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Human Resources in the Russian Federation: Assessment and Forecast of Development

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Abstract:

This article analyzes human resources in the Russian Federation, problems and forecasts of their development. The role of human resources for the country's development in the global economic space has been considered; the place of Russia in the world economy in terms of GDP has been shown; Russian human resources have been analyzed based on such criteria as population, population density, birth rate, mortality, sex and age composition, level of urbanization, population dynamics, indicators of external and internal migration, ethnic composition, qualification structure. These values allow predicting the employment level, identifying opportunities for the state in the development of social support for the population in the future, carrying out reforms in education, predicting changes in the structure and quality of the labor force. The authors present their forecast values of total, natural and migration growth of the population up to 2030, analyzing and comparing the indicators related to the population in Russia.

The paper also characterizes Russian human resources according to such modern evaluation indices as Human Development Index, Global Competitiveness Index, Education Index, World Happiness Index, and Gender Equity Index and analyzes the place of modern Russia in the ratings of the world countries with regard to these indices.

Keywords: heritage, human resources, management, Russia, Russian Federation.

JEL Classification: A31, E23, E27, E29.

1. Introduction

Human resources, along with the natural, industrial, financial, information, cultural resources today are one of the most important components of the modern state in the global economic space and a significant competitive advantage in all sectors of social production.

Economically developed countries attach great importance to the effective management and development of human resources, which are understood as the population having physical development and intellectual abilities necessary for employment.

Improving the management system in order to develop capacity and effectiveness of the use of human resources in favor of the present conditions is the most important task of modern governments. Development of human resources in an unstable political and economic environment gains particular importance for modern Russia today as a country, which is currently actively reforming and developing its economy and integrating into the global economy.

2. Methodological framework

2.1. Literature review

A certain set of knowledge on human resource management and their role in the development of the national economy has already been formed in the scientific literature. Thus, the most famous foreign scientists in the field of human resource management as a significant factor of economic growth are Armstrong (2014), Drucker (2015), Keenan (2008), Wilkinson (2008), Kaufman (2014) *et al*.

In Russia, the study of this problem has been paid attention by such authors as: Abalkin (1999), Zaytsev, Cherkasskaya (2014). Issue and research of human resources in Russia and their development from different points of view in English literature are reflected in the works Ardichvili, Zavyalova (2015), Horie (2014), Filippov (2012), Hayashi (2013) *et al*.

However, from the point of view of the authors of this publication, in scientific works devoted to this issue, the problem of assessing the human resources of the country is not enough deeply studied, there is no complex, multi-parameter analysis of Russia's human resources by the various assessment criteria in order to obtain generalized information on the current state of human resources in the Russian Federation.

2.2. Concept headings

The aim of this paper was to assess the state of human resources in modern Russia, providing generalized information on the various evaluation criteria, forecasting further development of the Russian human resources in the medium and long term.

To achieve the goal, the authors set a number of objectives: to review the role of human resources for the development of the country in the global economic space; to identify the place of Russia in the global economy; to carry out an analysis of the human resources in the Russian Federation by the main basic criteria (population size, population density, level of urbanization, population dynamics, indicators of external and internal migration, ethnic composition, etc.); to describe the human resources in Russia by the modern evaluation indices and to analyze modern Russia's place in the ratings of countries of the world according to these indices; to form a map of the obtained performance indicators in the framework of multi-parameter estimation; to formulate the predicted values of certain indicators based on official statistics; to develop general ways of improving the state policy of human resource management.

The following hypothesis has been put forward by the authors: Russian human resources in many respects are characterized by positive dynamics, which may continue in the long term, if the government reviews the measures of human resource management and expansion of programs for the development of the population, including human resources.

The paper used methods of comparison, analysis and synthesis, research and generalization. The sources on which the statements and conclusions of this publication were based, are the scientific works of foreign and domestic experts; data published on the official websites of such organizations as the World Bank, the Federal Service of State Statistics, Institute of Demography of the National Research University "Higher School of Economics", as well as articles and information from open Internet sources.

2.3. Results

As a result of the analysis undertaken by the authors, it has been revealed that despite the current challenges prohibitive to more effective management of Russian human resources, there is a positive trend in this area, which may persist in the long term, upon condition of improvement of the state of human resource management systems in such key areas as: optimization of the management system of the older generation human resource, including the field of social support; development and implementation of programs to reduce real unemployment in some regions of the Russian Federation (including youth unemployment); as well as programs for retaining highly qualified personnel in the country (we especially note that these programs should be more widespread and active, in combination with strong state control); improvement of the state policy in the field of migration, in order to prevent the transition to the shadow sector of a significant number of foreign migrant workers (which is not helpful for creating a climate of a "healthy" competition between foreign and domestic workers); enhancing the development of provincial cities with a view to harmonize immigration and labor flows (these activities will not only raise the level of infrastructure in cities, but also provide jobs for the younger generation, hold them, which will reduce the enormous burden on Russian cities (Moscow, St. Petersburg, Rostov-on-Don and others.)

2.4. Discussion

The article has conducted multivariable analysis of Russian human resources in order to develop the country in the global economic space; an analysis of human resources in the Russian Federation by the main basic criteria and modern evaluation indices has been carried out.

Based on the obtained data, a generic map of Russian human resources has been compiled in order to ease the use of the obtained information about human resources, including labor force.

