etc. The economic and social impacts represent other unavoidable issues. What are the expectations of the companies in this area and what are the risks of such an implementation they are afraid of?

¹ 17. listopadu 15/2172, 708 33 Ostrava – Poruba, Czech Republic

The aim of this article is to present some of the aspects, risk factors and barriers of the Industry 4.0 concept, as opposed to the expectations of the enterprises and the risks they are afraid of. The chosen method of research was a combination of the study of secondary sources and the questionnaire survey itself having a character of a research probe. The paper is namely focused on a description of the procedures of the executed research probe and an analysis of the acquired findings.

1. Literature review

There are many articles calling for the implementation of the Industry 4.0 concept and trying to motivate the companies to participate in this initiative. The review of the reference sources will be focused on the resources attempting to clarify the term "Industry 4.0" and also to draw attention to the difficulties related to the implementation of this concept.

One of the apposite Industry 4.0 definitions is presented by Hofmann and Rüsç (2017, 25): "Products and services are flexibly linked through the Internet or other network applications such as blockchain. Digital connection enables automated and self-optimizing production of products and services, including delivery without human interventions (self-adaptive manufacturing systems based on transparency and ability to predict). Value networks are managed in a decentralized way, while the system elements (such as manufacturing facilities or means of transport) perform autonomous decision-making (autonomous and decentralized decision-making)."

The authors of a Czech initiative called Industry 4.0 (Mařík *et al.* 2016) respond to the German Industry 4.0 project. The core of the Industry 4.0 concept is a challenge for the Czech Republic to change its production from independent automated units to fully integrated and continuously optimized manufacturing environments, the so-called "smart factories". They should take over not only the stereotype and simple activities but also the intelligent decision-making processes. The newly-designed company information systems monitor the physical processes, create a virtual copy of the physical world, perform decentralized decisions, and are able to predict eventual faults or errors, to configure themselves, and to adapt to the changing conditions in real time. The concept puts products in a role in which they will become more and more interactive during their own production and will be interconnected among the machines, production lines, and individual plants by means of a communication network. It is expected that products will be uniquely identifiable and localizable; they will have information about their history up to now, their current state, including the optional alternative paths to the desired final product. The basis for the functioning of such a production organization is the availability of all the relevant information in real time through a digital interconnection of all the relevant participants in the value chain.

It is expected (Mařík *et al.* 2016) that the main potential benefit will be the reduction of the energy and raw material intensity of production, increased productivity in production, optimization of logistics routes, technological solutions for decentralized energy production and distribution systems, or an intelligent urban infrastructure.

Mařík *et al.* (2016) state, that the Industry 4.0 concept has many uncertainties, risks, and threats. It has its winners but also its losers. They point out that the companies in the Czech Republic are predominantly in a disadvantageous position of cheap subcontractors. These authors note that the Industry 4.0 concept will lead to new requirements for applied research, system safety, standardization, and legal and regulatory framework of implementation. It will increase the qualification requirements of the labour force, and we can also expect changes in the employment with some social impacts.

Hofmann and Rüsç (2017) say the Industry 4.0 concept has become a fashionable word, but it still lacks a clear definition and is not fully anchored in practice yet. They state that although the idea of the so-called 4th Industrial Revolution may appear a self-propelled concept at the first glance, there are many objections, risks and barriers associated with its implementation. They predict that the traditional industry boundaries will be disappearing due to the reorganization of the value-creating processes and will cause great changes within and between organizations. The issues that will have to be addressed on the way to Industry 4.0 will include a definition of appropriate infrastructure and standards, provision of data protection and employee training. Based on discussions with experts, they outline the potential consequences and pitfalls of Industry 4.0, for example, in the area of the future logistics management from the feasibility perspective.

A survey conducted by Beier *et al.* (2017), in a form of a comparative study dealing with the anticipated impacts of digitization on the processes in enterprises in China and Germany (countries with a very different industrial structure), has concluded that the transformation of industry will affect not only the ecological aspect (efficiency of the use of resources, use of renewable energy sources), but the technical transformation will also be associated with social transformation. At the same time, their survey has shown that the expectation with regards to the nature and significance of the impacts and benefits of Industry 4.0 needs to be assessed in the light of the current technical development of the country, or of the company in question, where they are at the time of the commencement.

Matt, Rauch and Faccaroli (2016) investigated whether the sceptical attitude of small and medium-sized enterprises, with respect to the capabilities of Industry 4.0's to solve the discrepancy between the implementation of automation and the simultaneous reduction of batch sizes and the economic benefits resulting from that, is justified. The authors point out, based on a practical example of a company belonging to the small and medium-sized category, that Industry 4.0 is achievable not only for large companies. However, the implementation must be gradual and according to a clearly defined strategy.

Wahl (2015) published results of a survey focused on the comparison of business strategies with strategically important Industry 4.0 categories and he found only partial strategic readiness for the 4th Industrial Revolution. He stated that "in order to be prepared for the Fourth Industrial Revolution, the development of a strategic knowledge vision is needed".

Shamim *et al.* (2017) say the main triggers of Industry 4.0 are the social, technological, political, and environmental changes. The main challenges include mass customization, efficient and cost-effective supply chain, "smart" work, *etc.* In an uncertain environment, such as Industry 4.0, the key to success is training, learning and innovation capabilities, because companies have to be extremely sensitive to customer requirements. This article explains the appropriate management practices for Industry 4.0 to support learning, knowledge management and innovation capabilities. One of the lessons is the lack of a vision of leaders in an organization that hinders employees' interest in gaining knowledge that can be helpful in the future. Another finding is that managers are reluctant to share exact strategic information and keep things confidential. Leadership strategies, such as transformational leadership, ownership of tasks, knowledge-based leadership, result orientation, or orientation to the required competencies, contribute to the creation of the atmosphere of trust.

According to Kolář (2016), a number of companies, even on the Czech market, boast about meeting the principles of Industry 4.0. In most cases, however, they are only partial innovations that, in connection with the new fashionable term, work well as a marketing tool. Industry 4.0 is an idea rather than a specific goal, and a transition to more modern ways of management of logistics flows is an organic process.

More and more people think that robots will replace the labour force, they are already cheaper than people today, they can work 24 hours a day and they do not go on strike. On the other hand, however, it is a known fact that at present, for example, robots are still unable to assess quality, taste, they cannot reveal damage of the packaging like a human, and they cannot prepare individual pieces from pallets. They are not as flexible as humans and cannot react to sudden changes of the situation. The best positions for them to keep in the future are the positions where they will perform monotonous and repetitive work, or very physically demanding work.

Realistic considerations about the expected efficiency of specific Industry 4.0 solutions are inspired by the facts concerning very high prices of advanced auto-identification features at the moment. For example, Novotný (2017) points out that Radio Frequency Identification (RFID), as a material flow traceability tool, is still too expensive to be used, for example, on a bottle of milk, despite the price drop. There are also warnings concerning the low level of some ERP systems that are seen as an Industry 4.0 backbone and they may become an obstacle to information system linking or to the utilization of data from cloud (Lichý, 2017).

Companies are facing a problem of creating a strategy for the implementation of Industry 4.0 elements, where it will be necessary to correctly identify the key implementation areas, to select the most suitable technologies, and to ensure the organization of the designing and execution events. According to the theory of management, they can use various organizational forms (specialized departments, design teams, outsourcing,

etc.). There are signs showing that large corporations or their national branches are systematically building their own automation divisions.

2. Methodology

The following research questions have been defined:

- 1) What adverse business environment factors create pressure on the implementation of advanced technologies?
- 2) What are the attitudes and expectations of companies in the implementation of advanced technologies and what are the risks associated with it?

A survey looking for answers to these research questions was conducted as a research probe in industrial enterprises in the Czech Republic. The economy in this country in the middle of Europe is characterized by a strong representation of industry with a large share of foreign owners (especially German and Asian), a long tradition of industrial production, advanced labour force and a relatively low level of wages. Recently, the typical feature of the Czech Republic is its strong representation of the automotive industry, including a wide supplier base from various fields.

A questionnaire containing closed questions with a list of possible answers was prepared in relation to the survey questions. Several questions had more possible answers. The questions were based both on the current research findings of the authors of this article and on the findings from the tracking research and the search of secondary sources. The respondents could also add answers in the "other" category.

Representatives of selected companies were chosen as the respondents of the research probe. The questioning survey was anonymous and took place in electronic form in the months of May and June 2017. In the first phase, we approached the member companies of the Regional Chamber of Commerce (about 300 enterprises). The reaction was surprisingly little. In the second phase, the research team approached the representatives of the companies that had already been involved in some cooperation in the past.

The total number of completed questionnaires was 15. Although the sample is relatively small in terms of the possibility of generalization of the results, the acquired findings are not useless since the questions were focused on relatively specific characteristics of the real functioning of the enterprises.

Large enterprises with 250 or more employees (60%) slightly outweighed small and medium-sized enterprises in the sample of respondents. From the point of view of the field structure, industrial enterprises were slightly more dominating (again 60%) and they included mechanical engineering, automotive industry, beverage industry, energy and chemical industry. Non-industrial enterprises were classified as "other". The companies of domestic owners slightly outweighed foreign owners. According to the type of customers, companies supplying to a wider range of customers (73%) significantly outweighed companies specialized to a narrow range of customers.

Graphs of relative frequencies were created from the replies and the results were analyzed and interpreted.

3. Research probe results

This part of the article will comment on the most important findings. Graphical form is used to document the most important findings.

3.1 Adverse factors influencing the business activity

The respondents had a choice of 18 adverse factors (listed in Table 1), and they had to select 5 factors that most affected their business activity during the last 3 years, and then they had to use the same options to choose 5 factors whose influence they anticipate in the next 3-5 years. They could add additional factors.

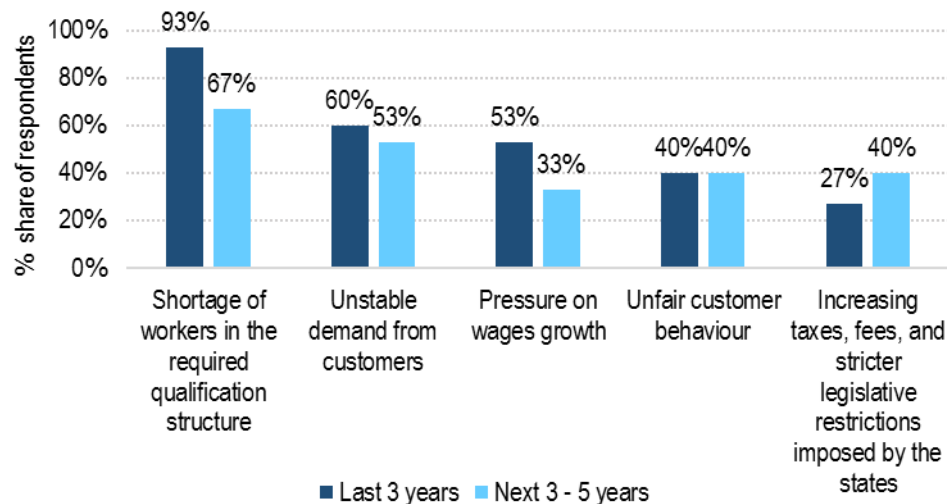
Table 1. Adverse factors influencing the business activity

FACTORS			
1.	Unreliability of suppliers	10.	Production technology is not perfect enough
2.	Significant changes in the offers from suppliers	11.	Shortage of workers in the required qualification structure
3.	Unstable demand from customers	12.	Pressure on wage growth
4.	Increasing requirements for individualization of products	13.	Insufficient performance of the company information system
5.	Unfair customer behaviour	14.	Little information connectedness among companies within the supply chain
6.	Changes of foreign currency exchange rates	15.	Insufficient cooperation among companies within the supply chain
7.	Quick innovations of competitors	16.	Natural disasters
8.	Unfair behaviour of competitors	17.	Criminality threatening supplies on the way from suppliers or to customers
9.	Increasing taxes, fees and stricter legislative restrictions imposed by states	18.	Political tension in the countries of the customers

Source: Authors

15 out of the 18 provided factors appeared in the respondents' replies. Factors 14, 16 and 17 were not selected by any of the respondents. Figure 1 presents the factors that were identified as the most important by 40% or more of respondents. The current and anticipated states are compared in this figure.

Figure 1. The most significant factors influencing the activity of companies



Source: Authors

Shortage of workers in the required qualification structure (93%) was clearly felt as the most adverse influence on the business activity by the respondents during the last three years. This factor remains the most significant one for the next 3-5 years for the sample of respondents, and the share of respondents expecting this factor to be significant in the future has decreased (from 93% to 67%).

Labour force shortage is associated with the pressure on wage increase, which was felt by 53% of the respondents. Demand fluctuation as an adverse factor for the present and future period of time was mentioned by more than 50% of the respondents. This information is completed by a finding of the representatives of large companies concerning the increasing demands for product individualisation. These facts act in favour of the

implementation of the technologies that enable achieving fast and low-cost transition between different assortment items in production (the internet of things, three-dimensional printers). As a significant factor, the unfair customer behaviour was identified by the probe. Similarly, this phenomenon was recognized as relevant in the paper by Minářová (2012).

The survey has shown that raising taxes and fees and stricter legislative restrictions imposed by the states are also among the most important adverse factors of business activity. Forty percent of the questioned enterprises ranked this factor among the top five factors for the next 3 to 5 years, which is significantly worse compared to the figure for the past three years.

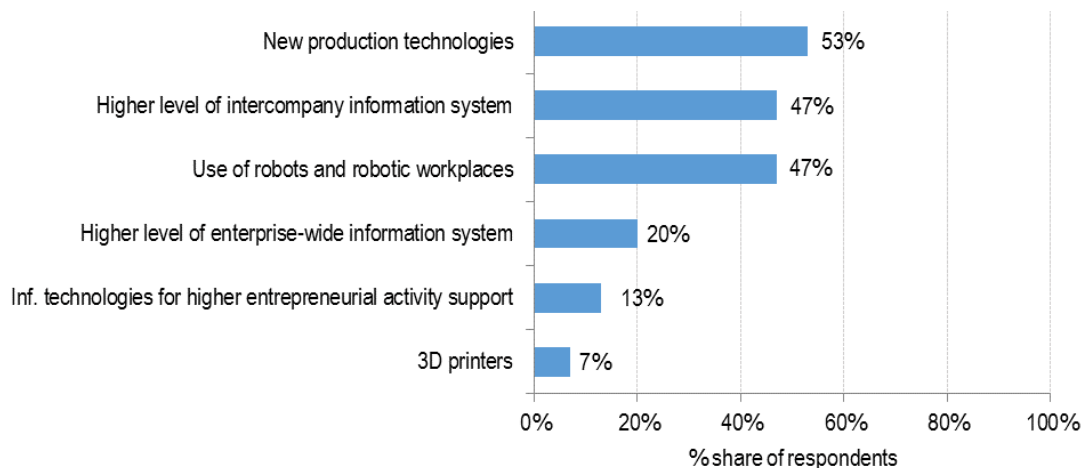
3.2 Attitudes and expectations of enterprises during the implementation of advanced technologies and the associated risks

The expectations of medium or slightly increased competitive pressure prevailed among the questioned companies in connection with the implementation of new technologies in a 3-5-year horizon.

The survey has shown that rational economic thinking prevails among the questioned companies during the implementation of the new production technologies – the new production technologies are usually implemented when they provide guarantees of economic efficiency. They are also looking for inspiration among the companies-innovators in the field.

The respondents do not give priority to the real implementation of a complex intelligent factory within 3-5 years. The company management rather opts for the wait-and-see position in this area. It could rather be seen as creating the conditions to implement certain specific elements of this system (Figure 2).

Figure 2. Need of the company to implement new technologies during the following 3 – 5 years



Source: Authors

Roughly half of the respondents feel the need to implement new production technologies, robotic workplaces, as well as higher levels of intercompany information system. The need to increase the level of the intercompany information system was not very frequent (only 20% of the respondents).

Surprisingly, it has been revealed that only a small part of the respondents (13%) feels the need to implement systems supporting a higher level of decision-making. This need was mentioned by the respondents from smaller companies.

3D printer technology was seen as not very useful among the respondents, which may be related to the business activities of the questioned enterprises.

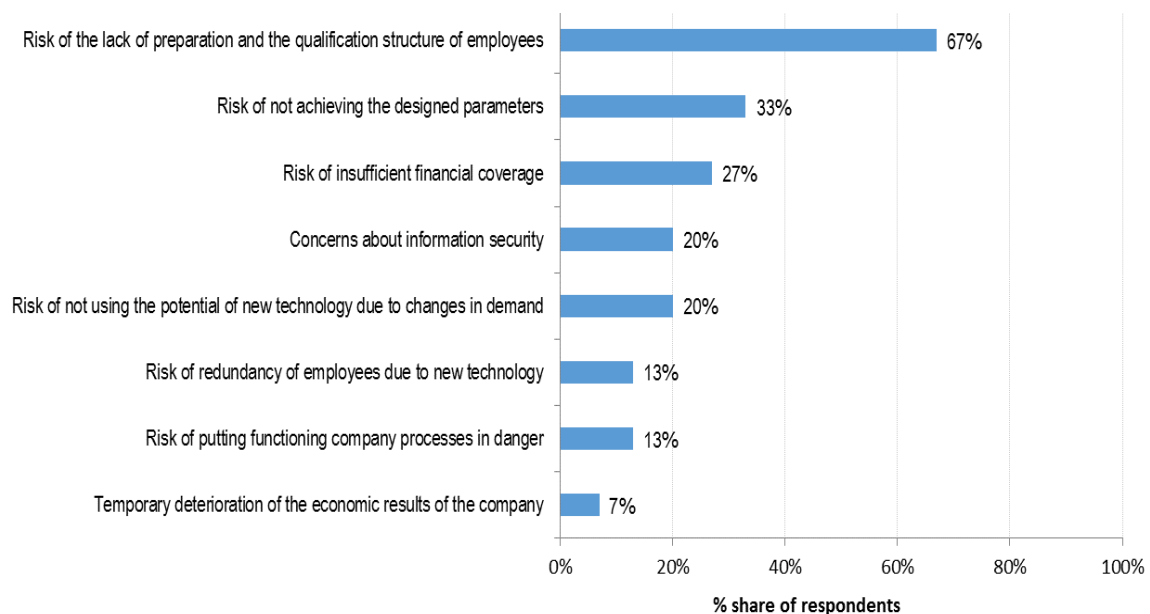
As far as the organizational issue of the implementation of new technologies is concerned, the answers have shown prevailing pragmatic approach, i.e. the "ongoing" solution within the existing organizational structure (46% of the respondents). Part of the companies takes advantage of external entities. A small part of the

respondents stated that these issues were dealt with by a super-departmental unit formed within an association of companies. In the sample did not appear any enterprise that has its own company innovation development (especially technological) section.

The effects of using new technologies of Industry 4.0 type were seen in two main areas by the respondents. The first one is business management, where two-thirds of the companies said they expected to get the data necessary for quicker and better decision-making, as well as faster response to customer requirements, as a result of the application of new information technologies. The second one is the area of production, where the anticipated factors included mainly production cost cuts (60% of respondents) and increase in quality (53% of respondents). The anticipated increase in revenues was mentioned only by less than a third of the respondents.

Concerning the risks that need to be taken into account when implementing new technologies, the respondents had the possibility to choose more answers from the prepared options. In Figure 3, the risks are arranged in descending order according to the share of respondents anticipating them.

Figure 3. Risks anticipated during the implementation of new technologies



Source: Authors

The responses included all kinds of risks from the provided options; moreover, one of the respondents added another one – a change not accepted by the employees.

The most frequently mentioned risk factor during the implementation of new technologies was the lack of preparation and the qualification structure of employees (67% of respondents). This risk is associated with human competences to work with a new technology. Obtaining these competencies cannot be done without proper preparation, special training, internship, etc. It assumes a change in the qualification structure of the employees.

Another risk factor one third of the companies is afraid of is that the new technologies do not have to achieve the designed parameters. A similar share of companies is concerned about the risks of insufficient financial coverage of the new investment. The risk of staff redundancy due to a new technology was not recorded as frequent and was rather pointed out by small companies.

Conclusion

The agenda necessary for the execution of the concept of Industry 4.0 is quite comprehensive and raises a number of open questions concerning not only the business activities, but also the social area, ecology, training and education, and other parts of the life of the human society. The authors of this article have focused their attention

only on a particular segment in the area of predominantly industrial enterprises in the Czech Republic. They have attempted to identify some factors or attitudes of companies and the risks of the implementation of new or advanced technologies affecting the business performance.

Despite the fact that we were working with a relatively small sample of respondents, the research probe has indicated that the shortage of workers in the required qualification structure, unstable customer demand, increased requirements for product individualization, and increasing competitive pressure may become strong risk factors and barriers to the viability of companies over a period of the next 3-5 years. On the one hand, the concept of Industry 4.0 assumes releasing the workers from the production, service and support processes, where they should be replaced by new technologies, robots and automated management systems. On the other hand, the companies are concerned that the implementation of the elements of Industry 4.0 will be facing a shortage of workers with the required qualification structure and new competencies. The risk of the lack of preparation and the necessary qualification structure of the employees has absolutely dominated among the anticipations of the respondents. It is particularly visible in the enterprises that use the "ongoing" strategy to respond to the emerging technological changes within the existing organizational structure, characterized by assigning additional tasks.

Companies feel the need to implement new technologies but do not act hastily, and they are pragmatically considering the economic efficiency of the solutions and are afraid of the financial demandingness of their execution. As far as the Industry 4.0 concept is concerned, the intentions of the respondents were not strictly defined. They depend on the conditions the companies are in, on their development phase, the field of activity, the size of the company, and the influence of the owners, etc. The companies are rather hesitating with respect to the 3-5-year horizon. They are more interested in certain elements of Industry 4.0 rather than in comprehensive concepts.

The drawbacks of the questionnaire method resulting from the fatigue of the practitioners due to the excessive number of questionnaire events and their alertness towards the possible leak of sensitive information became evident during the research probe. It has been implicitly revealed that when it comes to questioning related to a sensitive topic, people from companies with a more open atmosphere are more willing to be involved in the questioning. In companies with foreign owners, there are stricter rules and the employees in managerial positions are less willing or even afraid of providing information the owners were not officially informed about or were not directly asked to provide. This official way of directly addressing the owners is time-consuming and, as a rule, less feasible.

If we put the findings acquired from the conducted study of the secondary sources, from the research probe, and from the contacts with the selected companies in the Czech Republic together, it will be possible to deliver a hypothesis for further research stating that, due to the cheap labour force in the Czech Republic, the probability of the implementation of the elements of Industry 4.0 concept in advance is lower than the visions and wishes of the authors of Industry 4.0 appeals.

Acknowledgement

The paper was written with a financial support from the Student Grant Competition EKF, VŠB-TU Ostrava (project SP2017/102 - Research of Selected Approaches to Risk Treatment in Industrial Companies).

References

- [1] Beier, G., Niehoff, S., Ziems, T., and B. Xue. 2017. Sustainability aspects of digitalized industry – A comparative study from China and Germany. *International Journal of Precision Engineering and Manufacturing – Green Technology*. 4(2): 227 – 234. DOI: 10.1007/s40684-017-0028-8
- [2] Hofmann, E., and Růsch, M. 2017. Industry 4.0 and the Current Status as well as Future Prospects on Logistics. *Computers in Industry*. 89: 23-34. DOI: 10.1016/j.compind.2017.04.002
- [3] Kolář, V. 2016. Bez chytré logistiky je Průmysl 4.0 jen prázdný pojem. *Logistika*, No. 6: 14-17.
- [4] Lichý, A. 2017. Průmysl 4.0: hledání algoritmů. <http://businessworld.cz> (accessed March 27, 2017).

- [5] Mařík, V. et al. 2016. *Průmysl 4.0: výzva pro Českou republiku*. Praha: Management Press.
- [6] Matt, D. T., Rauch, E., and D. Faccaroli. 2016. Smart Factory für den Mittelstand. *ZWF Zeitschrift für Wirtschaftlichen Fabrikbetrieb*, 111(1-2): 52-55.
- [7] Minárová, A. 2012. Evaluation of Dependence of Occurrence of Risk Events in Logistics on Risk Factors by means of Sommers' d Coefficient. *Journal of Applied Economic Sciences*. 7(1): 73 – 85.
- [8] Novotný, R. 2017. Logistika za 10 let? Kompletní on-line monitoring. *Logistika*. No 4: 20 – 22.
- [9] Shamim, S., Cang, S., Yu, H., and Y. Li. 2017. Examining the Feasibilities of Industry 4.0 for the Hospitality Sector with Lens of Management Practice. *Energies*, 10(4): 499. DOI: 10.3390/en10040499
- [10] Wahl, M. 2015. Strategic Factor Analysis for Industry 4.0. *Journal of Security and Sustainability Issues*. 5(2): 241 – 247. DOI: 10.9770/jssi.2015.5.2(9)

Study of the Relationship between Value Orientations and Consumer Preferences of Young Consumers in Russia

Roman SIDORCHUK

Plekhanov Russian University of Economics, Moscow, Russia

Sidorchuk.RR@rea.ru

Suggested Citation:

Sidorchuk, R., 2017. Study of the relationship between value orientations and consumer preferences of young consumers in Russia. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 2012-2027.

Abstract:

In the context of growing competition, companies are becoming increasingly interested in the segment of young consumers, the dimensions of which are significant and interesting to many sectors of economy. Student audience can be considered the most active group of young consumers, influencing consumer behavior of the entire youth segment. The influence of the consumers' system of values on their consumer preferences is an important issue for the marketing impact on the youth segment. This paper studies the influence of the system of "human values", as the values of a higher level according to Schwartz, on consumer preferences of the young audience using ρ -Spearman's rank-correlation coefficients. The purpose of this research was to study the relationship between the values of the higher level and consumer preferences of young consumers as the basis for determining the degree of expression of higher level values that affect consumer preferences. The survey was conducted online by means of a structured questionnaire, developed by modifying and supplementing Schwartz's questionnaire. 239 respondents aged from 17 to 22 took part in the study. This study confirms the possibility of applying Schwartz's value theory for ranking the young audience's values of the higher level. The obtained results demonstrated the possibility of obtaining a significant motivational value, which determines consumer preferences of the young audience in the selected product categories (markers).

Keywords: marketing theory; human values; consumer value; activity reference point; value reference point; consumer preferences; young audience; Schwartz's value theory; Rokeach's value theory; marketing 3.0.

JEL Classification: M30; M31; D11; D12

Introduction

This study deals with the influence of young consumers' "values" on their "consumer preferences". The category of "value" is regarded here as "Human Values" (Schwartz 1994b), based on the theory of marketing formulated by Kotler *et al.* (2010). The structure of higher level values and "sub-values" (values of a lower level than the higher level values) was viewed as a complex hierarchical model of "Human Values" based on the value theories suggested by Rokeach (1973) and Schwartz (1992a). The methodology proposed in the study made it possible to avoid analyzing the whole system of "Human Values" hierarchy in determining its motivational influence on consumer preferences and thus to use only higher level values (according to Schwartz), which is considered to be "value guidelines". The hierarchy of "sub-values" and interrelations between them was considered to be a "black box" area of consumer values. The obtained results made it possible to determine the range of reference points significant for young consumers on the ranking of the higher level values. The obtained ranks of higher level values are related to the activity reference points of young consumers when they were assessing the categories of marker products proposed by researchers.

1. Research background and hypotheses

The indicated marker product categories describe the product categories which are meaningful for young students and which were discovered in the previous study (Sidorchuk *et al.* 2016): "Mobile phone or smartphone", "Tablet/laptop", "Everyday clothes", "Footwear for everyday wear", "Soft drinks and juices", "Snacks and chocolate bars", "Mobile communication and Internet services in the home region". These categories are not associated with a particular market or manufacturer, but with behavioral aspects of young consumers' preferences. As a result,

motivational values were obtained reflecting the statistics of the relationship between the values of the higher level and product categories. The revealed relationship demonstrates the influence of the higher level values on consumer preferences (the higher the value, the closer the connection). This allows companies working with the Russian young audience to build their marketing programs on the basis of the higher level values significant for this audience.

Young student audience was chosen as a target group for the study. This choice is predetermined by the importance of this segment in the structure of demand. In the face of increasing competition, companies pay special attention to young consumers (Binkli 2017). An important role here is played by young students. This segment can be viewed as the most active youth group, which not only affects the consumer behavior of the entire youth audience, but will also take the place of the “leader of opinions” of the whole society in the future, as well as determining the dominant consumer patterns of behavior. From the point of view of the marketing approach, market share is one of the most important indicators of market attractiveness. Therefore, for this study, the authors relied on the data provided by the Russian Federal State Statistics Service, which refers to the age category from 15 to 29 years old as the youth. Students were chosen from young people of this age group. The total number of students doing the Bachelor's, Specialist's and Master's programs in Russia in 2014-15 academic year was about 3.5% of the total population of Russia. In Moscow, this figure is significantly higher (about 7%). The proportion of students in the population can be used as an approximate assessment of the role of this market. According to Russian Federal State Statistics Service, the volume of retail trade turnover in Russia in 2016 amounted to 28.3 trillion rubles (FSSS, 2016). In the student market the retail sales volume is approximately 1 trillion rubles.

One can talk about comparable shares of the youth market in other countries by conducting a comparative analysis of demographic data for the Union of Independent States (CIS) and the European Union (EU). According to the data provided by the electronic magazine Demoskop Weekly “... in the CIS, the proportion of young people aged 15–29 makes 24% of male population, while in the EU it is 18% of male population”. Similarly, the proportion of “... girls aged 15-29 constitutes 20% of female population, while in the EU it is 17% (Shcherbakova 2017).

Apart from that, according to the data provided by United Nations Population Fund (UNFPA), almost nine out of ten young people in the world live in less developed countries (UNFPA. 2014). Youth accounts for slightly less than a quarter of the world's population. The largest numbers of young people live in India, China and Indonesia. About a quarter of the population of the United States of America (USA) is also made up of young people.

The above said allows us to conclude that the youth segment is large and interesting for many sectors of the economy.

In turn, studies examining the impact of “human values” on human behavior are widely presented in the literature, in particular in the studies by Parsons (1951), Rokeach (1973), Rohan (2000), Babin, and Babin (2001), Schwartz (1992, 1994a, 2012), Kansra (2014), Sidorchuk (2015) and others. At the same time, in the mentioned studies there is neither comparison between “human values” and “consumer preferences”, nor proposals on methods and marketing tools to be used by companies while working with youth audiences.

The novelty of the proposed research methodology is predetermined by a significant gap in earlier studies in this field. The proposed approach allows you to directly link the values of the higher level (according to Schwartz) to the marker product categories, without analyzing the entire hierarchy of the “sub-values” system and the links between them. At the same time, the applicability of the methodology has its limitations. First, the limitations are related to choosing only the students who are in their first year of the bachelor's degree of Plekhanov Russian University of Economics. Secondly, there is presumably a restriction associated with differences in the interpretation of semantic constructions describing the values of the higher level and the student audiences in different countries. This circumstance requires additional verification, taking into account the “socio-cultural codes” of the youth audience's ethnocentrism. The research tools include an adapted section of Schwartz's value survey (SVS) block, the Portrait values questionnaire (PVQ) and an additional section on value assessment of marker product categories, which allows you to substantiate the influence of higher level values on consumer choice.

The basis of this study is the study done by Sidorchuk and coauthors (2016) where the authors proposed a conceptual marketing model linking higher level values (as activity reference points) and consumer preferences.

The authors considered improving the marketing activities of companies as a practical marketing direction for using the proposed model. At the same time, the proposed conceptual approach required empirical validation. The results of this study are presented in this paper.

The purpose of our work was to study the relationship between the values of a higher level and the consumer preferences of young consumers, as the basis for determining the degree of the expression of the higher level values that affect consumer preferences.

The study is aimed at obtaining the value of the average assessment of expressing the audience's higher level values and evaluating the significance of the higher level values when choosing a marker product.

The set goal allowed us to formulate the hypotheses of the study:

H1 hypothesis: Schwartz's value theory is applicable to the youth student audience, making it possible to perform the ranking of higher level values and to identify the significant values that are the basis of their guiding life principles.

H2 hypothesis: Based on the study of the higher level values, you can get a significant motivational value that determines consumer preferences of the youth audience in marker product categories.

The methodology of the study was based on the classical methods of marketing research (Malhotra and Birks 2007): a survey, a comparative analysis of data, *etc.* The conducted study was of a multi-purpose character, and one of its directions is presented in this article. A modified and supplemented Schwartz questionnaire was used as a survey tool (Schwartz 2005). IBMSPSS 20 was used for statistical processing of the data.

2. Literature review

Conformity of the values broadcast through the marketing activities of companies to the values of a youth audience becomes an important aspect influencing marketing solutions of companies. In this context, researchers in different countries are looking for approaches to increasing the effectiveness of marketing influences.

For example, consumer behavior of young consumers is studied in order to develop strategies for trade networks (Bilińska-Reformat and Stefańska 2016). In this study, the authors note that "The ubiquity of retailers both online and offline allows young customers' comparison of their offers, evaluating alternative solutions of satisfying the needs and choosing the best option. This obligates retailers to be more oriented to a unique image and build it on values, which are important to this generation". This remark made by the authors emphasizes the importance of studying the values of young consumers, and, subsequently, developing marketing solutions in companies on this basis. Other authors study the influence of corporate values and social responsibility of businesses on the behavior of young consumers, pointing to the "moderate impact" of these factors (Vázquez-Burguete *et al.* 2017). The moderate impact of corporate values on young consumers requires the study of their value orientations in order to find more effective marketing tools. As it is highlighted in the work done by Ghosh (2016), studying the segment of the younger generation will have important managerial and economic consequences for companies. At the same time, the results of the study carried out by Ghosh do not provide an explanation of what values young consumers are guided by. In turn, in the studies devoted to analyzing the values of the youth professing Islam at the age of 18 to 24 years old, it is noted that the level of their consumption is influenced by "Islamic values" to a lesser degree (Riquelme *et al.* 2011).

In a comparative study of the behavior of young mobile application consumers in Russia and in Europe (Skorobogatykh *et al.* 2016), the authors identified interesting trends, such as unifying consumer preferences of Russian and European young consumers, thus showing their differences. Based on the survey of young consumers, researchers assess the impact of certain marketing tools affecting the choice of mobile applications. Some results obtained by the authors can be explained on the basis of the provisions of value ethnocentrism. At the same time, the comparative study which was carried out does not allow us to answer the question of whether there are any value differences or common features in the studied audiences that allow developing effective programs of the marketing impact.

The value aspects of ethnocentrism influencing consumers are noted by many researchers (Watson and Wright 1999, Taborecka-Petrovicova and Gibalova 2014, Durvasula and Lysonski 2014). At the same time, the analysis of the entire range of value orientations in these studies was not carried out, which does not allow us to assess the role of the influence of some values in comparison with others or the significance of certain values that affect consumer preferences.

The importance of consumers' values for companies and marketing was reflected in the study by Zeithaml (1988). The author notes that "... Strategies based on customer value standards and perceptions will channel resources more effectively and will meet customer expectations better than those based only on company standards". Zeithaml defined the concept of value through a consumer's perceived value of the product "...consumer's general assessment of the utility of the product (or service) based on perceptions of what is received and what is given" (Zeithaml 1988). Here a certain inaccuracy can be seen, because in our opinion, many factors influence the process of a consumer's perception of value, for example, external situational factors, level of the consumer's income, etc. In this sense, it is necessary to separate value preferences from the consumer's choice. A consumer's choice is significantly influenced by situational factors, including marketing decisions of companies. At the same time, there are factors that can predetermine a consumer's choice, minimizing the influence of external factors. For example, religious beliefs strictly regulate the paradigm of eating certain types of food for representatives of some religious confessions. Therefore, value preferences are understood as a system of "human values" that have a motivational effect on the consumer's choice.

A complex conceptual value approach in the marketing theory, such as "From Products to Customers to the Human Spirit", was proposed by Kotler, Kartajaya and Setiawan (2010). The authors do not deny the importance of "human reason" and "emotions" for marketing. At the same time, the authors consider the "turn" of marketing towards values that will allow companies to appeal to the "human soul", *i.e.* to "human values". This "turn" is referred to by the authors as the term "Marketing 3.0". Unfortunately, in the concept described by the authors, there are no practical tools that could allow assessing the influence of certain values on consumers' preferences.

In the literature there are various methods for assessing values, as well as continuous discussions in this area. The VALS (VALS2) technique is widely known (SBI, 2009-2017). The model is based on the analysis of statistical data on the basis of attitudinal and demographic questions, which allow us to classify consumers by their belonging to one out of nine types corresponding to a certain way of life. It is quite convenient to use this approach for segmentation. At the same time, one can find criticism of this model in the literature. The basis for criticism is the complexity of implementing the model and its significant dependence on the demographic characteristics of the respondents (Beatty *et al.* 1988).

It should be noted that the VALS methodology correlates with the theory of values proposed by Rokeach (1973), which is also widely used. Rokeach's approach presupposes the ranking of 36 values, which are divided into 18 basic values and 18 operational ones. (Zhao *et al.* 1988). In fact, Rokeach proposed a two-level system of values and "sub-values" (values of a lower level). Respondents are asked to rank these items in order of decreasing importance to them. The complexity of implementing the methodology lies in the creation of a system of questions that allow you not only to reveal what these values mean to the respondent, but also to link them together, and then to build a system of values of the group under study. Because of this, the obtained marketing tools become cumbersome and significantly complicate the research process, tiring the respondent. As a result, the study of values using this method becomes considerably expensive. Apart from that, on the one hand, the two-level system limits the scope of the study of value orientations and their connections, but on the other hand, it predetermines the need to consider them in an aggregate of the basic and operational levels.

In this regard, Schwartz's theory of values is more preferable to us, where the entire diversity of values is presented as a hierarchy in which there are 10 higher level values (Schwartz 1992). Relying on Rokeach's theory (Rokeach 1973), Schwartz formulated criteria that serve as guidelines in people's lives. The conducted studies allowed Schwartz to analyze the semantic structure of values and group them. This helped to overcome the problem of the existing abundance of semantic constructions that prevent us from carrying out their instrumental evaluation and identifying the connections to be applied in marketing. As a tool for the study of values, Schwartz proposed a questionnaire with two groups of questions: Schwartz's value survey (SVS) and Portrait values questionnaire (PVQ)

(Schwartz 2005). The first group – SVS consists of 2 lists of questions on values. The first part contains 30 words that describe the desired final state (in the form of a noun), and the second part contains 26 words that describe suitable ways of achieving the goal (in the form of an adjective). Each element corresponds to an aspect of the motivational goal of one value. The second part of the PVQ has the form of a questionnaire for giving the respondent's profile and outlining their value orientations, consisting of 40 utterances based on the "projective" methodology. In his work Schwartz notes that he developed the second approach in order to adapt the SVS approach for the samples, representing adolescents from 11 years old, elderly people, or respondents without education, in order to facilitate their perception of the survey. A certain ranking of the values of the higher level can be regarded as the result of the study using Schwartz's questionnaire. Subsequently, Schwartz considered various combinations and influences on the behavior of individuals, but the study based on this questionnaire does not allow us to relate consumer preferences to the received rank of values.

Using Schwartz's theory of values allows us to connect the values of the higher level with consumer behavior. For example, in a study of the cognitive link between car attributes and personal values (Pimenta and Piato 2016), the authors conducted 60 in-depth interviews using the "ladder" method. The results obtained in the study demonstrated the presence of this connection for the respondents. But, at the same time, the obtained results cannot be transferred to the whole population, because the study was of a qualitative, rather than a quantitative nature. A significant limitation of the results lies in the impossibility to segment consumers based on the identified parameters.

In the Russian scientific literature, two large-scale studies of values have been presented over the past decade. The first study was conducted in 1990 and 1994. (Lapin *et al.* 1996). The study was based on the Schwartz's value theory. In 1990, the sample comprised 973 respondents and additionally 445 respondents at the points of "social tension", as well as 1062 respondents in 1994. The structure of values consisted of 14 values of the higher level. The authors of the study added 4 values, as expected, to take into account the national specific features. In the conditions of evaluation, the results showed that the added value elements correlated with the core values (10 higher level values). Thus, no additional higher level values were identified.

The second study was conducted in 2001-2002 (Rjabov and Kurbangaleeva 2003). Here, an original method of searching for values was used on the basis of the algorithm for creating the "basic value in a given culture", about 200 semantic constructions, based on which a list of 35-40 values was singled out. The study consisted of two stages. At the first stage, there were three mass surveys each having a representative (quoted and zoned) sample of 1500 respondents. During the study, the main social groups with a certain "socio-cultural code" were singled out and described according to value preferences. At the second stage, which also contained three surveys with a sample of 1500 respondents, there was detailed identification of the content characteristics of large social groups having their own "socio-cultural code".

One should agree with the analysis done in the mentioned study that "the value system itself is so complicated for analysis that sometimes the conclusion about the discrepancy between behavior and values is made only because of the inability of researchers to understand the most complicated mechanism for determining the behavior of an individual's value structure". Therefore, firstly, it can be said that consumer preferences are not determined by the only basic value or a set of these values, but by the entire hierarchy with a complex system of interaction and interdependence. Secondly, there is a problem of interpreting the semantic structures that describe the values for different social groups. It is assumed that part of the specified problems can be eliminated by using the "generational" division of the general pool of respondents. In this case, the same semantic interpretation of the description of values will be obtained. On the other hand, as the authors rightly noted, "... values that are more important, i.e. those that are higher in the hierarchy, mean considerably more to a person than the lower values. However, the degree to which a certain value affects behavior cannot be determined only by its place in the hierarchy" (Rjabov and Kurbangaleeva 2003). In addition, assessment of the relative weight of each of the higher level values in the system does not solve the problem of mobility and dynamic character of the entire system, which, undoubtedly, influences consumers' preferences, but, in the light of external situational factors, ultimately determines a consumer's choice. We believe that in this case it is possible to apply the "black box" approach, considering the connections between Schwartz's higher level values and consumer preferences.

It should be noted that the issue of the influence of values on consumer preferences of the young audience is not developed enough in the literature. The closest approach was examined in two studies. In the first one (Chung *et al.* 2009), the authors use Schwartz's value theory to explore how cultural values influence university applicants' decisions, and what sources of information they prefer. Using the projective methodology, the authors identified three main values, which they interpreted in their study on the basis of the cultural perspective of Confucianism, as "honesty is the best policy in life", "living in harmony" and "helping others is important". "At the same time", in the study there are no value indicators of the influence of all higher level values according to Schwartz and the possibility of applying the results to other countries and cultural groups.

In the second study, (Basaran and Buyukyilmaz 2015), the authors examined the impact of individual values (utilitarian and hedonistic) on young consumers' satisfaction and their behavioral preferences in the sphere of fast-food and fast-casual restaurants in Turkey. The conclusion, which the authors arrived at from the sample of 431 students, statistically substantiated the fact that the value component (utilitarian and hedonistic) has a significant impact on satisfaction and behavioral intentions in these sectors. At the same time, the authors did not consider the entire possible set of values, which can influence consumer preferences, for example, whether other value components will exert a more significant influence than the utilitarian or hedonistic ones.

Summing up the review of the literature, it should be noted that the theoretical constructions describing the values are either purely theoretical in nature, or the research tools are complex for practical use in marketing and do not allow linking all the higher level values with consumer preferences. It is, undoubtedly, difficult to define contextual links in the semantic structures while describing, and most importantly, perceiving the value categories offered to the respondents. Also there are still problems of "declared behavior" and subjective factors. One should talk about a certain gap between the described methods of studying the value orientations and the observed behavior, which can be explained, in particular, by the shortcomings of the research apparatus.

3. Methods of studying the values of young consumers

In this study the authors relied on the methodology of marketing research (Malhotra and Birks 2007). The study was conducted in Moscow between June and October 2016.

The methodology of research was considered through the dualism of the "searching" and "descriptive" approaches in marketing research. On the one hand, as was shown in the literature review, there is a significant gap in the study of the influence of higher level values on consumer preferences, which gave our study a search character. On the other hand, the description of the influence of values on the consumer choice of the young audience makes our study descriptive.

Taking into account the hypotheses put forward in the process of study, information should be received on how the values of the youth student audience are expressed in the motivation of their consumer preferences (value preferences). This information can be obtained when the respondent meets certain criteria (qualification characteristics) and unambiguous interpretation of the semantic constructions used in the study.

To solve the problem of differences in the understanding of semantic constructions while specifying the determination of values of the higher level, an approach was used that takes into account the respondent's belonging to one "generation". The authors believe that belonging to one "generation" can be obtained on the basis of a sample, whose criterion is the respondents' belonging to the group of first year undergraduate students. This criterion creates the prerequisites for the unity of understanding the semantic constructions that describe the values of the higher level. Given the certain unity of the "sociocultural space" of Russia's youth student audience in the modern digital environment, it can be assumed that belonging to the same generation will enable the students of various Russian universities to equally understand semantic constructions describing values of the higher level.

To achieve the goal of the study and to confirm/refute the hypotheses put forward, it is required to solve the following tasks in the empirical part of the study:

- to obtain value indicators showing how the audience under study give average assessment to the expression of their higher level values;
- to obtain an assessment of how significant higher level values are while choosing a marker product.

The structure of the empirical part of the study consisted of the following procedures: determining the characteristics of the target audience, developing the procedures of measurement, scaling and survey instrumentation (questionnaire), developing criteria for selection of respondents and sample size, conducting a survey and subsequent processing of the results.

At first, it is necessary to identify respondents by their belonging to the youth audience (by age). The study covered the age group of 17 to 22 years old. The chosen age interval corresponds to the range of students doing their first year of the undergraduate program. In addition to the age restrictions, the year of studies (1 – 5) and the type of degree (bachelor's, specialist's or master's degree) were included in the criteria of selection.

To identify gender differences, a gender division criterion was set. In addition, the following criteria were used for the solution of additional tasks of the study (which are not considered in this article): religiousness, income, dependence on parents, marital status, place of residence before entering the university, the presence of a permanent job outside the university and the place of residence at the present time and presence of a "hobby".

As a research tool defining the measurement and scaling procedure, a questionnaire was used based on the sections of SVS, PVQ questionnaires and the original part linking the values of the higher level and the marker products. The SVS-based questionnaire is a modified questionnaire in which the number of questions was reduced to 20. To verify the possibility of using the abbreviated SVS questionnaire and to analyze the conformity of the values chosen by the respondent to marker products, PVQ projective questionnaire was used.

The developed original block was used to assess the significance of the higher level values while choosing a marker product, where respondents were asked to note the values having the strongest impact on their consumer preferences for the presented product categories. To overcome the problem of the influence of "sub-values" and the connections between them, an approach was adopted that considers only the higher level values according to Schwartz. This approach takes the entire complex hierarchy of "sub-values" and the connections between them as a "black box" through which the values of the higher level influence consumer preferences.

As marker products, the product categories were chosen that are most often purchased directly by the youth audience and identified in the previous study (Sidorchuk *et al.* 2016): "Mobile phone or smartphone", "Tablet/laptop", "Everyday clothes", "Footwear for everyday wear", "Soft drinks and juices", "Snacks and chocolate bars", "Mobile communication and Internet services in the home region". Additionally, respondents indicated the most recognizable brands in the selected product categories of the questionnaire.

Thus, the survey tool was a structured questionnaire consisting of 4 sections.

The first section is of a qualifying character, where the respondent completes qualification characteristics. The second section corresponds to Schwartz's projective questionnaire. In the projective scale, the respondent is asked to evaluate the "likeness of himself to a certain type of person, according to the criteria: "Very similar to me", "Similar to me", "Slightly similar to me", "Not similar to me". The third section contains an abridged version of SVS questionnaire, with a scale of respondents' responses: it is important, it is not important, I cannot assess it.

The fourth section contains a table of 10 rows (top-level values) and 7 columns (product categories), in which respondents were asked to mark what values are most important to them for each product category in the form of yes/no answers.

Based on the results of the questionnaire design, offline testing was conducted, as a result of which it was decided to use an online service to conduct a survey, because completing the questionnaire was time-consuming for the respondents. To do this, the questionnaire was uploaded to a special service called Google Forms.

In order to form the sample, the "snowball" approach was used, where the most active students were invited to send invitations to first-year students to participate in the study. "V Kontakte" social network groups of first-year students of all faculties in Plekhanov Russian University of Economics were used for distribution as this is the largest social network in Russia and CIS countries. The scope and structure of the sample correspond to the search character of marketing research. The survey was conducted in September-October 2016. In the process of the study, 239 questionnaires completed by respondents were received. 233 fully completed first-year students' questionnaires were accepted for processing. During the study, the authors took a confidence interval of 90%, with an error value of 5.4%, which is acceptable for conducting marketing research of a searching character. The results were coded and processed using the statistical processing package IBMSPSS 20.

In the course of processing, the expression of the higher level values was determined as the sum of the values for the columns of variables in sections 2 and 3 of the questionnaire, corresponding to the *i*-value of the higher level related to the size of the sample. The expression of higher level values by product categories was determined as the sum of the columns of variables in section 4 of the questionnaire, corresponding to the *i*-th higher level value related to the sample size. The rating of the higher level values was determined on the basis of the value estimates of how the higher level values were expressed, where rank 1 corresponds to the highest degree of expression, rank 10 - to the lowest. The rating of the top-level values by product categories was determined on the basis of the higher level values for the corresponding product category, where rank 1 corresponded to the highest degree of expression, rank 10 - to the lowest. The level of collaterality of the higher level values was determined on the basis of their pair autocorrelation. The degree to which higher level values influenced the preferences for product categories was determined on the basis of ρ -Spirman's rank-correlation coefficients.

During the research, to regulate and assist in solving difficult ethical issues, the researchers were guided by the provisions of the ethical code of the American Marketing Association.

4. Results

As a result of the conducted study, after processing the data, the following results were obtained, which allowed us to build a rating of values of the first level (Table 1).

Table 1. Rating of higher level values

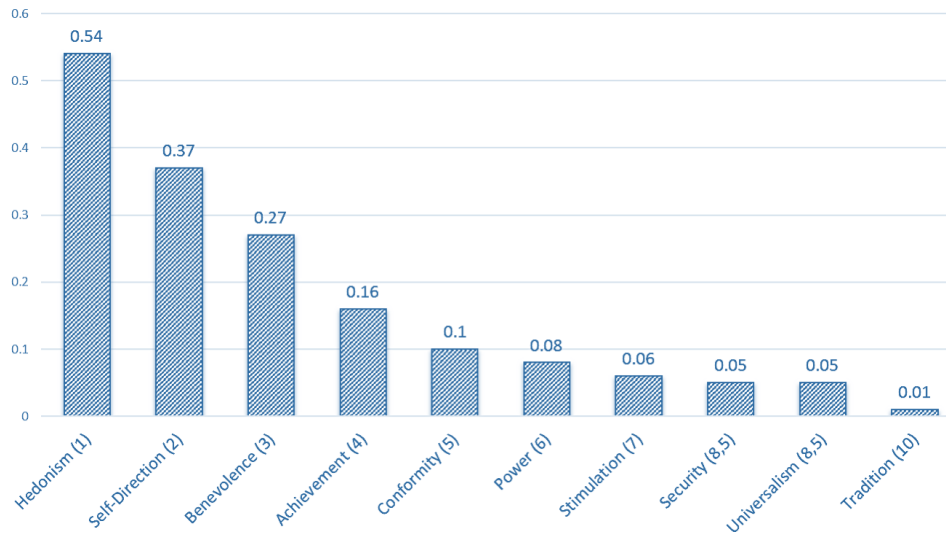
Higher level value	Average degree of expression	Rating of higher level values
Tradition	3.0334	10
Security	4.8479	9
Power	6.5609	8
Conformity	6.7084	7
Stimulation	6.8438	6
Universalism	7.0243	5
Achievement	7.2863	4
Hedonism	7.8431	3
Self-Direction	8.0029	2
Benevolence	8.3194	1

In Table 1, the maximum degree of the value expression (8.3194) corresponds to rank 1 for the value of "Benevolence". The minimum value of 3.0334 corresponds to grade 10 for the value of "Tradition".

The obtained values for the coefficients of correlation between the values of the higher level are in the range of values less than 0.3, which suggests a "weak connection" between them. The obtained data confirms the hypothesis (H1) about the possibility of using Schwartz's value theory for the youth student audience and highlighting the significant values that are the basis of their guiding life principles.

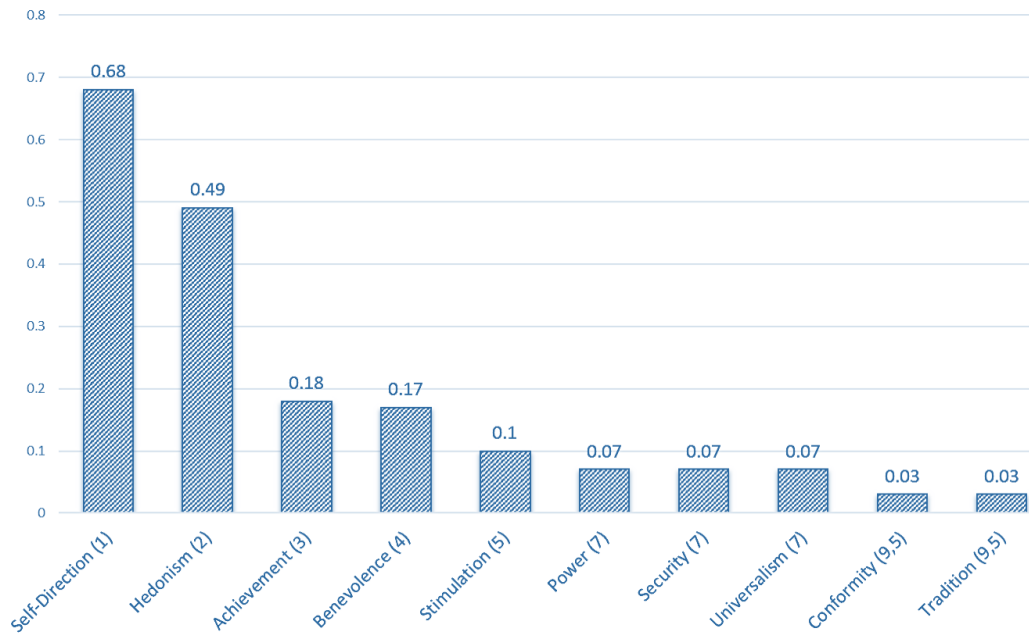
To confirm or refute hypothesis H2, the significance of the higher level values was assessed while choosing a marker product. In the survey, respondents were asked to note the values that, in their opinion, had a strong influence on the choice of product categories selected for the study. The results are shown in the Figures 1 -7.