As a result, the overall key areas for improvement of the state of human resource management policies have been developed, based on the analysis, study and generalization of the data obtained by the authors, to enhance its effectiveness in the long term.

3. Application area

The research results can be applied in the development of medium- and long-term programs for the development of human resources in the Russian Federation, both at the government level and at the level of individual Russian and/or foreign companies carrying out their business activities on the territory of the Russian Federation in the conditions of economic globalization, mainly in terms of changing the structure and quality of labor force.

3.1. Place of the Russian Federation in global economy at the present stage

After the collapse of the Soviet Union in 1991, Russia continues its path of development from a centrally planned economy to the open market.

Despite the fact that, since 2014, and until now the Russian Federation is facing a crisis as a result of the imposition of sanctions and the sharp drop in oil prices, Russia's economy in terms of purchasing power is estimated at $3.56 trillion, and its GDP per capita the population is $24764.

Before the economic crisis of 2014 Russia occupied the 5th position by the GDP volume in the world economy, see Table 1. (Analyst: politics and economics Website).

Table 1 – Rating of countries by GDP in the world economy (in mln. $)

Country	Year					
	2010	2011	2012	2013	2014	2015
China	12,358,729	13,810,256	15,147,732	16,554,707	18,030,931	10,354,832
USA	14,964,372	15,517,926	16,163,158	16,768,053	17,419,000	17,419,000
India	5,370,599	5,845,362	6,252,658	6,783,639	7,393,075	2,048,517
Japan	4,321,149	4,386,151	4,540,944	4,612,630	4,630,941	4,601,461
Russia	2,928,122	3,226,600	3,445,923	3,592,401	3,745,156	1,860,598
Germany	3,234,539	3,442,035	3,500,328	3,539,319	3,689,840	3,868,291

Source: compiled by the authors based on the World Bank website data (World Development Indicators).

Most experts, including the foreign ones, are confident in the high potential of Russia's economic growth in the next 5-10 years and the inevitable increase in its role in geopolitics and the global economy.

Despite all the difficulties, Russia has been and remains the richest country in the world in terms of mineral resources, the value of which over time will only raise ("The world economy" Portal).

For example, in 2015 the foundation of Russian exports to non-CIS countries were fuel and energy goods, whose share in the commodity structure of export amounted to 66.4% (in 2014 – 73.4%), with assessment of exports of $345.9 billion, and the total foreign trade turnover of the country $530.4 billion. However, the Federal customs service of the Russian Federation states that the foreign trade turnover has decreased by almost 30% in 2015 compared to the 2014 (The official website of the Federal Customs Service of Russia).

However, it should be noted that in 2016 the economies of developing countries, including Russia, according to World Bank forecasts, will increase by 3.5% – slightly lower than the average for the last time (The World Bank forecast global growth in 2016).

3.2. Analysis of Human resources in the Russian Federation by the basic criteria

In the context of the increasing role of human resources in the development of the modern state in the process of economic globalization, the role of a competent analysis of their structure and characteristics is strengthening for further action in the field of efficient use, social sector reforms, predicting the future population structure, the direction of investment in their development.

When forecasting the economic development of Russia in modern conditions of instability of political, economic and social environment, the assessment of human resources, their structure, characteristics and future potential is of interest. Thus, the basic indicators of human resource assessment, as a rule, include the following: population, density of population, fertility, mortality, sex and age composition, level of urbanization, population dynamics, indicators of external and internal migration, ethnic composition, qualification structure etc.

Analysis of the main indicators of human resources allows predicting the level of employment, opportunities for the state to increase social support in the future, carrying out reforms in education, predicting changes in

structure and quality of labor force, etc. According to the national census, conducted in 2010, the number of population of the Russian Federation amounted to 142.9 million people. Compared to the census in 2002, the number of Russians has decreased by 2.3 million people, including in urban areas – 1.1 million people less, in rural areas – 1.2 million people less. In 2015, the trend towards a reduction in population (the population was 136.69 million people) remained. However, despite this fact, the Russian Federation is among the top ten countries in the world in terms of population after China, India, USA, Indonesia, Brazil, Pakistan and Bangladesh (Table 2).

Table 2 – Rating of countries by population in 2015

Country's place in the rating	Name of the country	Population, ths.
1	China	1,390,000
2	India	1,260,000
3	USA	325,723
4	Indonesia	246,813
5	Brazil	209,401
6	Pakistan	193,419
7	Bangladesh	168,158
8	Nigeria	160,931
9	Russia	136,696
10	Japan	127,993

Source: All ratings sites.

Against this background, special attention should be paid to the fact that following the results of 2015 the natural population growth is maintained in the Russian Federation, which amounted to 32.7 thousand people (see Table 3).

Table 3 – The natural increase in the Russian population (thousands)

Year	2010	2011	2012	2013	2014	2015
Ths. people	-239.6	-129.1	-2.4	+22.9	+33.7	+32.7

Source: Federal Service of State Statistics of the Russian Federation.

According to the forecasts of experts, in 2016 the Russia's population will increase and will be 146.38 million people, and by 2020 it is expected to grow to 147.5 million people. Life expectancy according to forecasts will increase up to 74 years and the total fertility rate – up to 1.87 ("Vzglyad" newspaper's website).

According to the Federal State Statistics Service, the number of economically active population of the Russian Federation aged 15 to 72 years old in 2015 amounted to 76.6 million people. Among them, there were 72.3 million employed persons and 4.3 million of unemployed ones (The official website of the Federal Service of State Statistics). The biggest problems in the area of unemployment are noted in the youth category. For example, more than 30% of the unemployed in the Russian Federation are young people up to 25 years.

Ministry of Economic Development forecasts that the demand for specialization in the fields of agriculture, trade and services will increase in the Russian Federation in 2016 - 2018.

Among the popular occupations are such as: seller, builder, transport and mining areas workers. At the end of this period the demand for highly qualified physicists, mathematicians, informatics specialists in the areas of technical sciences, telecommunications, metallurgy workers and workers in the field of mechanical engineering is expected to increase.

The Russian Federation is a multinational state with a complex in ethnic meaning population. Along with the Russia, multinational states are Brazil, Iran, India, Canada, India, the USA, China and a number of countries in the African continent. It is extremely difficult to explore the characteristics, including ethno-psychological, human resources of these countries, especially with the population included in the top ten countries with the largest population in the world.

In such multinational countries, there are tens or even hundreds of different nationalities, which makes such a unique state in terms of cultural, behavioral and labor diversity of human resources.

According to the census, in 2010, 137,227,107 people, or 96.06% specified their nationality. Thus, in Russia at the time of 2010 there were seven most numerous peoples with a population over 1 million people (the Russians, the Tatars, the Ukrainians, the Bashkirs, the Chuvash, the Chechens and the Armenians (Table 4). Although in

Russia almost 78% of the population consider themselves as Russians, it is necessary to note that in Russia traditionally there is a mixture of nationalities, and the number of marriages among the representatives of different peoples in the country is not uncommon.

Table 4 – Ethnic composition of the RF (population over 1 million people)

Ethnicity	Number of people	% of RF population
Russians	111,016,896	77.71
Tatars	5,310,649	3.72
Ukrainians	1,927,988	1.35

Source: compiled by the authors based on the Federal Service of State Statistics data.

Compared to the 2002 census, the number of the Russians decreased by 4,872,211 people, or 4.20%. The number of the Tatars and the Ukrainians also decreased by 243,952 (4.39%) and 1,014,973 (34.49%), respectively. Of the nations with a population of over 1 million people in 2010, a reduction in numbers occurred in all but the Chechens and the Armenians. The number of the Chechen population increased by 71,107 persons (5.23%), the Armenians – 51,897 (4.59%) (The official website of the Federal Service of State Statistics).

3.3. Migration processes in the Russian Federation

Analyzing the population of Russia in the context of human resources, the migration processes should by no means be omitted. Russia's important position in the world economy has been stipulated not only by the fact that the country is one of the major exporter of oil and gas but also by the fact that it is one of the suppliers of labor for the world community.

In the Russian Federation, export of human resources is manifested through such positive characteristics as lower number of unemployed citizens, qualitative improvement of professional and cultural indicators and also greater financial revenues that come from the Russians who left the country for either permanent or temporary employment.

However, there are not only positive but also negative aspects as well, the principal among which being the following: brain drain and population decline.

Today 10.8 million of Russians live and work abroad. Most frequently the Russians migrate to the USA, Great Britain and Switzerland. Work force migration is regulated by intergovernmental and interdepartmental agreements between Russia and Poland, China, Finland, Germany, between the CIS Countries. All these agreements envisage some certain quotas. These quotas set limits to the number of Russians who can work in the territories of other states, namely, no more than 4 thousand people from Russia annually (The official website of the Federal Service of State Statistics).

According to the Federal State Statistics Service of the RF, in 2015 the population increase due to migration in Russia proved lower than the same figure in 2013 – 2014. Thereat, today the mobility of Russian population is not low: the number of internal displacements amounts to 4 mln that is twice as high as compared to the 2000s. The number of foreign labor migrants is gradually decreasing testifying of the lower interest of foreigners in Russian labor market and also of the tighter migration legislation in Russia.

According to the forecasts of the experts, in future the number of foreign citizens from the EAEU member states in Russia will be preserved at the same level and that from other CIS countries will decrease. In the territory of the RF there are now up to 10 mln foreigners, among which circa 8.7 mln are represented by the citizens of the CIS countries. In 2014 these figures made 11.1 mln and 9.1 mln accordingly. Consequently, the number of migrants decreased by 10% (The official website of the Federal Service of State Statistics).

Major donor countries that send foreign citizens to the RF (labor migrants in the first place) are still represented by the CIS countries: they account for 83% of the total number of foreign citizens (Table 5).

Table 5 – Residence of foreigners from the Middle abroad in Russia in 2014

Country	Persons
Azerbaijan	517,480
Armenia	26,323
Belarus	46,515
Kazakhstan	17,878
Kirgizia	59,096
Republic of Moldova	28,539
Tajikistan	32,030
Turkmenia	54,636
Uzbekistan	6,033

Source: compiled by the authors based on the official website data of the Federal Service of State Statistics.

However, the trends within this group of countries are different: since the beginning of 2016 the number of foreign citizens from such EAEU member states as Kazakhstan, Belarus, Armenia increased; the number of citizens of Kirgizia started increasing as late as August 2015 as the country joined the EAEU and it has not yet exceeded the indicators of the beginning of the year; the number of foreigners from all other countries has decreased on a year-on-year basis.

The number of people coming from Ukraine makes quite a considerable figure; it has been increasing up to August 2015 and then some certain decline was observed caused, probably, by a lull in the armed hostilities and by the announced cancellation of the preferential regulations on Ukrainian citizens' stay in Russia.