Figure 1. The influence of higher level values on the choice of cell phones



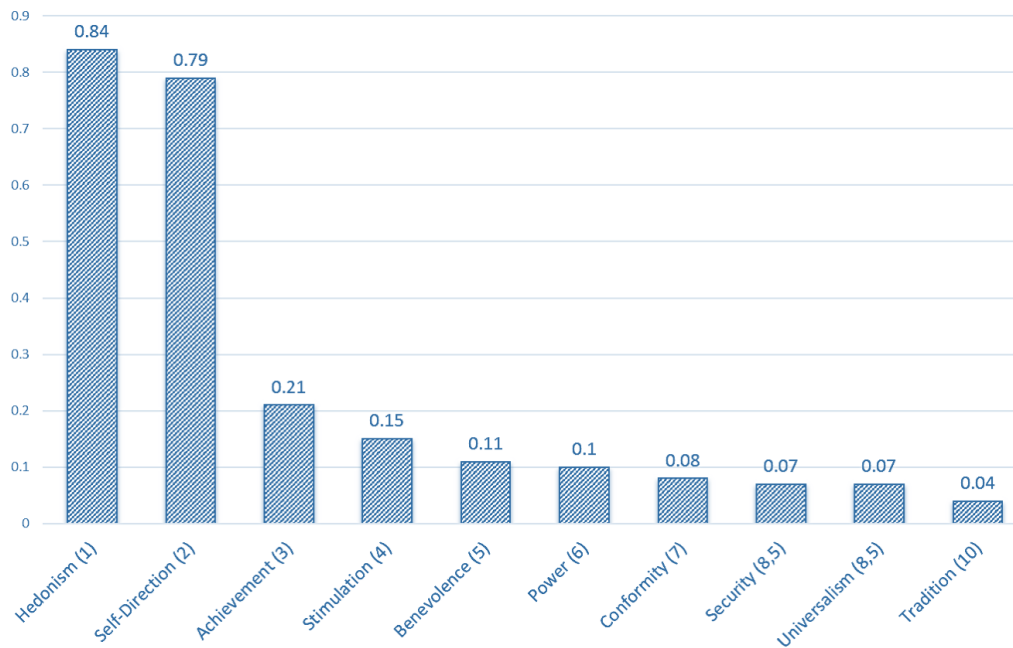
For each product category, the degree of significance of the higher level values was calculated (by summing up the corresponding respondents' assessments whose total values were divided by the number of respondents). As a result, the average indicators were obtained for the degree of influence of each base value on the choice of a product or service. The calculated indices were ranked in a descending order.

Figure 2. The influence of higher level values on the choice of tablets



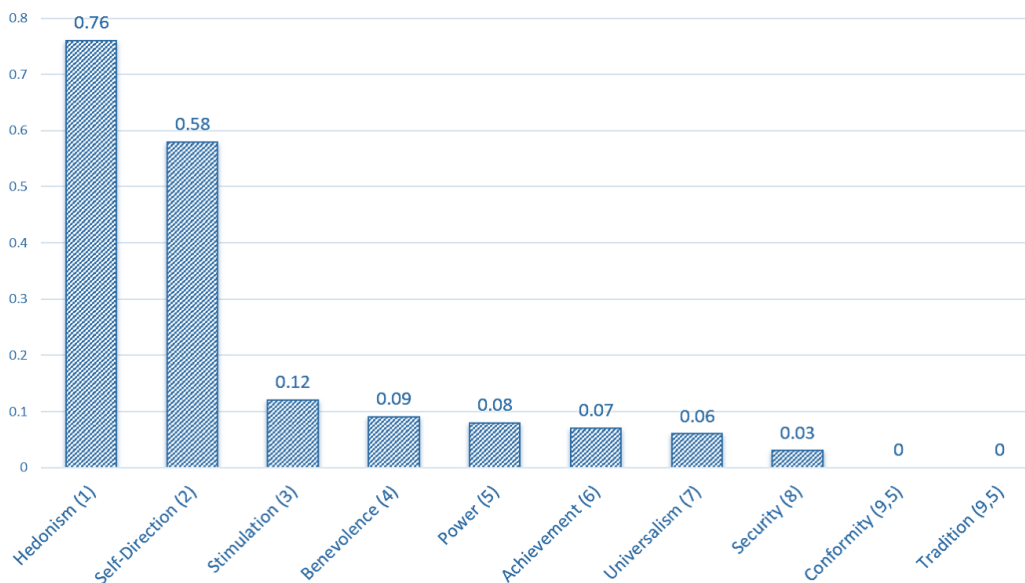
On the abscissa, the diagrams show the higher level values, as their rank decreases. The ordinate shows the values of the significance coefficients of the higher level values.

Figure 3. The influence of higher level values on the choice of casual clothing



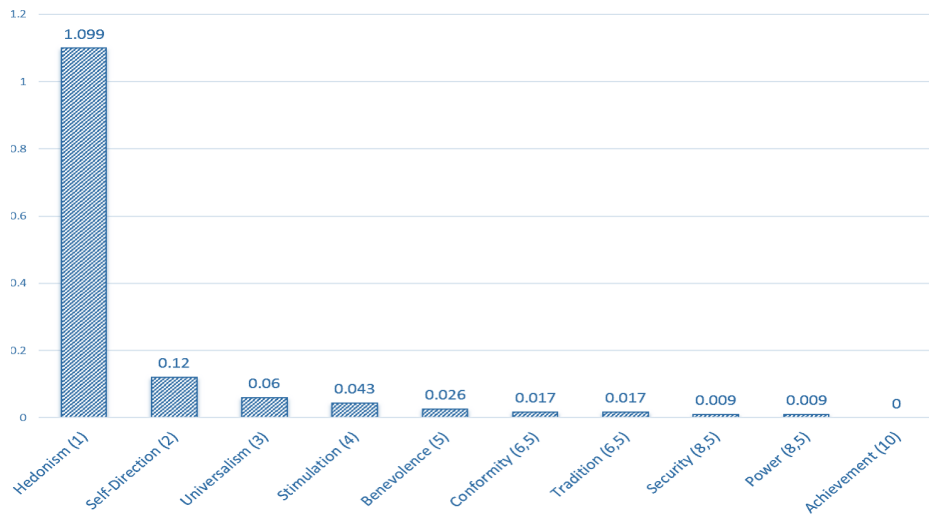
Each chart reflects one of seven product categories: “Mobile phone or smartphone”, “Tablet/laptop”, “Everyday clothes”, “Footwear for everyday wear”, “Soft drinks and juices”, “Snacks and chocolate bars”, “Services of mobile communications and the Internet in the home region”.

Figure 4. The influence of higher level values on the choice of shoes



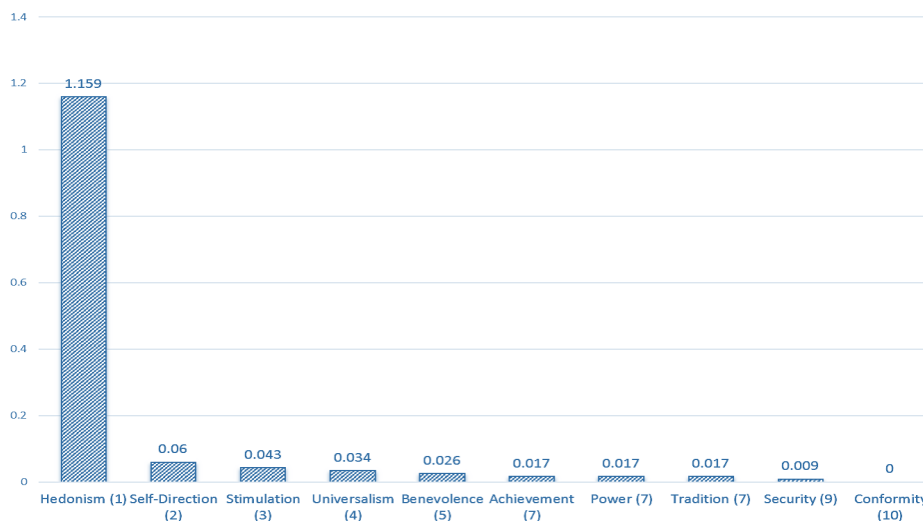
Visual analysis of the diagrams (Figures 1-7) and the data in Table 1 makes it possible to draw several conclusions about the influence of the higher level values on product preferences.

Figure 5. The influence of the higher level values on the choice of drinks



The most apparent is the influence of the values of “hedonism” and “independence”, which rank 1st or 2nd for each of the products examined. In the rating of the higher level values, “hedonism” took the third position, while “independence” came second.

Figure 6. The influence of the higher level values on the choice of snacks.

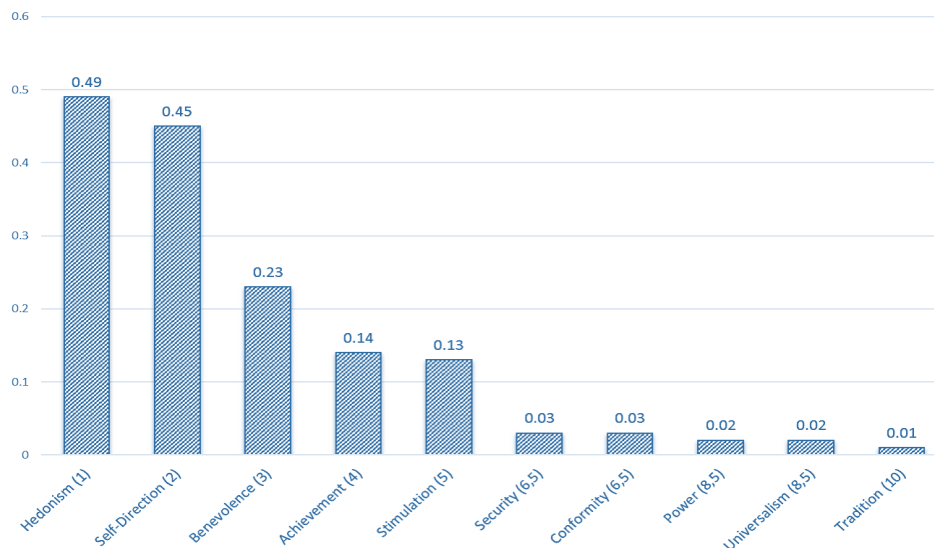


At the same time, the value of “benevolence”, which took the first position in the ranking of values, takes the 5th position in the analysis of consumer preferences, with the exception of preferences for choosing shoes (4th position) and cell phones (3rd position). The power of influence of such value as hedonism varies depending on the type of product according to Copeland (1923). It is more evident in the choice of goods purchased with minimal effort - beverages, snacks - and to a lesser degree when buying pre-selected goods (“shopping” goods) - smartphones, tablets, clothes and shoes. When choosing services, the values of “hedonism” and “independence” take the maximum values of 0.49 and 0.45 respectively, which demonstrates the presence of a moderate connection between these values and the choice of Internet providers and cell operators.

For all product groups, there were values in the ranking demonstrating a strong connection. It can be concluded that hypothesis (H2) was confirmed for the goods. Based on the study of the higher level values, you can get a significant motivational value that determines consumer preferences of the young audience in the selected product categories. Additional study is required in order to analyze the influence of higher level values on

consumer preferences for services. In general, it can be concluded that a set of values with strong and weak influence is fairly stable and it varies little for different goods.

Figure 7. The influence of the higher level values on the choice of Internet providers and cell operators.



Based on the results of processing the data from the diagrams (Figures 1-7), a table was made showing “hits” of the higher level values in the leading and closing groups (Table 2). For this, the top 10 values were divided into two groups. The first group of values has a rating of 1 to 5. The second group has values ranging from 6 to 10. Table 2 shows how many times each value of the higher level was in the first five by the degree of influence among all the values of the higher level, and how many times it got to the second ten by this indicator. Values numbered 1, 2, 3 and 9 refer to values with a “strong” influence. Values with little influence are numbered 5, 6, 7, 8 and 10 (Table 2).

Table 2. The number of hits of the higher level values in the leading and closing groups

Higher level values	Self-Direction	Stimulation	Hedonism	Achievement	Power	Security	Conformity	Tradition	Benevolence	Universalism
	1	2	3	4	5	6	7	8	9	10
Number of hits in the first five	7	6	7	4	1	0	1	0	7	2
Number of hits in the second five	0	1	0	3	6	7	6	7	0	5

The presence of a group of higher level values with a strong motivational influence (Self-Direction, Stimulation, Hedonism, and Benevolence) can serve as an additional confirmation of the hypotheses put forward in the study

5. Discussion and implications

The results show the achieved goal of studying the relationship between the values of the higher level and the consumer preferences of young consumers, based on ranking and determining the degree to which higher level values are expressed.

The obtained results indicate that, firstly, the student audience under study has a significant value system, being the basis for life principles they are guided by, which confirms hypothesis H1.

Secondly, significant motivational values were obtained that determine consumer preferences of the young audience in the categories of marker products.

The obtained results confirm the applicability of the Schwartz value theory to the youth student audience (Schwartz 1992, 1994a, 2005, 2012). The obtained values of the correlation coefficients demonstrate a weak "connection" between the values of the higher level, which coincides with the results of previous studies (Lapin *et al.* 1996).

According to the results of our study, the most important values for first-year students are goodwill in relationships, independence in behavior and thinking, as well as the pursuit of pleasures. Security and traditionalism received the lowest ratings, which can probably be explained by the respondents' age. Attention should be paid to small differences in the quantitative estimates of most values: the difference between the highest degree (benevolence) and the eighth most important value (power) rating is only 1.75 points. At the same time, the assessments of the last two values are significantly different from all the others. The assessment of the tenth ranking value is less than that of the eighth one by 3.5 points.

Simultaneously, the obtained values of the expression of the higher level values allow us to identify the "base" values that are the basis of the audience's guiding life principles while choosing products. "Self-Direction", "Stimulation", "Hedonism" and "Benevolence" refer to these values (Table 2.). It can be concluded that the set of values with a strong influence is fairly stable. In this part, the results of our study coincide with the results obtained earlier (Basaran and Buyukyilmaz 2015). In the study done by Basaran and Buyukyilmaz, "Hedonism" has a significant impact on satisfaction and behavioral intentions and the same is true for our study. But it has been revealed that "Hedonism" reflects only one of the values that are the basis of guiding life principles. This is due to the fact that Basaran and Buyukyilmaz did not consider other values in their study. As for utilitarian values, in our opinion, they are rather related to "situational" factors determining consumers' perception of price, quality and other attributes of a product.

Apart from this, the obtained results for the value of "Tradition" (Table 2) coincide with the results of the study done by Riquelme, Rios and Al-Sharhan (2011), where they noted a weak influence of traditional values on the youth audience.

In general, the developed research methodology supplements the conceptual value approach proposed by Kotler, Kartajaya and Setiawan (2010). In our opinion, the proposed methodology will allow companies to study the influence of values and appeal to consumers, relying on their value motivation. While analyzing the influence of values on consumer behavior, the most important issue for the theory and practice of marketing is the relevance of the method of studying the reality and its convenience for use in business practice. The conducted study made it possible, to a certain extent, to approach the solution of this problem.

A significant result obtained in the course of the study is the proven connection between the values of the higher level (according to Schwartz) with marker product categories. The novelty of the proposed methodology bridges the existing gap in earlier studies, since it eliminates the need to study the entire hierarchy of the "sub-value" system and the connections between them. At the same time, the proposed approach makes it possible to obtain a result that is meaningful for business practice on the basis of the connection between the ranks of values exerting a motivational influence on young consumers and marker product categories

Conclusion

Thus, when forming marketing activities and the communication policy, companies can be guided by the obtained results. In particular, when developing marketing programs aimed at young people aged 17 to 22 years old, it is necessary to rely on the dominance of such values as "hedonism" and "independence". At the same time, the conducted study leaves open the question of how the rating of values will change as respondents move to other age groups. This opens opportunities for further studies based on wave cohort studies that will provide an answer to this question.

The limitations, adopted by the authors while forming the sample for the study (age, level of education, educational institution), aimed at solving the problem of the unity of socio-cultural meaning in describing and perceiving respondents' higher level values are simultaneously a restriction for transferring the results to other

social groups where other interpretations of values may be required. While continuing studies in this direction, it is necessary to develop research tools and sampling criteria that will help to solve this problem.

Returning to the question of the influence of utilitarian values, the study of consumer decision-making in the following connection “higher level values” and “utilitarian values” is an interesting task.

Another interesting direction for continuing the study can be an ethno-cultural analysis of the higher level values. Our study does not allow us to definitely apply the results to other countries. In particular, this is due to the influence of “socio-cultural codes” of different countries that determine the characteristics of consumer behavior. Therefore, it will be interesting to conduct similar studies in other countries.

The study suggests a method of marketing research that allows you to link the values of the higher level (according to Schwartz) to marker product categories. An original questionnaire was developed for the value-based evaluation of marker product categories, which allows you to substantiate the influence of higher level values on consumer preferences. Schwartz’s value survey (SVS), a method for identifying values, was adapted for marketing research, which makes it possible to simplify the acquisition of the most significant values to be used by companies while working with young audiences. As a result, a significant connection was established between the respondents’ chosen values, which they are guided by as life principles, and the values which determine their consumer preferences

Acknowledgements

The author is grateful to colleagues from the Department of Marketing of Plekhanov Russian University of Economics who participated in this study: Professor Irina Skorobogatykh, Professor Aleksey Meshkov, Professor Boris Musatov, Associate Professor Dariya Efimova, Associate Professor Timur Tultaev, as well as students and post-graduate students of the Faculty of Marketing.

References

- [1] Babin, B., and Babin, L. 2001. Seeking something different? A model of schema typicality, consumer affect, purchase intentions and perceived shopping value. *Journal of Business Research*, 54(2): 89-96. DOI:10.1016/S0148-2963(99)00095-8
- [2] Basaran, U., and Buyukyilmaz, O. 2015. The Effects of Utilitarian and Hedonic Values on Young Consumers’ Satisfaction and Behavioral Intentions. *Eurasian Journal of Business and Economics*, 8(16): 1-18. DOI: 10.17015/ejbe.2015.016.01
- [3] Beatty, S.E., Homer, P.M., and Kahle L.R. 1988. Problems with VALS in International Marketing Research: An Example from an Application of the Empirical Mirror Technique. *Advances in Consumer Research*, 15: 375-380. Available at: <http://www.acrwebsite.org/volumes/6655/volumes/v15/NA-15>
- [4] Bilińska-Reformat, K., and Stefańska, M. 2016. Young consumers’ behaviours in retail market and their impact on activities of retail chains. *Poslovna izvrsnost Zagreb. Business Excellence*, 10(2): 123-135, Available at: http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=251877
- [5] Binkli, K. 2017. Luxury retailers of the future will stop competing with online stores at a price, Available at: <https://www.vedomosti.ru/realty/articles/2017/04/18/686138-lyuksovie-budushego>
- [6] Chung K.-C., Fam K.-S., and Holdsworth, D.K. 2009. Impact of cultural values on young consumers’ choice of international tertiary education. *Asia-Pacific Journal of Business Administration*, 1(1): 54-67. DOI: 10.1108/17574320910942178
- [7] Copeland, M.T. 1923. The Relation of Consumers’ Buying Habits to Marketing Methods. *Harvard Business Review*, 1: 282-289.

- [8] Durvasula, S., and Lysonski, S. 2014. Probing the etic vs. emic nature of consumer ethnocentrism: cross-national evidence. *Innovative Marketing*, 10(1): 7-16. Available at: http://epublications.marquette.edu/cgi/viewcontent.cgi?article=1149&context=market_fac
- [9] Ghosh, D. 2016. Identifying factors influencing positive attitude of young consumers towards online advertisement. *J A B E R*, 14(10): 7085 -7098.
- [10] Kansra, P. 2014. Determinants of the Buying Behavior of Young Consumers of Branded Clothes: An Empirical Analysis. *IUP Journal of Brand Management*, XI (3): 57-70.
- [11] Kotler, P., Kartajaya, H., and Setiawan, I., 2010. *Marketing 3.0: From products to customers to the human spirit*. John Wiley & Sons, Inc., Hoboken, New Jersey, USA.
- [12] Lapin, N.I., Beljaeva, L.A., Zdravomyslov, A.G., and Naumova, N.F. 1996. *Dynamics of the values of the population in the reformed Russia*. Moscow: Jeditorial URSS.
- [13] Malhotra, N.K., Birks, D.F. 2007. *Marketing research: An applied orientation*. New York: Pearson Education.
- [14] Parsons, T. 1991. *The Social System*. 2nd Ed. Routledge.
- [15] Pimenta, M.L., and Piato, É.L. 2016. Cognitive relationships between automobile attributes and personal values. *Asia Pacific Journal of Marketing and Logistics*, 28(5): 841-861. DOI: 10.1108/APJML-09-2015-0147
- [16] Riquelme, H.E., Rios, R.E., and Al-Sharhan, N. 2011. Antecedents of ostentatious consumption in Kuwait. *Journal of Islamic Marketing*, 2(3): 295-308. DOI: 10.1108/17590831111164813
- [17] Rjabov, A.V., and Kurbangaleeva E.Sh. (Eds.) 2003. *Basic values of the Russians: Social attitudes. Life strategies. Symbols. Myths*. Moscow: Dom Intellektual'noj Knigi.
- [18] Rohan, M.J. 2000. A rose by any name? The values construct. *Personality and Social Psychology Review*, 4: 255-277. DOI: [10.1207/S15327957PSPR0403_4](https://doi.org/10.1207/S15327957PSPR0403_4)
- [19] Rokeach, M. 1973. *The nature of human values*. New York: Free Press.
- [20] Schwartz, S.H. 1992. Universals in the content and structure of values: Theory and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in Experimental Social Psychology*, 25: 1-65. New York: Academic Press. DOI: [10.1016/S0065-2601\(08\)60281-6](https://doi.org/10.1016/S0065-2601(08)60281-6)
- [21] Schwartz, S.H. 1994a. Beyond individualism/collectivism: New cultural dimensions of values. In Kim, U. (Ed); Triandis, H.C. (Ed); Kâğitçibaşı, Ç.(Ed); Choi, S.-C. (Ed); Yoon, G. (Ed). *Individualism and collectivism: Theory, method, and applications*. (pp. 85-119). Thousand Oaks, CA, US: Sage Publications, Inc.
- [22] Schwartz, S.H. 1994b. Are there universal aspects in the structure and contents of human values? *Journal of Social Issues*, 50: 19–46. DOI: 10.1111/j.1540-4560.1994.tb01196.x
- [23] Schwartz, S.H. 2005. Robustness and fruitfulness of a theory of universals in individual human values In A. Tamayo and J. B. Porto (Eds.) *Valores e trabalho [Values and work]*. Brasilia: Editora Universidade de Brasilia, pp. 56–95.
- [24] Schwartz, S.H. 2012. An Overview of the Schwartz Theory of Basic Values. *Online Readings in Psychology and Culture*, 2(1). Available at: <http://dx.doi.org/10.9707/2307-0919.1116>
- [25] Shcherbakova, E.M. 2017. Young people of the CIS, demographic portrait Demoscope Weekly, 711-712. Available at: <http://www.demoscope.ru/weekly/2017/0711/barom01.php>
- [26] Sidorchuk, R. 2015. The Concept of “Value” in the Theory of Marketing. *Asian Social Science*, 11(9): 320-325. DOI:10.5539/ass.v11n9p320

- [27] Sidorchuk, R., Skorobogatykh, I., Efimova, D., Meshkov, F., and Danchenok, L. 2016. Conceptual aspects of studying value reference points and consumer preferences of young consumers. *J A B E R*, 14(10): 7337-7356.
- [28] Skorobogatykh, I.I. *et al.* 2016. Comparative study of young active consumers as mobile app users in Russia and Europe. *Marketing Management Firms. Marketing MBA*, 7(2): 171-196.
- [29] Taborecka-Petrovicova, J., and Gibalova, M. 2014. Measurement of Consumer Ethnocentrism of Slovak Consumers. *International Review of Management and Marketing*, 4(4): 247-258. Available at: <http://econjournals.com/index.php/irmm/article/viewFile/939/pdf>
- [30] Vázquez-Burguete, J.L., Sahelices-Pinto, C., and Lanero-Carrizo, A. 2017. Corporate social responsibility and consumer behavior in the cosmetics sector: a study in the Spanish context. *International Review on Public and Nonprofit Marketing*, 1–16. DOI: 10.1007/s12208-017-0178-y
- [31] Watson, J.J., and Wright K. 1999. Consumer ethnocentrism and attitudes toward domestic and foreign products. *European Journal of Marketing*, 34(9/10): 1149-1166. DOI: 10.1108/03090560010342520
- [32] Zeithaml, A.V. 1988. Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence. *Journal of Marketing*, 52(3): 2-22. DOI: 10.2307/1251446
- [33] Zhao, J., He, N, and Lovrich, P.N. 1998. Individual value preferences among American police officers. The Rokeach theory of human values revisited. *Policing: International Journal of Police Strategies & Management*, 21(1): 22–37. DOI: [10.1108/13639519810206583](https://doi.org/10.1108/13639519810206583)
- *** FSSS. 2016. Retail trade, services to population, tourism Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/retail/#
- *** SBI. 2009-2017. VALS Survey. Strategic Business Insight. Available at: <http://www.strategicbusinessinsights.com/vals/>
- *** UNFPA. 2014. State of world population 2014. The power 1.8 billion: adolescents, youth and the transformation of the future. Available at: <http://www.unfpa.org/sites/default/files/pub-pdf/RU-SWOP14-Report%20Rev-Web-update%2024%20Nov.pdf>

Insolvency Risk and Problems with Receivables Payments in the Environment of the Slovak Small and Medium-sized Enterprises and Young Entrepreneurs

Monika SOBEKOVA MAJKOVA
The Faculty of Economics and Business¹
Pan-European University, Bratislava, Slovakia
monika.majkova@centrum.sk

Aleksandr KLJUČNIKOV
Department of Entrepreneurship and Management²
University of Entrepreneurship and Law, Prague, Czech Republic
kliuchnikov@gmail.com

Suggested Citation:

Sobekova Majkova, M., and Ključnikov, A. 2017. Insolvency risk and problems with receivables payments in the environment of the Slovak small and medium-sized enterprises and young entrepreneurs. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 2028-2037.

Abstract:

European surveys declare the problems with defaulters are one of the most intensive of barriers of small and medium-sized enterprises (SMEs), including Slovakia. More than third of the companies state the insolvency risk and problems with receivables payments have strong impact on their growth and employing. The aim of this paper is to bring the statistical evidence that such factors as the age, the gender, the firm's size and the region where the company is located have a significant impact on the problems with receivables payments, defaulters and insolvency risk. The research uses the results of two studies, that involved 762 of traditional Slovak SMEs and young entrepreneurs in years 2012 – 2016. The data were analysed by method of Pearson's chi-square statistics, which allows confirm statistically significant dependencies between the chosen factors and the existence of the insolvency risk. The basic findings of the research team confirm statement the firm size and the gender are the factors with statistically significant impact on the problems with paying receivables. In the case of the age and the region the research team didn't find relevant evidence.

Keywords: payment management; defaulters; insolvency; SMEs; receivables payments

JEL Classification: G11; G32; L26; M21

Introduction

However, the SMEs are an important part of the market economy (Ewoudou 2010, Freel *et al.* 2010, Garwe and Fatoki 2012, Merková *at al.* 2012, Ključnikov and Junger 2014, Mama and Nkundabanyanga *et al.* 2014, Bylok 2016, Dolobac *et al.* 2016, Korcsmaros and Simonova 2016, Sobekova Majkova 2016, Koraus *et al.* 2017, Strakova *et al.* 2017, etc.) they face the special types of the business and financial risks because of their characteristics including insolvency risk more than large companies. The SMEs are less protected and less informed about the tools of the protection before defaulters (Paul and Boden 2011, Kubickova and Soucek 2013, Sauka and Welter 2014, El Kalak and Hudson 2016, Intrum Jusitita 2016). Problems with defaulters and payment risk are not rare among Slovak SMEs and also young entrepreneurs (Jakubec *et al.* 2012, Sobekova Majkova *et al.* 2017). The aim of the paper is to bring statistical evidence that insolvency risk is an important problem needed the solution because problems with defaulters are an important factor causing the secondary insolvency of the company. The aim is to prove the factors as the age, the gender, the firm size and the region of the company have significant impact on the insolvency risk of the company and problems with receivables payments. The fact that this paper is based on two similar researches, where the first was conducted in 2012 and the second in 2016, allows the research team

¹ Tematínska 10, 851 05 Bratislava

² Vltavská 585/14, 150 00 Prague 5

to show the gradual development of the insolvency risk of the SMEs in Slovakia. The first survey was carried out among young entrepreneurs and the second one was focused on the traditional Slovak SMEs.

1. Literature review

The financial market is in the broadest sense a very dynamic, risky and volatile in these times (Kolková 2016) what has also impact on the entrepreneurs. SMEs face more financial constraints and financial, payment and insolvency risks because of their characteristics in comparison with larger ones (Paul and Boden 2011, Kubickova and Soucek 2013, Dong and Men 2014, Sauka and Welter 2014, Strielkovski *et al.* 2014, Grancay *et al.* 2015, Petr 2016, El Kalak and Hudson 2016). They have weak capital power (Cheng and Tang 2012) and so the problems with defaulters and insolvency can be more destructive for their businesses (Molina and Prever 2012).

European payment survey (Intrum Justitia 2016), carried out among 9440 European companies (200 from the Slovakia), declares: "*Late payments, as well as long payment terms, cause trouble for enterprises all over Europe and the consequences can be counted in lost jobs and growth opportunities. More than every third SME (34 %) say they could hire more employees if they were paid faster.*" This report brings also others interesting facts as 35 % of respondents say that they do not get paid on time, that may even threaten the existence of the company and 41 % of the companies say late payments prohibit their growth, *etc.* 44% of the Slovak companies does not use any protect tools as guarantees, factoring or insurance in comparison with EU average 25%. This is alarming fact indicating poor protection of the Slovak SMEs.

Business Alliance of Slovakia (BAS 2015) brings the results of other comparative survey from 2015. Slovakia has the third biggest share of late payments of receivables 28% after the Greece and Bulgaria (30%). Customers from the Germany (17%) and Austria (18%) have the better payment morality. The average due date was the biggest in the Spain (more than 60 days) in 2015, for the comparison it was 43 days in previous years. The smallest average due date was in the Germany 25 days.

The following paragraphs present the results of the literature research focused on the topic of impact of such factors *assize, age, gender and location* on the insolvency risk.

Molina and Prever (2009) examine trade receivables policy for the firms in distress and its impact on firm's profitability and cash management. For empirical analysis they have used 79,926 firm year observations from the US Compustat data set during the period 1978-2000. They find that when a small firm's is facing distressed situation they reduce credit sales and tighten their receivables policy rather they want to sale more on cash to avoid insolvency. Therefore, authors argue that depending on the economic condition small firms adjust their receivables policy to remain in operation. The authors Bhimani, Gulamhussen and Da-Rocha Lopes (2010) observed connection among firm size, age, region and the sector for insolvency prediction on more than 30 000 loan data. They confirm the *firm size* is positively related to insolvency and the *age* negatively. Interesting is connection with *regions*. They state the business conditions in the capital city are better than in small local cities. The authors state the companies extending receivables for longer time are more likely to be insolvent because then they create liquidity crisis. The result for *age* suggests that more mature firms are unlikely to go for insolvency due to easy access to external finance and internal capital.

Paul and Boden (2011) proved in their study on UK SMEs the *firm size* is relevant factor connecting with payment policy. They argue that larger firms have more employees to look for the unpaid receivables and due to that larger firms can receive the trade receivables earlier than the micro or small firms. They also find that most of the large firms in their sample have credit management department and as a result of dedicated credit department large firms can manage the receivables efficiently. The authors Molina and Prever (2012) brought next but the newest research about the impact of the *firm size* on payment risk. They stat that smaller firms facing financial difficulties takes more time to pay off their payables than the large firms. Specially, the result indicates that large firms take 1.5 more extra days than their regular payment days when they face lack of sales. On the other hand, small firms take 5 days more than the normal payment days while facing financial difficulties. They also find that large firms use less trade payables than the smaller ones since they can finance from banks due to more bargaining power. Kestens *et al.* (2012) confirm pervious findings about the *firm size*. They bring evidence on more than 15 000 firms of Belgium that smaller companies have more problems with payments from receivables. The paper finds

evidence that in the crisis period small firms' facing liquidity crisis due to strict bank loans condition and hence they were using more trade payables as a source of finance. Moreover, lack of payments from receivables was compelling the micro and small firms to pay their trade payables with longer duration. Hence, micro and small firms were facing both receivables and payables problems in the period of financial crisis than the pre-crisis period. They also find that micro and small firms had reduced profitability in the crisis period and as a result they were also taking more time in paying their payables.

Tsuruta (2013) observed how Japanese financial crisis during 1996 – 2000 affected the trade payables and receivables of the small companies. The author find out the lower payments from customers were reducing the cash balance of the firms. The firms paid lower payments to accounts payables and which is making a problem for the supplier to stay in the business, thus creating a domino effect of insolvency. The authors Kubickova and Soucek (2013) examines the receivables of the 120 Czech SMEs, so they proved impact of the *firm size* on the payment risk. They found out that larger SMEs pay more attention on the credit history and monitoring of the receivables than smaller ones. One of the reasons is limited resources of the smaller SMEs. The results suggest that cca 80 % of the Czech SMEs face difficulties in the last three years with their receivables. Problem is usually with lack of monitoring the solvency status of the client, lack of communication, and lack of tools to motivate clients to pay in time. Orobia (2013) examines the impact of the *gender* on trade receivables and payables in Uganda. The author found that females are more concerned about their management of receivables and they believe that efficient management of receivables can increase the productivity of the firms than the male entrepreneurs. However females are not skilled and experienced enough to manage the receivables efficiently. The author's also finds that female entrepreneurs are also lack of proper long-term planning about collection of receivables on time. Therefore, female borrowers face more liquidity crisis than the male entrepreneurs. The paper also finds that men entrepreneurs are taking active measures for managing working capital efficiently and collecting their receivables. Many next researchers declare the gender characteristics have significant impact on SMEs finance (Verheul *et al.* 2006, Langowitz and Minniti 2007, Lim and Envick 2011, Garwe and Fatoki 2012, *etc.*).

Bastos and Pindado (2013) examined the issue of trade credit in Argentine in times of the financial crisis, Brazil and Turkey and proved impact of the *firm size* on paying receivables and payables. They find that firms those have problems with paying receivables from customer they used to make delayed payments more than the firms those are collecting more cash from their accounts receivables. Larger firms were using more trade payables because they have more business connections and so that they can make delayed payments than the smaller ones. The authors suggest that firms those collecting delayed payments from their customer were facing insolvency risk as their cash was getting low and hence they were also holding their payables to avoid the insolvency risk. The Latvian authors Sauka and Welter (2014) confirm that slow payment from the customer created cash crisis for the larger firms during the crisis. In terms of regional consideration, it is found that most of the firms reported insolvent in Riga, the capital of Latvia. The paper finds evidence that there is too much competition in the capital city and hence it was difficult for firms to deal with such competitions from large firms as well as from local businesses.

Marimuthu *et al.* (2014) present result of the survey carried out among 229 Malaysian SMEs in 1998 – 2003. They state that small and large companies have more problems with liquidity management and insolvency than medium. Large firms face the most critical condition in liquidity due to delayed payments from accounts receivables. Small firms have limited internal capacity to absorb insolvency as a result of higher receivables turnover days and which suggests small firms faced problem with receivables management. El Kalak and Hudson (2016) are the next authors confirming the impact of the *firm size* on the insolvency probabilities. They found that micro firms are more vulnerable to insolvency when they have lower level of working capital. It is also found that micro firms face difficulties in cash management and for which they have more liquidity crisis and increases the insolvency risk. Authors argue that micro firms are having difficulties in managing their liquidity because they have problems in collection of receivables due to lack of monitoring and enforcement. High overdue of receivables is increasing the chances for micro firms to exit the market. The authors examine also impact of the *age*. They state the older company can better manage the receivables due to its experience in the business and good connection with their customers. Thus, longer the firm survivable history lower is the possibility of default.

We brought the timeline of the studies connecting with the firm size in relation to the insolvency risk in majority cases. Only some of them proved impact of the gender, the region and the age on receivables payments. This is the reason why we consider this paper for benefit for the economic theory and practice because we are focused also on comparing impact all of these factors on traditional SMEs and also young entrepreneurs – the segment which is too much important for the economy but very vulnerable. The results indicate fireplace problems and outline ways of the possible solutions.

2. Methodology

This part of the paper contains information about the scientific methods used in the research, about the way of data collection, characteristics and size of the data sample, and information about the alternative working hypotheses.

Information about the selected sample and process of data collection

The most recent data published by the Slovak Business Agency in the SMEs Report 2015 (Slovak Business Agency, 2016), presented in Table 1, state that 531,063 SMEs were operating in Slovakia in 2015. While the total number of enterprises reached the value of 531,729 units, the share of SMEs was 99.9 %. A total number of the respondents of the surveys, presented in this paper, was 762, including 438 traditional SMEs and 324 young entrepreneurs).

Table 1. The number of entrepreneurs in Slovakia – comparison of the basic data set and the selected sample

Legal Form (2014)	Basic data set		Selected sample	
	Total values	Share (%)	Absolute values	in %
Micro enterprises (0-9 emp.) and individual entrepreneurs	515,236	96.9%	287	65.6%
Small enterprises (10-49 emp.)	12,984	2.4%	95	21.7%
Medium enterprises (50-249 emp.)	2,843	0.5%	29	6.6%
Large enterprises (250+ emp.)	666	0.1%	27	6.2%
TOTAL number of business units	531,063	100.0%	438	100.0%
SMEs from total	531,729		411	
Share of SMEs in %	99.9%		93.8%	

Source: Slovak Business Agency (2016): SMEs Report 2015, own processing

The major research was carried out among the Slovak SME in 2016. It was called Financial Risk of SMEs in Slovakia. The questionnaire of this research included five separate and thematically focused parts. Its online version was available on this link: <https://docs.google.com/forms/d/1Fhob6avbfQg4DcaYG44mxNYyohzcgZWDICXkUgFbNq4/viewform?c=0&w=1>. We had collected the research data by the following methods. At first we had chosen the random firms from the free Slovak business database www.vsetkyfirmy.sk by a method of random selection. We had contacted these chosen companies by the email or by phone. The next way of distribution of the questionnaires was the placement of the link on the research on the specialized economic and business internet portals focused on these types of business units. The last way of data mining was a direct addressment of the selected companies by the members of the research team. All the presented methods allowed the research team to collect a total number of 438 questionnaires. While the research team was concerned about the sufficiency of the number of the respondents, at the next step the verification of the validity of the data sample was conducted. The size of the selected sample was calculated at the base of the formula

$$n = (1.96)^2 \times \sqrt{p \times (1 - p) / 0.05^2} \quad (1)$$

(we assumed the probability of 9%). The calculations confirmed that the size of the required sample was 310, so the number of 438 respondents fulfills the preconditions of the validity of the research results.

In observing the commonalities of the basic data and the sample the similar characteristics of the structure of these data sets were identified. The share of SMEs on the total number of business units in the data set was

99.9 %, while SMEs share in the selected sample was 93.8%. These data files are also very similar in case of the regional structure of the data set and in case of the main economic activity. In observing of the regional structure of the selected business units we identified the average differences up to 3% except for two specific regions – Bratislava (capital of Slovakia) and Kosice (the biggest city in the Eastern part of Slovakia). The biggest differences between the basic data set and the selected sample were identified in Bratislava (10.7%), and the smallest differences were in Trenčín (1.7%). The next examined trait was the economic activity. The difference between the selected sample and the basic file was up to 5%. These findings indicate that the basic file and the selected sample do have similar characteristics.

The research team decided to monitor the development of the situation related to the insolvency risk in the segment of SMEs in Slovakia in the period since 2011. To investigate the changes of the attitudes to the risk of insolvency we decided to use the unpublished data from our research, which was made in cooperation with the Association of Young Entrepreneurs during 2011 and 2012. The research was called the barriers of the Young Entrepreneurs in Slovakia. The survey part was carried out using the online questionnaire which was distributed by the following ways: through the Association of Young Entrepreneurs, through the members of the research team and the specialized economic and business web portals (50% online and 50% personally). Total number of respondents of this survey was 1232. The research was focused on the younger people who either planned to start their own business (908 respondents), or had already opened a company (324 entrepreneurs in the category of SMEs). The detailed description of the research is available in the paper by Jakubec *et al.* (2012).

Similar characteristics were again identified in comparing the basic data set and the selected sample. Slovak statistical bureau informs that the share of the young entrepreneurs on the total number of SMEs is approximately 28%. In case of the selected sample of the presented research the value of this share was 37%. The gender distribution of the basic file and the sample was also very close. The data of SBA (Slovak Business Agency) proves that the share of the male entrepreneurs is 76.7%, and the share of the female entrepreneurs is 23.3%. The selection file presented the share of 64.20% of male entrepreneurs, and 35.8 % of their female counterparts. In observing of the regional structure of the selected sample the identified differences did not exceed the value of 7%.

The analysis of the obtained data involved the use of the instruments of descriptive statistics, including the averages and percentage. The research data were mainly evaluated in Microsoft Excel (version 2007) by the tools of the advanced pivot tables, and the methods of deduction and comparison. While the aim of this article was to bring the evidence about the statistical dependencies between the chosen factors and the insolvency risk, the research team applied the tools of the observing chi-square analysis (Pearson's chi-square), which is suitable for the deeper examination of the existing dependences. Verification of the obtained data was done through the statistical software placed at the website www.socscistatistics.com. The significance level has been set at the value of 5 %. We constructed three alternative hypotheses focused on the absence of the dependencies between the chosen factors and the insolvency risk. These alternative hypotheses were alternating the null hypothesis.

The formula for the calculation of the Pearson chi-square statistic:

$$\chi^2 = \sum_{i=1}^n \frac{(O_i - E_i)^2}{E_i} \quad (2)$$

where: χ^2 - Pearson's chi-square test statistic; O_i - observed frequency; E_i - expected frequency of type i in the null hypothesis; n - the number of observations in calculation.

Alternative hypotheses of the research

We prepared the following alternative hypotheses named H1, H2 and H3, the accuracy of which was verified by the statistical method of Pearson's chi-square. Null hypothesis assuming, the nonexistence of any dependencies, that can be statistically verified, between the observed factors and the insolvency risk was formulated as follows: *The statistically significant dependencies between the chosen factor and the insolvency risk, problems with defaulters and receivables payments do not exist.*

Alternative hypothesis was following:

- H1: Most of the Slovak SMEs have problems with secondary insolvency, resp. insolvency risk and defaulters. The firm size has significant impact on the insolvency risk of the company.
- H2: The factor of the gender of the entrepreneur does have the significant impact on company's insolvency among the SMEs and also among young entrepreneurs. We assume women have less problems with secondary insolvency than man.
- H3: The next factors with the significant impact on the insolvency of the company are the age of entrepreneurs and the region.

3. Case studies

We assumed that firm's size (the first factor) has a significant impact on the insolvency and the defaulters. There were only small companies in the research group of young entrepreneurs (2012). 59.88% (n = 194) of respondents declare problems with defaulters.

In the second group of respondents (SMEs) from 2016, 66.66% (n = 292) of companies state they have problems with insolvency and defaulters and only one third 33.34% (n = 146) didn't have problems with paying receivables. In observing the group of SMEs 68.1% have problems with defaulters. These numbers are alarming. They indicate that *two thirds of entrepreneurs have problems with insolvency* so it is obvious the theme of paying trade receivables is much actually because it has strong impact on the company liquidity and cash flow.

Table 2. Chi-square statistic calculation on firm size and insolvency of customers

Research 2016 Problems with the insolvency of customers	Positive		Negative		TOTAL	
	AV*	%	AV	%	AV	%
SMEs	280	68.1	131	31.9	411	100
Large	12	44.44	15	55.56	27	100
Micro	185	64.46	102	35.54	287	100
Small	72	75.79	23	24.21	95	100
Medium	23	79.31	6	20.69	29	100
Large	12	44.44	15	55.56	27	100
<i>p-value/χ²/dof.</i>	0.006504<0.05/12.273/3					

Note: *absolute value

Source: own processing

In the group of the young entrepreneurs (2012) there were only "small" companies, so we weren't able to analyze the impact of the firm size. But in the research carried out in 2016 we collected more extensive data because respondents of all firm size categories were obtained. Results are presented in Tabel 2. The value of chi-square is $\chi^2 = 12.273 = \chi^2_{0.01 \text{ with } 3 \text{ dof}}$. The value of *p* of 0.006504 confirms the statistical significance of the result at $p < 0.01$. These results *confirm an alternative working hypothesis H1* at the level of probability of 99%. *The firm's size has a significant impact on the insolvency risk of the company, resp. on receivables payments. SMEs have statistically significant more problems than large companies.*

The second observed factor was the gender of the entrepreneurs. In comparison of our two researches we found out interesting facts (Tabel 3): *Generally, female entrepreneurs have more problems with defaulters (77.05%) and secondary insolvency than male (42.86%)*. The value of the calculation of the chi-square ($\chi^2 = 48.7237 = \chi^2_{0.01 \text{ with } 1 \text{ dof}}$) indicates the working hypothesis H2 is confirmed at the 99% level of probability.

Table 3. Chi-square statistic calculation on the gender and the secondary insolvency

Research 2016	Positive		Negative		TOTAL	
	AV	%	AV	%	AV	%
Male	57	42.86	76	57.14	133	100
Female	235	77.05	70	22,95	305	100
<i>p-value/χ²/dof</i>	p-value<0.00001/48.7237/1					

Source: own processing

We bring next interesting finding: In both surveys the group of young entrepreneurs to 35/36 years achieve different results. The young female entrepreneurs have significant less problems with secondary insolvency and defaulters than male what indicate the young female are able to solve problems with default customers more effective than older ones. Table 4 presents obtained data and calculations from both researches that allow us to compare results. Even if we didn't obtained confirming results from survey 2012 ($\chi^2 = 2.3302 = \chi^2_{0.05 \text{ with } 1 \text{ dof}}$), data from next research from 2016 confirm the gender has significant impact on the problems with defaulters ($\chi^2 = 12.273 = \chi^2_{0.01 \text{ with } 1 \text{ dof}}$) that allow us to confirm working hypothesis H2 partially at the 99% level of probability.

Table 4. Chi-square statistic calculation on the gender and the secondary insolvency of the young entrepreneurs to 35/36

Research 2012 Problems with the insolvency of customers	Positive		Negative		TOTAL	
	AV	%	AV	%	AV	%
Male to 36	131	62.98	77	37.02	208	100
Female to 36	63	54.31	53	45.69	116	100
<i>p-value/χ²/dof</i>	0.126882>0.05/2.3302/1					
Research 2016						
Male to 35	91	77.8	26	22.2	117	100
Female to 35	17	37.0	29	63.0	46	100
<i>p-value/χ²/dof</i>	0.006504<0.01/12.273/1					

Source: own processing

Hypothesis H3 is focused on two last observed factors - the age of the entrepreneurs and the region. In researching impact of the age we found out that two thirds (66.16% in average) of respondents in each age group had problems with payments receivables and insolvency and only one third didn't declared any problems. However, data in Tab. 5 indicate the entrepreneurs 45 + have the biggest problems with insolvency (70.81%), the value of $\chi^2 = 2.6756 = \chi^2_{0.05 \text{ with } 2 \text{ dof}}$ allow us to reject an alternative working hypothesis H3 that the age has significant impact on problems with insolvency.

The impact of the region on the problems with insolvency was researched as a part of working alternative hypothesis H3 too. Data in Table 5 indicate the companies from Eastern part of the Slovakia have the biggest problems with insolvency (70.27%). This is probably connected with the fact the Eastern part is considered for the less developed part of the country with the worse infrastructure and high unemployment rate. Even if these differences among the regions value of $\chi^2 = 0.6613 = \chi^2_{0.05 \text{ with } 3 \text{ dof}}$ indicate the impact of the region on the insolvency is not statistically significant. Thanks to this number we reject working hypothesis H3.

Table 5. Chi-square statistic calculation on the age and the region in relation to the problems with insolvency

Age of the entrepreneurs (Research 2016)	Have problems with insolvency		Don't have problems		TOTAL	
	AV	%	AV	%	AV	%
To 35 years	108	66.26	55	33.74	163	100
36 – 45	70	61.4	47	38.60	117	100
45 +	114	70.81	44	29.19	158	100

$p\text{-value}/\chi^2/dgf$	0.262428 > 0.05 / 2.6756 / 2					
Region (Research 2016)						
Bratislava	133	66.83	66	33.17	199	100
Central	119	64.47	27	35.53	146	100
Eastern	26	70.27	11	29.73	37	100
Western	84	66.67	42	33.33	126	100
$p\text{-value}/\chi^2/dgf$	0.88227 > 0.05 / 0.6613 / 3					

Source: own processing

One of the aims of this paper was to statistically verify the existence or nonexistence of the dependencies between the firm's size and the risk of insolvency. We brought the evidence that the firm's size is a relevant factor in case of the payments of the receivables. SMEs do have more problems with the receivables payments than the large companies. This finding is statistically significant, and is conformal with the results of the studies of a large group of authors, including Bhimani *et al.* (2010), Molina and Prever (2009, 2012), Paul and Boden (2011), Kubickova and Soucek (2013), Bastos and Pindado (2013), El Kalak and Hudson (2016), and Sobekova Majkova *et al.* (2017). All of them consider the firm's size for the relevant factor affecting receivables payments and potential insolvency of the company.

The gender of the entrepreneur was the second observed factor. The research data indicate the female entrepreneurs do have statistically significantly more problems with the defaulters in comparison with their male counterparts. This scientific finding agrees with the study by Orobia (2013) who examined the impact of *gender* on the trade receivables and payables in Uganda. He found that females are more concerned about the management of their receivables and that they believe that the efficient management of the receivables can increase the productivity of the firms more than the male entrepreneurs. Unfortunately, females are not skilled and experienced enough to manage the receivables efficiently. The author also finds that female entrepreneurs also lack a proper long-term planning in case of the collection of the receivables on time. Therefore, female borrowers face liquidity crises more often than their male colleagues. The paper also finds that male entrepreneurs take more active measures for the efficient management of the working capital and the collection of their receivables. Many researchers similarly confirm that the gender characteristics have a significant impact on SMEs finance (Verheul *et al.* 2006, Langowitz and Minniti 2007, Lim and Envick 2011, Garwe and Fatoki 2012, *etc.*). They state that the females are facing the impact of the financial risk to a greater extend in comparison to the males. Female entrepreneurs have the different character traits than males, what is also transferred to the business activities.

The last two observed factors were the age and the region. At the base of the chi-square calculation we rejected the working hypothesis H3, that assumed that the age has a significant impact on the problems with the insolvency. This finding is contrary to the results of the study by Bhimani, Gulamhussen and Da-Rocha Lopes (2010) who stated that the age is negatively related to the insolvency. Also the authors El Kalak and Hudson (2016) stated that the older the company is, the better it can manage the receivables due to its level of experience in business and due to more developed relationships with their customers. Thus, longer firm's survivable history lowers the possibility of default.

The research results do not bring any statistically significant evidence of the existence of the dependence between the region where the company is located and the occurrence of the problems with receivables payments and the insolvency of the company on the sample of the Slovak SMEs. For the comparison - the authors Bhimani, Gulamhussen and Da-Rocha Lopes (2010) and the Latvian authors Sauka and Welter (2014) brought the evidence about the significant impact of the region on the insolvency risk. The researchers Bhimani, Gulamhussen and Da-Rocha Lopes (2010) stated that the business conditions in the capital city are better than in small local cities. The authors Sauka and Welter (2014) brought the opposite result. They found the evidence that there due to a higher level of competition in the capital city it becomes more difficult for the firms to deal with such competition from the large firms and from the local businesses at the same time, and this complication reduces the profits of the location of the company in the capital of the country. In case of the factor of the location of the enterprise the results of the

authors may differ due to the differences between the countries, where the researches were conducted. Slovakia seems to be quite homogeneous region, which is more like an exception in the modern business world. Payment discipline of the customers is a significant factor affecting company's financial health the most in times of crisis. Two thirds of the respondents of the presented surveys claimed the existence and the occurrence of the problems with defaulters. This finding is conformal with the European payment report, which informs that *late payments, as well as long payment terms, cause trouble for enterprises all over Europe and the consequences can be counted in lost jobs and growth opportunities* (Intrum Justitia, 2016).

Conclusion

The main objective of the paper was to bring scientific evidence that the factors as the age, the gender, the firm size and the region of the company have significant impact on the insolvency risk of the company and problems with receivables payments among the Slovak SMEs and young entrepreneurs. The basic findings of the research team confirm statement the firm size and the gender are the factors with statistically significant impact on the problems with paying receivables. In the case of the age and the region the research team didn't find relevant evidence. However, the problems with insolvency are much alarming (two third of entrepreneurs have problems with defaulters), we believe that by adopting single prevent tools companies can decrease their insolvency risk.

The results of the paper indicate that insolvency risk and the problems with the payments of the receivables are significant for the SMEs in Slovakia. In order to find a solution, the researchers identified that the smaller the company is, the more intensive are the problems with the defaulters. Our data show that small companies do not devote a sufficient attention to the control of their receivables and to the evaluation of their customers before they sell them the products or services. We assume this to be the biggest problem with the most significant impact on the occurrence of these risks. SMEs should use such preventive tools as the evaluation of the financial health of the customers and the insurance of the receivables much more intensively. Many online registers evaluating the companies and their financial health, that could be good assistants for the entrepreneurs, have appeared in the recent years. The entrepreneurs may also use the offer of the educational programs in the field of finance, available with the state support, or provided by state and private educational institutions. An improve in the level of the financial literacy may substantially reduce the losses of SMEs in Slovakia and the other countries.

We consider the size of the sample and its homogeneity for the strength of the survey. The biggest weakness was the fact that many of questionnaires were fulfilled online and not in person. The plan of the research team is to carry out the research about the financial risk among the SMEs as the comparative analysis among the V4 countries.

Acknowledgement

The funding of this paper was provided by of the grants of GA AA number 1-2016 and 3-2016.

References

- [1] Bastos, R. and Pindado, J. 2013. Trade credit during a financial crisis: A panel data analysis. *Journal of Business Research*, 66: 614-620.
- [2] Bhimani, A., Gulamhussen, M.A., and Da-RochaLopes, S. 2010. Accounting and non-accounting determinants of default: Ananalysis of privately held firms. *Journal of Accounting Public Policy*, 29: 517-532.
- [3] Bylok, F. 2016. Factors determining development of social capital in small and medium-sized enterprises. *Acta Oeconomica Universitatis Selye*, 5 (2): 42 - 55.
- [4] Dolobáč, M., Mura, L., and Švec, M. 2016. Personnel management and the new system of dual education in Slovak Republic. *Actual Problems of Economics*, 181(7): 282-289.
- [5] Dong, Y., and Men, Ch. 2014. SME financing in emerging markets. *Emerging Markets, Finance & Trade*, 50(1): 120-149.