It can be expected that in future the number of foreign citizens from the EAEU member states in Russia will remain great (that of the people from Kirgizia will probably be a little higher) and the number of people from other countries will start decreasing, including Ukrainian citizens (provided that no escalation of the military conflict occurs).

Given the political situation, in the next years the number of temporal and permanent migrants from such economically developed countries as the EU, the USA, Canada, Great Britain, Germany, etc. will decrease, i.e. the migrants from the countries which send high qualified specialists, investors, businessmen.

Thereat, 2015 was notable for the deteriorated situation in legalizing foreign workers on Russian labor market. In absolute terms, the migration growth of the population in 2015 was especially significant in Moscow (112.2 thousand people) and in the Moscow Region (87.6 thousand people).

The leaders in absolute growth of migration are still represented by the Krasnodar Territory (57.7 thousand people), Saint-Petersburg (25.3 thousand people), the Tyumen Region (17.9 thousand people), the Novosibirsk, the Voronezh and the Leningrad Regions (more than 12 thousand people each). In all other regions of the Russian Federation the migration-related growth of population amounted to less than 8 thousand people (Website of the Institute of Demography of the National Research University "Higher School of Economics" "Demoscope").

The decrease in migration rate is considerable in the Republic of Dagestan (-13.4 thousand people) and in the Yamalo-Nenets Autonomous District (-12.0 thousand people). This is explained by the fact that the Republic of Dagestan is today one of the most depressed regions in the Russian Federation; and the representatives of the republic, mostly young people, choose to move to the neighboring republics of to the large cities of the Country. Yamalo-Nenets Autonomous District is characterized by severe climate and difficult working conditions which stipulate high figures of migration from this region of Russia.

Analyzing and comparing such indicators as the number of the population in Russia, total and natural population increase and the migration flow the following forecasted values can be presented (Table 6).

Table 6 – Forecasts of Russia' change in population (ths. People)

Years	Average forecast variant			
	Population at the beginning of the year	Changes for the year		
		Total growth	Natural growth	Migration growth
2020	147509.5	111.9	-198.1	310.0
2025	147715.5	-52.5	-379.0	326.5
2030	147267.0	-112.9	-450.3	337.4

Source: compiled by the authors based on the official website of the Federal Service of State Statistics data.

3.4. Urbanization processes in the Russian Federation

Over the last 100 years the rate of urbanization as of the process of growth of the cities and of the number of their inhabitants in Russia has increased more than four times. Thus, the share of the inhabitants of the city districts increased from 17.5% in 1914 up to 74.2% in 2014 (Table 7). This growth was mostly associated with the economic policy adopted in the past by the government of the Soviet Union. In the mid-1960s the urbanization rate started decreasing gradually and in the 1980s it was no higher than 1.5% per year. Over the last two decades upon the disintegration of the Soviet Union the share of urban population in the Russian Federation remains virtually the same at the level of 74% and as of January, 1, 2014 it amounted to 74.2% or 106.549 mln people. Rural population in the Country accounts for 25.8% or 37.118 mln people.

Table 7 – The ratio of urban and rural population in Russia (in %)

Year	1914	1939	1959	1980	1990	2000	2010	2014
Urban population	17.5	33.5	52.2	69.6	73.6	73.1	73.6	74.2
Rural population	82.5	66.5	47.8	30.4	26.4	26.9	26.4	25.8

Source: compiled by the authors based on the official website of the Federal Service of State Statistics data.

In terms of the ratio of urban population today Russia is at the average European level. According to official data, circa 23 % of the population or 32.5 mln people live in the largest cities of the Russian Federation (Table 8).

Table 8 – Top 10 largest Russian cities in 2014

Place in the rating	City	Population
1	Moscow	12,108,257
2	St. Petersburg	5,131,942
3	Novosibirsk	1,547,910
4	Ekaterinburg	1,412,346
5	Nizhny Novgorod	1,263,873
6	Kazan	1,190,850
7	Samara	1,172,348
8	Chelyabinsk	1,169,432
9	Omsk	1,166,092
10	Rostov-on-Don	1,109,835
TOTAL		32,464,187

Source: compiled by the authors based on the site "population counter". (Population Counter Website)

Thereat, it has to be especially noted that while until the mid-1990s in Russia the classical type of urbanization was observed, namely, the ratio of the rural population was decreasing and that of the urban population was growing, over the last decade and up to now there has been a distinct trend of suburbanization associated with the extensive development of the suburbs of the large cities which decreases the number of urban population. This is mostly associated with the growth of the production facilities in the cities that entails poorer environmental conditions. The trend of suburbanization is most vividly revealed around such largest Russian cities as Saint-Petersburg and Moscow. Besides, the inhabitants of the country became more interested in the urban-type settlements located in the vicinities of the large cities in the economically developed regions of the country (for example, in the Kaluga and in the Belgorod regions).

3.5. Characterizing human resources in the Russian Federation applying modern evaluation indices

Among the indicators used for evaluating human resources a group of criteria can be distinguished that was developed not so long ago in the world practices: Human Development Index**,** Global Competitiveness Index, Education Index, World Happiness Index, Gender Equity Index etc. These indices are integrated ones and they make it possible to evaluate from different perspectives the level of human resources development in a country, to estimate the degree of people's satisfaction with living in this country, etc.