- [6] El Kalak, I. and Hudson, R. 2016. The effect of size on the failure probabilities of SMEs: An empirical study on the US market using discrete hazard model. *International Review of Financial Analysis*, 43: 135-145. DOI: <https://doi.org/10.1016/j.irfa.2015.11.009>
- [7] Freel, M., Carter, S., Tagg, S., and Mason, S. 2010. The latent demand for bank debt: Characterising discouraged borrowers. *Small Business Economics*, 1(1): 1–16. DOI: <https://doi.org/10.1007/s11187-010-9283-6>
- [8] Garwe, D.K., and Fatoki, O. 2012. The impact of gender on SME characteristics and access to debt finance in South Africa. *Development Southern Africa*, 29(3): 448 – 461. Available: <http://dx.doi.org/10.1080/0376835X.2012.706040>
- [9] Grancay, M., Grancay, N., Drutarovska, J., and Mura, L. 2015. Gravity model of trade of the Czech and Slovak Republics 1995-2012: How have determinants of trade changed. *Politická Ekonomie*, 63(6): 759-777. DOI: <https://doi.org/10.18267/j.polek.1025>
- [10] Cheng, M.E., and Tang, Y. 2012. Research on the Small and Medium-sized Enterprises Financing Problems. *Proceedings of the 6th International Symposium – The development of small and medium-sized enterprises*, Dec 15 – 19, 93-97.
- [11] Jakubec, V., Sobekova Majkova, M. and Solík, J. 2012. *Potreby mladých podnikateľov a prekážky v ich podnikaní*, ZMPS.
- [12] Kestens, K., Van Cauwenberge, P. and Bauwhede, H.V. 2012. Trade credit and company performance during the 2008 financial crisis. *Accounting and Finance*, 52: 1125-1151. DOI: 10.1111/acfi.2012.52.issue-4
- [13] Kljucnikov, A., and Junger, R. 2014. Barriers for foreign direct investments in Belarus: Case of business logistics. Conference: Carpathian Logistics Congress (CLC) Location: Cracow, POLAND Date: DEC 09-11, 2013 . VSB Tech Univ Ostrava; Technical Univ Kosice; TANGER Ltd CLC 2013: Carpathian Logistics Congress - Congress Proceedings, 139-145.
- [14] Kolkova, A. 2016. Zpětné testování efektivity vybraných ukazatelů technické analýzy na měnovém páru s využitím digitálních opcí. 8th International Scientific Conference Managing and Modelling of Financial Risks, 5th – 6th September, in Ostrava, Czech Republic.
- [15] Koraus, A., Kascakova, Z., Parova, V., and Veselovska, S. 2017. Sustainable economic development through human resource management: Social intelligence of managers and performance. *Journal of Security and Sustainability*, 6 (3): 457-477. DOI: [https://doi.org/10.9770/jssi.2017.6.3\(11\)](https://doi.org/10.9770/jssi.2017.6.3(11))
- [16] Korcsmaros, E., and Simonova, M. 2016. Selected Representatives of Regional Institutions to Support Small and Medium Enterprises in Slovakia. *Journal of Applied Economic Sciences*, Volume XI, 3(41): 435 – 440.
- [17] Kubickova, D. and Soucek, J. 2013. Management of receivables in SMEs in the Czech Republic. *European Research Studies*, 14(4): 97-111.
- [18] Langowitz, N. and Minniti, M. 2007. Entrepreneurial propensity of women. *Entrepreneurship Theory and Practice*, 31(3): 341-364. DOI: 10.1111/j.1540-6520.2007.00177.x
- [19] Lim, S. and Envick, E. R. 2011. Gender and Entrepreneurial Orientation: A Multi Country Study. *International Entrepreneurship and Management Journal*, 9: 465-482.
- [20] Mama, A.T., and Ewoudou, J. 2010. Who is credit constrained among denied or discouraged borrowers? Available at: www.econrsa.org/papers/w_papers/wp199.pdf (accessed January 18, 2016).
- [21] Marimuthu, M., Arokiasamy, L., Woon, L.F. and Kolandaisamy, I. 2014. Size effect and insolvency profiles among the SMEs: An empirical investigation. *Global Business and Management Journal: An International Journal*, 6(4): 290-299.

- [22] Merková, M., Rajnoha, R., and Novák, P. 2012. Quantitative and qualitative diagnostic methods for measuring the effects of foreign direct investment in terms of the wood-processing industry in the Slovak republic. *Drewno*, 187: 65-88.
- [23] Molina, C.A. and Preve, L.A. 2009. Trade receivables policy of distressed firms and its effect on the costs of financial distress. *Financial Management*, Autumn, 663-686.
- [24] Molina, C.A. and Prever, L.A. 2012. An empirical analysis of the effect of financial distress on trade credit. *Financial Management*, Spring, 187-205.
- [25] Nkundabanyanga, S.K., Kosozi, D., Nalukenge, I. and Tauringana, V. 2014. Lending terms, financial literacy and formal credit accessibility. *International Journal of Social Economics*, 41 (5): 342-316. DOI: <https://doi.org/10.1108/IJSE-03-2013-0075>
- [26] Orobia, L.A. 2013. Gender differences in working capital management among small business owners in Uganda. *Journal of Economics and Behavioural Studies*, 5 (4): 226-236.
- [27] Paul, S.L. and Boden, R. 2011. Size matters: the late payment problem. *Journal of Small Business and Enterprise Development*, 18(4): 732-747. DOI: <https://doi.org/10.1108/14626001111179776>
- [28] Petr, P. 2016. Superficiary right of building: Origin and development in central Europe. *Danube*, 7 (2): 31-140. DOI:10.1515/danb-2016-0008
- [29] Sauka, A and Welter, F. (2014). Determinants of business insolvencies during economic growth and recession in Latvia. *Journal of Baltic Studies*, 45 (3): 375-396. DOI: 10.1080/01629778.2013.848372
- [30] Sobekova Majkova, M. 2016. The Influence of the Selected Factors on Financial Risk Perception in Slovak SMEs. *Actual problems of economics*, 10 (184): 121 – 130.
- [31] Sobekova Majkova, M., Kljucnikov, A. and Solik J. 2017. Impact of Age of The Entrepreneur on the Export Financing. Case Study From Slovakia. *Scientific Papers of University of Pardubice*, XXII, 40 (2): 199-209.
- [32] Strakova, J., Partlova, P., and Vachal, J. 2017. Business management in new global economy. *Acta Oeconomica Universitatis Selye*, 6 (1): 155 – 166.
- [33] Strielkowski, W., Abrahám, J. and Herget, J. 2014. Success factors of growth and development for small and medium enterprises in tourism sector. *Journal of Applied Economic Sciences*, IX, 1 (27): 101 – 109.
- [34] Tsuruta, D. 2013. Credit contagion and trade credit: evidence from small business data in Japan. *Asian Economic Journal*, 27 (4): 341-367. DOI <https://doi.org/10.1111/asej.12018>
- [35] Verheul, I., Van Stel, A., Thurik, R. 2006. Explaining the Female and Male. Entrepreneurship at the Country Level. *Entrepreneurship and Regional Development*, 18: 151-183. DOI: <http://dx.doi.org/10.1080/08985620500532053>
- *** Business Alliance of Slovakia. Available at: <http://alianciapas.sk/meskajucich-platieb-ma-slovensko-stvrtinu-skoro-tolko-ako-rusko-bulharsko-a-grecko/> (accessed, February 4, 2017).
- *** Intrum Jusitita. 2016 European Payment Report 2016. Available at: <https://www.intrum.com/en/about-us/publications/european-payment-report/epr-2016/> (accessed, February 4, 2017).
- *** Slovak Business Agency. *SMEs Report 2015*. Available at: http://www.sbagency.sk/sites/default/files/sprava_o_stave_msp_2015.pdf (accessed March 7, 2017)

Analysis of Using Accrual Based Accounting System by the Theoretical Approach of Technology Acceptance Model 3

Dona PRIMASARI

Faculty of Economic and Business Universitas Diponegoro, Indonesia
Faculty of Economic and Business Universitas Jenderal Soedirman, Indonesia
dona_primasari@yahoo.com

Abdul ROHMAN

Faculty of Economic and Business, Universitas Diponegoro, Indonesia

FUAD

Faculty of Economic and Business, Universitas Diponegoro, Indonesia
tofud@yahoo.com

Suggested Citation:

Primasari, D., Rohman, A., Fuad. 2017. Analysis of using accrual based accounting system by the theoretical approach of Technology Acceptance Model 3. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 2039-2049.

Abstract:

The purpose of this study is to examine the use of accrual-based accounting system with the behavior of the theoretical approach of Technology Acceptance Model. The population of this study was 345 Heads of the Regional Team Work Unit (SKPD) in Java and Sumatera. The sampling method was done by using purposive sampling technique with judgment sampling criterion. This research used Structural Equation Modeling (SEM) with Amos program to test the proposed hypothesis. The results show that the external variables in the theory of Technology Acceptance Model have no effect toward the perception of acceptance of accrual based accounting system implementation. This research also proves that intrinsic motivation in Technology Acceptance Model theory influenced the perceptions of acceptance of accrual based accounting system implementation. Other results indicate that system quality (System Quality) influences the perceptions of ease of use of accrual-based accounting system. Commitment systems to use are proved to influence the perception of benefits accrual based accounting system. This study has limitations in terms of indicators because the formation of research variables is relatively small. The future research is expected to use more variables forming indicators, adding literature by integrating other theories and developing the research models.

Key words: accrual based accounting system; Technology Acceptance Model theory; system quality; commitment system to use

JEL Classification: M41, O33

Introduction

Technology Acceptance Model or TAM is a theory that was first introduced by Davis in 1989. The theory of Technology Acceptance Model describes the relationship between perceptions of acceptance of system implementation. They are considered from two sides: perceived usefulness and perceived ease of use. Both of them will affect the behavioral intention, and the actual use of the system or it is called use behavior.

The research of the factors that predict the acceptance of information technology and system implementation gets a lot of attention because many companies adopt and use information technology and system implementation using TAM concept (Mohd 2011). The phenomena concerning the perception of benefits and perceptions of ease of system operation also occur in some organizations as expressed in Ndubisi (2005), Ozag and Duguma (2007), Yin (2010), Eikebrokk (2007) and Kira *et al.* (2007). Overall, the study has concluded that the perception of benefits and perceptions of ease of operation of the system impact on the willingness of employees in using the new system.

In the government sector, research using TAM applications has not been done. However, research on TAM applications is widely used in industry, education, service companies in overseas. It can be seen on research resume of Chuttur (2009) as follows:

Table 1. TAM application along 2003th - 2008th

Criteria	Explanation
Variation of TAM application	Email, voicemail, fax, dial-up system, e-commerce application, groupware, word processor, spreadsheet, presentation software, database program, case tools, hospital IS, decision support system, expert support system, telemedicine technology
Country	USA, UK, Taiwan, Hong Kong, Switzerland, Japan, Australia, Turkey, Canada, Kuwait, Nigeria, France, Singapore, China and Finland
Research type	Lab study, Field Study dan Web surveys
Participant	Students, graduated student, private employees, physicists, banking managers, programmer analyzers, IT specialists, computer programmers, internet users, stockbrokers, and sales assistants

Source: Chuttur 2009

From the table above, it can be seen that so far the participants in TAM research are not included the government sector employees. The average research using basic TAM is done in private industry. In Indonesia, the research in the government sector that uses the concept of TAM is also still not much done (Setiadji, 2013). Further Setiadji (2013) revealed that research using TAM applications is largely done in the private sector and banking.

Based on the previous researches such as Ndubisi (2005), Ozag and Duguma (2007), Y Zi (2007), Eikebrokk (2007), Kira *et al.* (2007), Kartika (2009), Kristiyanto (2013), Hwang *et al.* (2003) gave different results. It shows that there is still a research gap in the use of Technology Acceptance Model theory.

The different results of these studies are due to the previous researches that were done based on the parallel hypothesis considerations with the TAM framework only. These studies only concern at individual behavioral factors in the acceptance of system implementation, regardless of the inputs available from a system implementation process (Berliance 2015). In addition, according to Maholtra (2005) generally the researches that use the concept of TAM only use the core concept of TAM without considering the core commitment that shapes the individual's desire to meet different personal goals.

So, this research will pay attention to the variables related to the implementation process of system usage. It is system quality variable or system quality consisting of response time, reliability, flexibility, and security. Thus, the core commitment that shapes the individual desire is proposed by commitment to system use variable. Commitment to system use is a development of social influence factors developed by Maholtra and Galletta (1999).

Specifically this research is motivated by the following factors: First, since the enactment of the Government Regulation (PP) of the Republic of Indonesia No. 71 of 2010 concerning Government Accounting Standard (SAP) regarding the implementation of new authority structure model and the design of new accounting system throughout Indonesia, The Regulation of the Minister of Domestic Affairs No. 64 of 2013 on the implementation of accrual based accounting standards in local governments, the Indonesian government has taken several steps to improve the performance of public sector. Secondly, there are still a few researches about the implementation of new accounting systems in non-profit organizations. Thirdly, there are still few researches using TAM 3 about the implementation of the new system.

1. Research originality

There are some reasons to show originality of the study as follows: first, this research is a research using Theory Acceptance Model 3 that has not been widely used in research both at home and abroad. The originality lies in TAM 3 applications toward the implementation of accrual-based accounting systems that have never been studied by previous researchers.

The second originality lies in the addition of system quality variables consisting of response time, reliability, flexibility, and security dimensions. The use of system quality variables is based on the opinions of Goodhue and Thompson (1995), Dewet and Jones (2001), Hamzah (2009), that changes in behavior within an organization can be due to the available organizational structure and systems that can promote synergy and efficiency in a person. Furthermore, it will be described in the basic theory of the effectiveness of information systems (Hall 2001) that the quality of information systems is a basic need that must be met by an organization. A good quality of system and information will encourage a person to carry out activities or reasonable actions in using technology and systems. It will help the government apparatus to improve the performance of good governance and service to the community by presenting transparent and accountable financial statements that deals with the stipulation of Government Regulation (PP) No. 71 of 2010. It is an accrual based financial statement.

In addition, this research proposed a variable of commitment system to use. The use of commitment system-to-use variables is based on the opinions of Maholtra and Dennis (2005), Kartika (2012), Rahmawaty (2014), and Subhan (2014) that the acceptance of system implementation and the intention of using the system is dominated by different commitments that are derived from individual desires to meet different personal goals. The commitment factor in the individual can encourage someone to cooperate with the implementation of the system. Furthermore, it will be explained in the theory of social influence (Maholtra 1999) that the existence of commitment in the individual as a result of social influence will impact toward the attitude in the future to receive and use the new information system.

2. Literature review

2.1. Technology Acceptance Model (TAM 3)

The TAM model is actually adopted from the TRA (Theory of Reasoned Action) model. It was first developed by Fishbein and Ajzen in 1980, the theory of action with the premise that one's reaction and perception of something will determine the person's attitude and behavior. TAM has two sides: the first is beliefs that consist of perceived usefulness and perceived ease-of use and the second is attitude, behavior intention to use and usage behavior (Straub, Limayen, Evaristo 1995 in Petra, 2005). TAM describes the relationship between beliefs (usefulness and ease of use) and attitude, user intentions, and real use of the system.

After the first version of TAM and TAM 2, Venkatesh and Bala form TAM 3 by adding variables that include the adjustment and anchor groups that are associated with the variables of perceived ease of use.

2.2. Implementation of accrual based accounting system in indonesia

Implementation of accrual based accounting system in Indonesia has begun to be implemented in stages. Government Accounting is begun to apply for the preparation of accountability report implementation of APBN / APBD Fiscal Year 2005. Based on the data from bpk.go.id, it is known that so far, local government has not used the accrual based accounting standards yet, even some areas are still in the socialization stage of the Government Regulation (PP) No.71 of 2010. Generally, the reason for the obstacles in implementing the accrual based accounting system is the lack of local government environment in facing the accrual based system, both from human resources and technology system in local government (Amelia 2015).

The main problem in this research is related to the acceptance of the implementation of accrual based accounting system in the government environment. In Indonesia, it can impact the result of accrual based financial report. The use of acceptance variables of accrual based system implementation is in line with the Government Regulation No. 71 of 2010 about Government Accounting Standards and Minister of Home Affairs Regulation No. 64 of 2013 about Implementation of Accrual Government Accounting Standards Toward Local Government.

The use of system quality variables is based on the opinions of Goodhue and Thompson (1995), Dewet and Jones (2001), Hamzah (2009), that behavioral changes within an organization can be due to the organizational structure and quality of information systems that can encourage synergy and efficiency in a person. Furthermore, it is explained in the basic theory of the effectiveness of information systems (Hall 2001) that the quality of the system and information is a basic need that must be fulfilled by an organization. A good quality of information

systems will encourage a person to carry out activities or reasonable actions in using technology and systems. So, employees of the organization can seek and absorb knowledge to run their work or solve problems in their work.

Government as a public sector organization is a driver and facilitator in the success of development. Therefore, the success of development needs to be supported by the speed of information flow and the quality of inter-agency system so that there will be system integration between government and other users (Handayani, 2014). The good quality of system and information will encourage government apparatus to improve the performance of bureaucracy, such as there is a transparent and accountable financial report.

In addition, this research proposed a variable commitment system to use. The use of commitment system-to-use variables is based on the opinions of Maholtra and Dennis (2005), Kartika (2012), Rahmawaty (2014), and Subhan (2014) that acceptance of system implementation and the intention of using the system are dominated by different commitments derived from individual desires to meet different personal goals. The commitment factor in the individual can encourage someone to cooperate towards the implementation of the system. Furthermore, it is explained in the theory of social influence (Maholtra 1999) that the individual commitment as a result of social influence will impact toward the future attitude to receive and use the new information system.

3. Methodology

Population, sample dan sampling technique

The population of this study was Regional Team Work Unit (*SKPD*). The unit of analysis referred to local government officials that were involved in the use of an accrual based accounting system with the Government Regulation (PP) No.8 of 2006 Article 10, that those who were involved in the use of the accrual based accounting system were the heads of Regional Team Work Unit.

The sampling technique of this study used purposive sampling technique or subjectively aimed sample. The selection of purposive sampling technique was done because the researcher had understood that the required information could be obtained from a certain target group that was able to provide the desired information. The criterion of research was judgment sampling. It used certain consideration which was adjusted to the developed research purpose or research problem.

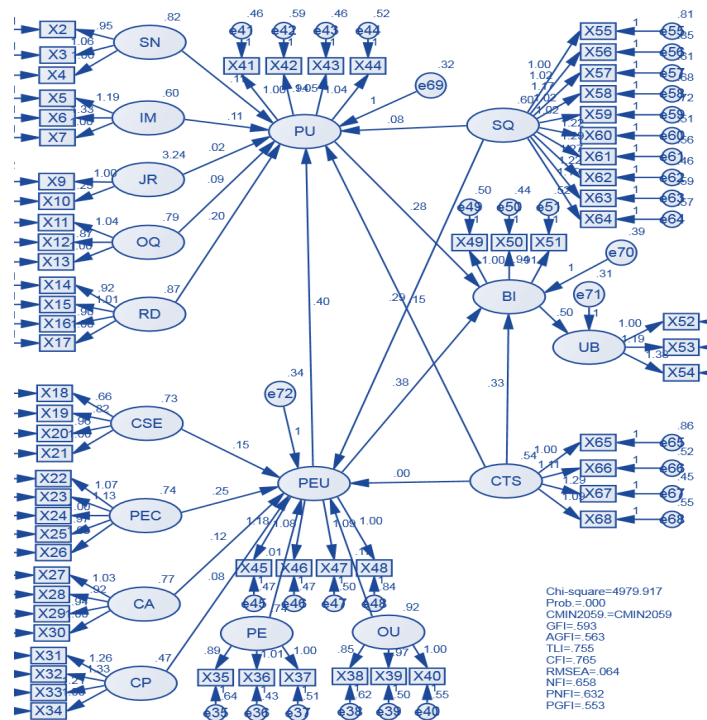
Hypothesis testing was done by SEM (Structural Equation Modeling) with AMOS (Analysis of Moment Structure) software. SEM (Structural Equation Modeling) is a set of statistical techniques that enable testing of a relatively complex set of relationships simultaneously.

4. Results and discussions

Questionnaires were distributed by postal services and delivered directly to the respondents. They were then taken back with the agreement between the respondents and the researcher. The data collection was 3 months, started on September 1, 2016 to December 1, 2016. The questionnaires were 511 distributed and 358 questionnaires returned, with a rate response rate of 70.0%. 13 questionnaires could not be included in the analysis because of incomplete fillings, therefore the amount of data that could be processed for analysis was 345 questionnaires.

Hypothesis testing results

Picture 1. Full model structural



Summary of estimation results of Path Coefficient and Statistical Test (Standardized)

Hypotheses		C.R	P	Note
H1:	Subjective norm is related to perceived usefulness	1.816	0.069	Not significant
H2:	Image is positively related to perceived usefulness	1.449	0.147	Not significant
H3:	Job relevance is positively related to perceived usefulness	0.286	0.775	Not significant
H4:	Output quality is positively related to perceived usefulness	0.462	0.144	Not significant
H5:	Result demonstrability is positively related to perceived usefulness	3.610	0.000	Significant
H6:	Computer self-efficacy is positively related to perceived ease of use	2.387	0.017	Significant
H7:	Perception of external control is related to perceived ease of use	3.824	0.000	Significant
H8:	Computer anxiety is negatively related to perceived ease of use	-1.988	-0.047	Significant
H9:	Computer playfulness is positively related to perceived ease of use	1.061	0.289	Not significant
H10:	Perceived enjoyment is positively related to perceived ease of use	0.171	0.864	Not significant
H11:	Objective usability is related to perceived ease of use	3.201	0.001	Significant
H12:	System quality is positively related to perceived ease of use	4.140	0.000	Significant
H13:	System quality is positively related to perceived usefulness	1.087	0.277	Not significant
H14:	Perceived ease of use is positively related to perceived usefulness	5.205	0.000	Significant
H15:	Perceived usefulness is positively related to behavioral intention to use	3.397	0.000	Significant
H16:	Perceived ease is positively related to behavioral intention to use	0.442	0.000	Significant
H17:	Commitment to system use is positively related to perceived usefulness	2.319	0.020	Significant
H18:	Commitment to system use is positively related to Perceived ease of use	0.035	0.972	Not significant
H19:	Commitment to system use is positively related to behavioral intention to use	4.370	0.000	Significant
H20:	Behavioral intention to use is positively related to use behavior	7.690	0.000	Significant

Source: Primary Data processed, 2017

Discussions

1. *Subjective norm variable had no effect toward perceived usefulness.* The results of this study did not support the results of the previous research conducted by Venkatesh and Bala (2008), Paramita (2012) which proved that subjective norms and images were positively related to perceived usefulness. However, the results of this study supported the research by George (2004) and Lin (2008) which showed no effect between subjective norms toward the interest of system usage. The difference in this study appeared because subjective norm was not a major factor in determining an interest to use accrual based accounting system. Based on the field research, it was found that the dominant supporting factor in the acceptance of system implementation was environmental factor in the government institution. The development of system and technology by over the time demanded the mindset and work processes of individual users of the system. Environmental conditions in the government sector tended to be less concerned about the rules and the norms to try and used the new system.

2. *It showed that the image had no effect toward perceived usefulness.* The results of this study did not support the findings of research by Venkanteesh and Bala (2008), Paramita (2014), Putra (2014). The results of this study supported the opinion by Setiadji (2014) that the image variable was not able to explain the perception of the benefits of system acceptance. It indicated that the use of accrual based accounting system implementation was not related to the improvement of employee performance profile, all employees were obliged to use the implementation of accrual based accounting system regardless of their performance level. The low responses of respondents to these conditions had an impact on the low perceptions of respondents' acceptance of the benefits of the implementation of accrual based accounting system.

3. *Job relevance was not related to perceived usefulness.* The results of this study did not support the results of research by Ramazani (2012). It occurred to the results of this study due to the different perceptions of the respondents. The respondents who had knowledge of accrual based accounting system but had not joined directly with the system, tended to be pessimistic that implementation of accrual-based accounting system would give positive effect to their work process.

4. *It showed that output quality was not related to perceived usefulness.* These findings were different from Venkantesh (2008), Paramita (2012) and Lee (2012) who suggested that output quality had a significant relationship with perceived usefulness. The officials in government agencies tended not to refer to the end result of the work that was assisted by the system, although the responses of employee perceptions were high to the implementation of accrual-based accounting systems that would produce transparent and accountable financial statements. However, they did not support improvements in perceptions of system benefits. The reason was that the employees had not seen significantly the benefits resulting from the use of an accrual based accounting system, even though their initial stages had used the accrual based accounting system but the resulting financial statements were still included in the fair criteria with exceptions or unreasonable.

5. *Result Demonstrability had a significant effect toward Perceived Usefulness.* The results of this study supported the previous research by Venkantesh (2008), Winarko (2003) and Marini (2003). This finding supported the TAM's theory toward the aspect of result demonstrability which assumed that the result of demonstrability was the tangibility of the result using innovation that influenced the perception of the system use. The results of this study also showed that employees had a positive assumption on the implementation of accrual based accounting system, where the results that used accrual-based accounting system could be felt directly, observed and disseminated to other parties.

6. *Computer self-efficacy affected perceived ease of use.* These findings supported the previous studies of Shrgill (2005), Princess (2003) and Berliance (2015). These findings provided a support to the theory of the TAM which proved that computer self-efficacy was an intrinsic motivation. Self-efficacy was proven to motivate positively to the employees in the stage of acceptance of the use of the implementation of accrual-based system. The results of this study also supported the theory by Bandura (1995) that the existence of one's confidence that he had the ability to perform certain behaviors would have a positive impact toward perceptions of acceptance of new system implementation. This theory dealt with the results of research that described the real conditions in the government environment, the emotional motivation in the form of employee confidence in their ability to use the implementation

of accrual-based accounting system, and other factors such as superiors support, facility support would have a positive impact on perceived ease of use of accrual-based accounting system.

7. *Perception of external control had a positive effect toward perceived ease of use.* These findings supported the results of previous research by Venkanteesh (2008), Schillwat (2000). This finding also supported the TAM's theory that perception of external control was a parameter of an individual trust that the existing organizational and the technical resources would support for system usage. The respondents in this study had varying degrees of education from undergraduate to doctoral degree. The higher-educated respondents had larger numbers than middle-ranked respondents, so it was concluded that employees who were respondents had adequate skills in using information technology. In addition, the support hardware for the implementation of accrual based accounting systems was adequately provided to government agencies. Based on the real situation in the field, it was found that most of the employees in government agencies had been facilitated with adequate hardware. Thus, the employees received accrual-based accounting training and socialization from experienced experts so that employees had confidence according to their ability. These factors were the decisive factors that affected the employee perceptions about the ease of a system.

8. *Computer anxiety was negatively related to perceived ease of use.* The results of this study supported the results of previous researches by Saade and Kira (2009) Teguh (2008), Emmons (2003), Syaiful Ali and Fadila (2008). The descriptive data of respondents showed that the higher level of anxiety of respondents would give a negative influence toward the perception of ease of use of the new system. The results of this study dealt with the research by Syarifudin and Fadila (2008), Emmon (2003), these findings also provided a description that the feeling of anxiety, worries about computers in employees would give a negative perception of the use of computers in helping their work.

9. *Computer playfulness had no significant effect toward perceived ease of use.* These findings did not support the previous studies by Heckbart et al. (2000), Zanaria (2013) and Venkantesh (2008). The differences in the results of this study with the previous ones were likely due to other factors such as organizational culture. The previous research used a unit of banking analysis, private companies and banking, where the work ethic and employee spontaneity were relatively high for trying to use the new system. This study used an analysis unit of the government agency employees who had different organizational culture with the private sector employees and banking. Besides, based on the results of descriptive analysis and the calculation of the index value that respondents' answers provided an overview that intrinsic motivation in self respondents did not encourage the emergence of perceptions ease of use for accrual-based accounting system. The perception of acceptance of the ease of use of the system was driven more by the availability of facilities and infrastructure to the organization, the skills that were possessed by the employees, the assistance training for the use of accrual based accounting system.

10. *Perceived enjoyment had no positive relationship to perceived ease of use.* The results of this study were different to the results of research by Qureshi et.al. (2008) Sun (2006) Lee et al. (2005 and Park et al. (2009). The differences in the results of this study were due to the dominant things that occurred in the environment of government agencies to use a system and the control and compliance supervision system to use the accrual based accounting system. It was indirectly affected the comfortable feeling because employees felt under-controlled by the concept of compliance supervision, so reducing their perception of the ease of use of accrual based accounting system.

11. *Objective usability was related to perceived ease of use.* The findings in the objective usability to perceived ease of use supported the research by Heijden (2004), Venkateesh (2000) and Park (2008). It proved that objective usability was related to perceived ease of use. The emergence of perceptions of willingness and efforts of employees in utilizing the accrual-based accounting system accompanied by software applications would provide a positive response that the implementation of accrual-based accounting system was able to assist employees in carrying out their work.

12. *System quality was proven that it had a significant effect toward perceived ease of use.* The results of this study supported the results of the research by Seddon and Kiew (1996) stated that usefulness showed the perception of the user about the usefulness of the system to optimize the achievement of users of the system. If

the system users perceived that the quality of the information system was good, the perception of the usefulness of the system would be high (Darmawan 2010).

13. *System quality was proven that it had no significant effect toward perceived usefulness.* The results of this study were different to the results of the research by Saleh *et al.* (2012), Ramachandra (2012), Bharata *et al.* (2014) and Delone and Mclean (1992). This difference was due to a special phenomenon that occurred in government agencies that the employees were not interested to use the available information systems because of the fear of making mistakes or human error. The difference in the results of this study was also due to the phenomenon that employees would feel unconfident if they got positions related to back office, such as office administration positions, administrative staff, general positions, or other administrative areas.

14. *Perceived ease of use had a significant effect toward perceived usefulness.* The results of this study supported the previous research by Chau (1996), Opiya (2008). The results of this study supported the research conducted Heijden (2004), Sun and Zhang (2006). The findings also supported the TAM's theory that perceptions of ease of use of information technology systems were able to convince users that used information technology, was easy, did not make them burdened, and increased the user's belief that the systems they used, would give benefits in their performance.

15. *Perceived usefulness had a significant effect toward behavioral intention to use.* The results of this study supported the previous research by Sun (2003), Wiyono (2008), Maharsi (2006) Rigopoulos *et al.* (2007), Lestari (2013). This result also dealt with the TAM's theory which stated the acceptance of the use of technology or information systems would certainly affect the interest of human behavior to use the system. In the implementation of the accrual based accounting system, the perception of ease and benefits of use would have a positive impact toward the intentions of employee behavior to use the system.

16. *Perceived ease of use had significant effect toward behavioral intention to use.* The results of this study supported the previous research by Lestari (2013) and Princess (2013). The results of this study also supported the concept of the TAM theory, which stated that there was a positive and significant relationship between perceived ease of use to behavioral intention to use. Based on the descriptive statistics of the respondents' responses, it was known that the perception of ease and benefits of use would have a positive impact toward the intentions of employee behavior to use the implementation of accrual based accounting system.

17. *Commitment to system use had an effect toward perceived usefulness.* The results of this study supported the research by Subhan (2014) stating that the commitments that arose in an individual would have an impact toward the acceptance of a system implementation.

18. *There was no influence between commitment to system use toward perceived ease of use.* The difference in this study was due to the perception of employee uncertainty in the government administration toward the implementation of accrual based accounting system, where they assumed that the implementation of the system did not provide benefits in completing their tasks. Based on the descriptive frame, it was seen that lowest answer variable of commitment to system use was in the third indicator which included the sense to have system. It indicated that the feeling of employees tended to be ignorant to the implementation of the system so that it implied the perception of system benefits.

19. *Commitment to system use had an effect toward behavioral intention to use.* The results of this study supported the results of research by Becker (1995), Agarwal and Sambamurthy (2003), the commitment in the employee to use the system would have a positive impact toward the intention of using the system. The attitude of employees at government agencies who had a sense and felt proud in using the system would affect their willingness to use the system.

20. *The results showed that there was an effect between behavioral intention to use toward use behavior.* The results of this study supported the research by Wang *et al.* (2003), Lu *et al.* (2004), Kamel and Hassan (2003), Kleinen *et al.* (2004), Bobek *et al.* (2003), Mustikasari (2007), Everard *et al.* (2006) and Lum (2007). The results of this study also dealt with the TAM theory that behavioral intention was a determining factor of actual behavior, the real attitude of individual actions in the implementation of a system. Perceptions of employees' intentions toward government agencies to use a system would have an effect to encourage employees to use the system.

Conclusion

Theoretical implications

This study has broad implications in the future, especially for research relating to the relationship of behavioral factors in the implementation of new system. Based on the findings of research results and the conclusions on the hypotheses and research problems, it can be explained that applying a system must pay attention to the socialization of cost and benefits to employees if they use the new system. In addition, the new system should also be designed in a friendly way to be easily applied by employees, so that the application of the system should only be considered on the ease of factual rather than perception, because the perception of difficult or easy system can be overcome by training and socializing new system.

The results of this study support that intrinsic motivation in TAM theory is an important component that must be considered in the implementation phase of the new system. It can be seen that there is a positive and significant correlation between intrinsic motivation variable to perception of benefit and system usage. This study is also expected to provide an overview to the government agencies that the success of the system implementation is not only determined by technical factors and funds, but the behavioral factors of the users also need to be considered. The results of this study also indicate that the external variables in the TAM theory have no significant effect on the perception of the use and the benefit of the system.

Research limitation

This study has several limitations to consider in evaluating the research results. They are as follows:

- The measurement instrument of research variables is used by translating the previous research instruments conducted abroad and in the private sector, so there may be differences in cultural background, and the characteristics of respondents that lead to differences in understanding. It is also possible that the respondent misinterpreted the true intention so that future research needs more in-depth study.
- This research uses data in the form of respondent answers to the questions posed in the research questionnaire. Collecting data using mail surveys can implicate meticulous answers or they may not be serious in answering to the question of the questionnaire.
- Some indicators forming research variables are elaborated in few questions only, and it affects the accuracy of indicators in forming of variables that result in the degree of perception index to respondents. Therefore, it may not deal with the expected goal from this study.
- This research is only done at one time (cross sectional) so that there is possibility of individual behavior change by over the time.

References

- [1] Agarwal, R., Sambamurthy, V., and Stair, R. 2000. Research report: the solving relationship between general and specific computer self efficacy an empirical assessment. *Journal of Information System Resources*, 11(4): 418-430.
- [2] Ajzen, I., Kuhland, J., and Beckman, J. (Eds). 1980. *From Intentions to Actions: A Theory of Planned Behaviour. in Action Control: From Cognition to Behaviour*, Springer, Heidelberg, pp.11-39.
- [3] Ali, Syaiful dan Fadila. 2008, *Computer anxiety and personal characteristic of accounting students*. Accounting National Simposium 11 Pontianak, Indonesia.
- [4] Al-Qahtani, Mona dan Faisal. 2012. Students' perception and attitude towards computer laboratory learning environment. *Educational Research*, 3(4): 402-411.
- [5] Awa, H., Ukoha, O. Ajiabo. 2012. Integrating TAM and TOE Frameworks and xpanding their Characteristic Constructs for E-Commerce Adoption by SMEs. *Proceedings of Informing Science & IT Education Conference (InSITE)*.

- [6] Baiman, S. 1982. Agency Research in Managerial Accounting: A Survey. *Journal of Accounting Literature*, 1: 154 -210.
- [7] Barutcu, S. 2007. Attitudes towards mobile marketing tools: A study of Turkish consumers. *Journal of Targeting, Measurement and Analysis for Marketing*, 16(1): 26-38.
- [8] Baurer, H. 2007. Identifying Cross-Channel Dissynergies for Multichannel Service Providers. *Journal of Service Research*, 10: 143-160.
- [9] Berliance, L. 2015. Analisis pemanfaatan web OPAC menggunakan technology acceptance model. *Jurnal STIMIK AMIKOM*.
- [10] Bertrand, M. and Bouchard, S. 2008, Applying the Techonology Acceptance Model to VR with people who are favourable to use journal. *Journal of Cyber Therapy and Rehabilitation*. Volume 2.
- [11] Bontos, Himawan Suseno, 2009. *Behavioral evaluation of an officer*, Erlangga Publishing,
- [12] Compeau, DR., Higgins, C. A., and Huff, S. 1995. Social Cognitif Theory and Individual Reaction to Computing Technology: A Longtitudinal Study. *MIS Quarterly*, 23 (2): 145-158.
- [13] Davis, F.D, Bagozzi, RP, and Warshaw, PR. 1992. Extrinsic and intrinsic motivation to use computers in the workplace. *Journal Appl. Soc. Psychol.* 22(14): 1109-1130.
- [14] Davis, F.D, Bagozzi, R.P. and Warshaw, P.R. 1989. User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35: 982-1003.
- [15] Davis, F.D, and Venkantesh, V. 2000. A theoretical extension of technology acceptance model four longitudinal field study. *Management Science*, 46(2): 186-204. Available at: <http://dx.doi.org/10.1287/mnsc.46.2.186.11926>
- [16] Davis, F.D. 1986. A technology acceptance model for empirically testing new end user information systems: theory and results. Doctoral dissertation, SloanSchool of Management, Massachusetts Institute of Technology.
- [17] Davis, F.D. 1989. Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly*, Volume 13, 3: 319-340, DOI: 10.2307/249008, Stable URL: <http://www.jstor.org/stable/249008>
- [18] Everal dan Galleta. 2006. How presentation flaws affect perceived quality, trust and intention to purchase from online store. *Journal of Management Information System*, 22(3), 55-95. Retrieved from <http://www.jstor.org/stable/40398797>
- [19] Faradila, A. 2014. *Standar akuntansi pemerintahan, telaah kritis PP no. 71 tahun 2010*. Disampaikan pada Seminar Balai Diklat Keuangan Makasar.
- [20] Fishbein, M., dan Ajzen. I. 1975. *Belief, Attitude, Intentions and Behavior: AnIntroduction to Theory and Research*, Addison-Wesely, Boston, MA.
- [21] Gardner, C., and Amoroso, D.L. 2004. Development of an Instrument to Measure the Acceptance of Internet Technology by Consumers. *Proceedings of the 37th Hawaii International Conference on System Sciences*, USA.
- [22] Ghozali, Imam. 2005. *Structure Equation Modelling with AMOS 24 Program*, Universitas Diponegoro Publishing.
- [23] Lum, G.M.L. 2007. Identification of factors preventing usage of mobile dataterminals in the Honolulu Fire Department. Unpublished Paper, Honolulu Fire Department, Honolulu.

- [24] Mangin, J.-P. *et al.* 2012. Testing Control, Innovation and Enjoy as External Variables to the Technology Acceptance Model in a North American French Banking Environment. *International Business Research*, 5(2):13-26.
- [25] Ramayah, T., and Ignasius, J. 2012. Impact of perceived usefulness, perceived ease of use and perceived enjoyment to intention shop online. Dikutip 13 Februari 2014 dari <http://www.slideshare.com>.
- [26] Ramazani, A., Ramazani, M. and Davirani, S. 2012. Studying impact of individual factors in occupation by use of Technology Acceptance Model (Iranian Case Study). *Global Journal of Management and Business Research*. 12(1): 1-7.
- [27] Rustina. 2004, Computer self efficacy mahasiswa akuntansi dalam penggunaan teknologi informasi: tinjauan perspektif gender. *Jurnal Akuntansi dan Keuangan*, 6 (1): 29-39.
- [28] Schillwart, N. 2000. The acceptance of information technology in the sales forces. *Decision Science Vol. 3*.
- [29] Simanjuntak, Binsar., 2010, *Implementation of accrual based accounting in Indonesia*. Kongres XI Ikatan Akuntan Indonesia, Jakarta.
- [30] Sutanta, I., Nyoman dan Astuti, Pratiwi Dwi. 2004. *Evidence of Technology-To-Performance Chain: Structural Equation Modeling methods*. Accounting National Simposium VIII Solo, Indonesia.
- [31] Venkantesh, V, and Hillol Bala. 2008. Technology Acceptance Model 3 and research agenda intervention. *Decision Science*, 39(2): 273 – 315.
- [32] Wang, Y.S. 2002. The adoption of electronic tax filing systems: An empirical study. *Government Information Quarterly* (online), 20: 333 – 352.
- [33] Yang, J. C., Chien, K. H., and Liu, T. C. 2012. A digital game-based learning system for energyeducation: an energy conservation pet. *The Turkish Online Journal of Educational Technology*, 11(2): 29-37.
- [34] Zhang, Ping, Heshan Sun. 2006. An Empirical Study on Causal Relationships between Perceived Enjoyment and Perceived Ease. Available at: <http://www.aicpa.org./pubs/zunitch.htm>.

Analysis of Kazakhstan's Transport Infrastructure in the Context of the Silk Road Economic Belt Development

Adilet Rashiduly KONGYRBAY
Al-Farabi Kazakh National University
R.B. Suleimenov Institute of Oriental Studies, Almaty, Kazakhstan
adilet_k@kkp.kz

Galymzhan Mustahimuly DUISEN
R.B. Suleimenov Institute of Oriental Studies, Almaty, Kazakhstan
galymzhan@inbox.ru

Lazat Seitkazievna SPANKULOVA
NARXOZ UNIVERSITY, Almaty, Kazakhstan
lazat.spankulova@narxoz.kz

Suggested Citation:

Kongyrbay, A.R., Duisen, G.M., Spankulova, L.S. 2017. Analysis of Kazakhstan's Transport Infrastructure in the Context of the Silk Road Economic Belt Development. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 2050-2060.

Abstract:

This study examines the political and economic realities of the international transportation corridor "The New Silk Road", analyzes trends in the development of transport infrastructure and transportation from China to the EU in terms of types of transport using the financial indicators of the projects being implemented. Temporal and spatial aspects for transport operations in the economic corridors are considered. Based on the SWOT analysis, the main obstacles and advantages of developing the transit potential of Kazakhstan in comparison with other transit routes are identified, taking into account transport potential, geographical, demographic and economic characteristics. The transport potential is assessed with regard to the socio-economic and natural conditions of Central Asia.

Keywords: SWOT analysis; transport infrastructure; Silk Road Economic Belt; transit hub

JEL Classification: F15; F5; L9; P52; R10; R41

Introduction

The Government of Kazakhstan pays special attention to the development of transit potential within the framework of international transportation corridors, which is reflected in the "Nurly Zhol" State Program for Infrastructure Development for 2015-2019. The program is aimed at increasing the volume of freight turnover (by 1.6 times) and the volumes of in-transit freight transportation (by 2 times) by 2020. In general, the state program provides for the implementation of 15 infrastructure projects in the transport sector (CFM, 2014).

"Nurly Zhol" State Program for Infrastructure Development is intended for the period of 2015-2019 and stipulates the development of transport, housing and industrial infrastructure. The budget of the program is about USD 24 billion, of which 9 billion dollars were financed in the form of loans from the World Bank, the European Bank for Reconstruction and Development, the Asian Development Bank, and the Islamic Development Bank (CFM, 2014).

Transportation corridor across Kazakhstan has a potential for further development due to the fact that Western regions of China are developing within the framework of the "Go West" program. This program encourages the increase in the volume of trade and transport operations. Thus, in 2015, the Chinese share in Kazakhstan's trade turnover amounted to 17.5% (USD 23.98 bln), reaching the level of the Russian Federation that is 17.4% of the total foreign trade turnover of Kazakhstan (USD 23.85 bln) (RK CS, 2017).

1. Literature review

The main goal of the Silk Road Economic Belt project is to build the basis of the transit motor road corridor across Kazakhstan. The use of transport corridors can significantly reduce distances and hence the terms of delivery of goods. The share of road transport in the transit traffic of the Republic of Kazakhstan is low. Rail transport has the best prospects for the development of transit traffic. Its share in international transportation in the total volume of freight turnover exceeds 70%.

“Western Europe – Western China” transportation corridor is of great importance for Kazakhstan, being a priority of the national development which contributes to the formation of reliable supply lines that allow Kazakhstan to integrate with the markets of goods and capital in the West (Europe) and in the East (China). Euro-Asian integration will be a prerequisite for improving Kazakhstan’s transit potential on the New Silk Road.

The foregoing facts predetermine the urgency of conducting a study to identify the positive and negative aspects of the transit hub development strategy as a growth point for Kazakhstan, since it seems that the development of the Silk Road Economic Belt international investment project will serve to boost the national economy and expand the international economic, political and public Influence of the country.

The objectives of the study are:

- to analyze the strengths and weaknesses, opportunities and threats of the transport infrastructure in Kazakhstan in the overall context of the development of the Silk Road Economic Belt international investment project;
- to carry out a comparative analysis of transport operations from the People's Republic of China to the EU countries as broken down by various types of transport.

The international projects for the development of transport hubs in Kazakhstan make *the subject of inquiry*. The originality and novelty of this study consists in determining the conditions for a favorable environment to create alternative multimodal corridors along the Western Europe - Western China route. The theoretical and practical significance of the results obtained is in the proposed solutions to the problems of the development of Euro-Asian motor road transport links and rail transportation to Kazakhstan.

The research hypothesis: Analysis of the strengths and weaknesses, as well as the opportunities and threats of the transport infrastructure of Kazakhstan in the overall context of the development of the Silk Road Economic Belt international investment project will enable to forecast and ensure the maximum rate of circulation of social and economic capital within the country.

In recent decades there has been an increase in the research interest in the study of the transport potential and infrastructure of the countries of Central Asia. The works by Habova (2015), Fedorenko (2015), Biriucov (2014), Bordachev *et al.* (2014), Bondaz *et al.* (2014) exemplify the research conducted to assess transport potential and infrastructure. The studies of reserachers as: Fedorenko (2015), Biriucov (2014), Bordachev *et al.* (2014), Bondaz *et al.* (2014) give the main factors for assessing the transport hub and infrastructure.

According to Veremeev (2011), if the country is located close to the regression line (the relationship between the GDP and the density of railways), then the development of the country’s transport infrastructure and its economy is balanced.

SWOT-analysis of the strategy for the development of global hubs is quite fully described, for example, in the works by Weihrich (1982), Flyaysher and Bensussan (2005), Leigh (2009), Saati (1989), Kangas *et al.* (2001), Kahraman *et al.* (2007).

It should be noted that currently the techniques for SWOT analysis are very diverse. For example, in Saati’s analytic hierarchy process, the emphasis is placed on a pairwise comparison of factors, the works of Kangas *et al.* (2001) focus on an order (rank) scale. The Telescopic Observations model and Porter’s Five Forces model (Panagiotou 2003) contain categories that play the role of a framework for the SWOT analysis factors.

The generalized views of the authors concerning the methodology for SWOT analysis of the positive and negative aspects of the transport hub development strategy in Kazakhstan are given in Table 1.

Table 1. Theoretical and empirical approaches to the SWOT analysis of transport hub development strategy

1. SWOT analysis and its targets (Businessballs 2017)
1.1. <i>Classical procedure for SWOT analysis</i> (Wehrich 1982; Flyaysher and Bensussan 2005; Bogomolova 2004; 2007).
1.2. <i>SWOT analysis of various targets</i> : - economic sectors (Terrados <i>et al.</i> 2007, Sokolova 2009, Anikina 2011); - cities and towns (Lyubanenko and Tsibulskiy 2003, Skalon 2009); - public and social institutions (Kahraman <i>et al.</i> 2007, Maysak <i>et al.</i> 2011); - science (Kleeva 2012), - political parties (Lees-Marshment 2001), - non-profit organizations (Bryson 1988, Panasenko 2005)
1.3. <i>The method of marketing research of enterprise activities in the market</i> (Bogomolova 2004, 2007, Houben <i>et al.</i> 1999, Bakanov <i>et al.</i> 2005, Flyaysher and Bensussan 2005, Belyaev 2007).
2. SWOT factors and their assessment. Methods applied (Businessballs, 2017)
PEST type models (Ograjenšek and Kenett 2008); Porter's Five Forces model (Ivanova 2009); Telescopic Observations model (Panagiotou 2003); ratio scale (Bogomolova 2004, Bakanov <i>et al.</i> 2005, Leigh 2009, Maysak <i>et al.</i> 2011, analytic hierarchy process (Saati 1989); order scale (Kangas <i>et al.</i> 2001, Kahraman <i>et al.</i> 2007).
3. SWOT strategies and the problem of finding connections between factors (Businessballs, 2017)
1) combinations of 'strengths' – 'opportunities'; 2) 'weaknesses' – 'opportunities'; 3) of 'strengths' – 'threats'; 4) 'weaknesses' – 'threats'; (Wehrich 1982)

2. Prerequisites for the development of transit trade in Central Asia

The New Silk Road and the role of Central Asia (CA) as a land bridge between Europe and China is one of the fundamental ideas in the entire history of the world economy. At present, there are economic and political prerequisites to recreate transit trade along the historical route. The main factors for assessing the transport infrastructure CA are given in Tables 2-4.

Table 2. Railroad and motorway density in the CA countries, km of roads per 1 thousand sq.km of territory (Turaeva 2014)

Countries and the world at large	Railroad density	Motorway density
Kazakhstan	5.53	34.35
Kyrgyzstan	2.35	92.52
Tajikistan	4.77	194.79
Turkmenistan	6.11	120.04
Uzbekistan	8.15	193.33
Russia	5.10	57.51
China	9.48	402.25
USA	23.34	675.48
The entire world for comparison		
The world at large	8.48	246.22

Source: <http://data.worldbank.org/>

Transport infrastructure of any country is one of the key factors affecting the overall functioning and further development of the national economy. In other words, being an important part of the infrastructure of the national economy, transport ensures the life-sustaining activity of individual regions and the country in general, and also its external positioning in unity and integrity. Obviously, the solution of a whole range of social tasks depends on the development of road transport infrastructure. Table 3 indicates the data of the annual survey of global competitiveness made by the World Economic Forum on assessing the quality of CA's road infrastructure in 2011-

2012 (as ranked among 142 countries). As can be seen from Table 3, Kazakhstan occupies the 33rd position in terms of the railway infrastructure quality and it is the 85th out of 142 states in terms of the overall quality of infrastructure.

Table 3. CA road infrastructure quality assessment in 2011–2012 (rating position among 142 states)

Country	Overall infrastructure quality	Motorway quality	Railroad infrastructure quality	Port infrastructure quality	Air transport infrastructure quality
Kazakhstan	85	125	33	104	103
Kyrgyzstan	93	116	61	142	136
Tajikistan	83	88	41	140	98

Note: * There are no data for Turkmenistan and Uzbekistan.

Source: 1) Agency on Statistics under the President of the Republic of Tajikistan. <http://www.stat.tj/en/> Agency of Statistics of the Republic of Kazakhstan. <http://www.stat.gov.kz/> 2) Turaeva 2014.

Problems of railroad transportation

At present, there are many problems that hamper the development of transit potential in the region considered by the authors. First, it is the lack of continuous tracking of rail transit between China and the Customs Union. Secondly, the consignors are unable to track the cargo and containers transported from the point of departure, stopping and delivery to the border. Third, there are no reliable schedules for the movement of container and freight cars. This is exacerbated by the fragmentation of small terminal capacities. Table 4 provides examples of data on the speed of delivery of goods to the nearby markets and the distances between the point of cargo departure from Astana and the point of cargo delivery to other cities in Asia and Europe.

Table 4. Overland transportation: access to the nearest markets

Point of departure	Point of delivery	Cargo delivery speed	Distance
Astana	Moscow	2.8 days	2250 km
Astana	Novorossiysk	2.8 days	2500 km
Astana	Klaipeda	4 days	3100
Astana	Bender-Abbas	6 days	2900 km
Astana	Lianyungang	6 days	4300 km
Astana	Duisburg	6.2 days	4350 km

Source: Authors' calculations based on ADB 2012 Annual Report (ADB, 2013).

The railways are very promising for transporting cargoes for long distances, some of the countries of the Silk Road are gradually privatizing some parts of the railway branches. The lack of multimodal transport hubs that would connect key infrastructure networks along the region is a major problem.

Table 5 gives data on the distance and traveling time along the Western Europe – Western China international transit corridor. Problems of development of Euro-Asian road transport links. Due to disproportion in geographical and economic conditions, there is an inconsistency in cooperation in the field of motor transport links.

In 2004, the first trans-China highway (Lianhuo Expressway) 4,393 km long was opened, which starts in the port of Lianyungang on the Yellow Sea coast and ends at the Khorgos checkpoint, *i.e.* the transport hub is brought to the borders. The total cost of the project can be estimated at USD 16.6 billion. Most of this high-speed expressway passed along a highway built by Soviet specialists in 1939-1940 (Hubbard 2015).

Table 5. Western Europe – Western China international transit corridor

Routes	Distance, km	Traveling time, days
North Trans-Asian Railway (TAR) (Lianyungang-Dostyk-Petropavlovsk-Brest-Hamburg)	11,516	11-13
Central TAR (Lianyungang-Dostyk-Astana-Ozinki-Brest)	9,654	12-14
South TAR (Lianyungang-Dostyk-Serakhs-Razi-Istanbul)	10,989	20-23
North-South (St. Petersburg-Aktau-Amirabad-Bender-Abbas)	6,191	13-15
TRACECA (Lianyungang-Dostyk-Aktau-Baku-Poti-Istanbul)	10,769	15
Transsib (Nakhodka-Petropavlovsk-Helsinki)	10,648	20-23
Kashgar (PRC) – Osh (Kyrgyzstan) – Gerat (Afghanistan)	11,060	18-20
South Sea Way	23,000	45-60
Chongqing-Duisburg	6,010	17-20

Source: Authors' calculations based on ADB 2014 Annual Report (ADB, 2014)

The technical characteristics of the autobahn allow moving along it with an average speed of 120 km/h. The new highway has cut the motor road from the Eastern to the Western limits of country from 15 days to 50 hours, that is, by 7.5 times (CAREC, 2012). The PRC Government announced the construction of 12 high-speed highways in the Xinjiang Uygur Autonomous Region (XUAR), which will connect Western China with the countries of Central Asia: Kazakhstan, Kyrgyzstan, Uzbekistan, and Tajikistan. In 2005, in the XUAR of the PRC the length of the highways with a hard surface was 80.9 thousand km, among them 7 motorways are of national importance. According to a new road construction plan, by 2020 the length of hard-surface roads should be 150 thousand km, that is, it should actually double (WEF, 2011).

In this regard, it is necessary to develop cooperation with international railroad forwarders in Europe, Russia, and China, to render consolidated services by rail and provide container block cars through Central Asia. In order to consolidate the planned trains at smaller terminals, it is required to coordinate the optimal redistribution of trains in Central Asia with railway companies and owners of private terminals.

In 2009, Kazakhstan began construction of 2,787 km international transportation corridor "Western Europe - Western China", which will pass through Khorgos, Almaty, Taraz, Shymkent, Kyzylorda, Aktobe and the dry port "Khorgos-Eastern Gate".

More than 95% of cargo is transported by sea between China and Western Europe. The increase in capacity and the lengthening of the terms of sea transportation compel the participants of international trade to seek new routes for the delivery of goods. One of the main obstacles to intensive trade between China and Europe through Central Asia is the high cost of transportation by road and rail as compared to sea transport. The current prices for transportation of 1 twenty-foot equivalent unit (TEU) by international logistics companies from China to Europe are given in Table 6. Up to date, the idea of creating one of the largest international investment projects "Silk Road Economic Belt" is very ambitious. Even with the first superficial glance, the main ideas of the project are visible - to search for mutually beneficial relations in a strategic perspective, to simulate the rapprochement of the countries of the Eurasian region, to reveal the economic potential of each state that will participate in the project.

Table 6. Comparative analysis of transport operations from the PRC to the EU according to types of transport

Route	Type of transportation	Transportation costs
Shenzhen – Antwerp	Rail	1 300 \$/TEU*
Shenzhen – Antwerp	Road	3 000 \$/TEU*
Shenzhen – Antwerp	Sea	390 \$/TEU*

Note: * TEU or 1 twenty-foot equivalent unit is a conventional unit for measuring the capacity of goods vehicles.

Source: Authors' calculations based on ADB 2012 Annual Report (ADB 2013), Russian Railways statistics (RZD, 2017)

When implementing the New Silk Road project, all the participating countries of the project, and in particular Kazakhstan, will be beneficiaries. The main obstacle to the project implementation is the lack of public funds to build the necessary infrastructure, the small number of investments in the financial, economic, industrial and agricultural sectors in the regions along the Silk Road, long distances between shopping centers and logistics parks (for example, the distance between Almaty and Astana is 1,288 km), high costs for overland transportation (the cost of transporting a container from Chongqing to Duisburg makes USD 4500) (NDRC, 2015).