Thus, Human Development Index (HDI) represents an annually (since 1990) calculated index of the United Nations Development Program (UNDP) that is based on several indicators and is intended for the purposes of comparing the countries with each other and for measuring the standards of living, literacy, education and longevity as basic characteristics of human potential in the country under analysis.

This index is calculated based on three evaluation criteria: Index of life expectancy (that characterizes the level of healthcare system and its accessibility in the country); Index of education (that measures the accessibility

of education, average duration of education of adults and children in the country); Index of gross national income (GNI) per capita of the population (USD). Over the last several years the system of these indicators was supplemented with such indices as the gender equity index and multi-dimensional poverty index.

The top positions in 2015 rating were occupied by Norway, Australia, Switzerland, Denmark, the Netherlands, Germany, Ireland, USA, Canada and New Zeeland. The rating ends with the countries where Human Development Index is low: Burundi, Chad, Eritrea, Central African Republic and Niger, where life expectancy is extremely low (40-50 years), social and economic environment is extremely unfavorable, literacy of the population is low and the disease-related death rate is high. According to Human Development Index, in 2015 Russia occupied position 50 (0.798) in the rating table (see Table 9).

Table 9 – Russia's place in Human Development Index rating (HDI) in the world countries in 2015

No	Country	Index indicator
1	Norway	0.944
2	Australia	0.935
3	Switzerland	0.930
4	Denmark	0.923
5	Netherlands	0.922
6	Germany	0.916
6	Ireland	0.916
8	USA	0.915
9	Canada	0.913
9	New Zeeland	0.913
50	Belarus	0.798
50	Russia	0.798
52	Oman	0.793
184	Burundi	0.400
185	Chad	0.392
186	Eritrea	0.391
187	Central-African Republic	0.350
188	Niger	0.348

Source: Compiled by the authors based on Humanitarian encyclopedia.

The Global Competitiveness Index, published by the World Economic Forum (WEF) and developed in 2004 by Columbian professor Xavier Sala-i-Martin includes such indicators as infrastructure, macroeconomic stability, health, primary education, labor market efficiency, technological level, higher education, professional training, innovative potential, business competitiveness, etc.

The top ten of the rating based on this index includes the countries as follows: Switzerland, Singapore, USA, Germany, the Netherlands, Japan, Hong-Kong, Finland, Sweden, and Great Britain. The rating ends with Burundi, Sierra-Leone, Mauritania, Chad, and Guinea. Russia takes position 45 between Latvia (position 44) and Mauritius (position 46) (Humanitarian Encyclopedia).

Education Index represents an indicator of the UNDP calculated as the index of literacy among the adult population and the index of the total ratio of students and trainees. In terms of this index Russia occupies position 36 between Argentine (position 35) and Cyprus (position 37).

The top positions in the rating are given to Australia, New Zeeland, Norway, the Netherlands, USA, Ireland, Germany, Lithuania, Denmark, and Check Republic. Among the countries with the lowest Education Index there are such countries as: Guinea, Chad, Burkina-Faso, Eritrea, Niger (Humanitarian Encyclopedia).

In evaluating human resources such index as Age Watch, initiated by Help Age International Organization in 2013 is also of great interest. The index measures the quality of life and the well-being of the elder people across the world based on 13 indicators split in four groups: 1. material security of the representatives of the older generation, 2. health conditions, 3. education and employment, 4. favorable accommodation conditions.

In this rating Russia occupies position 65 being placed between Belarus (position 64) and Serbia (position 63), as we can see in Table 10. Today in the Russian Federation there are more than 28 mln people aged 60 and older. The number of pensioners increases by 700 thousand each year and amounts to over 30 mln people now, and the experts expect this figure reach 50 mln people by 2020. Apart from the low level of material security of the older generation, extremely low level of their engagement in social activity and poor health conditions have also been noted in Russia.

Table 10 – Russia's place in the Older People's Quality of Life Index rating in the world countries in 2015

No	Country	Index indicator
1	Switzerland	90.1
2	Norway	89.3
3	Sweden	84.4
4	Germany	84.3
5	Canada	84.0
6	Netherlands	83.0
7	Iceland	81.8
8	Japan	80.8
9	USA	79.3
10	Great Britain	79.2
63	Lithuania	43.2
64	Belarus	42.1
65	Russia	41.8
66	Serbia	41.7
67	Bangladesh	41.1
92	Pakistan	12.7
93	Palestine	12.3
94	Mozambique	4.5
95	Malawi	4.1
96	Afghanistan	3.6

Source: Compiled by the author based on the Humanitarian encyclopedia.

World Happiness Index has been calculated by the UN in 2011 for the first time and today it includes such indicators as GDP per capita, corruption level, level of political freedom, social support of the population, life expectancy, satisfaction with life in the country, etc.

The index has been developed by the United Nations and it reflects the well-being of the population rather than the feeling of happiness experienced due to living in that or another country. In this rating Russia occupies position 56 being placed between Moldova (position 55) and Poland (position 56), see Table 11. The Gender Equity Index represents an integrated indicator that characterizes the level of social development of the country. This evaluation indicator was suggested in 1995 by the UNDP and it reflects the level of female health protection, education accessibility, civil rights and political freedom for women and their opportunities on labor market in the country. Thus, in the course of calculating the Gender Equity Index many indicators have to be calculated in turn including the following: correlation between male and female employment in the country, wages of men and women broken down by the sectors of the economy and by the offices held, sex ratio in the body of governmental power and among the top management of the large national companies, the levels of literacy among men and women and the correlation between them, correlation between the sex ratios covered by the systems of education (primary, secondary-level, higher), correlation between life expectancy of men and women.

Table 11 – Russia's place in the World Happiness Index rating, in 2016 (rating fragment)

No	Country	Index indicator		No	Country	Index indicator
1	Denmark	7.526		57	Poland	5.835
2	Switzerland	7.509		58	South Korea	5.835
3	Iceland	7.501		59	Bolivia	5.822
4	Norway	7.498		153	Benin	3.484
5	Finland	7.413		154	Afghanistan	3.360
53	Japan	5.921		155	Togo	3.303
54	Kazakhstan	5.919		156	Syria	3.069
55	Moldova	5.897		157	Burundi	2.905
56	Russia	5.856				

Source: Compiled by the authors based on countries' World Happiness Index in 2016.

The top five positions in the rating are occupied by Slovenia, Switzerland, Germany, Sweden and Denmark. In this rating Russia takes position 52 between Moldova (position 51) and the Bahamas (position 53) (Table 12).

Table 12 – Russia's place in the rating of Gender Equity Index according to the UNDP, in 2015 (rating fragment)

No	Country	Index indicator	No	Country	Index indicator
1	Slovenia	0.021	53	Bahamas	0.316
2	Switzerland	0.030	54	Romania	0.320
3	Germany	0.046	143	Côte d'Ivoire	0.645
4	Sweden	0.054	144	CAR	0.654
5	Denmark	0.056	145	Liberia	0.655
6	Austria	0.056	146	Mozambique	0.657
7	Netherlands	0.057	147	Democratic Republic of Congo	0.669
8	Italy	0.067	148	Mali	0.673
9	Norway	0.068	149	Afghanistan	0.705
10	Belgium	0.068	150	Chad	0.707
50	Kuwait	0.288	151	Niger	0.709
51	Moldova	0.302	152	Yemen	0.733
52	Russia	0.314			

Source: Compiled by the authors based on Humanitarian encyclopedia.

As a result of the undertaken analysis a chart of the human resources evaluation indices in the Russian Federation has been developed (Table 13).

Table 13 – Map of human resources evaluation indices in the Russian Federation

Type of criteria	Estimation criterion	Indicator
Quantitative	Population	136,69 million people
	Population growth	32.7 thousand people a year
	Population density	8.5 people per 1 sq.km.
	Birthrate	1.87
	Dependency ratio	39.3%
	Coefficient of pension burden	18.1%
	Average life expectancy	'74
	Urbanization index	74.2%
	Net migration	228 181 people
	Internal migration	4 million people
	GDP	1860598 million $
	Literacy rate	99.72%
Qualitative	Traditional beliefs	Orthodoxy, Buddhism, Islam
Combined	National composition	Seven of the most numerous peoples with a population over 1 million people (Russian, Tatars, Ukrainians, Bashkirs, Chuvash, Chechens and Armenians)
Complex index	Human development index	50th place (0.798)
	Education Index	0.780 (36th place)
	Gender Inequality Index	0.314 (52th place)
	Quality of Life Index of the elderly	41.8 (65th place)
	Global Competitiveness Index	4.44 (45th place)
	Happiness Index	5.856 (56th place)
Labor resources assessment indicators	Number of economically active population	76.6 mln people
	Employment rate	72.3 mln people
	Official unemployment rate	5.6%
	Total number of unemployed	4.3 mln people
	Average per capita income (in months).	26,340.5 rubles.

Source: Compiled by the authors based on Review of the United Nations "World Population Prospects", Humanitarian Encyclopedia, the official website of the Federal Service of State Statistics.

Conclusion

Under the conditions when the world community has recognized the importance of the sustainable development of the country that is associated with the social progress, the whole system of relations between the human resources and the country or business now has to be revised, when an individual becomes one of the most important factors of production completely changing his role in the social process, being a resource in the new paradigm that possesses the greatest reserves for improving the efficiency of modern organization and of the state in general. In the environment of the changing attitudes toward human resources it is now important to revise the management system based on the achievements of a number of such scientific areas as demography, sociology, psychology, social psychology, ethnic psychology, public and private management, corporate management, etc.

This system is capable of forming the complex, multifaceted management methodology focused on personal growth, fulfillment of one's own individual potential, improved knowledge and professional self-determination of an individual.

Summing up the results of the investigation on the human resources in the Russian Federation presented in this study above, it should be noted that positive dynamics is observed in many aspects of human resources management in Russia.

Thus, it may be expected that the population in the country will grow in the years to come; natural increase that has been positive over the last two years will retain its positive dynamics in future. Life expectancy in Russia will improve.

However, it should also be mentioned that given the sufficient number of inhabitants, the high level of education, specific national characteristics of the population of the Russian Federation, including the high value attached to knowledge by the society, the potential of the human resources in the country is not realized in full.

The major issues are considered to be represented by the imperfect system of managing the human resources of the older generation, including the sphere of social support; the lack of the programs focused on solving the issues of real unemployment in some regions of the RF (including unemployment among young people); or the programs focused on holding highly qualified professionals in this country. Such programs should be of more wide-scale and active nature and they are currently in need of thorough governmental control.

The solutions have to be found to the problems in the sphere of migration where there is an evident trend testifying of the fact that a considerable number of foreign labor migrants move into "shadow economy" which does not make for establishing "healthy" competiveness between foreign and Russian workers.