The following expectations can be singled out from the international project Silk Road Economic Belt for the Republic of Kazakhstan:

- consolidation of society in crisis conditions, economic growth due to the development of industrial projects. Each project represents the creation of jobs (about 200,000 on a national scale) in reality, and accordingly, addressing employment problems and budget replenishment, improving the quality of life of the population, and the infrastructure as a whole (Silk Road Fund, 2015).
- attraction of investments, creation of new logistics centers and realization of its logistic potential. With the launch of the project at full capacity, a significant increase in the volume of freight traffic is expected – by 2.5 times, therefore, revenues from transit will increase significantly, and employment of the population will increase (ADB, 2012).
- owing to development of transport infrastructure (autobahns, high-speed railways), regional integration, export and import growth in and out of foreign countries, the idea of a “long distance” is modified.

After the implementation of the project the cargoes can be transported from Central Kazakhstan to any point of Eurasia by rail within 6-7 days. In 2014, the economy of Kazakhstan was able to attract investments of USD 9.6 billion, which allowed the country to take the first place in this indicator among the countries without access to the sea (Ayşe Çete 2016).

Geographical isolation, closed location and the difficult terrain of Central Asia and Western China are seen as the main obstacle for expanding communications and developing new markets.

Uzbekistan is the only country in the world doubly closed from access to the sea. Urumqi, the center of Xinjiang Uygur Autonomous Region, is the largest city at the farthest distance from the seaport. As a result, transportation costs along the way to and from the Silk Road region are quite high. Kazakhstan, due to its economic potential and geographic location, including access to the Caspian, is the most capable for transit operations.

Table 7 provides data on the status of construction and the stretch of the Western Europe-Western China corridor.

Table 7. Construction status and length of “Western Europe – Western China” corridor

Country	Status	Spatial aspect (Road stretch, km)
Kazakhstan	Renovation planned	2 787
Russia	Renovation planned	2 300
China	Completed	3 358
TOTAL		8 445

Note: Authors' calculations based on ADB 2012 Annual Report (ADB, 2013).

Sources: Statistical agencies of Kazakhstan and Russia.

According to calculations by the Ministry of Investment and Development of the Republic of Kazakhstan, USD 6.6 billion will be spent on the construction of Kazakhstan's road section, while the cost of building each kilometer of the road will be \$ 2.4 million. According to Kazavtozhol estimates, the approximate annual revenue from the “Western Europe - Western China” international transportation corridor will be about USD 300 million (Table 8). The preliminary calculations show that at a given level of annual income construction expenditures for the transport corridor will be justified in 22 years.

Table 8. Financial profitability of the “Western Europe – Western China” international transportation corridor

Parameters	Amount
Target profit (for 1 year)	USD 300 mln
Planned expenditures (total)	USD 6.6 bln
Planned expenditures (per 1 km)	USD 2.4 mln

Source: Authors’ calculations based on ADB 2012 Annual Report (ADB, 2013)

Thus, Western Europe – Western China international transportation corridor will have a multiplier effect on the economy of Kazakhstan.

3. Discussion

The following information sources were used as a database: official statistics of ministries and departments of the Republic of Kazakhstan and the RK Agency on Statistics; reports, publications and industry reviews of the Asian Development Bank, TRACECA, IRU, NELTI, CAREC, UN, CIS Executive Committee, EurAsEC, Eurasian Economic Commission, the World Economic Forum, the World Bank, the European Bank for Reconstruction and Development.

Table 9. SWOT analysis of the implementation of the SREB development strategy

	Strengths (S)	Weaknesses (W)
Threats (T)	<ul style="list-style-type: none"> ▪ transformation of the landlocked countries into countries “connected by land routes”; ▪ creation of joint cross-border ventures; ▪ expansion of trade relations between countries of the same region; ▪ benefits for long-term development, helping countries be more competitive in the global arena; ▪ activation of the search for opportunities for further expansion of the market; ▪ -environmental threats to the countries-participants in SREB. 	<ul style="list-style-type: none"> ▪ development of small and medium-sized enterprises that will benefit most from the free regional market ▪ economic corridors can serve as a connecting infrastructure for the globalization of industrial sectors. ▪ climate change in the sectors, predicted improvements, increased economic mobility, new diseases will spread much easier across borders affecting humans and animals ▪ the need to provide protection for transport corridors from climate changes; ▪ increase in intensity of floods and droughts.
Opportunities (O)	<ul style="list-style-type: none"> ▪ opportunities for expanding investment in transport interconnection; ▪ opportunities for trade links between regional production networks; ▪ -opportunities for expansion and diversification of production processes. 	<ul style="list-style-type: none"> ▪ interconnection of cross-border physical and non-physical networks, including organizations providing services in the fields of logistics, finance, telecommunications, technologies and knowledge.

The advantages of the applied method of SWOT analysis are that it allows for consideration of those factors that cannot have a formal description and unambiguous evaluation and will enable to elaborate an assessment of opportunities, establish weaknesses and strengths of the strategy for implementing the global transport hub.

The authors carried out the SWOT analysis of the implementation of the strategy for the New Silk Road project development. The results of the strategy SWOT analysis are given in table 10. The Silk Road Economic Belt as a major transcontinental project will serve the interests of CA states by the possibility of “connecting to the Asian model - through infrastructure links” which are necessary for these territories and will contribute to the development of the Eurasian space.

Thus, it is assumed that the Silk Road Economic Belt transit-transport system will eventually connect the states of Central Asia and China, and also join the region with Africa and Europe. The tasks are to gradually and purposefully reduce, and then completely eliminate, trade and investment barriers between all participants to the Silk Road Economic Belt, which definitely will play a key role in revealing the investment and trading potential of

each country (Table 10). Table 10 shows that Kazakhstan is legitimately one of the key trade and economic partners in the implementation of the Silk Road Economic Belt project: the largest economy in the region, the accumulation of more than 70% of China's trade turnover from the countries of Central Asia and the location along the ancient Silk Road will lead to the transformation of Central Eurasia into regions of strategic stability, political security and economic progress.

When carrying out SWOT analysis, the authors adhered to the following framework: the parameters that promote the economic growth of countries were referred to the 'strengths'; the parameters hindering economic growth were referred to 'weaknesses'; environment parameters that are not controlled by the project participants and can impede economic growth were referred to 'threats'; and the parameters of the environment not controlled by the project participants and contributing to the economic growth of the countries were referred to the 'opportunities'.

Summarizing the results of qualitative analysis of the perspectives, it can be concluded that with this attention to managing the development strategy SREB acts as a catalyst for regional integration

Conclusion

The present study identifies a list of political, economic, social, and technological factors that characterize the internal and external environment of the strategy for the development of transport corridors in Kazakhstan.

Applying SWOT analysis for the main factors of transit hub assessment, such as: cost, quantity and time of cargo transportation, the share of services produced in this segment of the market, the transport network density per 1000 sq. km, density of cargo mass in the region, *etc.*, results were obtained that are important in practical terms and are used for scientific provision of rational and efficient management of large transit transport projects

Thus, the authors revealed that:

- It should be recommended to coordinate the construction of transport corridors in Central Asia with the geographic location of natural resource deposits. This could lead to an increase in demand for transportation on transport routes.
- Deliveries of cargoes from Europe to China and back through Kazakhstan have a number of advantages in comparison with other transit ways. When carrying out the communication between Europe and China through Kazakhstan, the haulage distance is reduced by half compared to the sea route and by one thousand kilometers compared to the transit through the territory of Russia. This circumstance makes it possible to forecast the growth of cargo traffic in the direction of China – Europe through Kazakhstan.
- Cross-border commodity flows of long-term effect (gas and oil pipelines, transport hubs, power networks, and communication systems) will lead to a general increase in the welfare of peoples living along the highway. This is the way to a geo-economic partnership in the world trade, to an increase in the use of production capacities through the provision of sustainable sales of products in foreign markets. The eastern part of the route attracts the Asia-Pacific economic circles, and the Western part is connected with the European economic circles.
- Joint projects are successfully implemented in the transport and communication sphere in Kazakhstan's section of the Western Europe - Western China highway. Together with "Kazakhstan temir zholy" National Company a railway construction project will be implemented that will allow Kazakhstan to reach the Pacific coast. Kazakhstan acts as a country for natural gas transit from Central Asia to China via the gas transportation network.

The authors conducted a comparative analysis of temporal and spatial aspects and assessed the transport potential of the economic corridor. The analysis and model assessment confirmed the main hypothesis of studying the impact of socio-economic and natural indicators on the development of the transport potential of economic corridors. Cargo transportation costs are a significant category in the choice of transportation routes. Geographic, socio-economic, demographic characteristics of the countries of Central Asia were also indirectly expressed in the level of the transport infrastructure development.

Thus, it can be concluded that Kazakhstan has a potential for developing transit transport infrastructure. This is evidenced by the availability of transport potential, favorable geographical location, high level of development of economic sectors and favorable socio-political situation in the country.

References

- [1] Anikina, I.D. 2011. Analysis of financial and investment strategies of Russian ferrous metallurgy companies. *Bulletin of Volgograd State University. Series 3. Economics. Ecology*, 2 (19): 133–139. [in Russian]
- [2] Ayşe Çete 2016. The Silk Road: Linking Europe and Asia through Trade. Available at: <http://www.comenius.institutelpalau.com/wp-content/uploads/2014/05/new-silkroad.pdf>
- [3] Bakanov, M.I., Melnik, M.V., and Sheremet, A.D. 2005. *Theory of economic analysis*. 5th Ed., rev. and add. Moscow: Finances and Statistics. [in Russian]
- [4] Belyaev, V.I. 2007. *Marketing: basic theory and practice*. Moscow, KNORUS. [in Russian]
- [5] Biriucov, E. 2014. Role of IGC TRACECA in Regional Integration and Transit Cooperation. Paper Presented at High-Level Thematic Roundtable within 2nd UN Conference on Landlocked Developing Countries on the theme “Regional Integration and Transit Cooperation”. Vienna, Austria.
- [6] Bogomolova, Ye.V. 2004. SWOT analysis: theory and practice of using. *Economic Analysis: Theory and Practice*, 17 (32): 57–60. [in Russian]
- [7] Bogomolova, Ye.V. 2007. The conceptual approach to the use of SWOT analysis methodology in trade organizations to assess the effectiveness of the organization. *Audit and Financial Analysis*, 2: 88–90. [in Russian]
- [8] Bondaz A., Godement F., Kratz A., Pantucci R. 2015. One belt, one road: China’s great leap outward. Asia Centre of European Council on Foreign relations. June. Available at: [http://www.ecfr.eu/page/China analysis belt road.pdf](http://www.ecfr.eu/page/China%20analysis%20belt%20road.pdf)
- [9] Bordachev, T.V., Likhacheva, A.B., and Xin, Z. 2014. What Asia Wants, or the “Four C’s”: Consumption, Connectivity, Capital & Creativity. *Valdai International Discussion Club Publication*, 1: 1-11. Available at: http://vid-1.rian.ru/ig/valdai/Paper_Asia_eng.pdf
- [10] Bryson, J.M. 1988. A Strategic Planning Process for Public and Non-profit Organizations. *Long Range Planning*, 21(1): 73–81.
- [11] Cottrell, S. 2003. *Skills for Success*. Palgrave Macmillan.
- [12] Fedorenko, V. 2015. The New Silk Road Initiative in Central Asia. *Rethink Institute Working paper 10*. Available at: <http://www.rethinkinstitute.org/wp-content/uploads/2013/11/Fedorenko-The-New-Silk-Road.pdf>
- [13] Flyaysher, K., and Bensussan, B. 2005. *Strategic and competitive analysis. Methods and means of competitive analysis in business*. Moscow, BINOM. [in Russian]
- [14] Habova, A. 2015. Silk Road economic belt: China’s Marshall Plan, Pivot to Eurasia or China’s Way of Foreign Policy. *KSI Transactions on Knowledge Society*, 8(1): 64-70.
- [15] Houben, G., Lenie, K., and Vanhoof, K. 1999. A knowledge-based SWOT-analysis system as an instrument for strategic planning in small and medium sized enterprises. *Decision Support Systems*, 26: 125–135.
- [16] Hubbard, P. 2015. China takes the lead on the Silk Road. East Asia Forum. Available at: <http://www.eastasiaforum.org/2015/08/04/china-takes-the-lead-on-the-silk-road/>

- [17] Ivanova, Ye. A. 2009. Features of SWOT analysis application in marketing activity of Russian companies. *Scientific Bulletin of the Ural Academy of Public Administration*, 1 (6). Available at: <http://vestnik.uapa.ru/ru/issue/2009/01/13/> [in Russian]
- [18] Kahraman C., Demirel N. C., Demirel T. 2007. Prioritization of e-Government strategies using a SWOT-AHP analysis: the case of Turkey. *European Journal of Information Systems*, 16: 284–298.
- [19] Kangas, J., Pesonen, M., Kurttila, M., Kajanus, M. 2001. A'WOT: Integrating the AHP with SWOT Analysis. *Proceedings of the 6th International Symposium on the Analytic Hierarchy Process (ISAHP)*, August 2-4, Berne, Switzerland: 189–198.
- [20] Kleeva, L.P. 2012. SWOT analysis of the development of fundamental science in Russia. *Competence*, 2 (93): 12–14.
- [21] Lees-Marshment, J. 2001. *Political Marketing and British Political Parties: The Party's Just Begun*. Manchester University Press.
- [22] Leigh, D. 2009. Chapter 5. SWOT Analysis. *Handbook of Improving Performance in the Workplace*, vol. 2: 115–140. John Wiley & Sons, Ltd.
- [23] Lyubanenکو, A.V., and Tsibulskiy, V.R. 2003. Features of SWOT analysis in selecting the development strategy of Tyumen. *Bulletin of Cybernetics*, 2: 126–135 [in Russian]
- [24] Maysak, O.S., Maysak, N.V., Sagitova, G.R. 2011. SWOT analysis as a means for improving healthcare organizational environment. *Modern Problems of Science and Education*, 6: 109-109. [in Russian]
- [25] Ograjenšek, I. and Kenett, R.S. 2008. Management statistics. pp.97 – 115. In S. Coleman, T. Greenfield, D. Stewardson, D. C. Montgomery. (Eds.) *Statistical Practice in Business and Industry*. John Wiley & Sons, Ltd, DOI: 10.1002/9780470997482.ch5
- [26] Panagiotou, G. 2003. Bringing SWOT into focus. *Business Strategy Review*, 14, (2): 8–10.
- [27] Panasenکو, S.V. 2005. Comprehensive analysis of strategic factors of external and internal environment of nonprofit organization. *Proceedings of North Caucasus State Technical University. Economics*, 2: 15-17. [in Russian]
- [28] Saati, T.L. 1989. Decision making. Analytic hierarchy process. Moscow, Radioandcommunication [in Russian]
- [29] Silk Road Fund. 2015. The Silk Road Fund Teams Up with ChemChina to invest in Pirelli. Available at: <http://www.silkroadfund.com.cn/enweb/23809/23812/26968/index.html>
- [30] Skalon, A.V. 2009. Small town: SWOT-analysis of the problem field. *Regional Researches*, 6 (26): 9–18.
- [31] Sokolova, N.G. 2009. Forming the strategy of municipal management of retail system: SWOT analysis. *Bulletin of Chelyabinsk State University. Economics*, 3 (141): 75–77. [in Russian]
- [32] Terrados, J., Almonacid, G., Hontoria, L. 2007. Regional energy planning through SWOT analysis and strategic planning tools. Impact on renewables development. *Renewable and Sustainable Energy Reviews*, 11: 1275–1287.
- [33] Turaeva, M.O. 2014. The transport infrastructure in Central Asia countries in the conditions of new-age regionalization: Report. Moscow: Institute of Economics Press, RAS. Available at: http://www.imepi-eurasia.ru/baner/Turaeva_paper_2014.pdf
- [34] Veremeev, V.A. 2011. Macroeconomic assessment of railway infrastructure development. Available at: http://2020strategy.ru/data/2011/04/22/1210948572/VA_Veremeev_Macroec_Evol.pdf
- [35] Weihrich, H. 1982. The TOWS Matrix – A Tool for Situational Analysis. *Long Range Planning*, 15(2): 54–66.

- [36] Xi Jinping, H.E. 2013. Promote Friendship between Our People and Work Together to Build a Bright Future. Ministry of Foreign Affairs of the People's Republic of China, Available at: http://www.fmprc.gov.cn/mfa_eng/wjdt_665385/zyjh_665391/t1078088.shtml
- *** ADB 2014 Annual Report. Asian Development Bank. Available at: <http://www.adb.org/documents/adb-annual-report-2014>
- *** ADB. 2012. "CAREC Ministers Agree on \$23 Billion Action Plan to Boost Central Asia Links." News and Events, Asian Development Bank. October 30, Available at: <http://www.adb.org/news/carec-ministers-agree-23-billion-action-plan-boost-central-asia-links>
- *** Agency of Statistics of the Republic of Kazakhstan. Available at: <http://www.stat.gov.kz/>
- *** Agency on Statistics under President of the Republic of Tajikistan. Available at: <http://www.stat.tj/en/>
- *** Businessballs. 2017. SWOT analysis method and examples, with free SWOT template. The origins of the SWOT analysis model. Available at: <http://www.businessballs.com/swotanalysisfreetemplate.htm>
- *** CAREC, 2012. CAREC/CPMM Corridor Performance Monitoring and Measurement. Annual Report 2012. Available at: <http://www.carecprogram.org/uploads/docs/CAREC-CPMM-Reports/1-CAREC-CPMM-Annual-Report-2012.pdf>
- *** CFM. 2014. Nuryly Zhol – The Path to the Future. Committee on Financial Monitoring of the Ministry of Finance of the Republic of Kazakhstan. Astana. Available at: <http://kfm.gov.kz/en/activity/strategy-and-program/state-program-on-infrastructure-development-nurly.html>
- *** NDRC, 2015. Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road. National Development and Reform Commission. Available at: http://en.ndrc.gov.cn/newsrelease/201503/t20150330_669367.html
- *** RK CS. 2016. Official statistics Operational data (express information, bulletins). Transport. Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan Available at: http://stat.gov.kz/faces/wcnav_externalId/homeNumbersTransport;jsessionid
- *** RK CS. 2017. Main indicators of foreign trade of the Republic of Kazakhstan as broken down by countries. Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan. Available at: http://www.stat.gov.kz/faces/wcnav_externalId/homeNumbersCommodity?_adf.ctrl-state=1a0qxpsjim_62&_afLoop=43708963986032
- *** RZD. 2017. West Siberian Railway. Road in figures. Available at: http://zszd.rzd.ru/static/public/ru?STRUCTURE_ID=60
- *** UN. 2013. International Merchandise Trade Statistics: Compilers Manual, Revision 1 (IMTS 2010-CM) Available at: <https://unstats.un.org/Unsd/trade/EG-IMTS/IMTS2010-CM%20-%20white%20cover%20version.pdf>
- *** WEF. 2011. The Global Competitiveness Report 2011–2012; World Economic Forum 2011, Available at: http://www3.weforum.org/docs/GCR2011-12/14.GCR2011_2012DTIIInfrastructure.pdf.

Community-Based Acceleration Model of Entrepreneurship Growth and Development on Telematics Creative Industries in Malang Raya Indonesia

Fajar SUPANTO

Department of Management, Faculty of Economics and Business
Merdeka University, Malang, Indonesia
fajar.supanto@unmer.ac.id

Yuntawati FRISTIN

Department of Business Administration Science, Faculty of Social and Political Science
Merdeka University, Malang, Indonesia
yuntawati.fristin@unmer.ac.id

Suggested Citation:

Supanto, F., Fristin, Y. 2017. Community-based acceleration model of entrepreneurship growth and development on telematics creative industries in Malang Raya Indonesia. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 2060-2072.

Abstract:

The current economic era has shifted from the information economy to the creative economy. The creative industry is one of the important contributors to the economies of countries in the world. The purpose of this research is to develop community-based acceleration model of entrepreneurship growth and development on Telematics Creative Industry (TCI) in Malang Raya. This is an exploratory research. The subjects of the research are communities and actors on telematics, local government organizations, business/industry, and academics. Data collection techniques used interview, Focus Group Discussion, Direct Observation and Documentation. Research data was analyzed by using qualitative descriptive analysis, SWOT analysis, and Analytical Hierarchy Process (AHP). The research concludes that the model that can be developed to increase the role of creative industry is Quadruple Helix model with optimization of each party's role to achieve synergy. Coordination is important for each region and among stakeholders. To improve the development of entrepreneurship in the field of Telematics Creative Industry in Malang Raya needs real actions from various parties, especially in the form of training, mentoring, facilitation and assistance.

Keywords: acceleration model; entrepreneurship; creative industries of telematics; Indonesia

JEL Classification: L26; F63; M13

Introduction

The creative industry is one of the important contributors to the economies of countries in the world. This evidence began from England in 1997 in which the development of its creative industry has driven a significant contribution from the industry to the state economy beyond the contribution of other conventional industries. Britain's success in developing its creative industry has been a driving force for similar efforts in other countries such as New Zealand, Norway, Sweden, Singapore, etc.

In Indonesia, the creative industry becomes a new economic power with its significant contribution to Gross Domestic Product (GDP). By 2015, the contribution of the creative industry to GDP is about 7.5% and is predicted to increase to 8% by 2016 (Wicaksono 2015). The creative economy is also proven to contribute to the employment of 10.65% of the total national workforce (Ariyanti 2015).

Government of East Java in order to develop the growth of new entrepreneurs engaged in the creative industry to formulate the Grand Strategy which since 2010 have been directed every development programs towards the realization of the East Java region as: "the leading center of the development of creative industries electronics and telematics, competitive, and sustainable towards an increasingly prosperous East Java". The growth potential of the electronics and telecommunications industries in East Java is also very high and is expected to continue to grow over the long term. The community's need for the telematics industry and its derivatives is increasing in line with the development of investment, technology and management. All these things are needed as a primary need, not just a mere lifestyle. This is also supported by the growing population of East Java, thus

forming a potential market for electronics and telematics products. East Java is also one of the provinces that occupy the top three national GDP (Strategic Plan of Ministry of Tourism and Creative Economy, 2012). The high PDRB is related to the purchasing power of creative industry products.

Nevertheless, the development of creative industries in East Java as in Indonesia generally faces various obstacles: (1) The development of creative industries that have not been optimum due to industry attractiveness factor, the dominant position of creative business, creative industry business model, and business risk to be faced; (2) The development of creative content, creation and technology has not been optimum due to inadequate internet infrastructure, performance building infrastructure has not met the standards, expensive production machines, expensive software product and creative services, lack of content research, lack of content archiving activity; (3) Lack of market expansion and penetration for creative products and services at home and abroad due to lack of appreciation of local creativity, lack of national distribution channels connectivity, overseas market concentration, high promotion costs, lack of online payment system, low monitoring royalties, licenses, copyrights; (4) Weak creative industry institutions due to factors; (5) lack of access to financing of players in the creative economy sector; (6) The development of creative economic resources is not optimal because of the low utilization of natural resources and the low utilization of human resources (2012-2014 Strategic Plan of Ministry of Tourism and Creative Economy, 2012).

Malang is one of the important cities for the development of creative industries both in East Java and national level. The development of creative industries in Malang is also growing very rapidly. In 2016, Malang became the center of the 2016 Indonesia Creative Cities Conference (ICCC) event which became the gathering place for creative economic entrepreneurs from all regions in Indonesia.

It is important to make efforts to develop the creative industries so that the goals set can be fulfilled. This research is intended to fill the gap by focusing on the preparation of acceleration model to cultivate and develop entrepreneurship in the creative industries of telematics in Malang Raya (Malang City, Malang Regency, and Batu City). The purpose of this study is to develop a community-based acceleration model of entrepreneurship growth and development in the Creative Industry of Telematics in Malang Raya.

1. Literature review

Entrepreneurship

Entrepreneurship defined by Jong and Wennekers (2008) as taking risks to run your own business by exploiting opportunities to create new business or innovative approaches so that managed businesses grow bigger and more independent in facing the competitive challenges. Hisrich & Peters (2002) defines entrepreneurship as a process of creating something new by devoting the necessary time and effort, assuming the financial, psychological, and social risks that accompany it, and receiving the resulting rewards of personal and monetary satisfaction and freedom.

Creativity and innovative factors are the main elements in entrepreneurship. Creativity refers to the ability to develop new ideas and to discover new ways of solving problems in facing opportunities. While innovation is the ability to apply creativity in order to solve problems and opportunities to enhance and enrich life (Suryana 2003).

Creative Industry

In Indonesia, the creative industry is an industry sector which is part of the activities of the creative economy subsector. The creative economy is an economic activity that encompasses the industry with the creativity of human resources as the main asset to create economic added value based on 14 economic sub-sectors. In the Indonesian Creative Economy Development 2025 (Ministry of Trade of RI, 2008) mentioned that creative economy is a field of economic activity that focuses on the creation of goods and services by relying on expertise, talent and creativity as intellectual property. While the Creative Industry is an industry derived from the utilization of creativity, skills and individual talents to create welfare and employment by generating and exploiting the creative and creative power of the individual (Tourism Ministry Strategic Plan, 2012).

Based on the Presidential Instruction of the Republic of Indonesia No.6/2009 on Creative Economy Development, it is mentioned that the scope of Creative Economic Development includes: Advertising; Architecture;

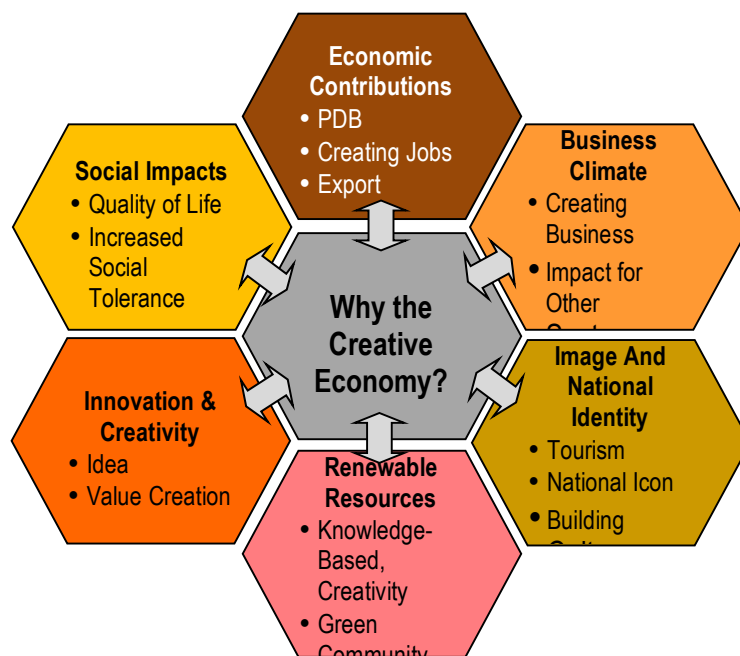
The art and antiques market; Craft; Design; Fashion (fashion); Film, video, and photography; Interactive games; Music; Performing Arts; Publishing and printing; Computer and software services; Radio and television; Research and development.

Creative Industry of Telematics

The term Telematics stands for Telecommunication and Informatics. Telematics means a combination of communication network system with information technology. Telematics is a remote communications technology, which conveys one-way, as well as reciprocal, information with a digital system. Understanding Telematics itself refers more to the industry associated with the use of computers in telecommunications systems (Taimiyyah, 2014). Telematics is a new hybrid technology that emerged as the impact of the development of digital technology. Telematics today is also called Information and Communication Technology (ICT).

The telematics industry in Indonesia has actually emerged and developed since the late 1970s. The era was called a pilot period until the late 1980s. The next period is the introduction period beginning in the 1990s. Currently the period of Indonesian telematics industry development is in the period of application that began in the 2000s.

Figure 1. Development of community-based creative industry of telematics



Source: Indonesia Ministry of Trade (2008)

The pilot period is marked by the commencement of learning and the use of information technology, telecommunications, and multimedia. Telephone networks, national television channels, national and international radio stations, and computers are becoming known in Indonesia, but their use is limited. In the Introduction Period, telematics technology has been used more and more widely known to the public. Amateur radio networks are growing, even reaching abroad as a result of the creativity of young people at the time. In the Application Period, the Indonesian government is seriously responding to the development of telematics in the form of political decisions and policies through regulations that encourage the development of telematics, especially in relation to the development of creative economy.

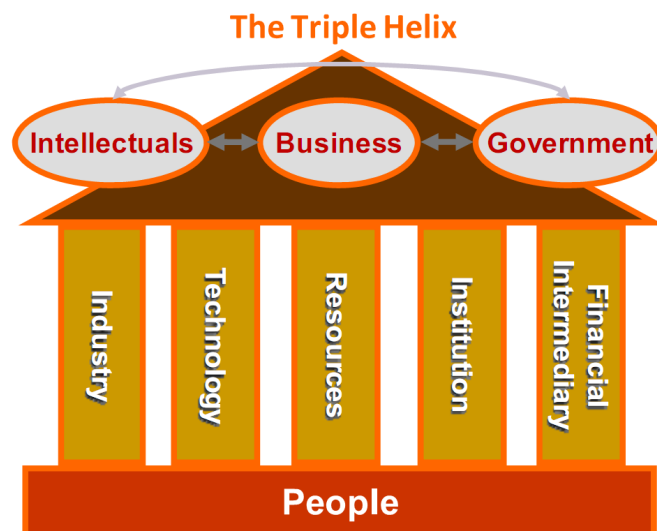
The National Information Technology Framework (KTIN 2000) formulates the vision of developing national information technology, namely the realization of a competitive civil society based on information technology in 2020, in support of the unitary state of the Republic of Indonesia. To support the achievement of the vision, the

following strategic sectors are defined: E-government for good governance; E-business to support people's economy; Community-based IT; IT for education; and E-Democracy.

Based on this, it can be seen that the development of community-based telematics or community become one of the strategic sectors to achieve the vision of national information technology development. Community-based IT/Community development strategies include: (1) Provision of information access and information applications for the general public in all district and sub-district capitals; (2) Provision of funds and government investment programs that encourage and empower communities to utilize IT; (3) Achievement of the acculturation process to become a society that can utilize information technology; (4) Promotion and improvement of IT research, oriented to market needs and IT activities in the community.

The national creative economy development model is shown in Figure 2. Based on the Figure 2, it can be seen that the foundation of creative industry is the human resource (People) of Indonesia which is the most important element in the creative industry. As a pillar of creative economic development is industry, technology, resources, institution, and financial intermediary. The main actors of creative economic development are intellectuals (scholars), business and government.

Figure 2. Model of creative economy development



Source: Ministry of Trade, Republic of Indonesia (2008)

2. Methodology

This type of research is exploratory research using Mix Method approach. The research is exploratory to reveal various factors related to the potential for accelerated growth and entrepreneurship development in Telematics Creative Industry in Malang Raya, opportunities and constraints faced, and models for its development. The research is conducted in Malang Raya (Malang City, Malang Regency, Batu City). The subjects of research are: (1) Communities and players in Creative Industry of telematics; (2) Regional Working Unit (SKPD); (3) Business Community; (4) Academics. Data collection techniques use Interview, Focus Group Discussion, Direct Observation and Documentation. Data analysis using qualitative descriptive analysis techniques, SWOT and Analytical Hierarchy Process (AHP).

3. Results and Discussion

Creative Industry of Telematics in Malang Raya

The holding of the Indonesia Creative City Conference 2016 (ICCC) event held in Malang on March 30-April 2 marked the momentum of the seriousness of the government and creative industry of telematics players in Malang

as well as various other related parties to jointly work together in advancing the creative industries in Malang. In the event the city of Malang declared itself as a creative city that focuses on telecommunications and informatics, especially digital animation.

To support these developments, the government of Malang has taken various strategic steps. One of them is the establishment of ILMETA and IATT Industry Sector in the Industry Department which there is a special section in charge of the development and development of Electronic Industry and IATT (Transportation and Telematics Equipment Industry). The commitment of Malang City Government is also shown through one of the missions of the Industry Service "Improving the Performance of Trade Sector and Creative Economy through the Facilitation of Promotion and Improvement of Trade Business Climate". Various events and activities have been conducted by Industrial services of Malang in order to foster and develop the telematics industry. Some of them are Mbois Festival, 3D Prototype Training, Android Application Development Training, Facilitation of Malang Animation Forum in INAFAC 2016, Digital Music Workshop, Graphic Design Workshop, Workshop Exhibition and Creative Industries Potential, and many other activities.

The Government of Malang City in 2015 has also built Technopark. Technopark is a gathering place for digital industry communities in Malang to develop their work in order to face the ASEAN Economic Community (MEA). This facility is located in the area of Public Library and Archive Building Office of Malang City.

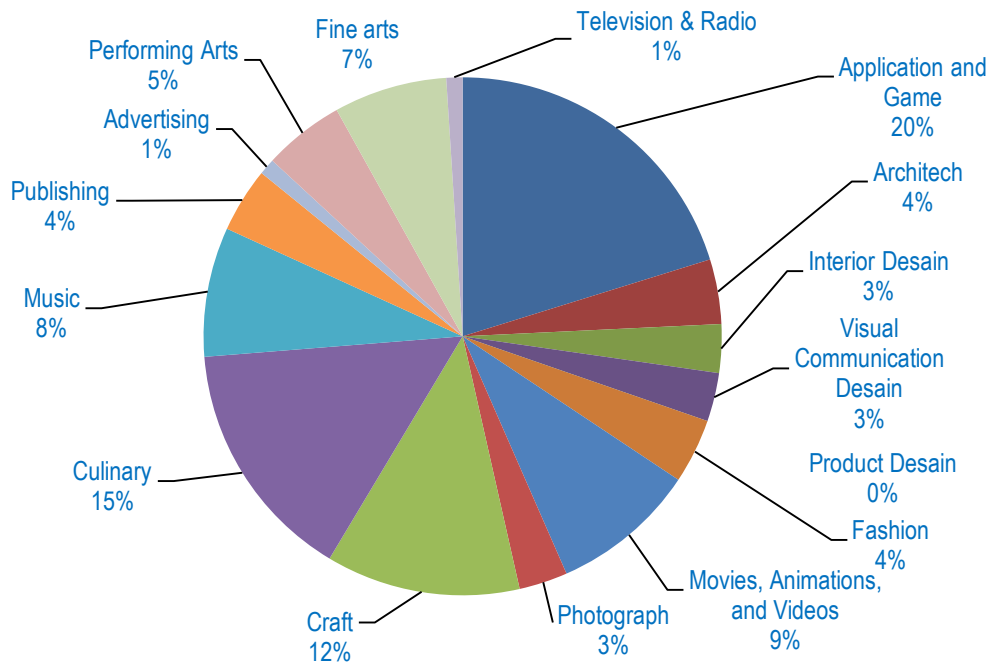
Another strategic step is to establish Malang Creative Fusion (MCF). MCF community is expected to be a forum for sharing experiences, information, and the development of creative economic potential. Malang City Government is keen to make Malang as creative city in a sustainable manner. Therefore, the city government strongly supports the growth of creative industries of telematics in Malang, such as animation, graphic design, music, *etc.*

MCF in its effort to develop creative industry in Malang City using Quadro Helix Strategy, which is development creative industry involving government, academic, business and community. The synergy efforts are carried out by the MCF Synergy Team. Meanwhile, in an effort to help increase the marketing capacity of Malang creative industry product and service both national and international market, hence formed Creative Industrial Cooperative of Malang (KIKM). KIKM has programs such as providing facilities and medium for consultation, incubation, training on marketing skill improvement of Malang creative industry. KIKM also provides promotional and marketing facilities for Malang creative industries in the form of Creative Products Gallery of Malang, Export Trade House and Exhibition Activities both local, national and international.

In recent years, the development of Telematic Creative Industry in Malang City is moving rapidly. The fields of telematics that many cultivated by creative industry players are animation, film and videography, illustration and graphic design, photography, and so on. Statistics of MCF show that telematics industry is the most developed industry compared to other creative industries (Figure 3).

One that is growing rapidly is digital animation. The start-up growth of this business and the level of productivity are quite encouraging. It is estimated that there are more than 1000 animators in Malang with an average animation production of 400 animations per month (Jatmiko 2016).

Figure 3. Statistics of creative industry in malang



Source: MCF and Industrial Services of Malang (2017)

There are several factors supporting the development of Telematic Creative Industry in Malang. First, government support both the Government of East Java Province and Malang City Government. East Java Provincial Government established a forum for creative community of Jawa Timur Information Technology Creative (JITC Malang). JITC as an Information and Communication Technology Entrepreneur Incubator Institution in Malang City has been successfully implemented various non-commercial work programs established on March 11, 2013 by accommodating communities with expertise in Videography and Film, Photography, Web Design and Development, Animation, Digital Music and Interactive Games. JITC Malang able to cultivate entrepreneurship of telematics industry especially community of creative beginner industry where overall development there are 132 volunteers divided in each sub area in year 2016. That number increased by 7 volunteers from 2015. The spread of volunteer number is quite varied based on expertise of each volunteer according to its sub-field, where sub field of animation have the most volunteer that is 43 volunteer. The second largest number of volunteers is the Videography and Film sub-section where there are 38 volunteers. Next is a sub field of photography with a total of 25 volunteers. The field of Web and Development number of volunteers increased to 9 people followed by Digital Audio field with the number of volunteers 8 people. Interactive Game field is still the number of volunteers from the year 2015 is 5 people. And the new-born field in 2016 is Digital Illustration Field with the number of volunteers 4 people. The number of volunteers who continue to increase from year to year shows that JITC continues to grow and become known by the community so that it becomes a place for people who have expertise in the field of telematics in Malang Raya and the community has an obligation to form a network of inter-community creative industries telematics industry as well as developing new incubators for the already established community for new industrial communities in their respective regions (Trade and industry offices of East Java, 2016). The Government of Malang City showed great support towards the development of creative industries of telematics. Visible serious efforts of Malang City Government to make Malang as a city that supportive and comfortable for the development of telematics industry.

The second factor is educated, skilled and innovative human resources. Malang is a city of education with many universities. According to Fahmi, Head of ILMETA and IATT Department of Industry of Malang City, many of Telematic Creative Industry in Malang start from 23 universities both public and private that have a telematics-

based program so that many gathered human resources (students) who have telematics skills reliable. Similarly, in secondary education, there are many vocational high schools in Malang Raya. Even the number of vocational secondary schools in Malang Regency (122 schools) is the second largest in East Java after Jember (161 schools) (East Java Province in Figures, 2016). Some Vocational High Schools in Malang have majoring in telematics.

The third factor is the growth and development of creative communities. The Creative Industries of Telematics actors have formed many communities according to their own interests and business focus. The community becomes a medium of communication and sharing experiences for member development.

Fourth factor, support from business/industry. Many companies also support the development of Telematic Creative Industry in Malang in various forms. *For example*, PT Telkom established Malang Digital Lounge (DiLo) which provides various facilities and facilities for telematics creative community event in Malang. BRI also contributed by establishing Creative House.

Fifth factor, the contribution of universities to the Telematic Creative Industry in Malang City, especially in providing education and training of telematics, telematics research, and technical assistance.

Contribution of Telematics Creative Industry to Malang city economy began to be taken into account by the government. Unfortunately, at this time is not known accurately how much contribution Telematics Creative Industry to the economy of Malang. Some factors causing it, as told by Fahmi (Head of ILMETA and IATT Department of Industry of Malang City), among others is the first, sub-field of Creative Telematics Industry in the measurement of the Central Bureau of Statistics is still spread into various sectors so that Telematics Creative Industry specific data is hard to be identified. Secondly, because of the nature of their business, most of the Creative Industry Telematics actors still enter the criteria of the informal sector and do not register their business officially to the government so that the number is not known with certainty. As a result, the government can not accurately measure the economic potential, business variation, productivity, location distribution, contribution to taxes, labor absorption, and other indicators.

Unlike the city of Malang, the development of Creative Telematics Industry in Batu City has not been detected by Batu City Government. According to Evi (Head of IKM SMEs, SMEs Industrial Service of Batu City) and Danang (Section Head of SMEs, UKM Industrial Service of Batu City) it is because the focus of industrial development in Batu City still in some creative industries besides telematics, namely batik, culinary and typical souvenir of Batu City. As a result, the Creative Telematics Industry in Batu is less developed as in Malang City due to lack of attention from Batu City Government. The Creative Industrial Community of Telematics in Batu is also not sustainable so that many actors of the Telematics Creative Industry in Batu establish communication and develop their community by collaborating with the communities of telematics creative industry in Malang.

The development of telematics creative industry in Malang Regency is also similar as in Batu. The development has not been detected by the local government. Unlike the city of Batu, Malang Regency Government has just begun seriously try to foster and develop the telematics creative industry in its territory in 2017, despite various obstacles. According to Indra Anggraeni (Section Head of IATT - Industrial of Transportation and Telematics Equipment), the main obstacle of the development of telematics creative industry in Malang Regency is the difficulty to identify the potentials and players of telematics creative industry in Malang Regency. As the city of Batu, as a result of the lack of attention from the local government on the creative industries of telematics, many creative resources in the region are choosing to migrate to Malang.

The creative industry of telematics in Malang City has been much developed to focus on telematics content. Unlike the phenomenon in the city of Malang, the City of Batu and Malang Regency is still developing as a tool or means to promote and market products of SMEs in the region. Coaching has been done to many actors of SMEs from various products, not the creative industries of telematics itself, where content is the main product. Thus the aspect of telematics content has not been so developed.

Supporting factors and constraints

Some of the factors supporting the development of TCI in Malang Raya are: (1) Efforts in TCI can run efficiently because the nature of the product (digital) does not require high investment, especially in the place of production and storage; (2) Strong government support for TCI development especially in Malang; (3) The market of open

telematics products is vast, not only domestically but worldwide; (4) Availability of educated, skilled and experienced human resources in the field of TCI. This is supported by the many colleges and vocational schools that have ICT-based courses to produce graduates of highly qualified telematics skills; (5) Telematics devices with better availability and affordability. The WTO agreement on telematics devices causes telematics product entry tariffs to be zero percent. Thus, TCI actors in Indonesia will be more efficient; (6) Business support is good enough for TCI in Malang Raya; (7) The support of universities is good enough, especially through workshops / training, research activities and community services directed at TCI, technical assistance, and so on; (8) There are business incubators ready to assist business start-up in the field of TCI; (9) Live, solid, and active TCI communities in coaching both community members and the wider community; (10) The number of companies both private and state-owned enterprises that actively participate in supporting TCI development in Malang is still open for improvement.

Several factors hindering TCI development in Malang Raya are as follows: (1) The development of TCI is still focused in Malang City, while in Batu and Malang Regency runs slowly; (2) Content has not been the main product of TCI in Batu and Malang Regency, but still limited to become media to support the marketing of regional products; (3) Many TCI businesses in Malang Raya face capital difficulties to develop the business; (4) The migration of human resources qualified telematics from Batu and Malang Regency to Malang City as an impact of the attractiveness of Malang which is considered convenient for TCI. As a result, Batu and Malang Regency lack potential human resources for the development of TCI in the region; (5) Government support has not been strong enough in Batu and Malang Regency. Government of Batu currently focuses more on developing the creative industries of food and beverages and batik than TCI. Meanwhile, the new Malang regency government this year (2017) started to identify and map the actors of TCI in Malang Regency; (6) The tax regulation is deemed not to favor the micro and small scale creative efforts in the field of telematics, especially the newly developing ones; (7) Public appreciation of TCI is still low; (8) The contribution of TCI to regional development (economy, employment, poverty, etc.) has not been accurately measured. The industry classification in the measurement conducted by BPS does not contain the creative industries in particular.

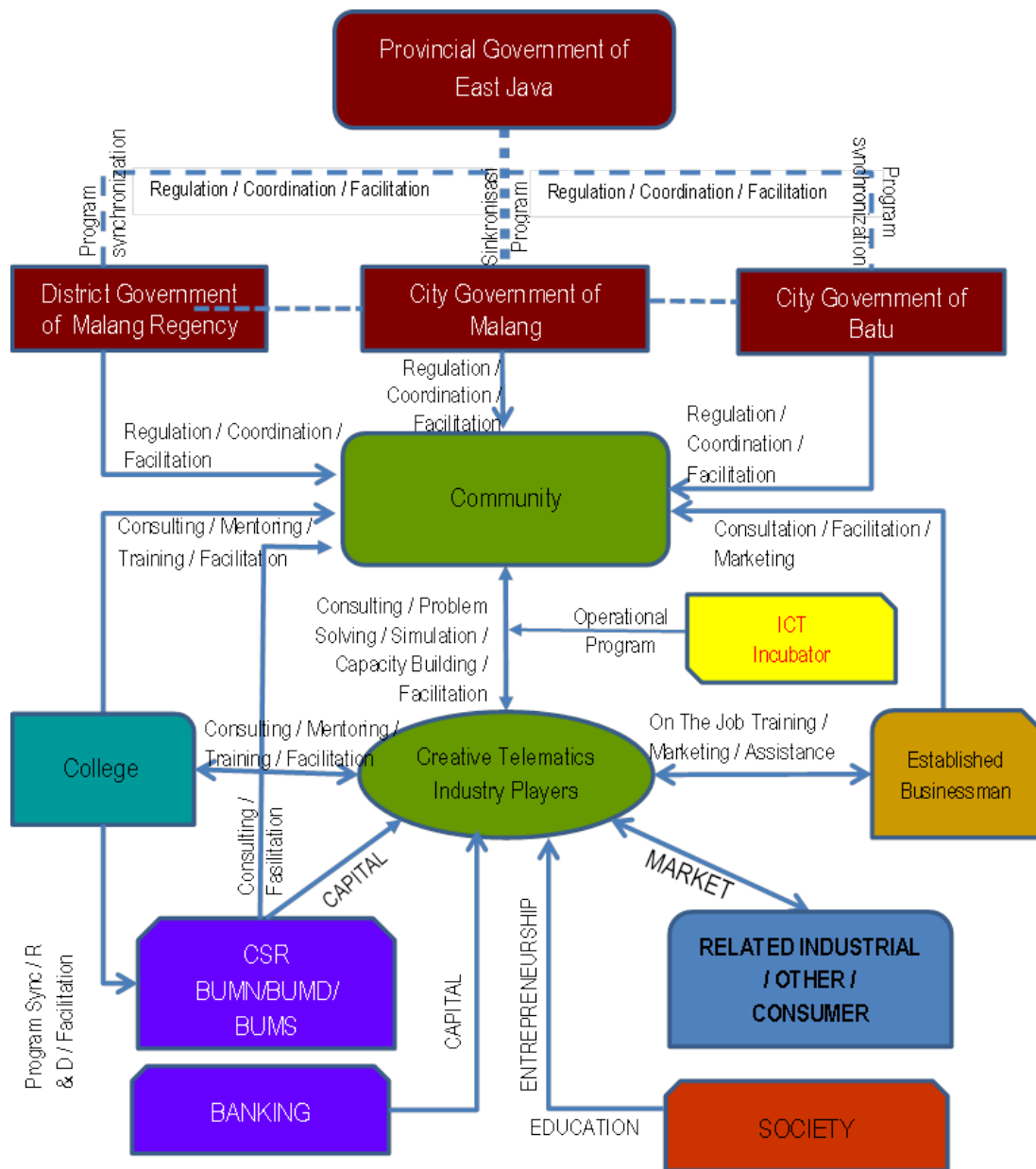
Community-Based Model of Telematics Creative Industry Development in Malang Raya

Based on the analysis of characteristics, supporting factors and obstacles in TCI development in Malang Raya, a model for accelerated growth and entrepreneurship development in the community-based Telematics Creative Industry in Malang Raya. The model is shown in Figure 4.

Model that can be developed to enhance the role of the creative industry is the Quadruple Helix model. Quadruple helix is a framework that integrates relevant public investment and the importance of completeness between economic differences, expensive investment and policies to achieve economic growth balance and is a collaboration of four sectors: Government, business, Academia and Civil society (Oscar 2010).

Quadruple Helix concept is a development of Triple Helix by integrating civil society (Afonso 2012). The close relationship, mutual support and mutualism symbiosis between the four actors is expected to be the driving force for the growth of sustainable creative industries. The role of intellectuals in the context of the creative industry is the desire to apply science and spread it. Scholars include culturalists, artists, educators at educational institutions, pioneers in community (paguyuban), hermitage (padepokan), cultural and art studios, individual or group studies and researchers, writers, and other figures in the arts, culture and science. The determinants of small business success are the structural factors in meeting the benefits and location and the uniqueness of the business (Chawla 2010).

Figure 4. Community-based acceleration model of entrepreneurship growth and development



The role of a business/company is as an organizational entity created to provide goods or services to consumers. Businesses are generally privately owned and formed to generate profits and increase prosperity for their owners, and can be shaped through sole proprietorships, partnerships, corporations and cooperatives. The role of government is as an institution that has the authority of creative industry development, both by central and local government, as well as interrelationship in substance as well as administrative interconnection. Synergy between departments and agencies in the central government, synergy between central and local government is needed to achieve the vision, mission and target of creative industry development.

Campuses have a great capacity to encourage the growth of creativity, and mature the concept of innovation and have the capacity to disseminate information with business networks. Intellectuals have the role of an agent that disseminates science, art and technology as well as agents who can develop creative industries in society.

The research results of the academics can be applied to the development of ideas or ideas for the creative industry players and business management development, and academics can implement their activities through continuous assistance for the improvement of management for creative industry players. Academics is one of the drivers of the birth of creativity, ideas, science and technology for the growth of creative industries, so that will produce a creative industry that stands firmly.

The role of the Government in fostering creativity of creative industry players is quite good, namely as an institution that has the authority to create and apply laws and laws, both central government and local government. The role in encouraging innovation for TCI development has not met their expectations. Therefore, the synergy between local government (Provincial and District/City) can be implemented to synchronize the program so that it will not run partially and overlapping either in the form of regulation or facilitation for community and TCI actors is very much needed to reach the vision, mission and target of TCI development.

The role of established business actors is as business actors, investors, creators of new technology and consumers as well as On the Job Training or apprenticeship for TCI beginner business actors in the hope of supporting the continuity of TCI and as a place of learning for start up business. The role can be realized in the form of creators of creative products and services, new markets that can absorb product and services generated, and create jobs for creative individuals, create community and creative entrepreneurs, namely as a driver of the formation of public space, so that will happen sharing thinking, which can hone the creativity of industry players. The establishment of the business community will be able to change the mind-set of creative industry business actors as well as sharing management of business management that leads to innovations in various fields that are able to support the development of creative industries.

Creative community has a role, among others, to build capacity, internalize the character of entrepreneurship in business start-up, as a place to consult as well as make it as a media problem solving related problems encountered.

The role of business incubators is to nurture and assist new companies, helping them survive and grow in the start-up period during these vulnerable times. The ICT incubator of the model has a role as a community-based TCI development and strengthening consultant in various aspects: management, production, market and marketing and even facilitation in connecting TCI actors to financial institutions both banks and non-banks through various programs implemented to the community and the actors of TCI start recruitment, training, apprenticeship and mentoring to prepare the creative industry players from the informal sector to the formal sector and strengthen the creative industry players who have legal entities to further develop.

The role of creative industry players as subjects in this model can directly get facilitation, facilitation and consultation as well as market access and capital from other stakeholders such as Higher Education Institution, BUMN/BUMD and Business Actors that have been established to develop the industry. In addition, consultation, assistance, facilitation and market access as well as capital through a community that is formed both from universities through the implementation of Higher Education Tri Dharma or through Corporate Social Responsibility (CSR) program. In the case of obtaining human resources as input in the process of entrepreneurial internalization sustainable then the source of input can come from the general public who are interested and have the required skills, vocational schools based on telematics and universities.

The role of Financial Institution (Banking) for Indonesian creative people is still low. Enterprises in the field of new creative industries based on digital content are still difficult to obtain financing support from financial institutions. This is because financial institutions do not understand the business nature in the creative industries, especially those based on this telematics. There is now a business credit financing scheme (KUR) launched by the President on November 5, 2007 based on a Memorandum of Understanding (MoU) between the Government, Guarantee Company and Banking (Bank Mandiri, BNI, BTN, BRI, Bank Bukopin, and Bank Syariah Mandiri) which may be utilized by the financing scheme for the creative industry. But this has not been able to be utilized by TCI due to the difference in business pattern of TCI sector in other industrial sectors, so banks tend to assess the creative industry sector has not been bankable. Therefore, it is necessary to create a policy or form of financing scheme appropriate for this TCI.

The position of BUMN / BUMD / BUMS institutions as facilitators who have the authority to provide program buffer facilities, so as to accelerate the process of achieving development targets related to the development of TCI based on the community. Various programs are activated by a well-established and strong business community, namely through CSR program.

The role of actors of similar industries and other industry actors as well as consumers is as a market of products and services produced by other industry actors. This is because the marketing of TCI products requires special attention, in addition, the design practice of marketing strategy of creative industry products requires its own creativity.

Strategy, Policy and Program of Telematics Creative Industry Growth and Development in Malang Raya

The incubator is a place or environment or institutional system, with certain conditions deliberately made in such a way that anything placed in the incubator will experience better growth (Kadarisman 1997). Potentially and actual, industrial area elements have ICT incubators that are expected to increase acceleration, accessibility and affordability of technology transfer process, diffusion of innovation, technology adaptation that closer product research and technology produced and indeed real needed by industry players. The incubator institution is an alternative to bridge the needs of the perpetrator to flow the information flow and the results of the study in accordance with real and perceived needs as well as market value, as well as to establish a synergistic collaborative relationship with the research resources institution.

ICT Incubator performs a real needs analysis of the targeted or potential clients whose clients are through gathering and filtering information about the needs or presenting the various findings and results available to the tenants with their specifications in accordance with the abilities and capacity of the targeted actors. Based on the analysis of needs obtained from industry players, then further determine the pattern of interventions that can be done to solve the problem of meeting the needs of tenants. Interventions that can be done by ICT incubators are through capacity building, creative industry strengthening and institutional capacity building.

Policy Priorities of Telematics Creative Industry (TCI) Development in Malang Raya

Exploration of the development of TCI in Malang Raya both to the government, TCI actors, and the community of telematics to produce some policy recommendations and programs. The policies and programs are then analyzed using Analytical Hierarchy Process (AHP).

Policies that can be taken by local government in Malang Raya are supporting, encouraging, and increasing the role of telematics community in: (1) Increasing motivation and entrepreneurship ability, especially among youth; (2) Improving capability in accessing capital and managing finances; (3) Improving ability in production process; (4) Improving ability in telematics product marketing; (5) Increase knowledge and ability in fulfilling aspect of business regulation, either licensing or protection of intellectual property rights.

Table 1 Program priority based on Analytical Hierarchy Process analysis

Alternatives	TOTAL	Normal	Ideal	Ranking
Aid	0.0755	0.151	0.3654	4
Facilitation	0.0983	0.1966	0.4757	3
Training	0.2067	0.4133	1	1
Mentoring	0.1195	0.239	0.5782	2

Source: AHP analysis results

Based on the AHP analysis of several criteria for the policy of growth and development of entrepreneurship TCI mentioned above, the sequence of program priorities that can be taken is as shown in Table 1.

The priority sequence of the TCI entrepreneurship growth and development program in Malang Raya is training, mentoring, facilitation and assistance. Training is very important to do specially to improve both hard skill and soft skill. Mentoring from various parties, whether government, academia, private, especially the community is needed so that the difficulties and obstacles faced by the new business does not kill the business. Facilitation is

expected by business actors in the field of TCI. Facilitation here means giving ease to the creative business of telematics to have access to various facilities that require a very long time to be fulfilled by themselves or even cannot be their own effort. Assistance is the last priority that can be done by stakeholders to develop entrepreneurship in the field of creative industries of telematics.

Conclusion

The research has resulted in the following conclusions: (1) Malang Raya has great potential for the development of Telematics Creative Industry due to government, private, intellectual and community support, broad market, the number of educated and skilled human resources, affordability of telematics equipment, business incubators; (2) Obstacles to the community-based growth and development of telematics creative industries in Malang Raya is the spread of uneven distribution of TCI, content has not become the main product of TCI in Batu and Malang Regency, capital difficulties, qualified telematics human resources migration from Batu and Malang Regency to Malang City, government support is not strong enough in Batu and Malang Regency, taxation regulation is considered not favored micro and small scale creative effort in telematics field, public awareness of TCI is still low, TCI contribution to regional development yet accurately measured; (3) A model that can be developed to enhance the role of the creative industry is the Quadruple Helix model by optimizing the roles of each party in synergy.

Based on these conclusions, the researchers recommend to the local government of Batu and Malang Regency to give more attention to Telematics Creative Industry in its territory so as not to be left behind by Malang City. Coordination is important for each region and among stakeholders to generate synergy. To improve the development of entrepreneurship in the field of Creative Telematics Industry in Malang Raya need concrete actions from various parties especially in the form of training, facilitation, facilitation and assistance.

References

- [1] Ariyanti, Fiki. 2015. Kontribusi Ekonomi Kreatif ke PDB Diprediksi Capai 8%. *Liputan 6*, 13 Desember 2015. Available at: <http://bisnis.liputan6.com/read/2388790/kontribusi-ekonomi-kreatif-ke-pdb-diprediksi-capai-8> (Accessed Mei 24th, 2016). (Accessed August 9th, 2016).
- [2] Creswell, J. W. 2009. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. California: Sage Publications, Inc.
- [3] Depdagri. 2008. *Buku 1: Pengembangan Ekonomi Kreatif Indonesia 2025*. Jakarta: Kelompok Kerja Indonesia Design Power - Departemen Perdagangan.
- [4] Depdagri. 2008. *Buku 2: Pengembangan Ekonomi Kreatif Indonesia 2025*. Jakarta: Kelompok Kerja Indonesia Design Power - Departemen Perdagangan.
- [5] Disperdag Jatim. 2016. *Laporan Kajian Kelayakan Pendirian Unit Pelaksana Teknis (UPT) Peningkatan Mutu Produk dan Teknologi Industri Kreatif Malang*.
- [6] Effendi, M. Irhas. 2014. Pengembangan Kewirausahaan dan Industri Kreatif Menuju Masyarakat Madani Berkearifan Lokal. *Prosiding Seminar Nasional Hasil - Hasil Penelitian dan Pengabdian*. LPPM UMP 2014.
- [7] Effendi, Syahrul. 2015. Ekonomi Kreatif: Permasalahan, Tantangan dan Prospeknya. *Kompasiana*, 17 Juni 2015. Available at: https://www.kompasiana.com/syahruleffendid/ekonomi-kreatif-permasalahan-tantangan-dan-prospeknya_54f40a4d745513a12b6c845f (Accessed Mei 24th, 2016).
- [8] Hermawan, Iwan dan VS Tripriyo PS. 2014. Membangun Kinerja Usaha Melalui Faktor Pembentuk Kapabilitas Pelaku Kewirausahaanindustri Kreatif Nasional. *3rd Economics & Business Research Festival*, 13 November 2014.
- [9] Hisrich, R.D., and Peters, M.P. 2002. *Entrepreneurship*. New York: McGraw-Hill Irwin.

- [10] Jatmiko, Bambang Priyo. 2016. *Kembangkan Industri Kreatif, Malang Siapkan Diri jadi Pusat Animasi Digital*. Kompas Online, 30 Maret 2016. Available at: <http://ekonomi.kompas.com/read/2016/03/30/222900226/Kembangkan.Industri.Kreatif.Malang.Siapkan.Diri.jadi.Pusat.Animasi.Digital> (Accessed August 9th, 2016).
- [11] Jerusalem, M. A. 2009. Perancangan Industri Kreatif Bidang Fashion dengan Pendekatan Benchmarking pada Queensland's Creative Industry. *Prosiding*. Seminar Nasional Program Studi Teknik Busana 2009.
- [12] Jong, Jeroen de & Sander Wennekers. 2008. Conceptualizing Entrepreneurial Employee Behavior. *Scientific Analysis of Entrepreneurship and SMEs*. 30 May 2008.
- [13] Puspardini, Hesti. 2011. *Strategi Pengembangan Industri Kreatif Di Sumatera Barat (Studi Kasus Industri Kreatif Subsektor Kerajinan: Industri Bordir/Sulaman Dan Pertenunan)*. Padang: Universitas Andalas.
- [14] Suryana. 2003. *Kewirausahaan, Pedoman Praktis, Kiat dan Proses Menuju Sukses*, Edisi Revisi. Jakarta: Salemba Empat.
- [15] Wicaksono, Arif. 2016. Kontribusi Ekonomi Kreatif Atas PDB Bisa Tembus 8 Persen di 2016. *MetroTVNews* 13 Desember 2015. Available at: <http://ekonomi.metrotvnews.com/read/2015/12/13/459829/kontribusi-ekonomi-kreatif-atas-pdb-bisa-tembus-8-perse> (Accessed Mei 26th, 2016).
- *** BPS Prov Jatim, "Provinsi Jawa Timur Dalam Angka 2016", Badan Pusat Statistik Provinsi Jawa Timur.
- *** KTIN. 2000. *Kerangka Teknologi Informasi Nasional*. Jakarta: Tim Koordinasi Telematika Indonesia.
- *** Kemenkum, HAM, "Peraturan Presiden Republik Indonesia Nomor 6 Tahun 2015 Tentang Badan Ekonomi Kreatif", Lembaran Negara Republik Indonesia Tahun 2015 Nomor 7, Kementerian Hukum dan HAM RI (accessed August 9, 2017).
- *** Kemenpar, RI. "Rencana Strategis 2012-2014", Kementerian Pariwisata dan Ekonomi Kreatif Republik Indonesia (accessed August 9, 2017)
- *** Pemkot Malang, "Pacu Industri Kreatif Digital, Kota Malang Resmikan Technopark", Bidang Informasi Publik Pemkot Malang. Available at: <http://malangkota.go.id/2015/12/23/pacu-industri-kreatif-digital-kota-malang-resmikan-technopark/> (accessed August 9, 2017).
- *** Malang Creatif Fusion, "Statistik Pelaku Industri Kreatif", Malang Creatif Fusion, Available at: <https://www.mcf.or.id/subsector> (accessed August 9, 2017).
- *** Taimiyah, Ibnu. 2014. *Apa Yang Dimaksud Dengan Telematika*. Available at: <http://ibnu-taimiyah.blogspot.co.id/2014/12/apa-yang-dimaksud-dengan-telematika.html> (Accessed Mei 26th, 2016).

Trade-Volatility Relationship in the light of Nigeria and the Euro Area

Ergin AKALPLER

Department of Economics, Faculty of Economics and Business Administration
Near East University, Yakin Doğu Bulvarı, Nicosia, North Cyprus
ergin.akalpler@neu.edu.tr

Huseyin OZDESER

Department of Economics, Faculty of Economics and Business Administration
Near East University, Yakin Doğu Bulvarı, Nicosia, North Cyprus
huseyin.ozdeser@neu.edu.tr

Sagiru MATI

Economics Department, Faculty of Economics and Administrative Sciences
Near East University, Yakin Doğu Bulvarı, Nicosia, North Cyprus
sagirumati@yahoo.com

Suggested Citation:

Akalpler, E., Ozdeser, H., Mati, S. 2017. Trade-volatility relationship in the light of Nigeria and the Euro Area. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 2074-2084.

Abstract:

In this study, the impact of exchange rate volatility on Nigerian exports to Eurozone countries is investigated. Monthly export data from January 1999 to December 2016 was used. This study utilizes the bounds test approach to cointegration to analyze how exchange rate volatility exerts influence on Nigeria's export to the Euro Area. GARCH (1,1) is employed to measure the volatility of the Naira/dollar exchange rate.

In the considered model, Nigeria's export to the Euro Area is taken as the dependent variable, whilst the independent variables include income of the Euro Area, price and the volatility measure

Given that the variables are a combination of I(1) upper bound and I(0), (lower bound the bounds test is used to test for cointegration. After confirming the existence of cointegration, the short-run and long-run coefficients are estimated. The short-run result shows that price and volatility have negative and positive lagged effects on Nigeria's export, respectively. In the long run, coefficients of price and volatility are significantly positive. The income of the Euro Area has no significant impact on Nigeria's exports in both the short and long run. The study recommends that Government subsidies and a floating exchange rate system are implemented

Key words: volatility; export; GARCH; bounds test; exchange rate

JEL Classification: F31; F10

Introduction

The shift from a fixed exchange rate system to a floating exchange rate was one of the beneficial policies adopted in the Bretton Woods system in 1973. However, this shift had a price, which was the uncertainty in the exchange rate movements. The uncertainty in turn exerted an effect on international trade.

Adoption of a floating exchange rate had no direct effect on volatility; whether the exchange rate is fixed or floating, volatility still exists in global trade. An IMF study in particular revealed the considerable impact of volatility on world trade. This research was produced for World Trade Organisation (WTO, formerly GATT) on the effects of exchange rate volatility in global trade and contributed to the understanding of the effects of floating and fixed exchange rates on world trade. According to the findings of this study, there were less effects and there is no unambiguous relationship between exchange rate and volatility (Raghuram Rajan 2004).

Researchers use various measures of volatility as a construct for this uncertainty. The results of various studies on the subject of the trade-uncertainty link or the trade-volatility link are mixed. Some authors have established a negative relationship, while others have been positive. In addition to this, some studies found no

linkage at all. Hence, this study joins other similar studies in a quest to determine the link between trade and exchange rate volatility.

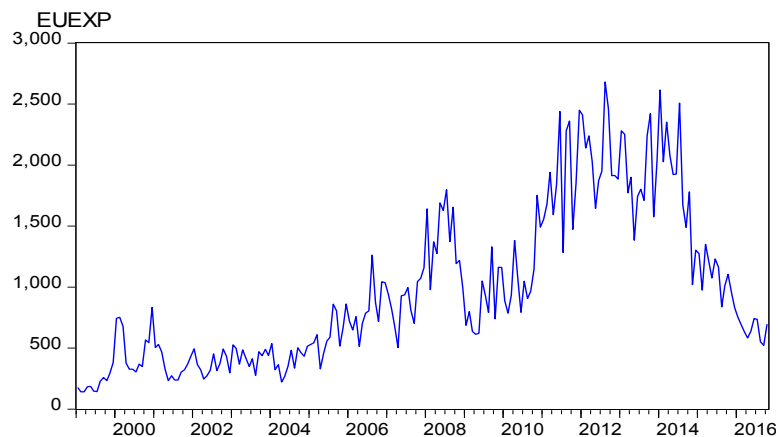
This is the first study of its kind to employ a blend of GARCH and ARDL methods to investigate the relationship between exchange rate volatility and Nigeria's exports to the Euro Area. The choice to examine the impact of exchange rate volatility on Nigeria's exports to the Euro Area is governed by the fact that Europe is Nigeria's second largest trade partner.

A limited number of scholars have established theories and models explaining the relationship between exchange rate volatility and trade. The scholars are of the consensus that there is a negative link between exchange rate volatility and international trade (Bloom 2009, Doğanlar 2002, Arize 1997). The empirical literature suggests that this theoretical argument might not always be true (see Kroner and Lastrapes (1993) and Baum and Çağlayan (2010)). In light of this contradictory empirical and theoretical evidence, the main objective of this research is to examine the impact of exchange rate volatility on Nigeria's exports to the Euro Area.

1. Nigeria's export to Euro area

There appeared to be a rising trend in Nigeria's exports to the Euro Area immediately after its inception in January, 1999. The exports reached their peak of \$2.68 billion in August, 2012. A sudden fall in the exports was also noticeable from \$1.22 billion in November, 2008 to \$995.23 million in December, 2008 and subsequently to \$686.82 million in January, 2009. This decrease represented 20.26% and 37.09% of the Nigeria-Euro Area exports, respectively. The reason for this could be linked to the 2008 global financial meltdown. Nigeria's total exports to the Euro Area between 1999 and 2016 represented more than 20 per cent of its total global exports over the same time frame. This demonstrates how important the Euro Area is to Nigeria as an export destination.

Figure 1. Nigeria's export to Euro Area in dollar million (monthly series)



2. Literature review

The adoption of the US dollar floating exchange rate regime in 1973 led to the implementation of a plethora of studies that attempted to estimate the relationship between the unexpected changes in exchange rates and trade balance. Nevertheless, the findings were diverse, as there was no unanimity about the impact of exchange rate volatility on trade flows. This lack of consensus is attributable to the difference in the econometric techniques (VAR, OLS, ECM, GARCH), data frequency (such as yearly, quarterly, monthly, daily), data measurement (nominal or real), length of time (century, decade), data series (time series or panel data), and the development level of the country of study (developing or developed).

Another determinant of the outcomes of the studies was the category of trade data used in empirical studies. Some authors prefer using aggregate or multilateral trade data to investigate the link between exchange rate volatility and trade, while others prefer employing bilateral trade data or sectoral trade data. However, there is no

harmony over the choice of category of data to be used as the outcomes of the studies are mixed in many cases: some studies reveal negative results, while others produce negative outcomes or even no effects at all.

Volatility-trade relationships could be explained in two ways: a partial equilibrium approach and a general equilibrium approach. The former considers the exchange rate as the sole determinant of trade (see for example Cote 1994, and Polodoo 2013). The partial equilibrium approach assumes that other factors such as transaction distance, costs, production patterns and market structure affect the exchange rate, while the exchange rate is the only determinant of trade. Clarke *et al.* (2004) and Sercu and Uppal (1995) criticized this approach based on the fact that it does not take into account the dynamic nature of the relationship between exchange rate volatility and trade (Polodoo 2013). This approach also does not account for the role of macroeconomic variables in influencing trade.

The general equilibrium approach, on the other hand, offers a solution to the inadequacies of the partial equilibrium approach. This approach explains the impact of exchange rate volatility on trade along with other possible factors that influence trade. In other words, this approach endogenises exchange rate. However, most of the studies on the trade-volatility relationship disregard the effect of trade on the exchange rate by modelling the latter as an exogenous variable. The argument of this approach is that endogenising the exchange rate produces a better explanation of the volatility-trade linkage.

As mentioned above, various studies have arrived at different conclusions. Some studies have revealed a significant negative relationship between trade and exchange rate volatility (*e.g.* Asogwa and Ngene 2012, Rahmetsyah *et al.* 2012, Sekantsi 2011, Hayakawa and Kimura 2009, Nishat and Aqeel 2006, Vergil 2002, and Chowdhury 1993). *However*, other studies have found a significant positive relationship between exchange rate volatility and trade flows (Zorlubas 2011, Ozturk and Kalyoncu 2009, Shehu 2008, and McKenzie 1998). *Furthermore*, some studies such as Polodoo *et al.* (2013) and Shehu (2008) have found no effect at all.

The studies in this area also differ in terms of econometric methodology. Some authors such as Chowdhury (1993), Nishat and Aqeel (2006), Vergil (2002) and Zorlubas (2011) used the Error Correction Model (ECM). Other authors, on the other hand, have employed different methodology such as Multiple Regression (see Hayakawa and Kimura 2009, Shehu 2008 and Baak 2004).

Studies in this area have also differed in terms of the data frequency. Annual data series are employed for some studies (for example Polodoo *et al.* 2013, Asogwa and Ngene 2012, Shehu 2008 and Baak 2004). However, Oloba *et al.* (2013), Rahmetsyah *et al.* (2012), Zorlubas (2011), Ozturk and Kalyoncu (2009), Nishat and Aqeel (2006) and McKenzie (1998) adopted quarterly data series in their analysis. In some cases, monthly data sets have been used (Bala and Asemota 2013, Ozkan *et al.* 2013, Hayakawa and Kimura 2009, Sekantsi 2009 and Vergil 2002).

A review of the literature above shows that the outcome of this study could be positive, negative or insignificant. Another important point is that no study has employed daily data series; this may be due to the unavailability of daily data series on trade.

3. Method of data collection

This research work utilizes monthly time series data from January, 1999 to December, 2016. The choice of the sample period is to reflect the establishment of the Euro Area, which coincided with the return of democratic rule in Nigeria. The source of data for all the variables is secondary: International Financial Statistics (IFS) database.

3.1. Model specification

As discussed, there are several types of trade models in the empirical literature namely, trade balance equations, import equations and export equations. This study will use export equations, as suggested by Asteriou, Masatci and Pilbeam (2016). The model in this study differs from their models as it takes the natural logarithm of the volatility measure, following Bahmani-Oskooee and Aftab (2017) and Bahmani-Oskooee and Harvey (2011). The model is as follows:

$$LX = \partial_0 + \partial_1LY + \partial_2LP + \partial_3LV + u_t \quad (1)$$

where: X is Nigeria's exports to the Euro Area, Y is the foreign income, P is relative prices, V is a measure of exchange rate volatility, subscript t signifies time, \ln stands for natural logarithms, ∂_1 and ∂_2 measure the income elasticity and price elasticity respectively, while U_t is the white noise error term. The variables are log-linearised in order to interpret the elasticity.

3.2 Measurement of the variables

This section explains the metrics and theoretically expected signs of the variables. The export variable is represented by the nominal value of Nigeria's exports to the Euro Area. The unit of measurement is the United States dollar. Due to the unavailability of Gross Domestic Product in the monthly series, income is represented by the industrial production index of the Euro Area (see Bahmani-Oskooee and Aftab (2017)). The coefficient of this variable is theoretically expected to be positive. The producer price index of the Euro Area is used as a measure of the relative price, following Civcir (2003). Therefore, the coefficient of relative price is theoretically expected to be positive.

Various models have been used to serve as a measure of exchange rate volatility. Some of the measures include implied volatility models, weighted moving average models as well as more recent measures, such as Autoregressive volatility models, Autoregressive Conditionally Heteroscedastic (ARCH) models, Generalized Autoregressive Conditionally Heteroscedastic (GARCH) models and other variants of ARCH techniques (Brooks 2014). The GARCH(1,1) model is adopted in this study as it the most commonly used measure in recent times (Bahmani-Oskooee and Aftab 2017, Asteriou, Masatci and Pilbeam 2016, Gür and Ertuğrul 2012, Bahmani-Oskooee and Harvey 2011, Baum and Çağlayan 2010). The naira/dollar exchange rate (end of period) is utilized to generate the GARCH measure.

4. Empirical result

First, the volatility measure is estimated using GARCH (1,1). The precondition for this technique is that the variable needs to be stationary. The natural logarithm of the exchange rate has a unit root, and therefore it is first differenced to make it stationary. See Table 1 for the unit root test result of the variable (DLEX). D represents the first difference, \ln is the natural logarithm and EX stands for the Naira/dollar exchange rate.

The next step is the determination of the best ARIMA model that can be used to estimate the GARCH. Akaike Info Criterion (AIC) and Schwarz-Bayes Criterion (SBC) are used in selecting the best model. The ARIMA model with the lowest value of AIC/SBC is the best model.

The information in from the Figure 2 can be used to determine the lag lengths of the ARIMA models. The probable models are ARIMA (15,0,1), ARIMA (1,0,15), AR (1), MA (1), AR (15) and MA (15). The last four models are flawed based on residual diagnostics; therefore, only the first two models are reported in Table. However, there is a conflict: AIC suggests model 2, while SBC suggests model 1. In this case, the first model is better in terms of residual diagnostics and its higher R^2 value. In addition to this, the ARCH LM test reveals the presence of an ARCH effect in model 1 at lag 15.

After confirming the ARCH effect, the next procedure is to generate the volatility measure by fitting DLEX in GARCH (1,1), as presented in Table 1. The optimization method OPG-HHH in Eviews is used to estimate the GARCH (1,1) using the sample of January, 1999 to December, 2016. After estimation, the GARCH variance series is generated to serve as the measure or proxy for the volatility/uncertainty. Since the lag length of the ARIMA model is 15 and that of GARCH is 1, it leads to the loss of 16 observations in generating the volatility measure. The new sample period is therefore May, 2000 to December, 2016, which is equivalent to 200 observations.

Figure 2. ACF and PACF Graph of DLEX

Date: 04/30/17 Time: 11:11
 Sample: 2000M05 2016M12
 Included observations: 200

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	0.207	0.207	8.7101	0.003
		2	-0.051	-0.098	9.2387	0.010
		3	-0.024	0.008	9.3592	0.025
		4	0.017	0.017	9.4206	0.051
		5	-0.031	-0.043	9.6196	0.087
		6	-0.016	0.003	9.6750	0.139
		7	0.006	0.005	9.6836	0.207
		8	-0.021	-0.028	9.7778	0.281
		9	-0.021	-0.007	9.8672	0.361
		10	-0.010	-0.008	9.8887	0.450
		11	-0.017	-0.018	9.9477	0.535
		12	-0.016	-0.009	10.005	0.616
		13	-0.037	-0.037	10.305	0.669
		14	-0.042	-0.031	10.683	0.711
		15	0.240	0.266	23.259	0.079
		16	0.063	-0.066	24.134	0.087
		17	-0.024	0.009	24.262	0.112
		18	0.018	0.038	24.333	0.144
		19	0.109	0.085	26.991	0.105
		20	0.011	-0.018	27.018	0.135
		21	-0.030	-0.010	27.221	0.164
		22	-0.022	-0.026	27.336	0.199
		23	-0.008	0.010	27.351	0.241
		24	-0.005	0.006	27.356	0.288
		25	-0.001	-0.006	27.356	0.338
		26	-0.008	-0.002	27.371	0.390
		27	-0.000	0.010	27.371	0.444
		28	-0.002	0.004	27.372	0.498
		29	-0.019	0.015	27.456	0.547
		30	-0.016	-0.087	27.515	0.596
		31	-0.008	0.012	27.532	0.645
		32	0.001	0.013	27.532	0.692
		33	-0.013	-0.020	27.574	0.734
		34	-0.003	-0.055	27.577	0.774
		35	0.027	0.041	27.754	0.803
		36	0.005	-0.005	27.760	0.836

Table 1. GARCH (1,1) Model for DLEX

Mean equation				
Variable	Estimate	Standard Error	z-value	Prob.
AR(15)	0.294137	0.085589	3.436647	0.0006
MA(1)	0.319479	0.086644	3.687755	0.0002
Variance Equation				
Constant	0.000583	0.000892	0.662923	0.5077
RESID(-1)^2	-0.012364	0.001023	-12.08142	0.0000
GARCH(-1)	0.534242	0.710728	0.751682	0.4522
ARCH LM Test	0.000			

The next step is to conduct the unit root test of all the variables including the volatility measure. The unit root tests of ADF and PP are conducted in order to avoid including I(2) variable in the model. Table 2 shows that all the variables are I(1), except the volatility variable, which is I(0). In other words, LX, LY, and LP are first-difference stationary, while LV is level stationary.

Table 2. Unit Root Test

ADF Test - Country (sample)				
Nigeria (2000-2016)	LEVEL		FIRST DIFFERENCE	
Model	Constant	Intercept and trend	Constant	Intercept and trend
DLEX	-11.37407*	-11.45884*	-9.117596*	-9.219671*
LX	-1.939842	-1.698059	-14.47128*	-14.51900*
LP	-1.485593	-1.078210	-7.689243*	-7.775428*
LY	-3.205821**	-3.223302***	-4.676687*	-4.664944*
LV	-13.16162*	-13.33640*	-7.556597*	-8.051110*
Phillips-Perron Test - Country (sample)				
Nigeria (2000-2016)	LEVEL		FIRST DIFFERENCE	
Model	Constant	Intercept and trend	Constant	Intercept and trend
DLEX	-11.33095*	-11.36423*	-80.43824*	-79.92462*
LX	-2.469290	-3.241436***	-25.30645*	-26.14380*
LP	-1.589402	-0.964552	-7.770334*	-7.874740*
LY	-2.406779	-2.424255	-14.63337*	-14.60611
LV	-13.16071*	-13.33664*	-160.7239*	-169.7169*

Table 3. Selection of ARIMA model: DLEX is the dependent variable

	Estimates		T-stat	Q-stats	AIC	SBC	R2
MODEL 1 (ARMA(15,0,1))	AR(15)	0.631284	16.514510	Q(8): 1.7126 (0.944) Q(24): 9.0079 (0.993)	-4.2818	-4.2348	0.23
	MA(1)	0.300933	5.326845				
	SIGMASQ	0.000759	24.114890				
MODEL 2 ARMA(1,0,15)	AR(1)	0.281746	5.035006	Q(82.7794 (0.836) Q(24): 11.720 (0.963)	-4.2093	-4.2373	0.20
	MA(15)	0.526344	8.507660				
	SIGMASQ	0.000789	18.059800				

Another important step is the test for cointegration among the variables. Since the variables are a mixture of I(1) and I(0), the most appropriate technique is the ARDL bounds test, which was pioneered by Pesaran, Shin and Smith (2001). The approach involves estimating the following equation:

$$\Delta LX_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{n-1} \beta_i \Delta LX_{t-i} + \sum_{i=0}^{m-1} \gamma_i \Delta LY_{t-i} + \sum_{i=0}^{m-1} \delta_i \Delta LP_{t-i} + \sum_{i=0}^{m-1} \epsilon_i \Delta LV_{t-i} + \Omega_0 LX_{t-1} + \Omega_1 LY_{t-1} + \Omega_2 LP_{t-1} + \Omega_3 LV_{t-1} + u_t \quad (2)$$

In Equation 1, above, u_t is a serially independent random error term with zero mean. The cointegration test involves two hypotheses: the null hypothesis of no co-integration and the alternative hypothesis of co-integration based on the F distribution developed by

$$H_0: \Omega_0 = \Omega_1 = \Omega_2 = \Omega_3 = 0$$

$$H_1: \Omega_0 \neq \Omega_1 \neq \Omega_2 \neq \Omega_3 \neq 0$$

The first hypothesis proposes a lack of cointegration among the variables, while the second hypothesis supports the existence of cointegration. If the F-statistic value is larger than the I(1) critical value, the null hypothesis is rejected. If the F-statistic value is less than I(0) critical value, the null hypothesis is not rejected and it can be concluded that there is no evidence of cointegration. If cointegration is established, the conditional error correction model (ECM), and the short-run and long-run relationships can be estimated. Mathematically, the ECM equation can be represented below, where π is the error correction term

$$\Delta LX_t = \alpha_0 + \alpha_2 t + \sum_{i=1}^{n-1} \beta_i \Delta LX_{t-i} + \sum_{i=0}^{m-1} \gamma_i \Delta LY_{t-i} + \sum_{i=0}^{m-1} \gamma_i \Delta LP_{t-i} + \sum_{i=0}^{m-1} \gamma_i \Delta LV_{t-i} + \Omega_0 LX_{t-1} + \Omega_1 LY_{t-1} + \Omega_2 LP_{t-1} + \Omega_3 LV_{t-1} - \pi e_{t-1} + u_t \quad (3)$$

ARDL bounds test result

Table 4 below reveals the ARDL bounds result as extracted from the Eviews output. The result establishes the evidence of a long-run relationship among the variables, because the F-statistic value is greater than the upper bounds I(0) critical values.

Table 4. ARDL Bounds Test: LX is the Dependent Variable (F-values)

Model	ARDL(4, 0, 2, 2)			
Optimal Lag	3			
F-values (bounds test)	5.776972*			
Critical value	10 %	5 %	2.50 %	1 %
Lower bounds I(0)	2.72	3.23	3.69	4.29
Upper bounds I(1)	3.79	4.45	4.79	5.65

Note: * represents significance at all levels of 1, 5, and 10%. The optimal lag is automatically selected by AIC. The critical values are from Eviews 9 output based on Pesaran, Shin, and Smith (2001). The ARDL model is estimated by using unrestricted constant.

To verify the outcome of the bounds test using the F-value, another bounds test using the t-statistics is conducted in Table 5. The decision to reject the null hypothesis or otherwise is exactly the same as that of the bounds test based on the F-value. The result reaffirms the existence of a long-run relationship, because the t-statistic value is greater than the I(1) critical values.

Table 5. ARDL Bounds Test: LX is the dependent variable (t-statistic)

Estimated model	ARDL(4, 0, 2, 2)			
Optimal lag length (AIC)	3			
t-statistic	-4.671467*			
Critical value	10 %	5 %	2.50 %	1 %
Lower bounds I(0)	-2.57	-2.86	-3.13	-3.43
Upper bounds I(1)	-3.46	-3.78	-4.05	-4.37

Note: * represents significance at all levels of 1, 5, and 10%. The ARDL model is estimated by using unrestricted constant

Short Run result

The short-run coefficients of the export equation indicated in the table 6 below. The coefficients of D(LP) and D(LV) represent the short-run estimates. The table shows that they are statistically insignificant. The coefficient of D(LY) is not reported because the lag length of LY is 0. However, the coefficients of D(LP(-1)) and D(LV(-1)) are significant at 5 and 10% significance levels, respectively. This means the price and exchange rate volatility affect Nigeria's export with a lag.

Table 6. Short Run Coefficients

Variable	Estimate	Standard Error	t-value	Probability
D(LX(-1))	-0.208523	0.089589	-2.327547	0.0210
D(LX(-2))	-0.073086	0.086203	-0.847829	0.3976
D(LX(-3))	0.125450	0.074821	1.676680	0.0953
D(LP)	5.870801	3.370675	1.573657	0.1173
D(LP(-1))	7.649401	3.811062	2.007157	0.0462
D(LV)	0.020488	0.018211	1.125053	0.2620
D(LV(-1))	-0.035487	0.018309	-1.938226	0.0541
C	-6.285280	1.295042	-4.853341	0.0000
ECMt-1	-0.379915	0.078396	-4.846096	0.0000

In the above table, the error correction term is estimated to be -0.379915, and its corresponding probability (0.0000) implies that it is statistically significant at 1, and 5% significance levels. Given that the error correction term is negative, large and significant, it signifies that 37.99% of the adjustment takes place every month.

Long run result

The long-run coefficients are presented in Table 7 below. The table shows that the coefficient of income (LY) is not significant, while the coefficients of price (LP) and volatility (LV) are significantly positive.

Table 7. Long Run Coefficients

Variable Name	Estimate	Standard Error	t-value	Prob.
LY	-0.432165	1.083708	-0.398784	0.6905
LP	5.923246	0.443004	13.370645	0.0000
LV	0.262806	0.090663	2.898721	0.0042

Diagnostic test

Table 8 reports the tests conducted on the residuals of the conditional ECM. These powerful tests indicate that the model is good.

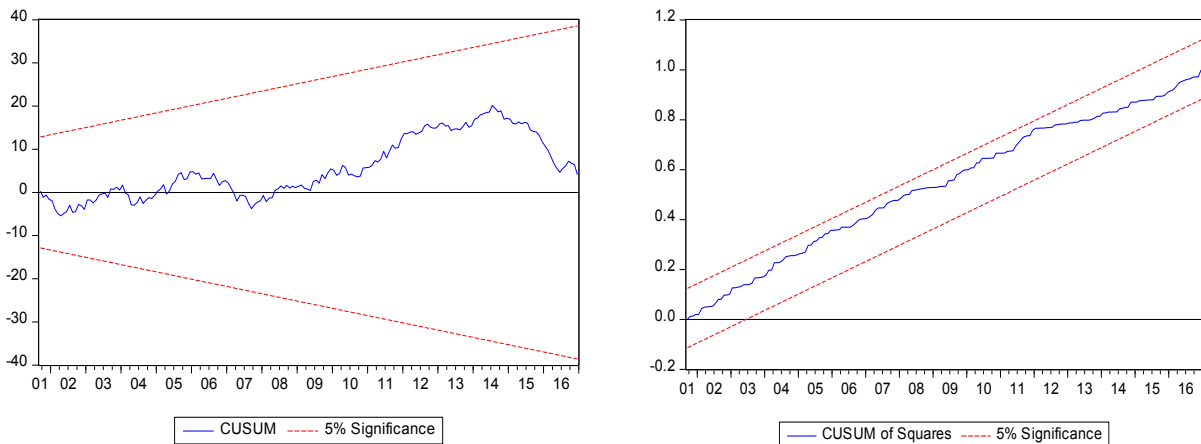
Table 8. Residual Diagnostic Test and Stability Test

Test	Test Statistic	Probability
Normality	0.678843	0.712184
Serial Correlation	1.027433	0.310900
Heteroskedasticity (BPG)	10.565020	0.480400
Arch	2.576092	0.108500
Stability (Ramsey Reset Test)	2.820846	0.094800

Stability test

The CUSUM test, as suggested by Brown, Durbin, and Evans (1975), provides a valuable insight into the stability of the model. The CUSUM test and CUSUM of Squares test are represented in Figure 3 below, which shows the stability of the parameter and variance estimates. If the CUSUM plot falls within the 5% significance boundary, the ECM model is stable, otherwise it is unstable.

Figure 3. Stability Test based on CUSUM and CUSUM of Squares



5. Discussion

The results of this study have numerous implications. Looking at the short-run coefficient of the ECM, it can be observed that insignificant coefficients of $D(LP)$ and $D(LV)$ signify that Euro Area price and Naira/dollar volatility do not immediately affect Nigeria's exports to the region. In contrast to this, the significance of the first lag of these two variables indicates that it takes at least one month for Nigeria to adjust its exports in response to price changes or Naira/dollar volatility. Other things being equal, a 1% increase in price in the Euro Area causes Nigeria's exports to rise by 7.64%, while a 1% increase in volatility decreases Nigeria's export by 0.035% in the subsequent month. In terms of economic theory, both of the coefficients are consistent.

The long-run result shows that the income in the Euro Area has no effect on Nigeria's exports, partly due to the fact that cheap raw materials represent a vast proportion of the exports. The fact that LP and LV have significant coefficients implies their impact on Nigeria's exports. The coefficient of price is consistent with economic theory and causes Nigeria to increase its exports to the Euro Area by 5.92% in response to a price increase of 1%, *ceteris paribus*. The volatility measure is not consistent with economic postulate. The explanation for this could be attributable to the hedging possibilities in the Euro Area, where highly developed financial institutions are prevalent; the uncertainty in the exchange rate volatility could be reduced or even overcome through spot contracts and foreign currency options. De Grauwe (1988) contended that the impact of exchange rate volatility depends on the risk attitude, so its effect could be either negative or positive. Therefore, a 1% increase in volatility causes Nigeria to raise its exports to the Euro Area by 0.26%.

Conclusion

This study used the estimated data and the bounds test approach to cointegration for analyzing the effects of exchange rate volatility on Nigeria's exports to the Eurozone, where GARCH (1,1) was employed for measuring the volatility of Naira/dollar exchange rate towards to the Eurozone trade, and the following findings have been concluded. In the unit root tests, ADF and PP, all considered variables are $I(1)$, except for volatility which is $I(0)$. The short-run result shows that price and volatility affect Nigeria's exports positively and negatively, respectively, when a one-month lag is considered. Their coefficients are consistent with their respective economic postulates. On the other hand, the long-run coefficients of price and volatility are significantly positive. The former is consistent with economic theory, while the latter is not. There are two reasons for the contradiction; one is risk attitude supported by De Grauwe (1988) and the other is the hedging possibility. The income of the Euro Area does not affect Nigeria's exports in both the short run and long run.

Since price affects Nigeria's export positively, both in the short run and long run, the government has to ensure that the prices of its export commodities are competitive. In addition to this, the government has to embark on trade policies that will ensure the immediate response of exports to any increase in price, rather than taking a

month to respond. This could be achieved by providing subsidies on export. Due to the fact that volatility affects Nigeria's exports positively in the long run, a floating exchange rate regime will be a more effective alternative than a fixed exchange rate regime.

References

- [1] Aqeel, A., and Nishat, M. 2006. The Effect of Exchange Rate Volatility on Pakistan's Exports. *Pakistan Economic and Social Review*, 44(1): 81-92. Retrieved from <http://www.jstor.org/stable/25825285>
- [2] Arize, A.C. 1997. Conditional exchange-rate volatility and the volume of foreign trade: Evidence from seven industrialized countries. *South. Econ. J.* 64(1): 235–254.
- [3] Asogwa, F.O, and Ngene, A. N. 2012. Exchange Rate Fluctuations and Trade Flows in Nigeria, *Academic Scholarship Journal*, 5(1): 11-24.
- [4] Asteriou, D., Masatci, K., and Pilbeam, K. 2016. Exchange rate volatility and international trade: International evidence from the MINT countries. *Economic Modelling*, 58: 133-140.
- [5] Baak, S. J., Al-Mahmood, M. A., and Vixathep, S. 2007. Exchange rate volatility and exports from East Asian countries to Japan and the USA. *Applied Economics*, 39(8): 947-959.
- [6] Bahmani-Oskooee, M., and Aftab, M. 2017. On the asymmetric effects of exchange rate volatility on trade flows: New evidence from US-Malaysia trade at the industry level. *Economic Modelling*, 63: 86-103.
- [7] Bahmani-Oskooee, M., and Harvey, H. 2011. Exchange-rate volatility and industry trade between the US and Malaysia. *Research in International Business and Finance*, 25(2): 127-155.
- [8] Baum, C. F., and Caglayan, M. 2010. On the sensitivity of the volume and volatility of bilateral trade flows to exchange rate uncertainty. *Journal of International Money and Finance*, 29(1): 79-93.
- [9] Bloom, N. 2009. The impact of uncertainty shocks. *Econometrica*, 77(3): 623-685.
- [10] Brooks, C. 2014. *Introductory Econometrics for Finance*. Cambridge University Press.
- [11] Chowdhury, A. R. 1993. Does exchange rate volatility depress trade flows? Evidence from error-correction models. *The Review of Economics and Statistics*, Volume 75, 4: 700-706. DOI: 10.2307/2110025. Available at: <http://www.jstor.org/stable/2110025>
- [12] Civcir, I. 2003. The Monetary Model of the Exchange Rate under High Inflation-The case of the Turkish Lira/US Dollar. *Czech Journal of Economics and Finance (Finance a uver)*, 53(3-4): 113-129.
- [13] Clark, P., Tamirisa, N., Wei, S. J., Sadikov, A., and Zeng, L. 2004. Exchange rate volatility and trade flows-some new evidence. IMF Occasional Paper, 235.
- [14] Côté, A. 1994. Exchange rate volatility and trade. Bank of Canada.
- [15] Doğanlar, M. 2002. Estimating the impact of exchange rate volatility on exports: Evidence from Asian countries. *Appl. Econ. Lett.* 9: 859–863.
- [16] Gür, T. H., and Ertuğrul, H. M. 2012. Döviz kuru volatilitesi modelleri: Türkiye uygulaması. *İktisat İşletme ve Finans*, 27(310): 53-77.
- [17] Hayakawa, K., and Kimura, F. 2009. The effect of exchange rate volatility on international trade in East Asia. *Journal of the Japanese and International Economies*, 23(4): 395-406.
- [18] Kroner, K. F., and Lastrapes, W. D. 1993. The impact of exchange rate volatility on international trade: reduced form estimates using the GARCH-in-mean model. *Journal of International Money and Finance*, 12(3): 298-318.

- [19] McKenzie, M. D. 1998. The impact of exchange rate volatility on Australian trade flows. *Journal of International Financial Markets, Institutions and Money*, 8(1): 21-38.
- [20] Ozturk, I., and Kalyoncu, H. 2009. Exchange rate volatility and trade: An empirical investigation from Cross-country comparison. *African Development Review*, 21(3): 499-513.
- [21] Polodoo, V., Seetanah, B., and Sanassee, R. V. 2013. An Analysis of Exchange Rate Volatility and Trade in Mauritius. Available at: <https://editorialexpress.com/cgi-bin/.../download.cgi?db>
- [22] Rahmatsyah, T., Rajaguru, G., and Siregar, R. Y. 2002. Exchange-rate volatility, trade and “fixing for life” in Thailand. *Japan and the World Economy*, 14(4): 445-470.
- [23] Raghuram Rajan 2004: Exchange Rate Volatility and Trade Flows - Some New Evidence, IMF, Available at: <http://www.imf.org/external/np/res/exrate/2004/eng/051904.pdf>
- [24] Sekantsi, L. 2011. The impact of real exchange rate volatility on South African exports to the United States (US): A bounds test approach. *Review of Economic and Business Studies*, 8: 119-139.
- [25] Sercu, P., Uppal, R., and HULLE, C. 1995. The exchange rate in the presence of transaction costs: implications for tests of purchasing power parity. *The Journal of Finance*, 50(4): 1309-1319.
- [26] Shehu, A. A. 2008. Impact of Foreign Exchange Volatility on Imports: A Case of Nigerian Foreign Exchange Market (1987-2008). In Proceedings of the 7th International Conference on Innovation & Management. Lagos.
- [27] Vergil, H. 2002. Exchange rate volatility in Turkey and its effect on trade flows. *Journal of Economic and Social Research*, 4(1): 83-99.
- [28] Zorlubas, C. 2011. Exchange rate fluctuations and the trade balance of Norway: An econometric analysis. California State University, Fullerton.

Investments of Innovative Type as the Most Important Condition for the Neoliberal Development of the Russian Economy

Ludmila Aleksandrovna KORMISHKINA

Department of Economics, OgarevMordovia State University, Saransk, Russia
econtheor@mail.ru

Evgenii Danilovich KORMISHKIN

Department of Economics, OgarevMordovia State University, Saransk, Russia
koloskov.s.567@mail.ru

Dmitrii Aleksandrovich KOLOSKOV

Department of Economics, OgarevMordovia State University, Saransk, Russia
kda1977@mail.ru

Suggested Citation:

Kormishkina, L.A., Kormishkin, E.D., Koloskov, D.A. 2017. Investments of innovative type as the most important condition for the neoliberal development of the Russian economy. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 2085-2100.

Abstract:

The article substantiates a new approach to the study of the essence of investments, according to which they are supposed to be considered as one of the key categories of the economic paradigm core (industrial, postindustrial, neoliberal), reflecting not only qualitatively new conditions of social reproduction, but also the role of a person in the modern world. Active development of the human component of intellectual capital and the formation of innovative technical and technological resources are considered as the main priorities of innovative investments. A complex criterion reflecting the state of investment in the innovative type can be the norm of gross accumulation, which, with respect to the Russian economy, in the conditions of a capital-intensive and innovative nature of investments, should not be lower than 28-30% of GDP. The purpose of the article is to disclose the content of innovation type investments aimed at continuous scientific and technical modernization and large-scale labor saving in order to meet the modern material, social and environmental needs of society, in the conditions of the formation of the neoliberal economic paradigm. The methodological basis for the study was formed on the principles of an integrative approach and rational (limiting) criteria for economic security. On their basis, the conclusion is drawn that the main constraint of innovative type investments in the Russian economy is the imbalance between the accumulated human potential, on the one hand, and the state of technical and technological resources and innovative systems (national and regional), on the other hand. Proposals on intensification of investment activity and transformation of investment policy in the Russian Federation were developed.

Keywords: neoliberal economic paradigm; innovative type; intellectual capital; deindustrialization; investment policy

JEL Classification: E22; O15; O38; O43; O47

Introduction

The global financial and economic crisis of 2008-2009 emphasized the attention of scientists and practitioners on the search for mechanisms for overcoming it in relation to the changed conditions of economic life. It also forced to recall the concept of the paradigm shift which actively discussed earlier in scientific communities, advanced in the 1960s by American historian and philosopher Kuhn (2014). It should be noted that the paradigm that prevails today in the world economic science (liberal, market) was formed in the XVIII–XX under the influence of the classics of economic science. However, it ceases to correspond to the needs of the economic and social progress of society. In this regard, it is appropriate to recall the statement of Porter, who in 1990 in his book "International Competition: Competitive Advantages of Countries" wrote: "... the world is becoming increasingly convinced that the prevailing paradigm of economic success ... does not meet modern requirements" (Porter 2016).

In conditions when the scientists of all countries have an urgent task of developing adequate to the challenges of the XXI economic paradigm, in our opinion, the neoliberal concept of modern development, formed

by Russian economic school in 2007-2014, evokes undoubted scientific interest. Its founder is Professor S.S. Gubanov, who laid out his fundamental program of new industrialization in the monograph "State Breakthrough. Neoliberalization of Russia and vertical integration" (2012) and series of articles (Gubanov 2011).

1. Relevance of the study

Under the new industrialization, the scientist understands the "historically logical process of productive forces development ... based on the technetronic triad: aggregate worker-computer-automated means of production... A qualitative measure of the new industrialization is the progressive change in the nature of labor and the structure of employment, accompanied by a reduction in the share of manual labor and an increase in the share of the intellectual; the emergence of intellectual labor as a mass and prevailing; labor saving... Its social result is embodied in the formation of the foundations of a new society, for which the reproduction of person and the quality of life is the first place, and not profit" (Gubanov 2015).

A key role in the implementation of the neoliberal formula for the development of the national economy belongs to the policy of internal accumulation and expanded reproduction on an innovative basis (Gubanov 2011). At the same time, it is known that the complexity of the mechanism for setting up a reproductive process is manifested in the category of "investments", which includes the entire complex of conditions for reproduction, uncertainty, risk, and the multivariance of choice (Kormishkina *et al.* 2016)

In the context of the said question on the modification of the content of investments in accordance with the goals and objectives of the new economic paradigm; on the increasing role of a high-tech investment resource in the neoliberal transformation of the national economy is of fundamental importance for economic theory and practice.

The current autonomous recession (without the recession in the G7 group), experienced by the Russian economy starting in 2013, once again confirms the strategic vulnerability of the export-raw model of the national economy and is largely due to the investment hunger provoked by the monetary policy of sterilization of savings (Daskovsky and Kiselev 2016). Under its influence, negative trends in the Russian economy (a low share of the science intensity of GDP; violation already in the long period of the process of reproduction of fixed assets, which led to the deindustrialization of the material and technical base and the degradation of innovation systems, the subsidy of the housing and communal services, the growth of the GDP salary capacity, non-prosperity increase of workforce productivity; high level of corruption, *etc.*), the preservation of which is capable of preserving the technological and economic backwardness of the Russian Federation, and increasing its gap not only with developed, but even part of developing countries, lead to a decrease in the level of national economic security and the national strength of the Russian state.

In the current situation, the creation of institutional and economic prerequisites for the activation and intensification of investment activities of economic entities, the achievement of rational (limit) indicators of investment security are becoming a decisive condition not only to improve the economic situation in the country and exit from an autonomous recession, but also to ensure a forced neoliberal modernization of the Russian economy and its transfer to the path of sustainable socially-oriented innovation development from the Volume of modern tendencies of internationalization of social production, directions of scientific and technical progress, informatization, growth of workforce productivity, acceleration of the accumulation of highly intellectual human capital.

Consequently, the development of conceptual approaches to the formation of an adequate neoliberal economic paradigm of the type of investment, to the creation of an effective state investment policy of initiating and stimulating such investments is, according to the authors of the article, a major scientific problem that is of great social and economic importance for the progressive development of Russia.

2. Literature review

As noted above, the global economic crisis of 2008-2009 confirmed the vulnerability of the economic development trajectory, which has been established in Western countries since the late 1970s and led to serious deformations of the economic structure in the core of the world system (Kushlin 2016). The economic system with stagnant industry, investment and innovative activity, which moved mainly to the virtual world, was in crisis. In this regard, not only in the scientific environment but also at the level of the governments of the leading countries of the world (Tolkachev 2015, Zaitsev 2016) there is a gradual abandonment of the postindustrial economic paradigm (Bell 1999, Masuda 1983, Toffler 2004) with its accent on the transition from the production of goods to the expansion of the service sector; from neo-liberal representations of the equivalence of all forms of activity in the context of globalization and the unconditional effectiveness of market self-regulation (Rodric 2011, 2016). In Russian economic science there is a paradigm shift in the direction of the previously mentioned concept of a new industrialization, whose supporters (A.A. Amosov, A.V. Buzgalin, S.D. Bodrunov, S.Yu. Glaziev, S.S. Gubanov, R.S. Grinberg, A.E. Karlik, A.I. Kotov, S.V. Kuznetsov, V.I. Kushlin, V.I. Maevsky, V.T. Ryazanov, *etc.*) substantiate its subordination to objective laws and leading tendencies of modern stage of social development (see for example: Gubanov 2011, Glaziev and Lokosov 2012, Mayevsky 2015). "From a strictly economic point of view, it (the welfare of future generations) will also depend on how much physical capital - cars and buildings - we give to future generations, and how much we invest in the creation of human capital of these generations, in particular through the costs of education and science "(Stiglitz *et al.* 2016).

The content of the new economic paradigm is expressed through an appropriate conceptual and categorical framework not only new, but already known earlier, in which the key role is given to investments (Daskovsky and Kiselev 2016). Despite the wide prevalence in the literature, the definition is ambiguous, is an acutely objectionable scientific problem.

Given the multifaceted nature of the investment problem, its relationship with all aspects of the functioning of the economic system at its macro, meso- and micro-levels to various issues of investment activity and investment policy to some extent were devoted to the works of the classics of economic theory: K. Gregory, J. Galbraith, J.M. Keynes, K. Marx, A. Marshall, J. Mill, V. Oyken, D. Ricardo, A. Smith, J.B. Sei, M. Friedman, F. Hayek and others.

Various issues related to capital management, the role of the stock market and other financial institutions in the implementation of investment activities are considered in the works of G. Aleksander, V. Leontiev, G. Markovic, P. Samuelson, L. Solou, J. Tinbergen, J. Hicks, W. Sharp, J. Schumpeter.

Investigation of investments in people is carried out within the framework of the theories of human and intellectual capital, the sources of which were such famous foreign scientists as G. Becker, T. Schulz, M. Blaug, F. Mahlup, T. Stewart, L. Edvinsson, J. Rouse, S. Pike and L. Feristem. A notable contribution to the development of the above theories is also made by Russian scientists, in particular: S.A. Dyatlov, R.I. Kapelyushnikov, M.M. Cretsky, V.L. Inozemtsev, B.B. Leontiev, V.S. Efremov, and others.

In the process of changing the economic paradigm for the development of Russia, the question of the need for the formation of new quality adequate investments to the idea itself is important and timely for individual researchers (V.I. Kushlin, E.B. Lenchuk, V.K. Senchagov, K.I. Pletnev) question of the need for the formation of new quality investments adequate to the very idea of a new industrialization - high-technology, science-driven, digital (Senchagov 2013). In addition, economic science and business practice today also need constructive proposals on overcoming the discrepancy of investment policy with the requirements of systemic implementation of innovative modernization of the Russian Federation national economy (Senchagov 2014).

The working hypothesis is based on the recognition of the objective necessity of initiating and stimulating investments of innovative type in the modern Russian economy adequate to the goals, tasks and driving forces of its neoindustrial development. Such investments correspond to economic laws and leading laws of the present stage of historical development; they are able to provide innovative quality and efficiency of economic growth.

3. Methods

- *The integrative approach*, through which research is conducted on the political, legal, economic and other prerequisites for the development of socioeconomic systems at different levels.
- *Method of comparing threshold (rational) criteria for the safe conduct of investment activity with its actual indicators*. Threshold values give quantitative certainty to national interests in this area of the economy; fix the limits between dangerous and non-dangerous phenomena and processes. Comparison of the threshold values of investment security indicators with real indicators of investment activity allows not only to judge current and potential threats in the sphere of vital activity, but also to form a set of program-targeted measures to reduce the identified and neutralize potential threats to investment security.
- *Author's methodology for assessing the effectiveness of the regional innovation system*. Its methodological basis was the European methods for calculating the composite of the Knowledge Economy Index (KSI); The Global Competitiveness Index (GCI), European Innovation Scoreboard (EIS), the Human Development Index (HDI), the Macro model of Innovative System (MMIS) proposed by Chen and Duhlmen (2006) and adapted to the Russian economy using the model-target structuring method (Glisin and Kalyuzhny 2011). This technique allowed conducting a comprehensive analysis of innovative processes in the constituent territory of the federation with the help of a large number of indicators with different dimensions based on the resulting indices. At the same time, by clustering the constituent territories of the Russian Federation in accordance with the value of the knowledge economy index, the method of *k*-average was used.

4. Results

In accordance with the concept of the new industrialization put forward by Russian economic school, the current stage of socioeconomic development is characterized by the entry into a new - neoindustrial - era, "historically higher, when workers in intellectual work and higher qualifications predominate in the aggregate workforce of society, and science acts as Immediate productive power" (Blagikh 2014). Such a society is characterized by a genuine "knowledge economy" in which knowledge and innovations are the main source of development, and the human component of intellectual capital becomes the basic factor of social production.

Accumulated knowledge of intellectual capital allowed scientists to the end of the XX to determine the general approaches to its structure and the forms of its manifestation. Proceeding from which, intellectual capital is understood as a multifaceted phenomenon formed as a result of interaction of human, organizational, emotional capitals and capital of relations, which causes the acquisition of new knowledge and activation of innovative activity at all levels of the economy (Kazakova *et al.* 2014).

It should be noted that intellectual capital has much in common with physical capital: Both arise as a result of investing resources (money, material, knowledge, qualifications, *etc.*) in the production of goods and services; bring their owner income; are a resource not only preserved but also replenished (Milner 2011) from this perspective, investments, according to the authors of the article, should be assigned the role of one of the key categories of the genetic (hereditary) core of the neoindustrial economic paradigm (Kormishkina *et al.* 2016).

It is clear that at present we should speak about a qualitatively new - innovative - type of investment adequate to the content and driving forces of the neoindustrial paradigm. Such investments, in our opinion, represent long-term investments in the development of intellectual capital and innovative spheres of the national economy that ensure the re-industrialization and creation of high technology, high-tech and digital productive forces, the growth of social workforce productivity, effective use and strengthening of human potential.

From the perspective of the leading trends in modern development (Stiglitz *et al.* 2016) and the concept of new industrialization, the following priorities for the development of innovative investment can be singled out: development of intellectual capital; formation of a high-tech investment resource in order to effectively implement and strengthen human potential; creation of dynamic and effective innovative systems (national and regional), sometimes referred to as the "triple helix" (Golichenko 2011), implying a mechanism for close interaction between the state, business and science (research universities) in the scientific and technological sphere.