Special attention should be paid to the extensive development of provincial towns in Russia in order to adjust migration and labor flows. This will help not only improve the levels of infrastructure in these towns but also provide jobs to younger generation, retain them where they are, thus decreasing the colossal load on Russian megalopolises (Moscow, Saint-Petersburg, Rostov-on-Don, etc.).

The results of the investigation and the recommendations developed thereupon can be used for the purposes of developing mid- and long-term programs on human resource management that are implemented by the government of the Russian Federation. Besides, basic ideas and conclusions of this study can facilitate improving the corporate human resource management policies in commercial companies including the foreign companies that do their business in the territory of Russia.

References

[1] Abalkin, L.I. 1999. *Economic Encyclopedia*. Moscow: Economics. ISBN 5-282-01934-5.

[2] Ardichvili, A., and Zavyalova, E. 2015. *Human Resource Development in the Russian Federation*. Routledge Studies in Human Resource Development.

[3] Armstrong, M., and Taylor, S. 2014. *Armstrong Handbook of Human Resource Management*. Kogan Publisher.

[4] Becker, Ch., Mendelsohn, S.J., and Benderskaya, K. 2012. Russian urbanization in the Soviet and post-Soviet eras. IIED, UNFPA.

[5] Druker, P. 2015. *Classic Works on Management*. Moscow: Alpina Publishe

[6] Filippov, S. 2012. Emerging Russian multinational companies: Managerial and corporate challenges. *European Journal of International Management*, 6: 323–341.

[7] Hayashi, H. 2013. Changes of Working Life and Work Motivation in Russia. *Journal of Northeast Asia Development*, 15.

[8] Horie, N. 2014. A Note on Human Resources Management in Russia: Path Dependency in Job Design. *The Journal of Comparative Economic Studies*, 9: 135–141. Humanitarian Encyclopedia. Centre of Humanitarian Technologies. Ratings countries in 2014-2016. Available at: http://gtmarket.ru/ratings/

[9] Kaufman, E. 2014. *The Development of Human Resource Management across Nations: Unity and Diversity*. Edward Elgar Publishing Limited.

[10] Keenan, T. 2008. *Human Resources management*. Edinburgh: Heriot-Wat. Population Counter Website. Available at: http://countrymeters.info/ru/Russian_Federation. Portal "The world economy". Russia's place in the global economy. http://www.ereport.ru/stat.php.

[11] Puffer, S.M., and McCarthy, D.J. 2011. Two decades of Russian business and management research: An institutional theory perspective. *Academy of Management Perspectives*, 25(2): 21–36.

[12] Redman, T., and Wilkinson, A. 2008. *Contemporary Human Resource Management: Text and cases*. Pearson Education Limited.

[13] Zaytsev, G., Cherkasskaya, G., Balkhen, M. 2014. *Human Resource Management*. A Textbook. Moscow: Academia.

*** All Ratings Website. Available at: http://total-rating.ru/1180-chislennost-naseleniya-v-stranah-mira-na-2015-god.html

*** Analyst: politics and economics Website. What place does occupy Russia on GDP in the year. Available at: http://www.news-usa.ru/kakoe-mesto-zanimaet-rossiya-po-vvp-v-mire-na-2015-god.html

*** The official website of the Federal Customs Service of Russia. Available at: http://www.customs.ru/index.php?Option =com_content&view=article&id=21621

*** The official website of the Federal Service of State Statistics. Available at: http://www.gks.ru/

*** United Nations World Population Prospects: The 2015 Revision. Available at: http://esa.un.org/unpd/wpp/Publications/Files/World_Population_2015_Wallchart.pdf

*** Vzglyad newspaper's website. Medvedev said Russia's population projected by 2020. Available at: http://vz.ru/news/2016/4/6/803853.html

*** Website of the Institute of Demography of the National Research University "Higher School of Economics" "Demoscope". Available at: http://www.demoscope.ru/weekly/2016/0677/barom02.php

*** World Bank website. The World Bank forecast global growth in 2016. Available at: http://www.worldbank.org/eca/russian/

*** World Bank Website. World Development Indicators. Available at: http://data.worldbank.org/

The Role of Money Market Liquidity in Dynamics of Crude Oil Prices

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Abstract

How does money market liquidity affect crude oil prices movements? This paper addresses the question by looking at liquidity from two different perspectives: safe and risky money availability. Using M2 and VIX as a proxy for each type of money liquidity, respectively, I find that risk money liquidity measured by VIX is significantly estimated to have a positive effect on the NYMEX WTI crude oil prices. Moreover, sub-period analyses show that the effect of risk money liquidity on oil price is prominently significant from 2007 to 2008, when the oil prices excessively rise and fall. These results imply that money liquidity in emerging countries is an important factor for explaining dynamics of crude oil prices especially when oil prices are turbulent.

Keywords: crude oil prices, money liquidity, US M2, VIX.

JEL Classification: E31, E32, Q41, Q43.

1. Introduction

Dramatic Changes in crude oil prices over the past decade raise the curiosity on what factors drive the changes. Existing literatures well demonstrate that physical oil market fundamental factors, such as, oil demand and supply are significantly effective, but non-fundamental financial factors, such as, money in- and out-flow into oil market has known to be not significant (Kilian 2009). As long as it is assumed that oil is used not anymore only as an industrial resource but also as a financial asset, it is a meaningful research to detect the link between oil prices and money factors.