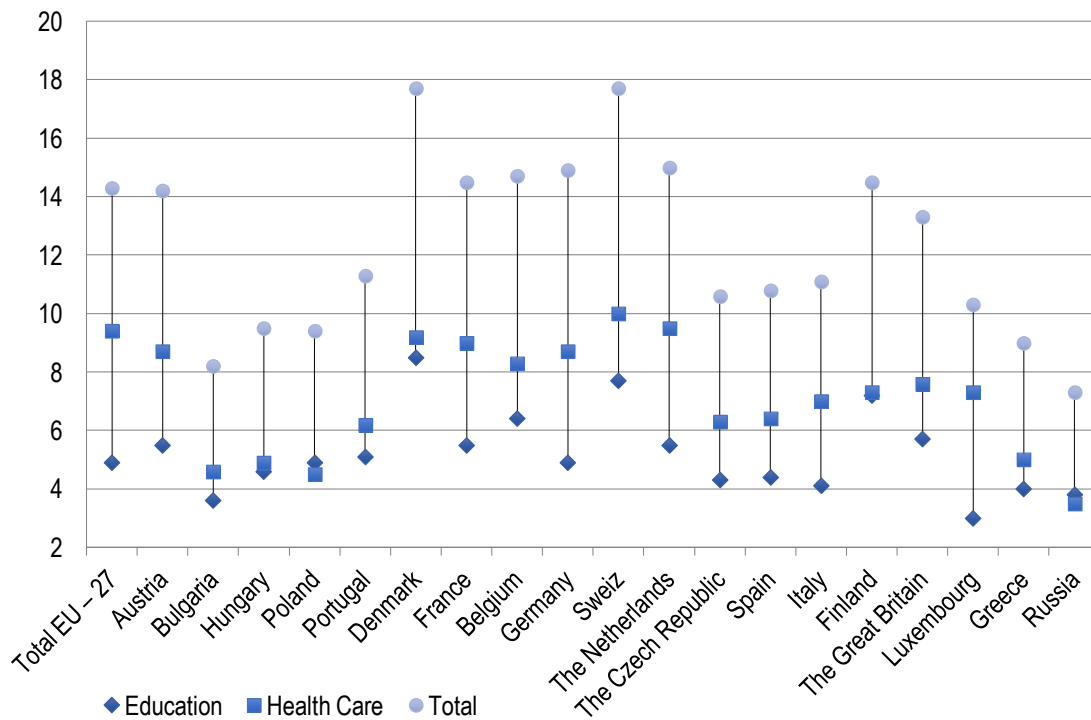
At the same time, the main priority for investments of innovative type is, undoubtedly, the human component of intellectual capital. The presence in the structure of human capital of such component as intellectual activity (Table 1), distinguishes the ability to creative work from the ability to perform work, and human capital from simple labor, determines the conditions and nature of the "capitalizing" the ability to work. It is the human component of intellectual capital, being one of the forms of labor resources of development, has the ability not only to create new knowledge, but also to transform them into new scientific and technological solutions that have practical value, and consequently, to intensify innovative processes in the economy.

Table 1. Decomposition of intellectual capital

Intellectual capital	<i>Human capital</i> is an active part of human potential	Knowledge; skills; creative skills; culture of work; moral values; intellectual activity
	<i>Organizational capital</i> - promotes more complete realization and development of human capital in the appropriate organizational environment	Technologies; processes; inventions; organizational structure; organizational culture, etc.
	<i>Consumer (client) capital</i> - the quantity and quality of a constant client base of the economic structure	Information about clients; communication with customers; customer loyalty; trademark; brand, etc.

The development of human capital means the mobilization of public and private resources. According to the UN Development Program, in the first decade of the 2000s, the accumulated investments in a person (or human capital) account for 64% of the total wealth, compared to 16% for physical capital. In many developed economies, it reaches 80%. There is another picture in Russia: 72% is a commodity factor, and only 14% is human capital (Milner *et al.* 2011). Figure 1 presents data that clearly illustrate the high level of aggregate spending on education and health in selected EU countries.

Figure 1. Expenditures on education and health in some EU countries and Russia in 2011-2015, % of GDP



Source: Oksenoit *et al.* 2016

It seems obvious that the effective transformation of new and scientific knowledge into innovation and their successful transformation into qualitatively new products, incl. investment resources, the growth of creative components of labor in the economic system, the solution of the problem of resource efficiency with a reference to the best world experience, etc. today it is impossible without the creation of an appropriate technological investment resource and a high-tech complex (HTC) in the national economy.

In this context, it seems appropriate to draw attention to the opinion of Stiglitz et al. (2013) that for the present period a "new intellectual consensus" is characteristic, when the importance of industrial policy is recognized by politicians and scientists at different poles of the ideological spectrum.

At present, the following science and capital intensive industries can be classified in the Russian economy in the sectoral dimension to the ETC: Airplane industry; Shipbuilding; Space manufacturing; Computers and office equipment production; Electronic engineering industry; Production of communication equipment; Pharmaceutical industry; Organic chemistry and plastics industry; Nuclear industry; Biotechnical industry; Arms manufacture; Instrument making industry; Electric machinery industry; Medical machinery industry; Machine-tool manufacture; Substitute material manufacture and *etc.*

In this regard, the authors of the article share the position of well-known Russian scientists (Glazyev S. Yu., Novitsky N.A., Senchagov V.K., *etc.*) in that the most important prerequisite for investment of innovative type is the achievement of rational (threshold) criteria for safe innovative and investment activities and the creation of a favorable macro-environment for the latter (Senchagov 2014). As such criteria experts in the field of economic security research (Senchagov 2014) are called:

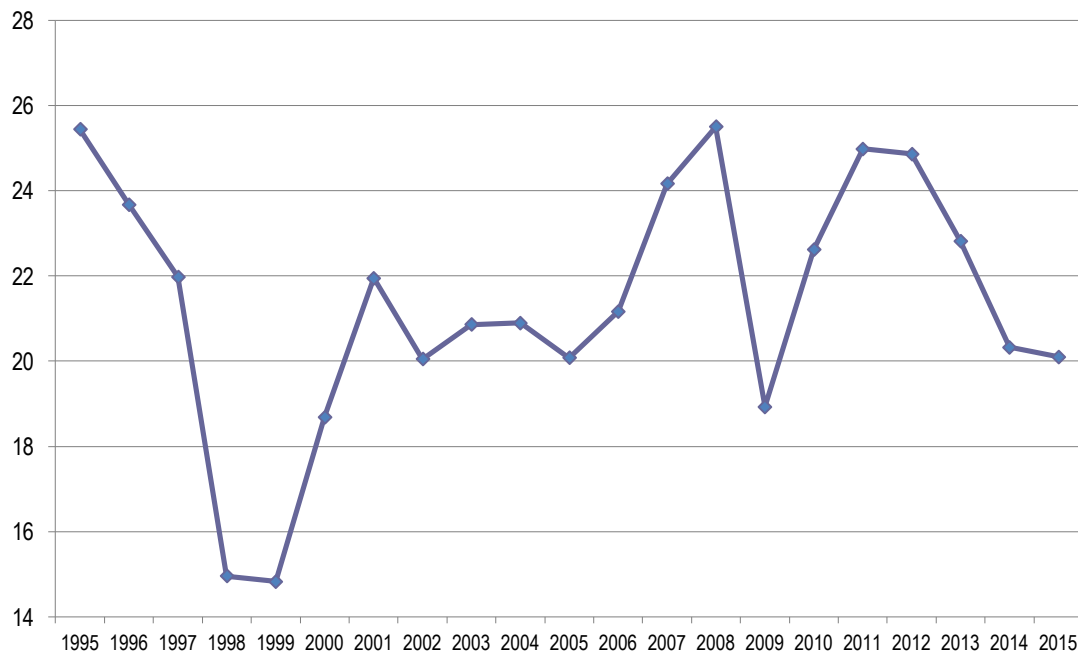
- the share of accumulation of gross investment in GDP (at least 25% of gdp, taking into account the development of high technology industries and the introduction of nanotechnologies into the economy of the Russian Federation - up to 28-30%);
- the ratio (excess) of investment growth rates and GDP growth rates (taking into account the inertia and growing capital intensity of innovations in the Russian economy, to obtain 1% of GDP growth, it is necessary to provide 2-3% of additional investment growth);
- excess of investments in renewal of fixed assets over compensation of their retirement in relation to the initial cost (not less than 50%);
- ratio of the economy profitability and the level of interest rates.

It is necessary to note with regret that the current investment policy in the Russian Federation is extremely poorly focused on observing the above criteria, and the state of the technical and technological investment resource and the country's innovative system does not correspond to the level of development of its human potential.

Let us remind that the Human Development Index (*HDI*), developed under the United Nations Development Program, was used to assess the latter. It divides countries on a scale from 0 (the weakest development of a person) to 1 (the highest development of a person). In 2015, the value of the HDI for the Russian Federation was 0.798; on this indicator, Russia, which took the 50th place in the rating of 188 countries of the world, is included in the group of countries with a high HDI.

At the same time, the analysis revealed a noticeable lag in the Russian economy from industrially developed countries in terms of the indicator of gross capital formation (Figure 2). In the Russian Federation, under the influence of the transformational recession of the 1990s, and radical changes in the investment mechanism associated with the transition from financing investment in fixed assets from the state budget to investing primarily at their own expense, the GDP structure underwent a fundamental change: In the amount of its final use, the share of accumulation of gross investment in GDP decreased from 38.7% in 1990 to 19.5% in 2015, which corresponds to the level of the 1960-1970s. Although the GDP growth observed in Russia during the period between the crises of 1998 and 2009, achieved mainly due to favorable external economic conditions and improvement of the loading and use of the existing production apparatus, allowed to increase the norm of gross fixed capital formation in GDP from 14.9% in 1998 to 18.9% in 2009. The value of this indicator was lower than in the G-7 countries actively carrying out industrial-technological modernization (Pogosov and Sokolovskaya 2014).

Figure 2. Dynamics of the share of gross accumulation in the GDP of the Russian Federation in 1995-2015 %



Source: Oksenoit *et al.* 2016

Today's values of this indicator in relation to the current conditions for the development of the Russian economy are clearly insufficient to overcome the autonomous recession of the implementation of reindustrialization (especially given the heavy exhaustion of fixed assets). It is known that the advanced countries that carried out the structural reorganization of the economy, for a long time, maintained a high level of investment in fixed assets. For example, in post-war Japan it reached 30%; in China in 2010 - 47.7%; India - 35.7%; Vietnam - 37.9% of GDP (Antonova *et al.* 2012).

While maintaining a low share of gross fixed capital formation, it is not necessary to count on reducing the economic and technological gap in the Russian Federation with developed and new industrial countries. The long-term nature of the under investment of the Russian economy has a negative impact on the state of the material and technical base of the national economy of the Russian Federation. The idea of colossal costs and efforts to restore it can be obtained if we turn to a retrospective analysis of the coefficients of reproduction of fixed assets (Table 2).

Table 2. Reproduction of Fixed Assets in the Russian Economy in 1970-2015. (Russia in Figures, 2016)

Index	Years													
	1970	1980	1990	1992	1995	1997	1999	2000	2004	2008	2011	2013	2015	
Coefficient of renewal of fixed assets	10.2	8.2	5.8	3.2	1.6	1.1	1.2	1.4	2.0	4.4	3.9	4.3	3.9	
Coefficient of retirement of fixed assets	1.7	1.5	1.8	1.1	1.5	1.2	0.9	1.0	1.1	1.0	0.8	0.7	0.8	

At a time when in developed economies 12.5% of the fixed assets active part are renewed annually (Daskovsky and Kiselev 2016), in the Russian Federation only 3.9%, which is clearly insufficient to overcome the tendency of growing wear during a long period fixed assets. On average, the value of this indicator (at the end of

the year) increased from 39.3% in 2000 to 50.5% in 2015 (Russia in figures, 2016) and approached the critical value of this indicator of investment security.

If we proceed from the national economic problem of the neoindustrial transformation of the productive forces of certain indicators of investment security, then the value of the retirement ratio of fixed assets at the level of 1.1-0.8, due to the current state of the amortization fund, does not facilitate the replacement of exhaustion machinery and equipment, innovative modernization of workplaces and growth of workforce productivity.

With the indicated values of the retirement ratio of fixed assets, it becomes basically impossible to reduce the average age of the equipment. And although the official Russian statistics somehow fix it, today the average age of fixed production assets exceeds 13 years (Investments in Russia 2015).

At the same time, it is known that the limitation of the useful life of equipment for 8-10 years is due to increased costs for its maintenance, which is accompanied by a decrease in profitability and competitiveness of products, a drop in demand for it (Daskovsky and Kiselev 2015).

Thus, the long-term problem of investment accumulation formed in the conditions of the export-raw material model of the national economy for replacing the exhaustion active part of fixed production assets predetermines the need for the exploitation of excessively exhaustion equipment and, in the final analysis, confirms the fairness of the conclusion that the Russian economy has a contradiction between the available human potential and the level of reproduction of fixed assets.

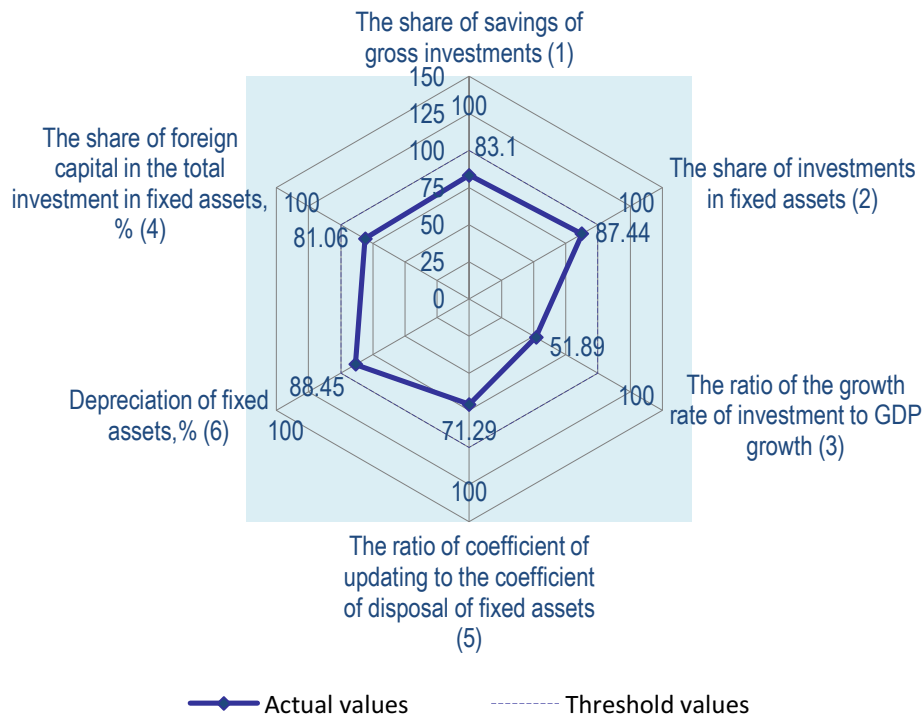
The necessity of activation and intensification of the investment activities in the Russian economy to improve its state and overcome the autonomous recession is also confirmed by the results of an article by the authors of an indicative analysis of the level of investment security. To visualize the results, a flap chart was used, containing the normalized indicators of investment security of the Russian Federation in 2015 (Figure 3). The most alarming indicators are "Ratio of renewal ratio and fixed assets retirement ratio", "Ratio of growth rates of investments and GDP growth rates," which confirms the conclusion that the Russian Federation's economy is not capable of non-industrialization of the productive forces under the current development model.

The current situation in the investment sphere of the Russian Federation has a restraining effect not only on the development of the material and technical base and human potential, but also on the dynamics and intensity of innovative processes in the country's economy and its subjects. In this context, we consider it necessary to dwell on the results of an analysis of the effectiveness of the regional innovative system of a specific constituent territory of the federation, the Republic of Mordovia, conducted by the authors.

The choice of this region is due to the fact that Mordovia is the leader of improving the rank in the rating of innovative development of the Russian Federation regions for 2008-2015 (Gochberg 2016). The Macro model of Innovative System (MMIS) (Chen and Dahlman 2006), consisting of four functional blocks of indicators (financial-economic, scientific-innovative, information-communication and educational) served as a methodological basis for such an analysis. The information base for the study was provided by the Federal Service of State Statistics of Russia. Based on the official statistics, the values of the MMIS indicators are determined; the minimum (x_{min}) and the maximum (x_{max}) value of each indicator are found. By the formula of linear scaling, the dimensionless x_i -th index is calculated (Glusin and Kalyuzhny 2011):

$$x_i = \frac{x_i - x_{min_i}}{x_{max_i} - x_{min_i}}. \quad (1)$$

Figure 3. Assessment of the severity of the crisis situation in the investment sphere of the Russian Federation



Source: authors' calculations.

With this definition, the resulting relative indicators x_i are always in the range from 0 to 1. The average level of indicators is determined by the value $x_i = 0.5$. Then higher the excess of x_i over the average value, then more actively innovative processes develop in the constituent territory of the federation and, conversely, at $x_i < 0.5$, the dynamics of innovative processes cannot be considered satisfactory.

The zero dimension and the same scale of measurement of the relative indices x_i allows them to aggregate. The resulting reduced index characterizing the efficiency of the MMIS indicators occurring within each of the four blocks can be determined using the arithmetic mean.

The effectiveness of the region's innovative system as a whole can be assessed on the basis of the Knowledge Economy Index (*KSI*) of the region, which is proposed to be calculated as the arithmetic mean of the indices of the MMIS functional blocks:

$$Y_i = \frac{\sum_i^4 x_i}{4}. \quad (2)$$

Based on the presented methodology, the authors of the article calculated *KSI* for the Republic of Mordovia, whose value in 2015 was 0.322 against 0.329 in 2011 under the influence of an autonomous recession in the Russian economy. The data of Table 3 show that a significant part of the indicators characterizing the level of development of the innovative system of the Republic of Mordovia does not reach the critical limit of 0.5 (the average value between the maximum and minimum for Russian regions).

Table 3. Efficiency of the innovative system of the Republic of Mordovia, 2011-2015

INDICES	Knowledge Economy Index		Rank of the knowledge economy index	
	2011	2015	2011	2015
1. Indicators of the financial and economic block				
GRP per capita	0.080	0.070	60	66
Profitability of the realized goods of processing branches	0.436	0.538	69	60
Profitability of realized goods of the enterprises electro gas and water supply	0.699	0.800	50	46
Ratio of shipped goods of manufacturing and extractive industries	0.335	0.758	5	2
Workforce productivity	0.024	0.036	69	69
Level of consumer prosperity	0.239	0.326	12	17
Solvency of legal entities	0.298	0.315	61	54
Efficiency of the use of labor resources	0.500	0.688	70	69
2. Indicators of the scientific and innovative block				
Level of scientific qualifications of researchers	0.123	0.129	71	67
The specific weight of internal current costs for equipment acquisition	0.577	0.028	4	69
Quality of inventive activity	0.491	0.624	5	27
Effectiveness of the inventive activity of researchers	0.146	0.117	21	31
Effectiveness of research organizations	0.018	0.025	38	47
Innovative activity of organizations	0.354	0.645	19	9
Rate of return of new technologies	0.061	0.487	47	7
Efficiency of costs for new technologies	0.127	0.155	9	16
3. Indicators of the information and communication unit				
Number of personal computers per 100 employees	0.244	0.156	49	64
Expenditures on ICT per capita	0.076	0.011	57	77
Relative specific weight of organizations using personal computers	0.365	0.531	77	67
The specific weight of organizations using special soft for scientific studies	0.098	0.036	62	74
The specific weight of organizations using special software to managing automated production or individual technical means	0.379	0.259	59	56
The specific weight of organizations using special software to solve organizational or economic problems	0.098	0.540	62	11
4. Indicators of the educational block				
Increasing the level of education	0.509	0.631	35	25
The ratio of the total number of specialists with primary and secondary vocational education and specialists with higher education	0.302	0.159	37	49
Number of specialists graduating from a higher educational institution	0.425	0.033	33	48
The number of students in educational institutions per 10,000 of population	0.514	0.532	20	14

At the same time, the most problematic indicators were the 1st (financial and economic) block "GRP per capita" and "workforce productivity". Low values of the indicator "expenditures on ICT per capita" ultimately determined the corresponding values of the indicators "use of personal computers in organizations" and "use of specialized software for solving organizational, managerial and other economic problems".

In addition, during the clusterization of constituent territories of the Russian Federation (based on the method of *k*-average), according to the criterion "the value of the Knowledge Economy Index of the region (*KSI*)" it was

established: firstly, the existence of a significant gap between the cities of federal significance and the other constituent territory of the federation; secondly, the preservation in 2011-2015 low innovative activity in most of the regions (Table 4).

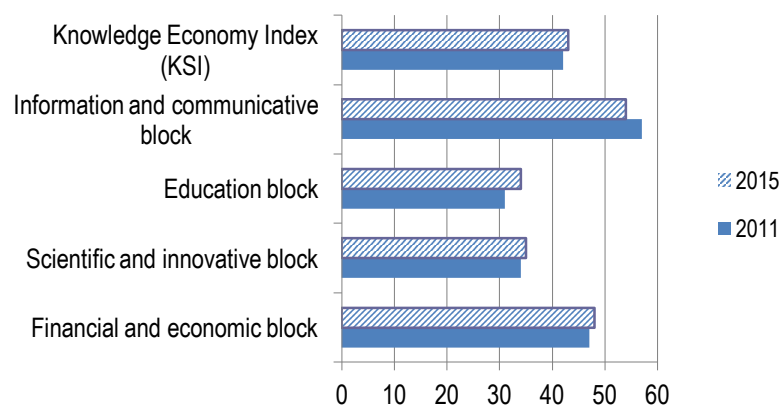
As a result of clustering, the Republic of Mordovia was included in the III cluster - the largest group of regions (37). The peculiarity of this cluster is low workforce productivity in its constituent entities; low levels of consumer security and scientific qualifications of researchers with high values of the proportion of internal current costs of equipment and the effectiveness of inventive activity of researchers.

Table 4. Clusterization of the constituent territories of the Russian Federation by *KSI* (based on *k*-average), 2014

Cluster No.	Constituent territories of the Federation
K1 (<i>KSI</i> =0.502)	Moscow, St. Petersburg, Irkutsk Region, Tomsk Region, Khabarovsk Region, Magadan Region.
K2 (<i>KSI</i> =0.342)	Moscow Region, Republic of Karelia, Komi Republic, Arkhangelsk Region, Leningrad Region, Murmansk Region, Krasnodar Territory, Republic of Tatarstan, Perm Region, Orenburg Region, Sverdlovsk Region, Tyumen Region, Altai Republic, Khakassia Republic, Krasnoyarsk The Kemerovo Region, the Republic of Sakha (Yakutia), the Kamchatka Territory, the Sakhalin Region, Chukotka Autonomous District
K3 (<i>KSI</i> =0.320)	Belgorod Region, Bryansk Region, Vladimir Region, Voronezh Region, Ivanovo Region, Kaluga Region, Kostroma Region, Kursk Region, Lipetsk Region, Orel Region, Omsk Region, Ryazan Region, Smolensk Region, Tver Region, Tula Region, Yaroslavl Region, Vologda Region, Kaliningrad Region, Novgorod Region, Pskov Region, Rostov Region, Republic of Dagestan, Kabardino-Balkaria Republic, Stavropol Territory, Republic of Bashkortostan, Mariy El Republic, <i>Republic of Mordovia</i> , Udmurt Republic, Kirov Region, Nizhny Novgorod Region, Penza Region, Samara Region, Saratov Region, Ulyanovsk Region, Kurgan Region, Chelyabinsk Region.
K4 (<i>KSI</i> =0.285)	Tambov Region, Republic of Adygea, Republic of Kalmykia, Astrakhan Region, Volgograd Region, Karachay-Cherkess Republic, Republic of North Ossetia-Alania, Republic of Buryatia, Republic of Tyva, Altai Territory, Novosibirsk Region, Primorsky Territory, Amur Region, Jewish Autonomous Region
K5 (<i>KSI</i> =0.251)	Republic of Ingushetia, the Chechen Republic, the Transbaikal Territory

Dynamics of the ranks of the main indicators of the knowledge economy of the Republic of Mordovia in 2011-2015 is shown in Figure 4. As can be seen from the data in Figure 4, the Republic of Mordovia, in spite of the low efficiency of its innovative system, in general for 2011-2015 managed to improve their positions (except indicators of the information and communication unit) in the rating of innovative development of the constituent territories of the Russian Federation.

Figure 4. Structure and Dynamics of the Ranks of the Main Indicators of the Knowledge Economy of the Republic of Mordovia from 2011 to 2015



5. Suggestions

With regard to the current Russian situation, the stable overcoming of the autonomous recession in the country, the degradation of its material and technical base and the low efficiency of the national innovative system is impossible without a radical transformation of the state investment policy and intensification of investment activities of economic subjects. The central part of the investment policy should be the creation of modernized industrial production in all vital sectors and spheres of activity. At the same time, the strategic task of establishing the country as a leader in scientific, technical and socio-economic development must be resolved. The solution of this complex task involves the following basic conditions:

1. Dynamic and large-scale increase of such a generalizing, integrated indicator of economic and investment security, as a share of the accumulation of gross domestic investment in the GDP of the Russian Federation. As noted above, this is due to the current predominance of capital-intensive (fuel and raw materials) industries in the economy of the country, on the one hand, and the prospects for the development of science-intensive industries (including machinery industry) and the introduction of nanotechnology, on the other. In the conditions of increasing the capital intensity of production, it seems expedient to increase the share of accumulation in GDP spent for investment from the current 20.3% to 28-30%, directing them through the Russian development bank to target investing in innovations and lending to the venture business (Senchagov 2014).

To increase the share of accumulation in GDP, it is also necessary to create a reliable mechanism for transforming the money accumulated by the population into investments by guaranteeing a full return of deposits under any defaults and charging high interest rates when investing in securities lending to investment projects for the development of the real sector of the Russian economy.

In addition, I would like to hope that the transition to the use of the program-target principle for the allocation of monetary funds to the federal budget's expenditure part, which began in 2014, will finally allow us to intensify investment activities and speed up the re-industrialization of the Russian economy.

2. Creation of a favorable macro environment for the radical transformation of the investment policy of Russian enterprises in the direction of restoring the active part of fixed assets and carrying out R&D on breakthrough technologies for the growth of the technical and technological level of production. This, above all, assumes optimization and reduction of the tax burden on commodity producers. For Russian companies producing tangible goods and products, the actual tax burden is 40% versus 25-30%, for example, in USA, Canada, Switzerland, Japan, hampering investment activity in the country. The rate of income tax is 20% (it is lower than, for example, in Lithuania and Latvia, etc.). However, in foreign countries the rate of this tax is differentiated and depends on the income of corporations. In the United States, there is no VAT for business (18% in the Russian Federation) and there is no property tax (2.2% in the Russian Federation), and equipment worth up to 2 million dollars per year is written off to cost; social contributions account for 13.3% (in the Russian Federation - 30%) (Kormishkina *et al.* 2015).

From the perspective of the creation of a favorable macro environment as a factor of stimulating investment activity in the real sector of the Russian economy, certain doubts are raised by the proposals of the Government of the Russian Federation regarding the implementation of the "tax maneuver" associated with the switchover in 2015-2017 channel of revenue receipt to the budget from the export-raw materials sector by replacing export duties by increasing the MET. Such measures, in our opinion, are virtually equivalent to an increase in the tax burden in this sector of the economy, which, unquestionably, will lead to an inevitable increase in costs of the production of finished goods.

Particular attention in this context should be paid to depreciation policy (use of depreciation for the purpose of renovation and development). The increasing physical wear and tear on equipment and technologies, the depletion of the depreciation fund, compensated not by physical renewal of fixed assets, but virtual - through accounting procedures for their revaluation - lead to a reduction in own working capital and forced replacement by expensive borrowed funds, causing an artificial investment hunger.

An important condition for the confrontation of destructive inflation and the return of the process of reproduction into a normal channel is the currently missing line of medium- and long-term lending for investment

demand for business at moderate rates, observing a well-known macro-financial ratio of the economic profitability, interest rates and inflation. Its failure to comply with careful analysis explains many existing problems to date, related to the underinvestment and withdrawal of capital in speculative operations, as well as its "illegal" outflow abroad.

3. Wider use of venture capital, which performs the function of a special investment resource in social reproduction, aimed at enhancing scientific, technical and innovative activities. It should be noted that the basic prerequisites have been created for the formation of venture capital and the development of venture capital investment in Russia (regulatory framework, institutional infrastructure in the form of various venture funds and the association of business angels that develops the activity of public-private partnerships (PPP). To activate venture investment in the Russian Federation, it is necessary:

- to expand the set of sources of venture investments through the formation of new forms of PPP;
- to enrich the mechanism of the state impact on the development of venture investment by additional motivation (tax benefits, free transfer of state intellectual property, exclusive guarantees, special protection of the rights of venture investors);
- to develop strategic programs for the development of the venture industry in each constituent territory of the Russian Federation, large municipal entities (Kushlin 2016).

4. Stimulation of investment and innovative activities of existing and newly created state corporations for the priority development of the high-tech complex of the ETC as a key source of innovative technical and technological resources in investment activities. It should be noted that today's ETC in the Russian Federation needs not just to update the technological basis on a modern scientific basis, but to building a constantly renewed interaction of its production sphere with a fundamental search and applied science (Kushlin 2016).

5. Formation of the insurance system for investment risks. We are talking about the risks that inevitably arise in the sphere of investing economic activity in the process of capitalization of financial and borrowed funds, caused by the need for reproduction and accumulation of fixed capital. As a rule, the majority of large investment projects are characterized by the impact of an integrated set of investment risks that make it difficult to implement the project. The way out of this situation is seen in attracting specialized insurance companies that are able to mitigate the consequences of investment risks to participation and implementation of such projects.

6. Creation of a loan fund for industry in the form of a state extra-budgetary fund in order to ensure government procurement in priority sectors of the manufacturing industry. Such a fund should be created both at the federal level and in the form of territorial units and function on the principles of subordination and coordination of actions, transparency, control and targeted use of funds.

The sources of such a fund could be natural rent, international reserves of the country, temporarily free funds of extra budgetary funds and state corporations, loans from the Bank of Russia, investment resources of Bank for Foreign Economic Activity, Sberbank of Russia, Bank for Foreign Trade, and so on.

Conclusion

At present, the macroeconomic and institutional conditions formed in Russia under the influence of the export-raw model of the national economy do not make a proper contribution to increasing investment activity and intensification of investment activities of economic entities, which ultimately restrains the reindustrialization of the productive forces and fixes the technological and economic backwardness of the Russian Federation from developed countries.

In this situation, it is obvious that there is a need to change the economic paradigm, to implement the accelerated modernization of the economy on the basis of innovative type investments, with a view to the subsequent transition of the Russian Federation to neoindustrial development. The driving force of such development is called upon to be the most educated part of society, which is the bearer of key competencies and world-view attitudes. In this connection, the importance of the relevant transformations in the system of education and retraining of personnel is growing.

Acknowledgments

The article was prepared with the financial support of the Russian Foundation of Fundamental Research (RFFR), project No. 15-02-00174 "Development of the Theory and Methodology of Innovative Investment Formation from the Point of View of the Neoindustrial Modernization Paradigm".

References

- [1] Antonova, O. I. et al. (Eds.).2012. *Russia and the Countries of the World: 2012*.Statistical Book. Moscow: Rosstat.
- [2] Bell, D. 1999. *The Future Post-Industrial Society. The Experience of Social Prediction*. Moscow: Academy. [in Russian]
- [3] Blagikh, I. 2014. Country Needs a New Industrialization. *The Economist*, 10: 10-17. [in Russian]
- [4] Chen, D.H.C., and Dahlman, C.J. 2006. *The Knowledge Economy, the KAM Methodology and World Bank Operations*. World Bank Institute, Washington, D.C.
- [5] Daskovsky, V., and Kiselev, V. 2015. The State of the Economy and its Adequate Measurement.*The Economist*. 11: 3-24. [in Russian]
- [6] Daskovsky, V., and Kiselev, V. 2016.Volume, Directions and Structure of Investments. *The Economist*. 5: 56-68. [in Russian]
- [7] Glaziev, S.Y., and Lokosov, V.V. 2012.Evaluating Extremely Critical Indicators of the State of Russian Society and Managing Socioeconomic Development with them. *Herald of the Russian Academy of Science*, 4(82): 229-245. DOI: 10.1134/S101933161204003X
- [8] Glisin, F., and Kalyuzhny, V. 2011.Monitoring of Regional Innovative Systems. *The Economist*, 6: 18-26. [in Russian]
- [9] Gochberg, L. M. (Ed.) 2016. *The Rating of Innovative Development of the Constituent Territories of the Russian Federation*. 4th Edition. Moscow: National Research University Higher School of Economics, [in Russian]
- [10] Golichenko, O.G. 1973. Main Factors of Development of the National Innovative System: Lessons for Russia. Moscow: Nauka. [in Russian]
- [11] Gubanov, S. 2011.Toward a Policy for the Neoindustrialization of Russia. *Problems of Economic Transition*, 53(11): 39-67. [in Russian]
- [12] Gubanov, S. 2012. *State Breakthrough. Russia's Non-Industrialization and Vertical Integration*. Moscow: Knizhny Mir. [in Russian]
- [13] Gubanov, S. 2015. Crisis Realities of Russia and Their Refraction in Government Assessments (analysis of the article by D. Medvedev). *The Economist*, 10: 3-50.
- [14] Ivanova, N. I. 2012.Research and Innovation in a Polycentric World. *Herald of the Russian Academy of Science*, 4(82): 269-280. DOI: 10.1134/S1019331612040090
- [15] Kazakova, O.B., Iskhakova, E.I., and Kuzminykh, N.A. 2014. Intelligent Capital: Composition, Structure and Conceptual Basis of Management. *Economics and Management: Scientific and Practical Journal*, 5 (121): 68-72.
- [16] Kormishkina L. A., Kormishkin E. D., Semenova N. N., and Koloskov, D. A. 2015. Favorable Macro Environment: Formula of Investment Activity Growth under the Economic Paradigm Shifted. *Mediterranean Journal of Social Sciences*, 6(4): 163–171. DOI: 10.5901/mjss.2015.v6n4s4p163

- [17] Kormishkina, L. A., Kormishkin, E. D., and Koloskov, D. A. 2016. Multiplier and Accelerator Effects of Investments in the Russian Economy (Facts, Trends and Prospects). *Indian Journal of Science and Technology*, 9(29): 115-128. DOI: 10.17485/ijst/2016/v9i29/99443.
- [18] Kun, T.S. 2014. *After the Structure of Scientific Revolutions*. Moscow: Publishing house: AST, Harvest. [in Russian]
- [19] Kuslin V.I. (Ed.) 2016. *Innovative Filling of the Investment Policy*: Monograph. Moscow: Prospect. [in Russian]
- [20] Masuda, Y. 1983. *The Information Society as Postindustrial Society*. Washington: World Future Soc.,
- [21] Mayevsky, V.I. 2015. Switchover Mode of Reproduction and the Problem of Coordination. *Economy of the Region*, 1: 10-17. DOI: 10.17059/2015-1-1
- [22] Milner. B.Z. (Ed.) 2013. *Innovative Development: Economy, Intellectual Resources, Knowledge Management*. Moscow: INFRA-M. [in Russian]
- [23] Oksenoit, G.K., et al. (Eds) 2016. *Russia and the Countries of the World: 2016. Statistical Book*. Moscow: Rosstat. Available at: http://www.gks.ru/free_doc/doc_2016/world16.pdf [in Russian]
- [24] Pogosov, I., and Sokolovskaya, E. 2014. Accumulation and Consumption in the Context of Neo-Industrial Modernization of the Economy. *The Economist*, 9: 41-54. [in Russian]
- [25] Porter, M. 2016. *International Competition: Competitive Advantages of Countries*. Moscow: Alpina Publisher. [in Russian]
- [26] Pronin, P., and Gritsenko, V. 2016. The Concept of Neoindustrialization and its Criticism. *The Economist*, 12: 43-47.
- [27] Rodrik, D. 2011. *The Globalization Paradox: Democracy and the Future of the World Economy*. New York: W. W. Norton&Company, Inc.
- [28] Rodrik, D. 2016. *The Economy Decides: Strength and Weakness of "Dark Science"*. Moscow: Gaidar Institute Press. [in Russian]
- [29] Romanova, O.A. 2017. Innovative Paradigm of the New Industrialization in the Conditions of Formation of an Integrated World Economic Structure. *Economy of the Region*, 17 (1): 276-289. DOI: 10.17059/2017-1-25
- [30] Senchagov, V.K. 2013. *Innovative Transformations as Imperative of Sustainable Development and Economic Security of Russia*. Moscow: Ankil. [in Russian]
- [31] Senchagov, V.K. 2015. *Economic Security of Russia. General Course: textbook*. 5th ed. (electronic). Moscow: BINOM. Laboratory of Knowledge. [in Russian]
- [32] Stiglitz, J., Sen, A., and Fitoussi, J.-P. 2016. *Falsely Estimating Our Lives: Why GDP Does Not Make Sense*. Report of the Commission on Measuring the Efficiency of the Economy and Social Progress: Trans. from English. Moscow: Gaidar Institute Press. [in Russian]
- [33] Stiglitz, J., Yifu Lin, J., and Monga, C. 2013. *The Rejuvenation of Industrial Policy*. Policy Research Working Paper. 6628. The World Bank.
- [34] Toffler, E. 2004. *The Third Wave*: Monograph. Moscow: AST. [in Russian]
- [35] Tolkachev, S. 2015. Two Models of Neoindustrialization: Germany - "industry 4.0", the United States - "industrial Internet". *The Economist*, 9: 13-23. [in Russian]
- [36] Zaitsev, A.A. 2016. Cross-Country Differences in Workforce Productivity: The Role of Capital, the Level of Technology and Natural Rent. *Issues of Economics*, 9: 67-93. [in Russian]

[37] Zubova, L.G. 2012. The Human Potential of Russian Science. *Herald of the Russian Academy of Science*. 4(82): 295-301. DOI: 10.1134/S1019331612040120

*** *Investments in Russia*. 2015: Statistical Book Moscow: Rosstat, 2015.

*** *Statistical Yearbook of Russia: Statistical Pocketbook*. 2016. Moscow: Rosstat,

*** *Russia in figures: Statistical Handbook*. 2016. Moscow: Rosstat. Available at: http://www.gks.ru/free_doc/doc_2016/rusfig/rus16e.pdf

Effect of Marketing Strategy and Experiential Value on Behavior Intention of Community in Dealing with ASEAN Economic Society

Beby Karina Fawzee SEMBIRING¹
Department of Management, Faculty Economics and Business
Universitas Sumatera Utara, Indonesia
beby@usu.ac.id

Ami DILHAM
Department of Management, Faculty Economics and Business
Universitas Sumatera Utara, Indonesia
ami@usu.ac.id

Fivi Rahmatus SOFIAH
Department of Management, Faculty Economics and Business
Universitas Sumatera Utara, Indonesia
fivii@usu.ac.id

Ilyda SUDRADJAT
Department of Economic Development, Faculty Economics and Business
Universitas Sumatera Utara, Indonesia
ilyda.s@usu.ac.id

Suggested Citation:

Sembiring, B.K.F, Dilham, A., Sofiah, R.F and Sudrajat, I 2017. Effect of marketing strategy and experiential value on behavior intention of community in dealing with ASEAN Economic Society. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 2101-2117.

Abstract

The purpose of this research is to know and analyze the influence of product, price, place, promotion, service excellence, servicescape, and playfulness toward behavioral intention of society in face of ASEAN Economic Community competition. The population in this study is the community of UMKM product users with the number of samples of 100 respondents selected by using Purposive Sampling technique. Primary data collection using questionnaires and secondary data collection using literature study. Hypothesis testing in this study using multiple linear regression analysis with significance value $\alpha = 5\%$ (0.05). The results show that product, price, place, promotion, service excellence, service escape, and playfulness have positive and significant influence toward behavioral intention of society in facing ASEAN Economic Community. The value of Adjusted R Square obtained by testing the Coefficient of Determinant (R^2) is 0.559 means that 55.9% of the behavioral intention of the community in facing the ASEAN economic community competition as dependent variable can be explained by the independent variables ie, product, price, place, promotion, service excellence servicescape, and playfulness while the remaining 44.1% can be explained by other variables not examined in this study.

Keywords: product; price; place; promotion; service excellence; servicescape; playfulness; behavioral intention

JEL Classification: M0; M30; P33; R58; D78

Introduction

Entering the era of ASEAN Economic Community (AEC), it encourages people to create businesses that will support their income besides working. The ASEAN Economic Community (AEC) is a manifestation of the ASEAN 2020 vision which affirms that ASEAN will create a stable, prosperous, and highly competitive ASEAN Economic Zone characterized by freer flow of capital, equitable economic development and reduced poverty and socio-

¹ Faculty Economics and Business Jl. Prof. TM Hanafiah, SH No.12 Medan, North Sumatera, Indonesia 20155

economic disparities, accelerating the trade liberalization in the field of services, and increasing the movement of professionals and other services freely in the region.

The Indonesian government's efforts in reducing poverty and socio-economic disparities is by focusing on boosting the creative economic growth through Micro, Small, and Medium Enterprises (MSMEs) that have international competitive quality standards (Muda *et al.* 2016). The Indonesian government encourages the productivity of Indonesian people to innovate their business development to meet the needs and demands of the market (Sirojuzilam *et al.* 2016; Tarmizi *et al.* 2016, 2017). MSMEs should understand the needs of the target market and create value for customers by setting marketing strategies aimed at understanding customer satisfaction better than competitors.

The percentage pattern of the people in spending their income for consumption and investment. Table 1 explains that at average consumers spend most of their income to buy commodity in food and beverage category, which is equal to 13.37%. Meanwhile, from other sector, Indonesian people mostly spend their income in the form of investment and consumption in housing sector and household facilities, which is amounted to 20.75%. The consumption of various kinds of goods and services is amounted to 12.35%. It indicates that the food and beverage sector is one of the highest sectors and the most demanded by Indonesian consumers.

Changes in lifestyle, habits, tastes and the way to enjoy and consume food in urban communities make culinary entrepreneurs become more creative in pouring new ideas to create food and drinks which are more creative, modern and preferred by consumers. Location, price, taste of food, and quality of service are no longer be the main reason of the consumers in choosing the type of food they want to consume. It is seen from the proliferation of businesses that offer ready food and beverages, whether they are typical food or beverage of certain areas in the form of snacks, cakes and chips, hangout place, café, or restaurant that offers fast food.

Globalization removes the barriers of trading, creating a wide space for the business world. Technological developments make people familiar with the various types of food that exist all over the world, whether it is a new type of food product or the development of existing food product which is created more attractive in accordance with the wishes of modern people that is not limited through social media. According to Chris Brogan (2010), in his book entitled *Social Media 101 Tactic and Tips to Develop Your Business Online*, social media is defined as a new set of communication and collaboration tools that allow many kinds of communication with various interactions that previously were not available to ordinary people. Meanwhile, according to Dailey (2009) social media is an online content created using publishing technologies that are highly accessible and scalable. The most important thing from technology is the shifting way of people know, read, and share news and search for information or content (Muda *et al.* 2017, Sadalia *et al.* 2017). Recently, there is a lot of social media content to connect one person or more with other people who exist in various places around the world. The popular social media nowadays are instagram, facebook, twitter, path and so forth.

Social Media connects all types of people and all types of businesses to inform various things in the world. In addition to seeking information and communication, social media is also used as a promotion media by businessman/ businesswoman to provide information about the products for consumers (Sadalia *et al.* 2017). Promotion means the activities to convey the benefit of the products and persuade the customers to buy it (Kotler and Armstrong 2008). Promotion in the current digital era should not just be done in a traditional way namely *Word of Mouth* anymore. Through social media, the promotion tends to be more significantly known by consumers. Just like the power of mouth to mouth, social media has a similar way of working, such as instagram uses the sign # or commonly called *hashtag* which refers to the activity being done, place, or something that is used or that will be shown by the instagram user. It is an activity or something new and is being hotly discussed/trending topic to be shared or disseminated.

This is the opportunity that marketers need to catch in order to start a new business or to expand their business. The marketing strategy that is done through promotion in social media has a big influence on today's society behavior of modern economics. The marketing strategy is the marketing logic where the business is expected to create value customers and achieve a profitable relationship (Kotler and Armstrong 2008). Furthermore, the business unit can design an integrated marketing mix consisting of several factors under its control namely product, price, place, and promotion.

According to Kotler and Armstrong (2008) the marketing mix itself is a collection of tactical controlled marketing tools that is combined by the company to produce the desired response in the target market. These various possibilities can be categorized into four groups of variables called 4P. They are Product, Price, Place, and Promotion. Such a marketing strategy can be utilized by businessman/businesswomen, especially for Micro, Small, and Medium Enterprises or commonly referred to as MSMEs. Recently, the development of MSMEs becomes the main focus of creative economic growth that is being optimized by the Indonesian government. The rate of growth and development of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia in 2012-2013 keeps increasing.

Table 1. Data of Micro, Small, and Medium Enterprises (MSMEs) and Large Enterprises (LE) Development in 2012 – 2013

No	Indicator	Unit	Year 2012 **)		Year 2013 ***)		The Development Year 2012-2013	
			TOTAL	(%)	TOTAL	(%)	TOTAL	(%)
(1)	(2)	(3)	(6)	(7)	(8)	(9)	(10)	(11)
1	BUSINESS UNIT (A+B)	(Unit)	56.539.560	100	57.900.787	100	1.361.227	2.41
	A. Micro, Small, and Medium Enterprises (MSMEs)	(Unit)	56.534.592	99.99	57.895.721	99.99	1.361.129	2.41
	- <i>Micro Enterprises (MiE)</i>	(Unit)	55.856.176	98.79	57.189.393	98.77	1.333.217	2.39
	- <i>Small Enterprises (SE)</i>	(Unit)	629.418	1.11	654.222	1.13	24.803	3.94
	- <i>Medium Enterprises (ME)</i>	(Unit)	48.997	0.09	52.106	0.09	3.110	6.35
	B. Large Enterprises (LE)	(Unit)	4.968	0.01	5.066	0.01	98	1.97
2	LABOR (A+B)	(People)	110.808.154	100	117.681.244	100	6.873.090	6.20
	A. Micro, Small, and Medium Enterprises (MSMEs)	(People)	107.657.509	97.16	114.144.082	96.99	6.486.573	6.03
	- <i>Micro Enterprises (MiE)</i>	(People)	99.859.517	90.12	104.624.466	88.90	4.764.949	4.77
	- <i>Small Enterprises (SE)</i>	(People)	4.535.970	4.09	5.570.231	4.73	1.034.262	22.80
	- <i>Medium Enterprises (ME)</i>	(People)	3.262.023	2.94	3.949.385	3.36	687.363	21.07
	B. Large Enterprises (LE)	(People)	3.150.645	2.84	3.537.162	3.01	386.517	12.27
3	GDP AT CURRENT PRICES (A+B)	(Rp. Billion)	8.241.864.3	100	9.014.951.2	100	773.086.9	9.38
	A. Micro, Small, and Medium Enterprises (MSMEs)	(Rp. Billion)	4.869.568.1	59.08	5.440.007.9	60.34	570.439.8	11.71
	- <i>Micro Enterprises (MiE)</i>	(Rp. Billion)	2.951.120.6	35.81	3.326.564.8	36.90	375.444.2	12.72
	- <i>Small Enterprises (SE)</i>	(Rp. Billion)	798.122.2	9.68	876.385.3	9.72	78.263.1	9.81
	- <i>Medium Enterprises (ME)</i>	(Rp. Billion)	1.120.325.3	13.59	1.237.057.8	13.72	116.732.5	10.42
	B. Large Enterprises (LE)	(Rp. Billion)	3.372.296.1	40.92	3.574.943.3	39.66	202.647.2	6.01
4	GDP AT CONSTANT PRICE 2000 (A+B)	(Rp. Billion)	2.525.120.4	100	2.670.314.8	100	145.194.4	5.75
	A. Micro, Small, and Medium Enterprises (MSMEs)	(Rp. Billion)	1.451.460.2	57.48	1.536.918.8	57.56	85.458.5	5.89
	- <i>Micro Enterprises (MiE)</i>	(Rp. Billion)	790.825.6	31.32	807.804.50	30.25	16.978.9	2.15
	- <i>Small Enterprises (SE)</i>	(Rp. Billion)	294.260.7	11.65	342.579.19	12.83	48.318.5	16.42
	- <i>Medium Enterprises (ME)</i>	(Rp. Billion)	366.373.9	14.51	386.535.07	14.48	20.161.1	5.50
	B. Large Enterprises (LE)	(Rp. Billion)	1.073.660.1	42.52	1.133.396.05	42.44	59.735.9	5.56
	C. Government	(Rp. Billion)						

Source: Ministry of Cooperatives and SMEs. www.depgo.id (2014)

Based on the table above, from the business unit aspect, it can be seen that MSMEs had increased from 2012-2013 by 2.41%, while in terms of labors, MSMEs had increased by 6.20%. GDP at current prices had increased by 9.38 and GDP at constant prices had increased by 5.75%. Among so many products, they do not only offer the consumable use value, but also the appearance or packaging, such as a unique name or a certain characteristic, which has historical, art and culture value, uniqueness of presentation, distinctive taste, a widely known brand, and so forth. From those values, it can be seen how the experience of the customers who try and desire the uniqueness of a particular product and can be applied the experiential marketing. Experiential marketing is defined as an event or experience that gives the target to explore the products and experiences for future purchases. Experiential marketing is more focused on extracting the essence of the product and then applying it into intangibles, physical, and interactive experiences that enhance the value of the product or service and help the customers to make their purchasing decisions (Williams 2006).

1. Literature review

Behavioral Intention

According to Peter and Olson (2014), behavioral intention arises from the selection or decision-making process when two types of consequences, namely attitudes and subjective norms are considered and integrated to evaluate alternative behaviors and choose between them.

Place food branding

Brand is a set of assets (and liabilities) associated with brand names and symbols that add or derive from the value provided by a product or service (Aaker 1996). Brand is basically a message or symbol that differentiates and is used to identify a product or service. The purpose of brand is to differentiate a product with other similar products. Anholt (Kavaratzis 2011) provides a framework to evaluate the effectiveness of place food branding, as well as a tool that primarily helps in branding effort. Place Food Branding is divided into six dimensions, namely The Presence, The Place, The Potential, The Pulse, The People and The Prerequisites.

Customer experience

According to Schmitt, Customer Experience Management (CEM) is a process of strategically managing the entire customer experience with a product or company. All aspects of the product or service are related to the human senses through sight, sound, touch, taste, and smell. Sense deals with styles and verbal or visual symbols that capables of creating the integrity of an impression (Schmitt 2003). Experience must connect brands with consumers both rationally and emotionally (Handoko *et al.* 2017). Thus, the company should create a touch point (physical and non physical) with the brand to create a deep impression and embedded in consumers' mind (Brakus *et al.* 2009, Joseph 2010).

Experiential marketing

Experiential Marketing is a process of identifying and satisfying the need of consumers and beneficial aspirations, involving the consumers through two-way communication. Two-way communication and interactive engagement is the key to create an impressive experience that drives word of mouth, and transforms consumers into the brand supporter and develop customers' loyalty to a brand (Smilansky 2009). Experiential marketing has four characteristics consisting of:

- focus on functional features and benefits;
- product category and competition are narrowly defined;
- customers are viewed as rational decision makers;
- methods and tools are analytical, quantitative and verbal.

Experiential value

Based on the two dimensions, four types of experience values can be identified: (1) service excellence, the reactive source of the extrinsic value; (2) servicescape, the reactive source of intrinsic value; and (3) playfulness, the active

source of intrinsic value. (Mathwick *et al.* 2001). Bitner (1992) states that there are three composite dimensions relevant for the present analysis, namely ambient conditions, spatial layout and functionality, signs, symbols, and artifacts.

Playfulness

Playfulness exists to some degree in any activity that is free in motion. Playful action has restorative abilities and operates beyond material interests (Day 1981). According to Babin, Darden and Griffin (1994) Escapeism is an entertainment aspect that allows customers to temporarily "gain from it all" often involves "pretending" elements.

ASEAN Free Trade Area (AFTA)

Free market in the ASEAN region (AFTA) or commonly known as the ASEAN Economic Community (MEA), has been echoed by the government since 2015 ago. This free trade aims to create a single market and unity of production in the ASEAN region, where the flow of goods such as service products, production, investment and capital will enter freely. In this free market also, the elimination of tariffs for trade between ASEAN countries. Business SMEs also have great opportunities to gain advantage in this free market, where the government has provided many facilities and facilities aimed at business owners of SMEs (Muda *et al.* 2016).

For Indonesia, MEA will be a good opportunity because trade barriers will tend to decrease even become non-existent. This will have an impact on increasing exports that will eventually increase Indonesia's GDP. This condition can create a climate that supports the entry of Foreign Direct Investment (FDI) that can stimulate economic growth through technological development, job creation, human capital development and easier access to world markets. There is a tremendous opportunity for job seekers because there can be plenty of job opportunities with varying skills needs (Dalimunthe *et al.* 2016). In addition, access to go abroad in search of work becomes easier even can be without any particular obstacles. MEA is also a good opportunity for entrepreneurs to find the best workers in accordance with the desired criteria (Nurzaimah *et al.* 2016). Indonesian workers can also work in ASEAN member countries freely and in accordance with the skills they possess. With the ASEAN Economic Community (MEA), Indonesia can stabilize the country's economy for the better. One example is with the free market, Indonesian goods can expand the range of exports and imports without any cost and too long goods retention in customs. Investors can expand their investment space without any limitations of space between ASEAN member countries.

Entrepreneurs will be more creative because of intense competition, the workforce will increase the level of professionalism and talents it has. Investors from Indonesia are more keen in choosing, and many other positive things that Indonesia can enjoy in the coming ASEAN Economic Community. Indonesian nation will be able to face various challenges in welcoming the coming of ASEAN Economic Community. If we have strong competitiveness, good preparation, domestic products will be host in our own country and we are able to utilize the presence of MEA for enjoying positive impacts for the common good and for the prosperity of the people of Indonesia (Yahya *et al.* 2017). Technology is very helpful in expanding market share to the whole world. In addition, the use of technology will make the work more effective and efficient and timely (Gusnardi *et al.* 2016). Therefore, it is time for the government to conduct regular training on human resources in Indonesia on technology to realize qualified human resources.

Previous research

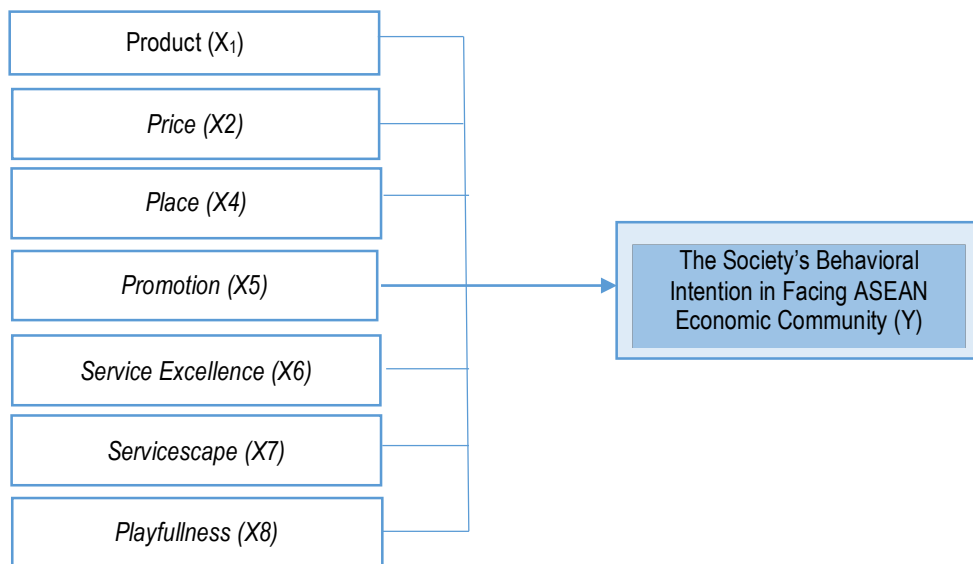
Table 1. Previous Research

Researcher	Title	Variable	Result
<ul style="list-style-type: none"> Alief Rakhman Setyanto, Bhimo Rizky Samodra, Yogi Pasca Pratama (2015) 	<ul style="list-style-type: none"> Study of MSMEs Empowerment Strategy in Facing the ASEAN Free Trade Area 	<ul style="list-style-type: none"> Strategy of MSMEs Empowerment, ASEAN Free Trade Area 	<ul style="list-style-type: none"> Development pattern of Batik Laweyan MSME are by innovating, updating product then applying social capital through expanding business network

Researcher	Title	Variable	Result
<ul style="list-style-type: none"> ▪ Purnama Kusumaastuti Ega Maharani Asih dan Carmidah (2015) 	<ul style="list-style-type: none"> ▪ MSMEs' Strategies and Steps; ▪ In Facing the ASEAN Economic Community (AEC); 	<ul style="list-style-type: none"> ▪ MSMEs' Strategies and Steps, Facing the ASEAN Economic Community (AEC) 	<ul style="list-style-type: none"> ▪ MSMEs Readiness to face AEC requires supports from all parties including governments and MSME associations, because AEC is a global issue that needs to be handled together by government and entrepreneurs.
<ul style="list-style-type: none"> ▪ Vega Cyndra Ragatantya (2015) 	<ul style="list-style-type: none"> ▪ An Analysis on Product Quality And Brand Image Influence to Antimo Consumers' Behavioral Intention 	<ul style="list-style-type: none"> ▪ Product Quality, Brand Image, Behavioural Intention 	<ul style="list-style-type: none"> ▪ Brand Image positively influences behavioral intention. There is a positive influence of product quality on behavioral intention.
<ul style="list-style-type: none"> ▪ Gaby Rodorea Agrippina (2016) 	<ul style="list-style-type: none"> ▪ Consumers' Behavior Intention In Assessing Self Care Services Quality 	<ul style="list-style-type: none"> ▪ Behavior Intention, Self Care Services Quality 	<ul style="list-style-type: none"> ▪ Consumers' behavior intention significantly influences beauty shop services assessment.
<ul style="list-style-type: none"> ▪ Pradipta Ayu Larasati, Budi Suprpto (2015) 	<ul style="list-style-type: none"> ▪ The Influence of Experiential Marketing on Blackberry Product Experiential Value 	<ul style="list-style-type: none"> ▪ The influence of experiential marketing, experiential value 	<ul style="list-style-type: none"> ▪ The research results showed that sense experience, feel experience, think experience, act experience dan relate experience significantly influence customer return on investment and service excellence. Sense experience, feel experience, act experience and relate experience significantly influence playfulness and aesthetic, whereas think experience.

Conceptual framework

Figure 1. Conceptual framework



2. Research methods

Types of research

This research is an associative explanation research. It is a research that aims to determine the relationship between two variables or more. The purpose of explanatory research can also be to explain (Erlina *et al.* 2017). This study has the highest level compared with the descriptive and comparative because with this research can be built a theory that can work to explain, predict and control a symptom.

Variable operational definition

Tabel 2. Variable operationalization

Variable	Definition	Variable Indicator	Scale
<i>Product</i> (X ₁)	Product is everything offered by MSMEs for a market to be noticed, requested, used to satisfy the wants / needs of the society	1. Qualified MSMEs products 2. Unique MSMEs products (Handoko <i>et al.</i> 2017)	Likert
<i>Place</i> (X ₂)	Place can be defined as the choice of place or business location by MSMEs.	1. Strategic MSMEs location. 2. MSMEs location with adequate transportation	Likert
<i>Price</i> (X ₃)	Price is the amount of money needed to obtain some combination of goods and its services set by the MSMEs.	1. The price offered by MSMEs is affordable. 2. The price offered by the MSMEs entrepreneur in accordance with the product quality.	Likert
<i>Promotion</i> (X ₄)	Promotion is a component used to inform and influence the public	1. Advertising through banners / billboards. 2. Advertising through social media.	Likert
<i>Service Excellence</i> (X ₅)	Service Excellence is an activity or sequence of activities that occur in form of direct interaction between the MSMEs entrepreneurs and the community or the machine physically, and provide community satisfaction	1. The MSMEs entrepreneurs provide a pleasant service to the public as consumers. 2. The MSMEs entrepreneurs make customer satisfaction a main priority.	Likert
<i>Servicescape</i> (X ₆)	Servicescape is the physical environment and its elements that influence the behavior of society and form the experience of society in consuming goods or services offered by MSMEs.	1. The MSMEs entrepreneurs create attractive appearance on the products it offers. 2. The MSMEs entrepreneurs provide facilities needed by the society as consumers.	Likert
<i>Playfulness</i> (X ₇)	Playfulness is entertainment as an intrinsic pleasure from activities that absorb people's attention, to the point of offering escape from the demands of the everyday world	1. MSMEs create a trend of social activity among the society to attract public attention as the consumers. 2. MSMEs create an innovation trend that attracts the public attention.	Likert
<i>Behavioral Intention</i> (Y)	Behavioral Intention is defined as the desire of society to behave in a particular way in order to own, discard, use products or services offered by MSMEs	1. MSMEs make people satisfied because their desires are met. 2. People recommend MSMEs products to their close friends.	Likert

Sample and population

The population of this research is people who visited as patients and live in Medan City with the total number of 2.210.624 people. The sample size is determined using the Slovin formula: (Lubis *et al.* 2016)

$$n = \frac{N}{1+Nec^2} \quad \text{in which: } n = \text{number of samples; } N = \text{population size; } e = \text{error level.}$$

Therefore, the number of samples becomes:

$$n = \frac{N}{1+Nec^2} \quad n = \frac{2.210.624}{1+ 2.210.624 (0.05)^2} \quad n = 399.927 \text{ or } 400 \text{ (rounded)}$$

To simplify the research, there were 400 respondents as the sample of this research. The sampling technique used non probability sampling. It is a sampling technique that does not give equal opportunity for every element or member of the population to be selected as sample (Sugiyono 2012). The specified sample criteria are the people who are domiciled in the area of Medan City, people who are in the area of Medan City with the interval age of 17-59 years old.

Types of research data

The primary data in this research were obtained through direct interviews to the respondents based on questionnaires prepared including the identity of the respondents, marketing strategies of MSMEs, Experiential Value, and Behavioral Intention of the Society in ASEAN Economic Community.

Multiple Linear Analysis Hypothesis Testing

Multiple regression models used are:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \epsilon$$

where: Y = Behavioral Intention of the society in facing ASEAN Economic Community, a = Constant; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = Regression coefficient ; $X_1 = Product; X_2 = Price; X_3 = Place; X_4 = Promotion; X_5 = Service Excellence; X_6 = Servicescape; X_7 = Playfulness; e = Standard error.$

3. Results and discussion

3.1. Result

3.1.1 Respondent Characteristics by Sex

The following is the respondent characteristics by sex:

Table 3. Respondent Characteristics by Sex

Sex	Number of Respondents	Percentage
Man	28	28 %
Woman	72	72 %
TOTAL	100	100 %

Source: Primary Research Results (Data Processed in 2017).

Based on the Table, out of 100 respondents of this research, 28 respondents were men (28%) and 72 respondents were women (72%). It shows that female respondents are more dominant in this research.

3.1.2 Respondent characteristics by age

The following is the respondent characteristics by age:

Table 4. Respondent Characteristics by Age

Age	Number of Respondents	Percentage
18-35	72	72 %
36-50	18	18 %
> 51	10	10 %
TOTAL	100	100 %

Source: Primary Research Results (Data Processed in 2017).

Based on the Table, out of 100 respondents of this research, the most dominant respondents were ages 18-35 years old with a total of 72 people (72%), then the respondents aged 36-50 years old were 18 people (18%), and the last was respondents aged > 51 as many as 10 people (10%). It shows that the age range of 18-35 is the most dominant in this research.

3.1.3 Respondent characteristics by occupation

The following is the respondent characteristics by occupation:

Table 5. Respondent Characteristics by Occupation

Occupation	Number of Respondents	Percentage
Employee	41	41%
Non-Employee	59	59%
TOTAL	100	100%

Source: Primary Research Results Data Processed in 2017.

Based on Table, out of 100 respondents, there were 41 people (41%) who worked as employees and 59 people (59%) as non-employee. It shows that non-employees are the most dominant profession in this research.

3.1.4 Multiple Linear Regression analysis

Multiple linear regression analysis was used to test the effect of independent variables on dependent variable. Multiple regression models used are:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \varepsilon$$

where: Y = Behavioral Intention of the society in facing ASEAN Economic Community; a = Constant; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ = Regression coefficient; X_1 = Product; X_2 = Price; X_3 = Place; X_4 = Promotion; X_5 = Service Excellence; X_6 = Servicescape; X_7 = Playfulness; E = Standard error.

To obtain accurate results, the SPSS (Statistic Product and Service Solution) software was used. The result of multiple linear regression analysis can be seen in the following Table:

Tabel 6. Multiple Linear Regression analysis results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	1.848	.601		3.076	.003
	Product	-.072	.089	-.084	-.809	.420
	Price	.029	.070	.032	.409	.684
	Place	-.173	.116	-.157	-1.487	.140
	Promotion	-.087	.092	-.106	-.951	.344
	Service Excellence	.344	.086	.325	3.985	.000
	Servicescape	.290	.118	.320	2.450	.016
	Playfulness	.445	.076	.573	5.835	.000

a. Dependent Variable: Behavioral Intention

Source: SPSS Processing Result (2017).

Based on the result of data processing in the Table, column Unstandardized Coefficients section B, it is obtained the following multiple linear regression equation:

$$Y = 1.848 + (-0.072) X_1 + 0.029 X_2 + (-0.173) X_3 + (-0.087) X_4 + 0.344 X_5 + 0.290 X_6 + 0.445 X_7 + e$$

- Constant (a) = 1.848. It shows constant prices, in which if the product, price, place, promotion, service excellence, servicescape, and playfulness variables are constant, the behavioral intention will be

increased by 1848.

- Coefficient $X_1(\beta_1) = -0.072$. It shows that if the product variable is increased, and the variables of price, place, promotion, service excellence, servicescape, and playfulness are constant, the behavioral intention will be decreased by - 0.072 units
- Coefficient $X_2(\beta_2) = 0.029$. It shows that if the variable of price is increased, and the product, place, promotion, service excellence, servicescape, and playfulness variables are constant, the behavioral intention will be increased by 0.029.
- Coefficient $X_3(\beta_3) = -0.173$. It shows that if the place variable is increased, and the product, price, promotion, service excellence, servicescape, and playfulness variables are constant, the behavioral intention will be decreased by - 0.173 units.
- Coefficient $X_4(\beta_4) = -0.087$. It shows that if the promotion variables are increased, and product, price, service excellence, servicescape, and playfulness variables are constant, the behavioral intention will be decreased by - 0.087 units.
- Coefficient $X_5(\beta_5) = 0.344$. It shows that if the service excellence variable is increased, and the product, price, place, promotion, servicescape, and playfulness variables are constant, the behavioral intention will be increased by 0.344 units.
- Coefficient $X_6(\beta_6) = 0.290$. It shows that if the servicescape variable is increased, and the product, price, place, promotion, service excellence, and playfulness variables are constant, the behavioral intention will be increased by 0.290 units.
- Coefficient $X_7(\beta_7) = 0.445$. It shows that if playfulness variable is increased, and product, price, place, promotion, service excellence, and servicescape variables are constant, the behavioral intention will be increased by 0.445 units.

3.1.5 Classical assumption test

3.1.5.1 Normality test

Normality test using Kolmogorov Smirnov approach can be seen in the following Table:

Table 7. One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		100
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	.97811153
Most Extreme Differences	Absolute	.112
	Positive	.112
	Negative	-.071
Kolmogorov-Smirnov Z		1.117
Asymp. Sig. (2-tailed)		.164
a. Test distribution is Normal		
b. Calculated from data		

Source: SPSS Processing Result (2017).

Based on the Table, it is seen that Asymp.Sig. (2-tailed) value is 0.164, and above 5% significant value (0.05), in other words the residual variable is normally distributed.

3.1.5.2 Heteroscedasticity test

Glejser test result can be seen in the following Table:

Tabel 8. Glejser Test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	1.442	.389		3.707	.000
	Product	.012	.058	.033	.202	.841
	Price	-.024	.046	-.066	-.535	.594
	Place	.033	.075	.073	.433	.666
	Promotion	-.033	.060	-.097	-.549	.585
	Service Excellence	-.092	.056	-.212	-1.637	.105
	Servicescape	.002	.077	.006	.030	.976
	Playfulness	.001	.049	.002	.015	.988

a. Dependent Variable: Res2

Source: SPSS Processing Result (2017).

Based on the Table, it is clear that none of the variables statistically and significantly affect the Ut absolute dependent variable (absUt). This is seen from the probability of significance above the 5% confidence level (Muda *et al.* 2017) so it is concluded that the regression model does not affect heteroscedasticity.

3.1.5.3 Multicollinearity test

The multicollinearity test can be seen in the following table:

Table 9. Multicollinearity test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics		
	B	Std. Error	Beta			Tolerance	VIF	
1	(Constant)	1.848	.601		3.076	.003		
	Product	-.072	.089	-.084	-.809	.420	.374	2.672
	Price	.029	.070	.032	.409	.684	.679	1.473
	Place	-.173	.116	-.157	-1.487	.140	.364	2.749
	Promotion	-.087	.092	-.106	-.951	.344	.327	3.055
	Service Excellence	.344	.086	.325	3.985	.000	.609	1.643
	Servicescape	.290	.118	.320	2.450	.016	.237	4.213
	Playfulness	.445	.076	.573	5.835	.000	.420	2.380

a. Dependent Variable: Behavioral Intention

Source: SPSS Processing Result (2017).

The VIF value of product, price, place, promotion, service excellence, servicescape, and playfulness value is less than 10 (VIF <10), it means between the independent variables in the regression model does not exposed to multicollinearity (Lutfi *et al.* 2016, Azlina *et al.* 2017). Tolerance value of product, price, place, promotion, service excellence, servicescape, and playfulness is greater than 0.10 (Tolerance > 0.10), it means there is no multicollinearity among the independent variables in the regression model.

3.1.6 Hypothesis testing

The value of F_{count} compared with the value of F_{table} at the level of $\alpha = 5\%$ (7:92) = 2.11.

Tabel 10. Simultaneous Significance Testing (F-Test) Result

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	159.246	7	22.749	22.098	.000 ^b
	Residual	94.714	92	1.029		
	Total	253.960	99			
a. Dependent Variable: Behavioral Intention						
b. Predictors: (Constant), Playfulness, Service Excellence, Price, Produk, Promotion, Place, Servicescape						

Source: SPSS Processing Result (2017).

From the Tabel 10, it can be seen that the acquisition of F_{count} in column F is equal to 22.098 with significance level = 0.000. Meanwhile the F_{table} at 95% confidence level ($\alpha = 0.05$) is 2.11. Based on the decision-making criteria, $F_{\text{count}} > F_{\text{table}}$ ($19.228 > 2.11$) and the significance level ($0.000 < 0.05$), therefore H_a is accepted and H_0 is rejected (Nasir *et al.* 2017, Hasan *et al.* 2017). It means that the influence of independent variables (product, price, place, promotion, service excellence, servicescape, and playfulness) are simultaneously positive and significant to behavioral intention. Meanwhile the T-test result is as follows:

Table 11. Partial Significance Test (T-Test) Result

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.848	.601		3.076	.003
	Product	-.072	.089	-.084	-.809	.420
	Price	.029	.070	.032	.409	.684
	Place	-.173	.116	-.157	-1.487	.140
	Promotion	-.087	.092	-.106	-.951	.344
	Service Excellence	.344	.086	.325	3.985	.000
	Servicescape	.290	.118	.320	2.450	.016
	Playfulness	.445	.076	.573	5.835	.000
a. Dependent Variable: Behavioral Intention						

Source: SPSS Processing Result (2017).

Based on the Table 10, it can be seen that:

1. Product Variable (X_1)

The t_{count} value of Product variable is -0.809 and the t_{table} value is 1.661 therefore $t_{\text{count}} < t_{\text{table}}$ ($-0.809 < 1.661$), meaning that H_0 is accepted and H_a is rejected. It can be concluded that product variable negatively, insignificantly ($0.420 > 0.05$), and partially affects Behavioral Intention of the society in facing the ASEAN Economic Community. This condition can happen because the products offered by MSMEs do not suit the Behavioral Intention of the society.

2. Price Variable (X_2)

The t_{count} value of Product variable is 0.409 and the t_{table} value is 1.661 therefore $t_{\text{count}} < t_{\text{table}}$ ($0.409 < 1.661$), meaning that H_0 is accepted and H_a is rejected. It can be concluded that price variable doesn't significantly ($0.684 > 0.05$) and partially affect the Behavioral Intention of the Society in Facing ASEAN Economic Community. This condition can happen because the products offered by MSMEs do not suit the Behavioral Intention of the society.

3. Place Variable (X_3)

The t_{count} value of Product variable is -1.487 and the t_{table} value is 1.661 therefore $t_{\text{count}} < t_{\text{table}}$ ($-1.487 < 1.661$), meaning that H_0 is accepted and H_a is rejected. It can be concluded that price variable doesn't significantly ($0.140 > 0.05$) and partially affect the Behavioral Intention of the Society in Facing ASEAN Economic Community. This condition can happen because the products offered by MSMEs do not suit the Behavioral Intention of the society.

4. Promotion Variable (X_4)

The t_{count} value of Product variable is -0.951 and the t_{table} value is 1.661 therefore $t_{\text{count}} < t_{\text{table}}$ (-0.951 < 1.661), meaning that H_0 is accepted and H_a is rejected. It can be concluded that price variable doesn't significantly (0.344 > 0.05) and partially affect the Behavioral Intention of the Society in Facing ASEAN Economic Community. This condition can happen because the products offered by MSMEs do not suit the Behavioral Intention of the society.

5. Service Excellence Variable (X_5)

The t_{count} value of Product variable is 3.985 and the t_{table} value is 1.661 therefore $t_{\text{count}} > t_{\text{table}}$ (3.985 > 1.661), meaning that H_0 is accepted and H_a is rejected. It can be concluded that price variable doesn't significantly (0.000 < 0.05) and partially affect the Behavioral Intention of the Society in Facing ASEAN Economic Community. This condition can happen because the products offered by MSMEs donot suit the Behavioral Intention of the society.

6. Servicescape Variable (X_6)

The t_{count} value of Product variable is 2.450 and the t_{table} value is 1.661 therefore $t_{\text{count}} > t_{\text{table}}$ (2.450 > 1.661), meaning that H_0 is accepted and H_a is rejected. It can be concluded that price variable doesn't significantly (0.016 < 0.05) and partially affect the Behavioral Intention of the Society in Facing ASEAN Economic Community. This condition can happen because the products offered by MSMEs do not suit the Behavioral Intention of the society.

7. Playfulness Variable (X_7)

The t_{count} value of Product variable is 5.835 and the t_{table} value is 1.661 therefore $t_{\text{count}} > t_{\text{table}}$ (5.835 > 1.661), meaning that H_0 is accepted and H_a is rejected. It can be concluded that price variable doesn't significantly (0.000 < 0.05) and partially affect the Behavioral Intention of the Society in Facing ASEAN Economic Community. This condition can happen because the products offered by MSMEs do not suit the Behavioral Intention of the society.

3.1.7 Coefficient of Determination (R^2)

The coefficient of determination testing result using SPSS program can be seen in the following Table:

Table 12. Coefficient of Determination Testing (R^2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792 ^a	.627	.599	1.015
a. Predictors: (Constant), Playfulness, Service Excellence, Price, Produk, Promotion, Place, Servicescape				
b. Dependent Variable: Behavioral Intention				

Source: SPSS Processing Result (2017)..

The value of R is 0.792. It means that the relationship between product, price, place, promotion, service excellence, servicescape, and playfulness variables to behavioral intention of society in facing economic society of ASEAN variable is equal to 0.792%. It can be said that they have close relationship. Adjusted R Square of 0.599 indicated that 55.9% of the variables can be explained by the behavioral intention of the society in facing the ASEAN economic community through product, price, place, promotion, service excellence, servicescape, and playfulness variables, whereas the rest were not examined in this research.

3.2 Discussion

It is based on the validity test on 16 statements representing valid variables. The r_{count} on the Corrected Item-Total Correlation is greater than r_{table} (0.361) therefore the statement can be used for the research. In reliability test, it is also stated that all statements in this research are reliable because the Cronbach's alpha value is greater than 0.80, which is 0.883. Based on the result of multiple linear regression analysis, product, price, place, promotion, service excellence, servicescape, and playfulness are simultaneously positive and significant to behavioral intention of the society in facing the economic community of ASEAN. The F_{count} test results indicates that F_{count} in column F is equal to 22.098 with significance level = 0.000. Meanwhile the F_{table} at 95% confidence level ($\alpha = 0.05$) is 2.11. It means that product, price, place, promotion, service excellence, servicescape, and playfulness can improve the behavioral intention of the society in facing the ASEAN economic community. The result showed that

lifestyle, brand image, and reference group accounted for 55.9% of purchasing decisions. Meanwhile the rest of 44.1% could be explained by other variables not examined in this study.

Conclusion

The results show that product, price, place, promotion, service excellence, service escape, and playfulness have positive and significant effect on behavioral intention of the society in facing ASEAN Economic Community. The value of Adjusted R Square obtained through Coefficient of Determination (R^2) test of 0.559 means that 55.9% of the society's behavioral intention in facing ASEAN economic community competition as dependent variable can be explained by the independent variables namely product, price, place, promotion, service excellence, servicescape, and playfulness while the remaining 44.1% can be explained by other variables not examined in this research:

- for the Government and the public, it is expected to provide information on the marketing strategies and experiential value of MSMEs as input to formulate strategic policy in facing ASEAN Economic Community;
- as a reference material for further research, it is suggested to enrich the knowledge of marketing strategy and experiential value of MSMEs as an input to formulate strategic policy in facing ASEAN Economic Community;
- for the researcher, this research provides insight and deep understanding about the influence of marketing strategy and experiential value of MSMEs as an input to formulate strategic policy in facing the ASEAN Economic Community.

References

- [1] Andreani, F. 2007. Experiential Marketing (A Marketing Approach), *Journal of Marketing Management*, 2(1): 88-102.
- [2] Anggippina, G. R. 2016. Behavior Consumer Intention in Assessing Service Quality and Personal Care Service (Case Study on Consumer of Salon Service Industry in Bandar Lampung City). *E-Journal Unila*. 6(1): 115-129.
- [3] Anholt, S. 2011. The Anholt - GMI City Brand Hexagon and the Saffron European City Brand Barometer. A Comparative Study. *Journal of Regional and Business Studies*, 3(1): 555- 562.
- [4] Asih, N. S. 2016. The effect of excellent service to customer satisfaction of Agata Singaraja Salon, *Journal of Economic Education Study Program (JPPE)*. 7(2): 155-167.
- [5] Azlina, N., Desmiyawati, A. H., and Muda, I. 2017. The Effectiveness of Village Fund Management (Case Study at Villages in Coastal Areas in Riau). *International Journal of Economic Research*, 14(12): 325-336.
- [6] Barata, A. A. 2003. *Fundamentals of Excellent Service*, Prints 2. PT. Elex Media Komputindo: Jakarta.
- [7] Bitner, M. J. 1992. Servicescape: The Impact of Physical Surroundings on Customers and Employees, *Journal of Marketing*, 56(2): 57-71.
- [8] Dalimunthe, D.M.J., Fadli, and Muda, I. 2016. The application of performance measurement system model using Malcolm Baldrige Model (MBM) to support Civil State Apparatus Law (ASN) number 5 of 2014 in Indonesia. *International Journal of Applied Business and Economic Research*, 14(11): 7397-7407.
- [9] Erlina, A. S., Muda, I. 2017. Antecedents of budget quality empirical evidence from provincial government in Indonesia. *International Journal of Economic Research*, 14(12): 301-312. Available at http://serialsjournals.com/articles.php?volumesno_id=1332&journals_id=41&volumes_id=1068 (accessed July 21, 2017)
- [10] Erlina, A. S. and Muda, I. 2017. The Analysis of the Influencing Factors of Budget Absorption. *International Journal of Economic Research*, 14(12): 287-300. Available at http://serialsjournals.com/articles.php?volumesno_id=1332&journals_id=41&volumes_id=1068 (accessed July 21, 2017)
- [11] Fevzi, O., Mc Kercher, B. 2007. Incorporating local and international cuisines in the marketing of tourism destinations: The cases of Hongkong and Turkey. *Journal of Tourism*, 7(2): 253-261.

- [12] Gesperz, V. 2002. *Quality Management in Service Industry*. Publisher: PT. Gramedia Pustaka Utama, Jakarta.
- [13] Ghozali, I. 2013. *Application of Multivariate Analysis with IBM SPSS 21 Program*. Issue 7, Dipenogoro University Publisher, Semarang.
- [14] Gusnardi, R., R.M., and Muda, I. 2016. Competency mapping and analysis of students' competency based on economics subject national examination and its alternative solutions in state high schools at Pekanbaru. *International Journal of Economic Research*, 3(5): 2133-2148.
- [15] Handoko, Bagus. Sunaryo and Muda, I. 2017. Difference Analysis of Consumer Perception of Motorcycle Product Quality. *International Journal of Economic Research*, 14(12): 363-379.
- [16] Hasan, A., Gusnardi and Muda, I. 2017. Analysis of Taxpayers and Understanding Awareness Increase in Compliance with Taxpayers Individual Taxpayers. *International Journal of Economic Research*, 14(12): 75-90.
- [17] Holbrook, M. B., Corfman, K. P. 1985. Quality and value in the consumption experience: Phaedrus Rides again, In Perceived Quality: How Consumers View Stores and Merchandise. *Journal of Marketing*, 8(1): 177-189.
- [18] Kartajaya, H. 2006. *Hermawan Kartajaya on Marketing*. Gramedia Pustaka Utama: Jakarta.
- [19] Kususmaastuti, Purnama, Ega Maharani Asih, and Camidah. 2015. *Strategy and Steps of SMEs in Facing the Economic Community of ASEAN (MEA)*. Padjadjaran Press.
- [20] Larasati, Pradipta Ayu, and Budi Suprpto. 2015. The Effect of Experiential Marketing on Experiential Value on Blacberry Products. *E-Journal Undip*. 2(2): 34-56.
- [21] Lubis, A., Torong, Z.B., and Muda, I. 2016. The urgency of implementing balanced scorecard system on local government in North Sumatra – Indonesia. *International Journal of Applied Business and Economic Research*, 14(11): 7575-7590. Available at <http://www.serialsjournals.com/serialjournalmanager/pdf/1502169155.pdf> (accessed July 21, 2017)
- [22] Lubis, A.F., Lubis, T.A., and Muda, I. 2016. The role of Enterprise Resource Plan (ERP) configuration to the timeliness of the financial statement presentation. *International Journal of Applied Business and Economic Research*, 14(11): 7591-7608. Available at <http://serialsjournals.com/serialjournalmanager/pdf/1481524509.pdf> (accessed July 21, 2017)
- [23] Lutfi, M., Nazwar, C., and Muda, I. 2016. Effects of investment opportunity set, company size and real activity manipulation of issuers in Indonesia Stock Exchange on stock price in Indonesia. *International Journal of Economic Research*, 13(5): 2149-2161.
- [24] Maddy, K. 2009. *The Nature and Understanding of Excellent Service*. Chama Digital: Jakarta.
- [25] Mathwick, C., Malhotra, N., and Rigdon, E. 2001. Experiential value: conceptualization, measurement and application in the catalog and the Internet shopping environment, *Journal of Retailing*, 77(1): 39-56.
- [26] Mowen, J.C., and Minor, M. 2002. *Management Accounting*. Volume II. Publisher Erlangga: Jakarta.
- [27] Muda, I., and Abykusno Dharsuky. 2015. Impact of Region Financial Information System (SIKD) Quality, Role Ambiguity and Training on Precision of Financial Statement of Local Government Presentation in North Sumatra. *International Journal of Applied Business and Economic Research*, 13(6): 4283-4304. Available at: http://www.serialsjournals.com/articles.php?volumesno_id=919&journals_id=22&volumes_id=788 (accessed July 21, 2017)
- [28] Muda, I., et al. 2017. The Influence of Human Resources Competency and the Use of Information Technology on The Quality of Local Government Financial Report with Regional Accounting System as an Intervening. *Journal of Theoretical and Applied Information Technology*, 95(20): 5552-5561. Available at <http://www.jatit.org/volumes.php> (accessed July 21, 2017).

- [29] Muda, I., Dharsuky, A., Siregar, H.S., and Sadalia, I. 2017. Combined loading and Cross-dimensional loadings timeliness of presentation of financial statements of local government. *IOP Conference Series: Materials Science and Engineering*. 180. DOI: 10.1088/1757-899X/180/1/012099
- [30] Muda, I. et al. 2016. Critical Success Factors Downstream Palm Oil Based Small And Medium Enterprises (SME) In Indonesia. *International Journal of Economic Research*. 13(8): 3531-3538. Available at <http://serialsjournals.com/serialjournalmanager/pdf/1499428227.pdf> (accessed July 21, 2017)
- [31] Muda, I., Mutia I., and Marhayanie. 2017. Impact Allocation Capital Expenditure on The Improvement of the Local Government Assets in North Sumatra and Effect on Local Revenue Sustainability. *International Journal of Economic Perspectives*, 11(2): 151-164. Available at http://www.econ-society.org/ijep_contents_11.2.php (accessed July 21, 2017)
- [32] Muda, I., Dharsuky, A., Sadalia, I., and Siregar, H.S. 2016. Impact of capital investments and cash dividend policy on Regional Development Bank (BPD) PT. Bank Sumut to the district own source revenue and economic growth. *International Journal of Applied Business and Economic Research*, 14(11): 7863-7880. Available at: http://www.serialsjournals.com/articles.php?volumesno_id=1118&journals_id=22&volumes_id=840 (accessed July 21, 2017).
- [33] Muda, I. 2017. The Effect of Supervisory Board Cross-Membership and Supervisory Board Members' Expertise to The Disclosure of Supervisory Board's Report: Empirical Evidence from Indonesia. *European Research Studies Journal*. XX(3A): 702-716. Available at: <https://ideas.repec.org/a/ers/journl/vxxy2017i3ap691-705.html> (accessed July 21, 2017)
- [34] Mudarajad, K. 2013. *Research Methods for Business and Economics*. Issue 4. Issuer Erlangga: Jakarta.
- [35] Nasir, A., Yesi Mutia Basri, Kamaliah and Muda, I. 2017. Effectiveness of Potential Tax Region as the Real Local Revenue Sources in Riau Coastal Area. *International Journal of Economic Research*, 14(12): 313-324.
- [36] Nurzaimah, R., and Muda, I. 2016. The skills and understanding of rural enterprise management of the preparation of financial statements using Financial Accounting Standards (IFRs) financial statement on the Entities without Public Accountability (ETAP) framework on the implementation of village administration law. *International Journal of Applied Business and Economic Research*, 14(11): 7417-7429.
- [37] Pratomo and Shaff, A. 2000. *Excellent service*. Angkasa Bandung: Bandung.
- [38] Rahmayanty, N. 2013. *Excellent Service Management*. Graha Science: Yogyakarta.
- [39] Sadalia, Isfenti, Nur Ahmadi Bi Rahamani and Muda, I. 2017. The Significance of Internet Based Financial Information Disclosure on Corporates' Shares in Indonesia. *International Journal of Economic Research*, 14(12): 337-346.
- [40] Sarwono, J. 2012. *Path Analysis for Thesis Research*, Thesis and Dissertation. Publisher Elexmedia Komputindo: Jakarta.
- [41] Schmitt, B. 1999. Experiential Marketing, how to Get Customer to Sense, Feel, Think, Act, Relate, to your Company and Brands. New York: The free press, *Journal of Marketing Management*, 15(1): 53-67.
- [42] Setyanto, Alief Rakhman, Bhimo Rizky Samodra, and Yogi Pasca Pratama. 2015. Study of MSME Empowerment Strategy in Facing Free Trade Area Asean. *Working Paper*. Universitas Sumatera Utara.
- [43] Sirojuzilam, H., S., and Muda, I. 2016. Identification of factors of failure of Barisan Mountains Agropolitan area development in North Sumatera, Indonesia. *International Journal of Economic Research*, 13(5): 2163-2175.
- [44] Situmorang, S. H., Muslich L. and Muda, I. 2012. *Data Analysis for Management and Business Research*, USU Press, Medan.

- [45] Sugiyono. 2010. *Statistics for Research*. Alfabeta Publisher: Bandung.
- [46] Sunyoto, D. 2009. *Regression Analysis and Hypothesis Testing*. First Edition, Media Pressindo: Yogyakarta.
- [47] Tarmizi, H.B., Daulay, M. and Muda, I. 2016. The influence of population growth, economic growth and construction cost index on the local revenue of tax on acquisition of land and building after the implementation of law no. 28 of 2009. *International Journal of Economic Research*, 13(5): 2285-2295. Available at from <http://www.serialsjournals.com/serialjournalmanager/pdf/1502169196.pdf> (accessed July 21, 2017)
- [48] Tarmizi, HB., Daulay, M., and Muda, I. 2017. Impact of the Economic Growth and Acquisition of Land to the Construction Cost Index in North Sumatera. *IOP Conference Series: Materials Science and Engineering*. 180. DOI: 10.1088/1757-899X/180/1/012004
- [49] Tsang (Smon) Tsai, Wang. 2016. Experiential value in branding food tourism, *Journal of Destination Marketing & Management*, 1: 212-571.
- [50] Varshneya, D.2017. Experiential value: Multi-item scale development and validation, *Journal of Retailing and Consumer Services*, 34(1): 48-57.
- [51] Wahjono, S. Imam. 2010. *Organizational Behavior*. First Edition. Graha Science: Yogyakarta.
- [52] Yahya, I., Torong, Z.B., and Muda, I. 2017. Influence Behavior in Legislature Budget Development of Regions in the Province of Aceh and North Sumatra. *International Journal of Economic Research*, 14(8): 147-159.
- [53] Zeithaml, V. A, Berry, L., and Parasuraman, A. 1996. The Behavioral Consequences of Service Quality. *Journal of Marketing*, 60(2): 31-46.

On Equilibrium of the Financial Flows within the System of Compulsory Pension Insurance in the Russian Federation

Pavel KOZLOV

Risk Management, Insurance and Securities Market Chair
Department of Finance, Plekhanov Russian University of Economics¹, Russia
pavel.kozlov01@mail.ru

Yulia FINOGENOVA

Risk Management, Insurance and Securities Market Chair
Department of Finance, Plekhanov Russian University of Economics, Russia
jjfinogenova@gmail.com

Irina KHOMINICH

Risk Management, Insurance and Securities Market Chair
Department of Finance, Plekhanov Russian University of Economics, Russia
9204977@mail.ru

Suggested Citation:

Kozlov P.A., Finogenova Y.Y., Khominich I.P. 2017. On equilibrium of the financial flows within the system of compulsory pension insurance in the Russian Federation. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 2118-2128.

Abstract:

The widening imbalances in the financial flows of the Russian State Pension Fund was caused by such factors as: narrowing of the base for compulsory insurance premium collection due to the economic problems, dynamically changing the structure of the labor market, rising labor migration within the country and overseas, the steady aging of the population.

This article reviews the suggestions on elaborating the policy of compulsory pension insurance rates in the Russian Federation aimed at enhancing the equilibrium of financial flows within the system and providing exercise of pension rights without attracting the lacking funds from the federal budget.

Authors suggested that the problem of financial stability of pension system in the short run has to be solved only by changing the pension insurance tariff policy, *i.e.*, due to the growth in pension system's revenues. We believe that the current government proposals, aimed at settlement of the mandatory pension insurance system's expenditure (*i.e.* by decreasing the size of pensions and their indexation) lead to falling of pension insurance coverage.

Keywords: public pensions; financial sustainability; compulsory pension insurance system; state pension fund; reform

JEL Classification: H55; H69; J26; J38

Introduction

Recently, national pension systems of a number of countries have faced with common challenges, which can have described as dilemma: "how to ensure financial sustainability of the pension system together with the adequacy of pensions?" The search for ways for overcoming these challenges have already led many countries to various pension reforms. During the last 5 years, efforts were mostly driven by the widespread need for fiscal consolidation, and a majority of countries indeed implemented reforms to improve the financial sustainability of their pension systems. Some countries have done so while maintaining or improving retirement income adequacy, at least for some population groups.

The system of compulsory pension insurance is unique and cannot be replaced by analogues. Despite its inertness—the system is related to demographic processes that cannot be fast-paced by their nature – it might be sensitive to changes in social and economic conditions: for instance, in crises basic pensions (as a rule, funded by

¹ Stremyanny per. 36, 117997 Moscow

the government budget) take on a greater importance while during the period of economic growth and improvement in people's welfare their significance decreases.

1. Literature review

Currently, most countries faced the need to optimize the pension expenses under the public pension insurance systems. In this regard, may be useful to study international experience to identify optimization opportunities.

"The economies of scale are dominant in explaining differences in costs across pension schemes" and collective schemes are always more cost efficient compared to private (Steenbeek and Lecq 2007).

Auerbach and Leeb (2011) analyzed the "abilities of the public pension systems in different countries (as actual and hypothetical) absorb the risks arising from demographic and economic challenges (as for a particular generation as across generations)". They, they "estimate expected utility for generations based on simplifying assumptions and incorporate these expected utility calculations in an overall social welfare measure". In the result, they found, that "actual Swedish system smoothes stochastic fluctuations more than any other by accumulating a buffer stock of assets that alleviates the need for frequent adjustments". However, "this accumulation of assets leads to a lower average rate of return that more than offsets the benefits of risk reduction".

Heijdra and Rompe (2009) in their research studied "effects of demographic shocks on the macroeconomic performance". They simulated impacts of early retirement provisions on the macroeconomic performance of a number of advanced economies. Their findings demonstrate, that "pension reform must have any effects on the retirement behavior of workers" and stimulate (motivate) individual agents to retire at a normal pension age.

Another similar research performed by Hernæsa *et al.* (2016) was devoted to consequences of Norwegian pension reform, connected to the increased work incentives for the elderly and removing earnings test on pensions. They found that "increasing the returns to work is a powerful policy: the removal of an earnings test, implying a doubling of the average net take-home wage, led to an increase in average labor supply by 30-40%".

Kudrna (2016) also developed the topic, devoted to effects of means-tested pensions. In this research was "applied an overlapping generations model stylized to the Australian economy, with the capacity to investigate tightening the existing means test (by increasing the taper rate at which the pension is withdrawn) and increasing the pension access age".

Godínez-Olivaresa *et al.* (2016) approached to creation of "an automatic balancing mechanism (ABM), which absorbs economic and demographic changes through the key-variables of the pension system (such as contribution rate, normal retirement age and indexation of pensions)". They implemented optimization techniques indiscrete-time (Generalized Reduced Gradient Method (GRG)). "Sustainability ABM proposed restores the sustainability of the PAYG system according to the difference in present value between spending on pensions and income from contributions". The findings of the research demonstrated, that "model presented in this paper could be an alternative to the traditional parametric reforms of the PAYGO systems around the world".

The system of government compulsory pension insurance is unique and cannot be replaced by analogues (Soloviev 2015). Despite its inertness – the system is connected to demographic processes that cannot be fast-paced by their nature – it might be sensitive to changes in social and economic conditions: for instance, in the time of crises basic pensions (as a rule, funded by the government budget) take on a greater importance while during the period of economic growth and improvement in people's welfare their significance decreases (Mesa-Lago and Bertranou 2016), (Roik 2015).

Under conditions of the new social and economic challenges and significant macroeconomic uncertainty the importance of a stable pension system as a source of investment resources in the economy and securing the guaranteed social standards grows. Due to that the study of the theoretical basis of transformation of the existing pension system of the Russian Federation is quite relevant with the purpose of improving its equilibrium on the one hand and increasing the effectiveness of creation of pension rights on the other hand.

This article reviews the suggestions on updating the policy of compulsory pension insurance rates in the Russian Federation aimed at enhancing the equilibrium of financial flows within the system and providing exercise of pension rights without attracting the lacking funds from the federal budget.

2. Methodology

Russia is not the only country that faces the challenge of securing the pension system's equilibrium in the long term: the population ageing processes have become an objective factor of the pension schemes restructuring in many countries. Other factors defining the misbalance of the pension system are the decrease in number of employees with simultaneous growth of the self-employed individuals, a large number of people occupied in the informal economy along with a relatively low unemployment rate (typical of Russia only), the slowdown in economic growth rates and the reduction of the payroll budget as a result, a relatively low retirement age threshold (typical of Russia only). The influence of the mentioned factors makes some countries restructure the existing models of the pension system or their selected elements while others seek additional resources by tightening the fiscal policy and attracting inter-budget transfers from the federal (state) budget.

Some economists identify the problem of resource scarcity within the Russian pension system as a technical one as the joint liability of the state with regard to the liabilities of the Pension Fund of the Russian Federation (PFR) is stipulated. At the same time, the existence of this kind of liability has led to the PFR's dependence on the federal budget funds due to the measures taken by the government in the sphere of compulsory pension insurance (it concerns the compulsory funded pensions and decisions regarding the tariff policy in the first place). In addition, the decisions are funded in full measure during the period of strong economic growth, but in the time of crisis that leads to certain negative consequences (like the funded pensions' freeze in 2014-2017 or the incomplete indexation of insurance pensions in 2016). Hence, it can be said that the problem of misbalance of the Russian pension system brings forth the misbalance of the federal budget itself which has been especially clear since 2014 with the beginning of a recession in the Russian economy (see Table 1).

Table 1. The dynamics of the transfer for funding the deficit of Pension Fund of the Russian Federation (in respect of compulsory pension insurance) in 2011-2019

Year	PFR revenues, RUB billion	Transfer from the Russian federal budget for compulsory pension insurance		
		RUB billion	% of PFR revenues	% of GDP
2011	5,255.60	924.41	17.59	1.65
2012	5,890.40	1,033.14	17.54	1.54
2013	6,388.40	942.81	14.76	1.33
2014	6,159.10	336.32	5.46	0.43
2015	7,126.60	814.18	11.42	1.01
2016	7,528.80	810.50	10.77	0.98
2017	8,101.53	984.50	12.15	1.13
2018	8,536.38	961.20	11.26	1.04
2019	8,931.35	957.10	10.72	0.97

Source: Made by authors on the basis of federal laws on execution of the PFR budgets (2011-2015) and on the PFR budgets (2016-2019)

In view of the mentioned above, the essence of the pension system's equilibrium should be evaluated both through the lens of securing the balance of the PFR's budget and with due account for the possibilities of covering the total state pension liabilities of a particular reporting period with total contributions received in the framework of state pension scheme. In the first case the pension system's equilibrium will be determined by the principle of equilibrium of any budget of the Russia's budget system (article 33 of the Budget Code of the Russian Federation). That implies covering the costs by revenues and sources of funding to the full extent which secures the authority meeting the budget commitments. In this case in the sources of covering the budget commitments of PFR both transfers from the federal budget and the sources of funding its deficit will be accounted for. If the equilibrium of the pension system is construed in this manner, its deficit might be minimized via building up inter-budget transfers even if the compulsory contributions received for pension insurance decrease.

In the second case it is necessary to adjust the financial flows of benefits from the pension system basing on its own capabilities in respect of mobilization of the desired source of revenues. This determines the use of other approaches to securing the equilibrium of the pension system; therefore, the following types of it can be distinguished:

- the absolute equilibrium attained via compulsory pension insurance contributions received by PFR only;
- the controllable equilibrium attained via own revenues of the PFR budget and transfers (financial aid) received from the federal and other budgets of the budget system of the Russian Federation;
- the reserve equilibrium attained via the use of resources of a sovereign wealth fund established especially for these purposes (in the case of Russia it is the National Wealth Fund the purpose of which is co-financing the pension benefits and compensating the shortfalls in receipts of the Pension Fund of the Russian Federation).
- the general equilibrium attained via repayable financial resources for funding the resulting deficit.

As of 2017 and until the end of 2019 the insurance contributions are to be paid by the employer in the amount of 22% of the payroll budget up to the limit value of the base for accrual of insurance contributions; at the same time the limit value of the base depends on the average monthly accrued wages of the employees of the country (with due account for multipliers) and is reconsidered by the Government of the Russian Federation on the annual basis; in 2017 it amounts to RUB 876,000. Also the insurance contributions are accrued to the earned income in excess of the established limit value of the base at the rate of 10%.

For the period 2017-2025 the multipliers shown in the Table 2 are stipulated:

Table 2. The values of multipliers applied in establishing the limit base for accrual of compulsory pension insurance contributions

	2017	2018	2019	2020	2021 and further
Values of multipliers	1.9	2.0	2.1	2.2	2.3

Source: The Federal law from 24.07.2009 N 212-FZ (as amended on 19.12.2016) "On insurance contributions to the Pension Fund of the Russian Federation, Fund of social insurance of the Russian Federation, Federal Fund of compulsory medical insurance"².

We shall now determine the limit value of the base for accrual of compulsory pension insurance contributions for 2017-2019. The resulting values will be rounded up to thousands of rubles in accordance with the statutory provisions (see Table 3).

Table 3. Calculation of the limit value of the base for accrual of compulsory pension insurance contributions for 2017-2025

Year	Nominal average monthly accrued wages, RUB	Values of multipliers	Limit value of the base for accrual of compulsory pension insurance contributions, RUB	Average monthly accrued wage rate not exceeding the limit value of the base for accrual of compulsory pension insurance contributions, RUB ³
2017	38,433.71	1.9	876,000	73,000.00
2018	40,796.39	2.0	979,000	81,583.33
2019	43,099.65	2.1	1,086,000	90,500.00
2020	45,893.79	2.2	1,212,000	101,000.00
2021	48,882.49	2.3	1,349,000	112,416.67
2022	51,797.40	2.3	1,430,000	119,166.67
2023	54,782.53	2.3	1,512,000	126,000.00

² Available at http://www.consultant.ru/document/cons_doc_LAW_89925/ (accessed March 1, 2017)

³ This rate is different from the product of the nominal average monthly accrued wages and the multiplier which is the result of rounding of the values of limit value of the base for accrual of compulsory pension insurance contributions

Year	Nominal average monthly accrued wages, RUB	Values of multipliers	Limit value of the base for accrual of compulsory pension insurance contributions, RUB	Average monthly accrued wage rate not exceeding the limit value of the base for accrual of compulsory pension insurance contributions, RUB ³
2024	57,815.69	2.3	1,596,000	133,000.00
2025	60,850.04	2.3	1,679,000	139,916.67

Sources: The forecast of Russia's social and economic development for the year 2017 and for the planning period of 2018 and 2019 (including the data calculated for the period until 2025) made by the Russian Ministry of Economic Development; The Federal law from 24.07.2009 N 212-FZ (as amended on 19.12.2016)

Self-employed individuals pay insurance contributions according to the level of their own revenues. If the income does not exceed RUB 300,000 per year the contributions are paid in the fixed amount, otherwise the variable part is added, see Equation (1):

$$IC^{\text{self-employed}} = IC_{\text{fixed}}^{\text{self-employed}} + IC_{\text{fixed}+1}^{\text{self-employed}} \quad (1)$$

where $IC^{\text{self-employed}}$ – insurance contributions paid by self-employed individuals; $IC_{\text{fixed}}^{\text{self-employed}}$ – insurance contributions paid by self-employed individuals in case their income does not exceed RUB 300,000 per year; $IC_{\text{fixed}+1}^{\text{self-employed}}$ – insurance contributions paid by self-employed individuals in case their income exceeds RUB 300,000 per year.

In their turn, insurance contributions paid by the self-employed individuals whose income does not exceed RUB 300,000 per year are calculated as follows in Equation (2):

$$IC_{\text{fixed}}^{\text{self-employed}} = \text{Minimum wage} * 26\% * 12 \quad (2)$$

where *Minimum wage* is established by the Russian law and is effective throughout the whole of the country; at the same time, the regional authorities have the right to determine the minimum wage in the federal subject with due account for the specific social, economic and geographical features.

It is worth noting that the self-employed individuals are the only category of insurance contribution payers who pay the full rate of 26% whereas the contributions for the employees are accrued on the basis of the rate 22% + 10%. If the income of the self-employed individuals exceeds RUB 300,000 per year, a contribution of 1% of the revenue exceeding RUB 300,000 per year is paid in addition to the contribution paid in the fixed amount. At the same time the law states that the contributions paid with 1% should not exceed the following value: 7 * Minimum wage * 26% * 12. In other words, the maximum rate of insurance contribution for self-employed individuals is calculated as it is shown in Equation (3):

$$IC_{\text{max}}^{\text{self-employed}} = 8 * \text{Minimum wage} * 26\% * 12 \quad (3)$$

Certainly, the most important underlying equilibrium of the pension system in the period of developing its model and tariff policy in respect of the compulsory pension insurance contributions should be the absolute equilibrium. Therefore, the elaboration and justification of the objective system of rates with due account for the interests of the employers, insured persons and the budget system in general is of great importance

In the most general terms the equilibrium of financial flows within the compulsory pension insurance system can be described by the following thesis “the revenues of the Pension Fund of the Russian Federation must not be lower than the funds payable” and the following in Equation (4):

$$\sum IC_{\text{CPI}} + \sum Tr - t_{\text{FB}} \geq \sum IP + C_{\text{burial}} + C_{\text{system}} \quad (4)$$

where $\sum IC_{\text{CPI}}$ - the sum of compulsory pension insurance contributions due; $\sum Tr - t_{\text{FB}}$ - the sum of inter-budget transfers related to compulsory pension insurance from the federal budget to the budget of the Pension Fund of Russian Federation; $\sum IP$ - the sum of costs of insurance pension benefits (regardless of the

grounds they were awarded on); C_{burial} - costs of funding the allowance for burial and burial-related services in accordance with the catalogue of such services guaranteed to the deceased pensioners who were beneficiaries of insurance pension or accumulated pension and who were unemployed at the date of death; C_{system} - administrative costs of the Pension Fund of the Russian Federation (personnel costs, occupancy costs, construction, personnel training, R&D ordering etc.);

The formula does not contain the revenues and costs related to funding the social benefits paid out by the Pension Fund of the Russian Federation or the revenues from investment of unobligated assets of the Fund or mulcts and fines received, both those not related to compulsory pension insurance and those having insignificant impact on the subject of this study.

3. Case studies

When making forecast calculations the authors used the data provided in the forecast of Russia's social and economic development for the year 2017 and for the planning period of 2018 and 2019 (including the data calculated for the period until 2025) made by the Russian Ministry of Economic Development⁴; the authors applied the statistical forecasting methods (simple exponential smoothing method, ARIMA, Holt's method) as well.

The authors' calculations show that during the period 2017-2025 the system of compulsory pension insurance will remain misbalanced (see Table 4).

It is obvious that drastic actions are required in order to transform not only the existing system of compulsory pension insurance contributions, but the selected elements of the pension system as well, such as retirement age threshold and mechanisms of pension capital accumulation in the first place. However, the modern discussion on the new face of the pension system revolves around nothing but its fiscal aspects. The ultimate goal of all the measures suggested by the Russian Ministry of Finance, Russian Ministry of Economic Development, Ministry of Labor and Social Protection and even the Bank of Russia is not attaining the long-term equilibrium of the budget of the Pension Fund of the Russian Federation, but lowering the volume of transfers from the federal budget. However, the fact that the pension system is a source of long-term funding that the Russian economy needs so badly for restoring its growth and introducing structural changes, is completely ignored.

Table 4. Forecast of financial sustainability of the compulsory pension insurance system for the period 2017-2025

Year	Revenues ($\sum IC_{CPI} + \sum Tr - t_{FB}$), RUB billion	Expenses ($\sum IP + C_{burial} + C_{system}$), RUB billion	Equilibrium of the financial flows of the compulsory pension insurance system	
			RUB billion	%
2017	5,745.88	6,448.05	- 702.17	89.11
2018	6,100.06	6,809.43	- 709.36	89.58
2019	6,442.68	7,175.91	- 733.23	89.78
2020	6,857.60	7,470.68	- 719.11	91.79
2021	7,230.17	7,868.37	- 757.29	91.89
2022	7,575.79	8,272.29	- 827.94	91.58
2023	7,933.21	8,682.10	- 887.73	91.37
2024	8,288.80	9,103.73	- 959.72	91.05
2025	8,654.65	9,536.13	- 1,032.7	90.76

Source: Authors' calculations

One should bear in mind that the problem of improving the financial sustainability of the pension system can be solved in the short term and in the long term.

In the short term it can be solved only by introducing changes into the tariff policy which should lead to the growth of the revenue side of the budget of Pension Fund of the Russian Federation (Gryanchenko 2015, 112). In

⁴ Forecast of the socio-economic development of the Russian Federation for 2017 and for the planned period 2018 and 2019 by Ministry of the Economic Development of the Russian Federation [accessed 2017 May 24] <http://economy.gov.ru/minec/activity/sections/macro/2016241101>

the authors' opinion, the suggestions aimed at settlement of the expense side of the compulsory pension insurance system lead to either a decrease in the number of people covered by pension insurance and their transfer to the social security system or to a further increase in costs.

The analysis of the tariff policy in compulsory pension insurance allowed determining the main problem areas that the efforts aimed at the increase of the financial sustainability of the pension system should be focused on. They are as follows:

- the rate of compulsory pension insurance is unreasonably low;
- the insured persons do not participate in creation of pension rights;
- a certain part of insurance contributions is used for non-personified payments related to insurance coverage;
- there are exemptions concerning payment of insurance contributions for employers in certain sectors of the economy.

At present there is no direct correlation between the decrease in social contribution rates and the growth of wages, increase in investment in human capital and boosting the attractiveness of certain sectors. Nevertheless, due to introduction of exemptions in Russia the principles of social insurance are violated. In most countries the opposite trends are observed when at the state level the attractiveness of certain sectors is increased by improving the quality and skills of employees and introduction of new technologies and innovations.

The measures aimed at improving the financial sustainability via the tariff policy are as follows:

- changing compulsory pension insurance contribution rate through dividing the rate into fixed and variable parts;
- making the payment of insurance contribution by the insured persons obligatory;
- canceling the funding of the defined benefit through insurance contributions and introducing a separate contribution for funding it;
- replacing the reduced contribution rates in compulsory pension insurance with federal subsidies;
- increasing the base of fixed payment for compulsory pension insurance for self-employed individuals from 1 to 2 minimum wages with simultaneous introduction of subsidies for the amount of base increase.

Having integrated the open source data, one can assume that in the Russian Federation the contribution rate in respect of compulsory pension insurance of employees is calculated as follows in Equation (5):

$$\text{Rate}_{\text{CPI}}^{\text{employees}} = \frac{C_{\text{IP}} + C_{\text{burial}} + C_{\text{system}} - \sum \text{IC}_{\text{self-empl}}^{\text{CPI}}}{\text{PB} * R_{\text{income}} * R_{\text{highlypaid}}} \quad (5)$$

where: C_{IP} - the costs of funding the insurance pension after deduction of costs of funding the defined benefit; C_{burial} - costs of funding the allowance for burial and burial-related services in accordance with the catalogue of such services guaranteed to the deceased pensioners who were beneficiaries of insurance pension or accumulated pension and were unemployed at the date of death; C_{system} - administrative costs of the Pension Fund of the Russian Federation (personnel costs, occupancy costs, construction, personnel training, R&D ordering *etc.*); $\sum \text{IC}_{\text{self-empl}}^{\text{CPI}}$ - the sum of compulsory pension insurance contributions paid by self-employed individuals; PB - payroll budget on the nationwide scale; R_{income} - compulsory pension insurance contributions and defined benefit contributions income ratio; $R_{\text{highlypaid}}$ - ratio registering the percentage of employees to whose salaries the compulsory pension insurance contributions will be accrued to full extent.

The introduction of the insurance contribution rate in respect of the defined benefit is suggested. It will increase transparency of the financial flows in compulsory pension insurance, because as of today this non-personified benefit is funded at the expense of a proportion of compulsory pension insurance contributions. As a result, there is a threat of growth of transfers from the federal budget when the insured persons for whom the contributions are being paid now, will retire. It is also suggested that insurance contributions in respect of the defined benefit should be paid by the insured persons directly. For employees it will be calculated as follows in Eq. (6):

$$\text{Rate}_{DP}^{\text{employees}} = \frac{C_{FP} - IC_{DP}^{\text{self-employed}}}{PB * R_{inc}} \quad (6)$$

where: C_{FP} - costs of funding the defined benefit for the insurance pension; $IC_{DP}^{\text{self-employed}}$ - insurance contributions paid by self-employed individuals for funding the defined benefit.

After introducing the suggested mechanism of calculating the compulsory pension insurance rate into effect, the sum of the contribution rates in respect of compulsory pension insurance and defined benefit for employees will amount to the values shown in Table 5.

Table 5. Forecast of overall insurance contributions load on compulsory pension insurance and defined benefit for employees for 2017-2025 (%)

Year	Rate _{CPI} ^{employees}	Rate _{DP} ^{employees}	∑ ^{employees} IC
2017	19.25	10.77	30.02
2018	19.09	10.76	29.84
2019	18.99	10.79	29.77
2020	18.20	10.74	28.94
2021	18.18	10.71	28.89
2022	18.30	10.68	28.98
2023	18.39	10.66	29.05
2024	18.51	10.64	29.15
2025	18.62	10.63	29.25

Source: Authors' calculations

At the same time, for self-employed individuals the growth of the rate will be less important and will result as follows in Equation (7):

$$\text{Rate}_{CPI}^{\text{self-employed}} = \text{Minimum wage} * 22.32\% * 12 \quad (7)$$

The defined benefit funding rate paid by the self-employed individuals as a fixed sum is given in Equation (8):

$$\text{Rate}_{DB}^{\text{self-employed}} = \text{Minimum wage} * 4\% * 12 \quad (8)$$

The new rates include administrative costs of the Pension Fund of the Russian Federation. The authors consider it necessary to establish the rule regarding the balance of the amount of administrative costs and the expense side of the Fund's budget with the purpose of improving the quality of the administrative work. The expense level itself should amount to 1.44%, which follows the example of Germany (DRV) (OECD 2015).

The authors share the position of Scholtz (2015, 23) who showed the tenuity of attempts to compare the pension systems (or their elements) of different countries and to compile rankings on that basis in his study. Also it should be emphasized that the direct correlation is ascertained between the degree of the pension system's development (to what extent the pensions are diversified, the way that the personified records are kept, if the records of other revenues of the insured person or a household are kept *etc.*) and the administrative costs (Sluchynsky 2015, 40).

The authors suggest taking guidance in the matter of administrative costs at least from the example of Germany, otherwise the consistent lowering of administrative costs might lead to the deterioration of quality of duties performed by the Pension Fund of the Russian Federation (outflow of the qualified personnel, insufficient investment in infrastructure causing slow and incorrect data processing *etc.*)

On that basis, the authors consider it appropriate to use the formula provided above as a justification of insurance contribution rate for the following 3 years and to consider the matters of lowering or raising the rate and

the budget estimates of the Pension Fund of the Russian Federation simultaneously. In this regard it is suggested that the distribution of the insurance contribution rate should be as follows (see Table 6).

Table 6. Compulsory pension insurance contribution rate

Up to the limit value of the base	Employer	Employee
	16.0% + i	2.0%

Note: "i" is the variable part of the rate calculated on the basis of expected costs of payment of insurance pensions in the following year (calculated as the difference between rate calculated for the compulsory pension insurance contribution and 18%)

Source: Authors' calculations

Also it seems reasonable that insurance contributions for the defined benefit should be paid only by insured persons in case there is no limit for accruing insurance contributions, as in that case the principle of solidarity will be complied with. It is suggested that the transition to the new tariff policy should be carried out in not less than two years after its announcement. A two-year postponement is required for anticipatory social discussion of the measures and preliminary notification of both employers and employees of the upcoming changes. Hence, the transition may be carried out not earlier than starting from January the 1st, 2020.

The distribution of overall insurance contributions loading between the employees and employers in the period 2020-2025 will be as follows (see Table 7).

Table 7. Distribution of insurance contribution payments loading in respect of compulsory pension insurance and funding of the defined benefit between employees and employers in 2020-2025

	Employee	Employer	TOTAL
Compulsory pension insurance contributions	2.0	16.18 – 16.62	18.18 – 18.62
Insurance contributions for funding the defined benefit	10.63 – 10.79	0,0	10.63 – 10.79
TOTAL	12.63 – 12.79	16.18 – 16.62	28.89 – 29.25

Note: the value in the cell TOTAL – TOTAL corresponds to the calculated values shown in Table 2

Source: Authors' calculations

The expected proceeds from insurance contribution payments are shown in Table 8.

Table 8. Calculation of rate for compulsory pension insurance contributions paid in respect of employees for 2017-2025

Year	PB, RUB billion	Rate _{CPICR} , %	$\sum IC_{\text{self-employed}}$ RUB billion	C_{burial} RUB billion	R_{income} %	$R_{\text{highly paid}}$ %	$\sum IC_{\text{employees}}$ RUB billion
2020	24,048.33	17.77	148.13	9.30	98.70	93.30	4,792.25
2021	25,407.48	17.72	153.83	9.66	98.70	93.90	5,040.87
2022	26,763.96	17.82	159.52	10.02	98.70	93.90	5,293.88
2023	28,144.20	17.91	171.56	10.38	98.70	93.90	5,556.34
2024	29,553.64	18.03	177.40	10.74	98.70	93.90	5,826.96
2025	31,010.73	18.14	183.16	11.10	98.70	93.90	6,104.34

Source: forecast of Russia's social and economic development for the year 2017 and for the planning period of 2018 and 2019 (including the data calculated for the period until 2025) made by the Russian Ministry of Economic Development, authors' calculations.

As a result of application of the suggested rates the volume of revenues received by the Pension Fund of the Russian Federation with due account for the inter-budget transfers from the federal budget will be comparable to the volume of funding of the insurance pensions.

Conclusion

The transition to the new tariff policy starting from 2020 will secure the long-term financial sustainability of the pension system, decrease its dependence on the federal budget, increase the transparency of the formation of the budget and its expenditure items and it will also allow providing clear long-term conditions for creating pension rights of the insured parties and running a business activity.

Reconsideration of the tariff policy will not influence the future pension rights of the insured persons directly. This is due to the points system of compulsory pension insurance that is in effect in Russia where only wages and pension insurance record have impact.

It is necessary to stop considering the pension system as an institute of fiscal load on the budget system and employers and to transform all decisions regarding its modernization from the perspective of encouraging investment in human capital, alleviation of poverty of the future pensioners and increasing their purchasing power. Due consideration for these criteria in the pension plan will employ its resources for stimulating the economic growth in Russia.

In this regard the authors point out the possibility of saving the compulsory funded pension even if with the minimum 1-2% rate of contributions from the payroll budget. In the future in case the real earnings of population recover up to the level of 2013 the introduction of the voluntary pension saving system is possible both in the framework of corporate pension plans and personal decisions made by individuals. This measure will allow attracting additional resources to the financial market in order to fund the long-term investments which under conditions of relative stabilization of the ruble exchange rate will secure a higher level of their profitability and higher returns on investment of pension capital as a result. According to the evaluation of the National rating agency, as a result of extension of the moratorium on pensions in 2017 the Russian financial market loses capital in the amount of 700-800 billion with capital multiplier effect taken into account.⁵ Considering the average rate of gross capital accumulation in Russia being 21.3% the fixed capital formation losses only for 2017 will amount to RUB 150-160 billion. Due to that the use of pension savings in the federal budget for further funding of the transfers to the Pension Fund of the Russian Federation without restructuring the pension system encourages consuming the future potential of human capital and is therefore unacceptable.

Along with that the OECD points out that the low interest rates decrease the capacity of pension funds and life insurance companies to deliver on their promises regarding the pensioners and pension savers in the defined benefit pension plans⁶.

Taking into account the social focus of the pension savings as well as a rather limited range of income sources of the senior citizens and on the basis of a modest list of facilities for investment of the pension savings and significant limitations in respect of building of investment portfolios, the authors believe that the matter of including or excluding the compulsory funded element from the pension system should be considered only in the framework of a certain country, as the generalized international recommendations are unproductive in this case. In addition, if a decision is taken in favor of the compulsory funded level, it will be more advisable to develop it alongside the distributive level, not instead of it.

References

- [1] Auerbach, A.J., and Leeb, R. 2011. *Welfare and generational equity in sustainable unfunded pension systems*. *Journal of Public Economics*, 95(1–2): 16–27 [accessed 2017 May 24] Available at: <https://doi.org/10.1016/j.jpubeco.2010.09.008>
- [2] Blair, C. 2014. *Securing Pension Provision. The Challenge of Reforming the Age of Entitlement*. Palgrave Macmillan UK. X, 152 p.
- [3] Gryanchenko, T.V. 2015. Main problems of the Russian Federation pension system and the guidelines for its improvement. *Labor and Social Relations*, 1(26): 111-127 [in Russian].

⁵ RBC data: <http://www.rbc.ru/finances/01/09/2016/57c718939a79475bb69b72c5>

⁶ OECD (2015), *Pensions at a Glance 2015: OECD and G20 indicators*, OECD Publishing, Paris. – 2016. – 378 p. [accessed 2017 May 24] http://dx.doi.org/10.1787/pension_glance-2015-en

- [4] Heijdraa, B. J., Rompe, W. E. 2009. Retirement, pensions, and ageing. *Journal of Public Economics*, 93(3–4): 586–604 [accessed 2017 May 24] Available at: <https://doi.org/10.1016/j.jpubeco.2008.10.009>
- [5] Hernæsa, E., Markussena, S., Piggottb, J., and Røeda, K. 2016. Pension reform and labor supply. *Journal of Public Economics*, 142: 39–55 [accessed 2017 May 24] Available at: <https://doi.org/10.1016/j.jpubeco.2016.08.009>
- [6] Hinrichs, K., and Jessoula M. (Eds.) 2012. *Labour Market Flexibility and Pension Reforms*. Flexible Today, Secure Tomorrow? Series: Work and Welfare in Europe. Palgrave Macmillan UK. 2012. XVIII, 262 p.
- [7] Kudrna, G. 2016. Economy-wide effects of means-tested pensions: The case of Australia. *The Journal of the Economics of Ageing*, 7: 17–29 [accessed 2017 May 24] Available at: <https://doi.org/10.1016/j.jeoa.2016.04.004>
- [8] Launa, T., and Wallenius, J. 2015. *A life cycle model of health and retirement: The case of Swedish pension reform*. *Journal of Public Economics*, 127: 127–136 [accessed 2017 May 24] Available at: <https://doi.org/10.1016/j.jpubeco.2013.11.002>.
- [9] Mesa-Lago, C., and Bertranou, F. 2016. Pension reforms in Chile and social security principles, 1981–2015. *International Social Security Review*, 69: 25–45. Available at: dx.doi.org/10.1111/issr.12093 [accessed 2017 May 24]
- [10] Roik, V.D. 2015. Pension insurance in XXI century. *Population*. 2(68): 28-38 [in Russian].
- [11] Scholz, W. 2015. Financing social security out of contributions: About origins, present discussions and prospects of a success story. *International Social Security Review*, 68: 3–24. Available at: dx.doi.org/10.1111/issr.12085 [accessed 2017 May 24]
- [12] Sluchynsky, O. 2015. Benchmarking administrative expenditures of mandatory social security programmes. *International Social Security Review*, 68: 15–41. Available at: dx.doi.org/10.1111/issr.12078 [accessed 2017 May 24]
- [13] Soloviev, A.K. 2015. Pension reform in the Russian Federation – 2015 in context of globalization and international norms of social security law. Materials of the annual scientific conference in memory of Professor
- [14] Steenbeek, O.W., and van der Lecq S.G.F. (Eds.) 2007. *Costs and Benefits of Collective Pension Systems*. Springer. X, 247 p.159.
- *** OECD 2015. Pensions at a Glance 2015: OECD and G20 indicators, OECD Publishing, Paris. – 2016. – 378 p. [accessed 2017 May 24] http://dx.doi.org/10.1787/pension_glance-2015-en

Latin American Integration Effects on Trade Relationships: Survival, Growth and Initial Volume

Pedro Gabriel DEGIOVANNI
Institute of Economics and Finance, Faculty of Economic Sciences
National University of Córdoba²⁵, Córdoba, Argentina
pedrogdegiovanni@hotmail.com

Luis Marcelo FLORENSA
Institute of Economics and Finance, Faculty of Economic Sciences
National University of Córdoba, Córdoba, Argentina
florensa@eco.unc.edu.ar

María Luisa RECALDE
Institute of Economics and Finance, Faculty of Economic Sciences
National University of Córdoba, Córdoba, Argentina
lrecalde@eco.unc.edu.ar

Suggested Citation:

Degiovanni, P., Florensa, L.M., and Recalde, M.L. 2017. Latin American integration effects on trade relationships: survival, growth and initial volume. *Journal of Applied Economic Sciences*, Volume XII, Winter 7(53): 2129-2142.

Abstract:

In this paper, we analyze the effects of economic integration agreements on trade survival, initial volumes of trade, and export growth. We focus on annual trade data at the 5-digit SITC level for Latin America exports to over 150 countries from 1962 to 2009 and examine whether these effects differ depending on the required depth of the agreement. We also test whether the quality of trade agreements has an impact on the survival of trade relationships. Results indicate that the effects of trade agreements in Latin America differ from those found in previous studies; that those effects are also different depending on the trade agreements depth, and that higher quality agreements lead to higher increases in the survival rate of trade relationships.

Keywords: economic integration agreements; Latin America; trade survival; random effects probit

JEL Classification: F14; F15

Introduction

In a previous work (Besedes *et al.* 2015), from now on referred to as BMN, have studied the effects of trade agreements on the survival of trade relationships. Their results, however, must not necessarily be homogeneous across regions as aggregation may hide different trade reactions to economic integration agreements.

For example, (Florensa *et al.* 2014 and Florensa *et al.* 2015) have found that in Latin America, EIA's effect on the intensive and extensive margins of trade, and the effect of institutional variables and the quality of trade agreements differ markedly from those found for the whole world. Whereas (Florensa *et al.* 2011) on the survival of trade relationships in Argentina's provinces-obtain results that are in line with the ones found for developed countries.

In the present paper we focus on Latin America with the objective of testing whether the effects of Economic Integration Agreements (EIAs) on trade survival are similar to those described for the whole world. To this aim, we have applied BMN's methodology.

Our main contributions are the expansion of BMN's work by examining whether these effects differ according to the kind of integration agreement and by analyzing trade duration, growth and initial value sensitivity to trade agreement quality.

²⁵ Institutional postal address: Avenida Valparaiso s/n, Ciudad Universitaria, 5000 Córdoba, Argentina.

1. Literature review

Several studies have analyzed the duration of trade as well as the determinants of exports survival. (Besedes and Prusa 2006, and Nitsch 2009) analyzed the duration of imports for US and Germany, respectively; (Carrere and Strauss-Khan 2014) studied developing countries exports survival in the OECD. In the same line, (Minondo Uribe-Etxeberria and Requena 2012) consider the length of exports using data for the regions of Spain, and (Florensa *et al.* 2011) analyze the extensive and intensive margins of trade for Argentinian provinces and the determinants of their survival rate.

All the above mentioned papers found that the duration of trade relationships was extremely short. In fact, a high failure rate along with low percentages in the number of long-term trade relationships show the relevant role played by survival. Both (Besedes and Prusa 2006, and Florensa *et al.* 2011) have found that high failure rates of the newly-started relations are not necessarily a consequence of the level at which the products are encoded, and that exports relationships which start with higher values, offer a higher survival rate throughout the service years than those of a smaller initial size. *Furthermore*, in a study for Córdoba (Argentina), (Diaz Cafferata *et al.* 2011), proved one of the (Rauch and Watson 2003) hypotheses: homogeneous goods provincial exports survival rate is lower than that of differentiated ones.

The literature that investigates the effects of EIAs on the length of trade relationships is fairly recent and therefore scarce. (Kamuganga 2012) has studied treaties among African countries and BMN have examined the effect of economic integration agreements on trade relationships length using annual trade for 180 countries. BMN have found that trade agreements significantly increase the survival of those trade relationships which had already started when the agreement took place; however, these agreements increase the hazard of trade ceasing and also reduce the initial volumes for those relationships that started afterwards. The longer the elapsed time since the signature of the agreement, the higher the hazard of trade for both kinds of spells. Therefore, the positive effect of trade agreements on the survival of preexisting spells diminishes over time, whilst the negative effect on new spells worsens.

2. Descriptive data

Throughout this paper we will consider three different 'levels' of EIAs, in accordance with (Baier and Bergstrand 2007). The weakest, or 'shallowest', form of integration we consider is Non Reciprocal Preferential Trade Agreements (NRPTA), labeled 'Level 1 EIAs'. These are unilateral agreements, by which developed nations concede trade benefits to developing countries by granting "the most favored nation" status. These type of agreements are usually extended to several countries at once

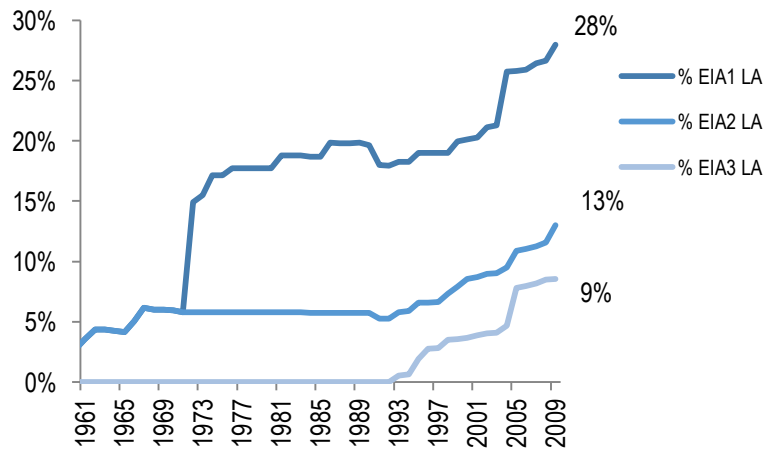
A second level of integration, considered 'deeper', as it entails a bilateral negotiation, is Preferential Trade Agreements, by which two countries grant each other special trade benefits. Finally, we consider a third class of agreements which comprehends the 'deepest' levels of integration: Free Trade Agreements, Customs Unions, Common Markets, and Economic Unions, though the latter two are not present in Latin America.

Figure 1 shows the evolution of utilization rates²⁶ of Latin American EIAs over time for three different minimum levels required to consider an agreement as an EIA. Whereas global trade integration grew substantially at the beginning of the seventies, when the utilization of EIA jumped from 2.5% to over 10%, a similar pattern can be seen in Latin America, where the percentage of trade relationships with trade agreements increased from less than 10% to about 20% in a few years. The utilization rate has grown ever since, with a new upward shift at mid-2000s; it has now reached 21% for the world and 28% for Latin America.²⁷

²⁶ We define the utilization rate as ratio between the country pairs that have signed an EIA and total number of country pairs.

²⁷ All utilization rates referring the world were taken from (Besedes *et al.* 2015).

Figure 1. Utilization rates for Latin America



Source: own calculation based on (Bergstrand 2015)

In Latin America, in particular, these trade agreements have been mostly shallow. Most of the integration that took place in the early seventies has taken the form of NRPTA (EIAs of Level 1). It was during the mid-nineties that deep integration began to take place with the creation of MERCOSUR and the proliferation of Free Trade Agreements, signed mainly by Chile, Colombia and Peru. Consequently, the utilization rate for EIAs of level 3 or higher (Free Trade Agreements and Custom Unions) rose from less than 1% in 1990 to 5% in 2000 and 9% in 2009. The Appendix contains a list of all trade agreements considered and their classification.

Table 1. Survival of trade relationships for Latin America 1962-2009

Spell length	Number of spells	Fraction of spells
1	271,083	49.24%
2	76,094	13.82%
3	41,160	7.48%
4	26,521	4.82%
5	20,737	3.77%
6	15,498	2.82%
7	12,434	2.26%
8	10,783	1.96%
9	8,657	1.57%
10	7,982	1.45%
11-20	36,684	6.66%
21-30	13,900	2.52%
31-40	6,921	1.26%
40 +	2,093	0.38%
TOTAL	550,547	100%

Source: own calculation based on WITS.

Table 1 shows that almost half of trade relationships in Latin America do not survive past their first year, 70% fail by year 3 and almost 90% have ceased by year 10. Less than ten thousand (about 1.64%) of the more than half a million spells included in our sample survived more than 30 years. Albeit low, these survival rates are in fact higher than those for the whole world. The world's survival rate for 1, 3, 10 and 30 years are 45%, 22%, 7% and 1.4%, respectively, even lower than for Latin America in all cases.

3. Methodology

a. Empirical strategy

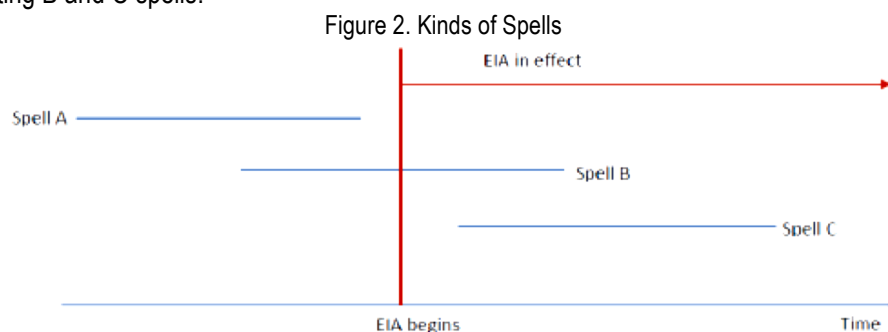
BMN's methodology was followed and a random effects logit²⁸ was run for the probability of trade ceasing and a fixed effects panel regression was run for the growth and initial value of exports. In all regressions, only the founders of the Latin American Integration Association (LAIA), Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela, were considered.

a.1. Random Effects Logit

The focus of attention has been the effects of an EIA on the hazard of trade ceasing. Figure 2 reproduces BMN's Figure 2, in which three kinds of spells are differentiated. Spells such as spell A start and end before the agreement goes into effect; spells such as spell B start before the agreement takes place but do not end until it has taken effect; finally, spells such as spell C start and end after an agreement has taken place.

In order to capture the different effects an EIA may have on trade hazard, BMN's methodology was followed and three dummy variables were constructed. The first one, 'EIA exists', identifies all pairs of countries which have ever had an agreement, whether it has already taken place or not. This variable allows analyzing whether spells such as A have different hazards than spells between countries which never sign an agreement. Thus, we control for possible endogeneity of EIAs, that is, countries with unusually long – or short - spells may tend to sign more agreements.

The second dummy variable, 'EIA in effect', identifies the years following the signing of an agreement, as shown in Figure 2. This allows us to distinguish between A and B spells but not between B and C ones. The third dummy variable is called 'Spell starts after EIA' and identifies those spells that started after the agreement has taken place thus differentiating B and C spells.



Source: (Besedes *et al.* 2011)

The definition of what constitutes an EIA is crucial for a region such as Latin America. Many developed countries have granted LA countries the "most favored nation" status (Non Reciprocal Preferential Trade Agreement, NRPTA), which is considered an EIA by (Baier and Bergstrand 2007) and the specific literature. However, this kind of agreement does not necessarily entail serious integration intentions, and therefore, their characteristics may be different from those of the deeper agreements signed since the 90s. Moreover, as all Latin American countries have received these benefits, it would be impossible to distinguish them from the Free Trade Agreements signed afterwards. For this reason, we have constructed the dummy variables considering three minimum levels of integration for an agreement to be considered an EIA.

The first criterion considers all agreements registered on the WTO as an EIA. This is the one followed by BMN and allows us to compare our main results. The next two criteria require an agreement to be classified at least

²⁸ Besedes *et al.* (2015) run a random effects probit, whereas we use a logit because of computational limitations. As a robustness test, we have run a logit model using the same sample they do and we have found identical signs (these results are available upon request). Therefore, we believe we can compare our results with theirs without worrying about differences on the marginal effects.

as a Preferential Trade Agreement by WTO or as a Free Trade Agreement, respectively²⁹. This discrimination lets us examine whether the effects of economic integration on the hazard of trade ceasing vary depending on the depth of the agreement. A random effects logit was run using the ones considered in the literature of duration of trade as explanatory variables: the spell current length at every point in time, the exports initial volume, exporter and importer GDP, distance, common border, and common language (Besedes 2008, and Fugazza and Molina 2011).

Four specifications to measure the effects of trade integration were considered. The first one, adds the dummies 'EIA exists' and 'EIA in effect' to the standard variables. The second specification includes the additional dummy 'Spell starts after EIA'; the third specification adds a fourth dummy, Years since EIA, which measures the length an agreement has been in place. This variable allows the identification of whether the effect of an agreement depends on the time span it has been in place, either diminishing in time as its effect dilutes, or increasing as its effects consolidate through time.

The last specification explores the quality of trade agreements, a feature that could distinguish LA countries from the rest of the world. Many attempts at promoting economic integration have failed throughout time, among which LAIA, the ANDEAN community, and now allegedly MERCOSUR - (Peña 2016) - can be mentioned. However, the usual depth measures of an EIA do not consider how many of its provisions have been actually enforced. Therefore, in our fourth specification, we have included the variable constructed by (Kohl *et al.* 2016) which measures trade integration agreements quality in addition to the three dummy variables that we have considered. It is expected that the sign of this variable be negative, as higher quality of trade agreements should promote the survival of trade relationships. There is no *a priori* hypothesis on how its effects vary across spells of the type A, B, or C. Each specification was run three times, once for each minimum level of integration considered.

a.2. Fixed effects panel regression

A panel regression for the growth and initial volume of exports, including country pair, time, and 3-digit SITC code fixed effects was run. Export growth was defined as:

$$XGrowth_t = \frac{export_t - export_{t-1}}{export_{t-1}} \quad (1)$$

All regressions are run in logarithms and, as in our trade hazard analysis, three different minimum levels of integration for EIAs were considered.

b. Data sources

Exports from the eleven founding LAIA countries – Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru and Venezuela – to 157 countries were analyzed for the period 1962-2009. Trade data were obtained from WITS, and were classified according to the 5-digit Standard Industrial Trade Classification (SITC), Revision 1. The variable indicating the level of integration between country pairs takes the form of a polychotomous index built by (Baier *et al.* 2014).

Exporter and importer GDPs were measured in current dollars and were obtained from the World Development Indicators provided by the World Bank; distance, adjacency and common language were obtained from CEPII. The trade agreements quality index constructed by (Kohl *et al.* 2016) was utilized. It measures trade agreements heterogeneity and it takes values between 0 (lowest institutional quality) and 1 (highest institutional quality). The database contains a list of 296 agreements (43 including LAIA countries) and provides a set of indexes for each agreement. The simple average of the indexes of Coverage, Index(C), and of Enforceability, Index (E) was used. When a pair of countries has entered into more than one agreement³⁰, the one with the greatest resulting value was considered.

²⁹ Baier *et al.* (2014) also consider Customs Unions, Common Markets and Economic Unions; we do not include them as a separate threshold as they are scarce or they do not exist in Latin America.

³⁰ For example, Argentina and Bolivia are currently signatories of three agreements: they both are LAIA members since 1981 with an index value of 0.20. Bolivia signed a treaty with MERCOSUR in 1997 with an index of 0.39 and signed another treaty as a member of the Andean Community in 1998 with an index of 0.27.

4. Results

Following BMN, we first examine the effects of EIAs on trade ceasing hazard. Afterwards, we analyze its impact on the growth of trade volume within each spell, and finally we examine the effects on the initial volume of each spell. Within each of these characteristics, we distinguish the effects of different kinds of agreements.

a. Hazard

We estimate trade ceasing hazard by using a random effects logit which allows us to control for unobserved heterogeneity. As usual in the specific literature, we assume that hazard depends on the logarithm of the duration of the spell, measured in years. Results are presented in Table 2. All standard variables have the expected signs and the magnitudes are similar to those found by BMN; these results do not vary across different definitions of EIA. However, the similarities become nuanced when the impact of the EIA dummies is compared. The specifications that should be used as a direct comparison with BMN are those labeled as EIA ≥ 1 .

In parallel to the results for the whole world, the existence of an EIA for a pair of countries ('EIA exists') decreases the hazard of trade ceasing. This effect is maintained across all specifications, although its effect is somewhat lower for deeper trade agreements (-0.19 for EIA ≥ 1 , -0.164 for EIA ≥ 2 and -0.117 for EIA ≥ 3). This implies that countries which have signed an EIA at any point of the sample period have a lower risk than those that have not. Therefore, EIAs in Latin America could be seen as a way of reinforcing otherwise relatively safe trade relationships.

However, and conversely to the results for the whole world, in specification 1, an active EIA has a positive but non-significant effect on the hazard of trade ceasing, that is, the effect of the EIA over the survival of trade is nil. For EIAs greater or equal than 2 (PTA or higher), the result is negative and non-significant. Finally, when we only consider FTAs or deeper, the coefficient has a negative sign and is highly significant. This result is contrary to that found by BMN, in which an EIA in effect increased the hazard of trade. For Latin America, countries with an economic integration agreement start with a low level hazard, and the signing of a shallow EIA has no additional effect. However, when the EIA is deep enough, the final effect is the reduction of the overall exports hazard.

In our second specification, which considers whether a spell starts before or after an EIA has been signed, we also find that the effect of an EIA depends on the depth of the trade agreement. Considering the shallower agreements as a threshold (NRPTA and PTA, EIAs 1 and 2 respectively), we find that EIAs lower the hazard of trade ceasing for those spells that began after the signing of the agreement, but rise the risk for the already existing spells in opposition to the results found by BMN for the world as a whole. When setting a higher bar for an agreement to be counted as an EIA, however, the results vary: an integration agreement benefits both the spells that had started at the time of its signing and those that come afterwards. The comparison with our previous specification reveals that the nil effect of EIAs in effect on hazard for shallow EIAs was the result of a combination of an increase in the hazard of the existing spells and a reduction in the ones that start afterwards. On the other hand, the reduction in risk produced by the deeper EIAs benefits both preexisting and new trade relationships.

In our third specification, which takes into account time (in years) since the signing of the EIA, the effects once again differ from those for the whole world and across levels of trade agreements. Whereas hazard increases as more time elapses since the signing of an EIA for the whole world, the opposite is true for Latin America. For the shallower EIAs, their impact on trade hazard is positive both for those spells which were already ongoing at the time of the signing and for those that start afterwards. As time passes, however, hazard is steadily reduced. The same happens for deeper EIAs, although the initial effect is a reduction of risk for all spells, those that start after the signing and those that had started before. Contrarily to BMN, in Latin America, the older the agreements, the more effective they become. Besides, this effect doubles for FTAs. These results suggest that trade agreements implementation and enforcement are important issues and that time is needed to achieve full effect.

Finally, specification 4 incorporates trade agreement quality, as measured by (Kohl *et al.* 2016), into the explanatory variables. We find that its effect on trade hazard is significant and negative as expected; that is, the better the quality of an agreement, the higher the survival rate of trade relationships. The addition of this variable reduces the coefficient of "EIA exists" thus suggesting that the effect of an EIA depends on its quality. This result is particularly relevant for Latin America, where economic integration agreements abound (there are two customs unions in effect – Mercosur and Andean) but their quality is particularly low.

Table 2. The Effect of EIA on the Hazard of Trade Ceasing

	EIA >= 1				EIA >= 2				EIA >= 3			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Spell Duration (ln)	-0.591***	-0.595***	-0.549***	-0.548***	-0.591***	-0.594***	-0.567***	-0.561***	-0.569***	-0.574***	-0.566***	-0.564***
	-207,96	-207,50	-179,40	-178,84	-208,03	-207,66	-191,04	-189,32	-197,06	-195,66	-190,31	-188,79
Initial Exports (ln)	-0.114***	-0.114***	-0.119***	-0.119***	-0.113***	-0.113***	-0.116***	-0.118***	-0.118***	-0.118***	-0.119***	-0.119***
	-107,11	-106,83	-109,04	-109,5	-106,34	-106,32	-107,32	-108,67	-108,80	-109,02	-109,35	-109,34
Exporter GDP (ln)	-0.258***	-0.259***	-0.256***	-0.250***	-0.249***	-0.251***	-0.250***	-0.246***	-0.247***	-0.248***	-0.248***	-0.247***
	-115,52	-115,58	-112,60	-109,66	-111,20	-111,48	-110,3	-108,28	-109,87	-109,89	-109,98	-109,08
Importer GDP (ln)	-0.081***	-0.080***	-0.073***	-0.075***	-0.094***	-0.093***	-0.088***	-0.086***	-0.089***	-0.089***	-0.089***	-0.088***
	-51,50	-50,61	-44,78	-45,7	-64,58	-64,33	-59,96	-58	-60,53	-60,23	-59,99	-59,6
Distance (ln)	0.257***	0.257***	0.258***	0.252***	0.254***	0.253***	0.257***	0.257***	0.250***	0.248***	0.244***	0.244***
	46,49	46,47	45,43	44,09	45,66	45,52	45,33	45,04	44,47	44,17	43,35	43,13
Adjacency	-0.029***	-0.021**	0.018*	0.037***	-0.003	0.012	0.057***	0.042***	0.039***	0.039***	0.044***	0.046***
	-2,77	-2,04	1,68	3,42	-0,29	1,12	5,17	3,8	3,51	3,53	3,94	4,12
Common Language	-0.251***	-0.249***	-0.222***	-0.207***	-0.215***	-0.208***	-0.166***	-0.189***	-0.207***	-0.206***	-0.206***	-0.203***
	-30,78	-30,48	-26,38	-24,43	-25,54	-24,56	-19,15	-21,52	-24,59	-20,14	-24,38	-23,93
EIA Exists	-0.190***	-0.183***	-0.160***	-0.153***	-0.164***	-0.156***	-0.142***	-0.129***	-0.117***	-0.116***	-0.121***	-0.095***
	-18,81	-18,04	-15,45	-14,75	-18,69	-17,72	-15,89	-14,29	-15,68	-15,47	-16,11	-12,19
EIA is in Effect	0.007	0.101***	0.107***	0.131***	-0.003	0.095***	0.099***	0.335***	-0.269***	-0.207***	-0.142***	-0.067***
	0,81	7,78	8,20	10,01	-0,34	7,04	7,30	21,71	-35,22	-20,14	-12,73	-5,28
Spell Starts After EIA		-0.112***	0.106***	0.072***		-0.131***	0.109***	-0,024		-0.112***	-0.024*	-0,018
		-9,95	8,59	5,75		-9,77	7,35	-1,55		-8,91	-1,74	-1,26
Years Since EIA			-0.012***	-0.010***			-0.012***	-0.009***			-0.022***	-0.023***
			-44,59	-33,71			-37,43	-27,55			-14,25	-14,59
Quality of the Agreement				-0.292***				-0.527***				-0.212***
				-21,38				-32,14				-12,1
Constant	6.610***	6.591***	6.297***	6.255***	6.635***	6.664***	6.479***	6.318***	6.504***	6.519***	6.559***	6.516***
	77,65	77,35	72,48	71,89	78,09	78,34	75,19	73,03	75,83	78,92	76,22	75,58
Observations	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136	1.817.136
Wald Chi Sq.	122.069	121.973	119.558	119.435	121.837	122.013	120.315	120.107	120.190	120.483	119.804	119.574
Log Likelihood	-852.782	-852.733	-851.711	-851.479	-852.835	-852.788	-852.073	-851.547	-852.062	-852.022	-851.919	-851.845

Notes: ***, **, * indicate significance at 1, 5 and 10%, respectively

Source: own calculation

b. Trade Growth

We estimate the effects of EIAs on trade growth by running a fixed effects panel regression on exports growth. The standard variables – spell duration, initial exports, exporter's GDP and importer's GDP, distance, common language and adjacency – are all significant, they have the expected signs and their coefficients don't vary much across specifications and definitions of EIA (Table 3).

The variable 'EIA exists' has a positive and significant effect for all specifications in which agreements of level 2 or higher are considered. This implies that countries that sign trade agreements are the ones whose trade already had a high growth rate. The presence of a trade agreement – 'EIA in effect' – also has a positive effect that persists throughout all specifications, though it is non-significant for some specifications when the deeper EIAs are considered.

The effect on EIAs that start after the agreement has entered in effect, on the other hand, is consistently nil. The impact of the signing of EIAs on growth rates seems to be evenly distributed between existing and new spells. However, as time passes, the effect of an agreement on trade decreases, as can be seen in the coefficient of the variable 'Years since EIA', which is negative in all cases. This implies that trade agreements have a positive effect on trade growth that declines over time, in contrast with its effect on hazard, which increases. Finally, the quality of trade agreements has a positive effect on growth for EIAs when considering EIAs ≥ 1 and EIAs ≥ 3). The effect is nil when considering both PTAs and FTAs.

c. Initial Volume of Trade

We finally run a fixed effect panel regression on the initial volume of trade (Table 4). The usual variables have the expected sign: exporter and importer's GDPs and adjacency have a positive sign, and distance has a negative one. Contrary to expectations, common language has a negative sign, which is always significant across specifications and different levels of agreements.

Our interest; however, lays in the effect of the integration dummies. The variable 'EIA exists' is consistently negative and significant implying that countries that have signed an integration agreement at some point of the sample usually have lower initial volumes of trade. The variable 'EIA in effect', conversely, varies depending on the depth of integration. For shallower EIAs, the initial volume of trade is increased, whereas for deeper ones it is decreased. Something similar occurs with the time elapsed since EIAs are signed: it has a positive sign for EIAs ≥ 1 , and a negative one for deeper agreements. Finally, trade agreements quality reduces the initial trade volumes for shallower EIAs, while it has a nil effect for FTAs.

Table 3. The Effect of EIA on the Growth of Trade

	EIA >= 1				EIA >= 2				EIA >= 3			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Spell	-0.281***	-0.281***	-0.278***	-0.279***	-0.282***	-0.282***	-0.282***	-0.282***	-0.280***	-0.280***	-0.277***	-0.277***
Duration (ln)	-11,521	-11,521	-11,399	-11,445	-11,571	-11,584	-11,584	-11,566	-11,503	-11,503	-11,368	-11,354
Initial	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***
Exports (ln)	-64,176	-64,037	-64,044	-64,125	-64,335	-64,333	-64,331	-64,350	-64,075	-63,956	-63,773	-63,815
Exporter	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***	0.016***
GDP (ln)	23,733	23,734	23,767	23,974	25,783	25,783	25,756	25,784	25,508	25,475	25,543	25,388
Importer	0.011***	0.011***	0.010***	0.010***	0.009***	0.009***	0.009***	0.009***	0.010***	0.010***	0.009***	0.009***
GDP (ln)	9,833	9,735	9,539	8,791	8,335	8,340	8,337	8,309	8,902	8,899	8,845	8,728
Distance (ln)	0.004*	0.004*	0.004*	0.006***	0.008***	0.008***	0.008***	0.007***	0.006***	0.006***	0.006**	0.006**
	1,726	1,732	1,751	2,660	3,359	3,353	3,347	3,226	2,738	2,735	2,412	2,500
Adjacency	0.016***	0.017***	0.018***	0.014***	0,006	0,005	0,005	0,006	0.010**	0.010**	0.010**	0.010**
	4,206	4,218	4,497	3,522	1,468	1,338	1,319	1,437	2,379	2,379	2,499	2,409
Common	0.014***	0.014***	0.014***	0.013***	0,005	0,005	0,005	0,005	0.010***	0.010***	0.010***	0.011***
Language	4,095	4,079	4,134	3,921	1,519	1,480	1,466	1,296	3,030	3,029	2,977	3,051
EIA Exists	-0,010	-0,009	-0,007	-0,011*	0.013***	0.013***	0.013***	0.014***	0.017***	0.017***	0.017***	0.013***
	-1,557	-1,524	-1,181	-1,722	3,123	3,128	3,107	3,299	4,853	4,850	4,830	3,584
EIA is in	0.017***	0.018***	0.019***	0.015**	0.022***	0.020***	0.020***	0.026***	0.006*	0,006	0.015***	0,007
Effect	2,954	2,767	2,971	2,329	5,109	3,683	3,678	3,841	1,667	1,564	3,066	1,226
Spell Starts		-0,002	0,004	0,007		0,003	0,002	-0,001		-	0,007	0,008
After EIA		-0,373	0,869	1,457		0,578	0,331	-0,136		0,029	1,187	1,232
Years Since			-0.000**	-0.000***			0.000	0.000			-0.002***	-0.002***
EIA			-2,116	-2,941			0,114	0,187			-3,170	-3,208
Quality of the				0.038***				-0,012				0.025***
Agreement				6,538				-1,430				3,058
Observations	571.855	571.855	571.855	571.855	571.855	571.855	571.855	571.855	571.855	571.855	571.855	571.855
R2 Within	0,008181	0,008184	0,008209	0,008212	0,008192	0,008190	0,008190	0,008193	0,008165	0,008165	0,008196	0,008200
R2 Between	0,036312	0,036320	0,036366	0,036442	0,036590	0,036595	0,036594	0,036635	0,036397	0,036397	0,036373	0,036358
R2 Overall	0,019520	0,019520	0,019526	0,019607	0,019745	0,019745	0,019745	0,019748	0,019593	0,019593	0,019610	0,019628
RMSE	0,836846	0,836846	0,836835	0,836816	0,836800	0,836807	0,836807	0,836826	0,836831	0,836830	0,836817	0,836808

Notes: ***, **, * indicate significance at 1, 5 and 10%, respectively

Source: own calculation

Table 4. The Effect of EIA on the Initial Volume of Trade

	EIA >= 1			EIA >= 2			EIA >= 3		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Importer GDP (ln)	0.149*** 71,160	0.148*** 70,216	0.147*** 69,858	0.124*** 65,554	0.130*** 68,381	0.131*** 68,692	0.127*** 66,706	0.128*** 67,128	0.128*** 67,095
Exporter GDP (ln)	0.106*** 36,246	0.107*** 36,456	0.108*** 36,655	0.111*** 37,410	0.107*** 36,072	0.107*** 36,094	0.109*** 36,901	0.107*** 36,375	0.107*** 36,367
Distance (ln)	-0.053*** -7,048	-0.051*** -6,729	-0.053*** -6,958	-0.030*** -3,974	-0.037*** -4,877	-0.038*** -4,997	-0.041*** -5,392	-0.049*** -6,432	-0.049*** -6,399
Adjacency	0.115*** 7,870	0.104*** 7,081	0.111*** 7,493	0.081*** 5,351	0.149*** 9,749	0.142*** 9,259	0.120*** 7,839	0.127*** 8,298	0.127*** 8,275
Common Language	-0.149*** -13,369	-0.152*** -13,592	-0.147*** -13,110	-0.165*** -14,218	-0.119*** -10,109	-0.129*** -10,977	-0.150*** -13,116	-0.148*** -12,936	-0.148*** -12,958
EIA Exist	-0.370*** -26,911	-0.390*** -27,418	-0.384*** -26,878	-0.139*** -11,756	-0.094*** -7,919	-0.082*** -6,866	-0.021** -2,005	-0.022** -2,140	-0.025** -2,338
EIA is in Effect	0.100*** 8,226	0.076*** 5,869	0.075*** 5,799	0.113*** 9,081	0.287*** 20,899	0.345*** 23,316	-0.198*** -17,149	-0.033** -2,197	-0.042** -2,398
Years Since EIA		0.002*** 5,476	0.003*** 6,360		-0.013*** -30,051	-0.012*** -28,201		-0.036*** -16,980	-0.035*** -16,889
Quality of the Agreement			-0.088*** -4,615			-0.238*** -10,501			0,025 1,002
Constant	-4.810*** -35,802	-4.833*** -35,955	-4.821*** -35,862	-4.645*** -34,480	-4.612*** -34,237	-4.605*** -34,196	-4.522*** -33,563	-4.399*** -32,602	-4.401*** -32,611
Observations	522.619	522.619	522.619	522.619	522.619	522.619	522.619	522.619	522.619
R2 Within	0,046	0,045	0,046	0,046	0,048	0,048	0,046	0,047	0,047
R2 Between	0,250	0,250	0,250	0,246	0,247	0,247	0,247	0,247	0,247
R2 Overall	0,196	0,196	0,196	0,194	0,195	0,195	0,194	0,194	0,194
RMSE	1,706	1,706	1,706	1,705	1,702	1,703	1,705	1,704	1,704

Notes: ***, **, * indicate significance at 1, 5 and 10%, respectively

Source: own calculation

Conclusions

In this paper we have applied (Besedes *et al.* 2011) methodology to test the effects of Latin America Economic Integration Agreements (EIAs) on trade survival, initial volumes of trade relationships and export growth. We have found that their results do not necessarily hold when examining the Latin American experience, as several of their dummy variables reverse their signs. We have also found that the effects on trade depend heavily on the depth of the agreements considered for this region. These results should warn us against conducting worldwide analyses, as regional differences may be lost when aggregating, especially in regions with fewer spells. Our empirical analysis allows us to conclude that:

- economic Integration Agreements have a positive effect on the survival rate of trade; however, this effect is lower for deeper trade agreements. Therefore, countries which have signed an EIA face a lower risk than those that have not.
- for spells started before the agreement signing and continued afterwards, the effect depends on the depth of the agreement: only agreements that are FTAs or deeper have a significant positive effect.
- spells started after an EIA has been signed face a low risk of trade ceasing, however the magnitude of this significant effect depends on the depth of the integration agreement.
- the hazard rate decreases as time elapses since the signing of an EIA both for those spells which were already ongoing at the time of the signing and for those that started afterwards.
- regarding the effect of trade agreements quality, higher quality agreements lead to higher increases on the survival rate of trade relationships.
- when trade growth is taken as a dependent variable, the estimated coefficients suggest that countries that signed trade agreements are those whose trade has already had a high growth rate. The signing of an EIA has a positive effect on growth, though this effect decreases overtime.
- finally, the evaluation of the effect on the initial volume of trade shows that countries that have signed an integration agreement have lower initial volumes of trade. However, for spells that started before the agreement and continued afterwards, the effect depends on the depth of integration: for shallower ones the effect is positive whereas for deeper EIAs it is negative.

Acknowledgements

The authors gratefully acknowledge the support and collaboration of SECYT, Universidad Nacional de Córdoba. The authors thank Lucía Iglesias and Emilia Bullano for their participation in database processing.

References

- [1] Baier S. L., Bergstrand, J. H. and Feng, M. 2014. Economic integration agreements and the margins of international trade. *Journal of International Economics*, 93: 339–350. DOI: <http://dx.doi.org/10.1016/j.jinteco.2014.03.005>
- [2] Baier, S. L., and Bergstrand, J. H. 2007. Do free trade agreements actually increase members' international trade? *Journal of International Economics*, 71: 72–95. DOI: <http://dx.doi.org/10.1016/j.jinteco.2006.02.005>
- [3] Besedes, T. 2008. A Search Cost Perspective on Formation and Duration of Trade. *Review of International Economics*, 16(5): 835-849. DOI: <http://dx.doi.org/10.1111/j.1467-9396.2008.00752.x>
- [4] Besedes, T., Moreno-Cruz, J., and Nitsch, V. 2015. Trade Integration and the Fragility of Trade Relationships: Theory and Empirics. Georgia Tech Working Paper. Available at: http://www.freit.org/EITI/2015/SubmittedPapers/Tibor_Besedes97.pdf
- [5] Besedes, T., and Prusa, J. 2006. Ins, Outs and the Duration of Trade. *Canadian Journal of Economics*, 39(1): 266-295. DOI: <http://dx.doi.org/10.1111/j.0008-4085.2006.00347.x>
- [6] Carrere, C., and Strauss-Kahn, V. 2014. Developing Countries Exports Survival in the OECD: Does Experience Matter? CEPR Discussion Paper 10059.

- [7] Diaz Cafferata, A., Barone, S., Descalzi, R., Moncarz, P., Neder, A., and Recalde, M.L. 2011. Aportes a la formulación de una estrategia de inserción internacional de la Provincia de Córdoba. Informe final COPEC. Available at: http://www.copec.org/?page_id=157.
- [8] Florensa, L., Márquez-Ramos, L., and Recalde, M.L. 2015. The effect of economic integration and institutional quality of trade agreements on trade margins: evidence for Latin America. *Review of World Economics*, 155(2): 329-351. DOI: <http://doi.org/10.1007/s10290-015-0209-x>
- [9] Florensa, L., Márquez-Ramos, L., Recalde, M.L., and Barone, M.V. 2014. Does economic integration increase trade margins? Empirical evidence from LAIAs countries. Working Papers 2014/05. Universitat Jaume I, Economics Department, Castellón, Spain. Available at: http://www.doctreballeco.uji.es/wpficheros/Florensa_et_al_05_2014.pdf
- [10] Florensa, L., Recalde, M.L., and Barone, M.V. 2011. Survival and Growth of Argentina's Exports: A Regional Study. Paper presented at the 12th Conference on International Economics, Universitat Jaume I, June 16-18, 2011, in Castellón de la Plana, Germany.
- [11] Fugazza, M., and Molina, A.C. 2016. On the Determinants of Exports Survival. UNCTAD Blue Series Papers 46, United Nations Conference on Trade and Development. Available at: http://unctad.org/en/Docs/itcdtab47_en.pdf
- [12] Kamuganga, D. 2012. Does intra-Africa regional trade cooperation enhance Africa's export survival? Graduate Institute of International and Development Studies Working Paper No: 16/2012. Available at: <http://repository.graduateinstitute.ch/record/15443/files/HEIDWP16-2012.pdf>
- [13] Kohl, T., Brakman, S., and Garretsen, H. 2016. Do trade agreements stimulate international trade differently? Evidence from 296 trade agreements. *World Economy*, 39(1): 97-131. DOI: <http://doi.org/10.1111/twec.12272>
- [14] Minondo Uribe-Etxebarria, A., and Requena Silvente, F. 2012. The intensive and Extensive Margins of Trade: Decomposing Export Growth Differences across Spanish Regions. *Investigaciones Regionales*, 23: 53-76.
- [15] Nitsch, V. 2009. Die Another Day: Duration in German Import Trade. *Review of World Economics*, 145(1): 133-154. DOI: <https://doi.org/10.1007/s10290-009-0008-3>
- [16] Peña, F. 2016. Política comercial e integración regional de Argentina: hacia una nueva etapa? Puentes 17(1). International Centre for Trade and Sustainable Development. Available at: <http://www.ictsd.org/bridges-news/puentes/issue-archive/%C2%BFnuevos-actores-y-paradigmas-en-la-gobernanza-internacional>
- [17] Rauch, J., and Watson, J. 2003. Starting Small in an Unfamiliar Environment. *International Journal of Industrial Organization*, 21(7): 1021-1042. DOI: [https://doi.org/10.1016/S0167-7187\(03\)00018-3](https://doi.org/10.1016/S0167-7187(03)00018-3)
- *** Database on Economic Integration Agreements. 2015. Bergstrand, J. Notre Dame. Available at: <http://www3.nd.edu/~jbergstr/DataEIAsSeptember2015/EIA%20Database%20September%2030,%202015.zip>

Appendix

List of Latin American Economic Integration Agreements

EIA 1: Non Reciprocal Preferential Trade Agreements (NRPTA)

- European Union GSP¹ (1971);
- Japan GSP (1971);
- Norway GSP (1971);
- Liechtenstein GSP (1972);
- New Zealand GSP (1972);
- Switzerland GSP (1972);
- Australia GSP (1974);
- Canada GSP (1974);
- United States GSP (1976);
- Russia GSP (1994);
- Iceland GSP (2000);
- Turkey GSP (2002);
- Belarus GSP (2004).

EIA 2: Preferential Trade Agreements (PTA)

- Latin American Free Trade Association – LAFTA (1960-1980), conformed by Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela;
- Andean Community – CAN (1969-1995), conformed by Bolivia, Colombia, Ecuador and Peru;
- Latin American Integration Association – LAIA- (1981), conformed by Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela. Cuba joined in 1999;
- Venezuela – CARICOM²(1993);
- Colombia - CARICOM (1995).

EIA 3: Free Trade Agreements (FTA), Customs Unions (CU), Common Markets (CM) and Economic Unions (EU)

- Andean Community– CAN (1969), conformed by Bolivia, Chile, Colombia, Ecuador and Peru. Chile left in 1976; Venezuela joined in 1973 and left in 2006;
- Venezuela – Guatemala (1987);
- MERCOSUR (1991), conformed by Argentina, Brazil, Paraguay and Uruguay;
- Bolivia – Chile (1993);
- Chile – Venezuela (1993);
- Andean Community (1995) became a Customs Union;
- Bolivia – Mexico (1995);
- Colombia – Mexico (1995);
- Mexico – Costa Rica (1995);
- North American Free Trade Agreement – NAFTA (1995), conformed by Canada, Mexico and the United States;
- Chile – MERCOSUR (1996);
- Chile – Canada (1997);
- Chile – Peru (1998);
- Mexico – Nicaragua (1998);
- Chile – Mexico (1999);
- Mexico – European Union (2000);

¹ Generalized system of preferences.

² Conformed by Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname and Trinidad and Tobago. Haiti joined in 2002.

- Mexico – Israel (2000);
- Mexico – EFTA³ (2001);
- Mexico – Northern Triangle⁴ (2001);
- Chile – Central America⁵ (2002);
- Chile – Costa Rica (2002);
- Chile – El Salvador (2002);
- Chile – European Union (2003);
- Chile – EFTA (2004);
- Chile – Korea (2004);
- Chile – United States (2004);
- CAN – MERCOSUR (2005);
- Mexico – Japan (2005);
- Trans-Pacific Strategic Economic Partnership – TPSEP (2006), conformed by Brunei, Chile, New Zealand and Singapore;
- Chile – China (2007);
- Chile – Honduras (2008);
- Chile – India (2008);
- Chile – Japan (2008);
- Chile – Colombia (2009);
- Chile – Panama (2009);
- Peru – United States (2009).

³ Conformed by Iceland, Liechtenstein, Norway and Switzerland.

⁴ Conformed by El Salvador, Guatemala and Honduras.

⁵ Conformed by Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.

JOURNAL 
of Applied Economic Sciences

ISSN 2393 – 5162

ISSN - L 1843-6110