This paper, therefore, investigates the relationship between oil prices and money liquidity. Although Ratti and Vespignani (2013 a, b, c) have dealt with the liquidity factor, we more specifically look at liquidity from two different perspectives: safe and risky money availability.[1] By using US M2 and VIX as a proxy for each type of money liquidity, respectively, this paper finds that risk money liquidity measured by VIX is significantly estimated to have a positive effect on the NYMEX crude oil prices.

Moreover, by conducting sub-period analyses this paper finds that the effect of risk money liquidity on oil price is prominently significant from 2007 to 2008, when the oil prices excessively rise and fall. These results shed lights on the implication that money liquidity in emerging economies is an important factor for explaining dynamics of crude oil prices especially when oil price are turbulent.

2. Theoretical background: Liquidity and oil prices

Standard macroeconomic theory suggests that increase in money supply leads to higher real prices of commodity and assets since the money increase stimulates inflation expectation. A number of empirical studies well support the theory by finding that money increase influences inflation as well as real prices of commodity or asset.[2] All these studies conceptualize the liquidity as money availability, so that increase (decrease) in liquidity means greater (lesser) money availability.

In view of macroeconomics as above, it is simple that higher oil price is a consequence of liquidity growth since oil is regarded as one of commodities. But, this paper hypothesizes a more specific channel from money liquidity to oil price movements by dividing money into two types: safe money measured by US dollar and risky money.

First, this paper posits that increase in US dollar liquidity leads to higher crude oil price through financial market as well as physical market. For the oil financial market, more safe money in-flows in the oil as a financial

[1] This paper is broadly consistent with Ratti and Vespignani (2013 a) in terms of examining the effect of liquidity on international oil prices. But, unlike Ratti and Vespignani (2013a), this paper first utilizes VIX as a liquidity variable in terms of risky asset type. Also, this paper considers US oil demand and supply variable for US-based oil prices unlike global level oil demand and supply for global level oil price.

[2] In order for the link between money increase and inflation expectation, please see, for example, Baks and Kramer (1999), Ruffer and Stracca (2006), Sousa and Zaghini (2007), D'Agostion and Surico (2009). To check the money increase effect on prices of assets or commodity, please see Barsky and Kilian (2002) on US and other 9 OECD commodity, Belke et al (2010) on the price of housing, Brana *et al.* (2012) on emerging countries commodity.

asset pressures the prices upward, which is consistent with most of field experts and policy makers in the early section of Introduction. For the oil physical market, safe money liquidity growth meaning that US dollar supply growth leads to weak US dollar in foreign exchange market and consequently lower the value of oil that internationally uses US dollar as invoicing currency.

Considering that most of oil exporting countries in Africa and Middle East highly depends on oil exports revenue for the national economy, these key global oil suppliers should call for higher oil prices to compensate for lower purchasing power caused by lower value of oil that is based on US dollar.

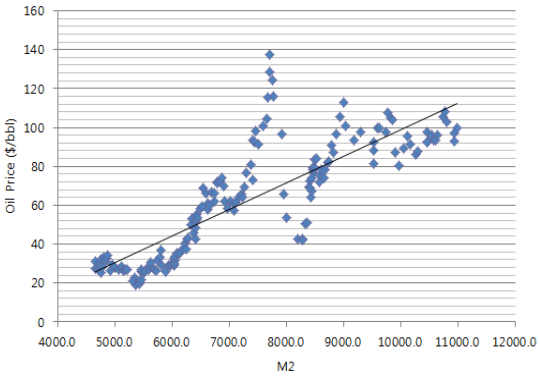
Thus, this paper selects the US case to test whether liquidity of US dollar as safe money positively affect NYMEX WTI crude oil futures price that is an international benchmark crude oil price as well as an US-based financially traded asset.

Second, this paper posits that greater risky money liquidity positively affects crude oil prices. Since this paper defines the type of risky money as the financial assets of emerging countries, greater risky money liquidity means economic growth of emerging countries.

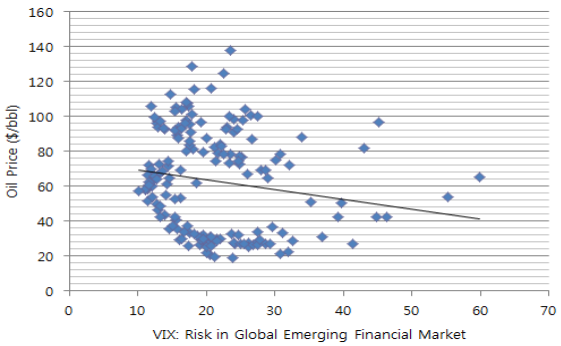
Therefore, international crude oil prices are upward pressured as emerging economies grow. This paper uses CBOE VIX for a risky money proxy because VIX is known to be the best measure of risk premium at the global level.[3]

Figure 1 apparently supports for the above two posits. Panel A in Figure 1 displays the relationship between US M2 and NYMEX WTI crude oil prices from Jan. 2000 to Dec. 2014. The positive relationship between two appears to be consistent with the first posit that increase in safe money liquidity leads to higher oil prices. As Panel B shows, the negative relationship between VIX and the oil prices during the period is in line with the second posit. Since VIX is a measure of risk, higher VIX means lower liquidity in emerging financial market. Thus, the negative relationship between VIX and oil prices is correct to support the second posit that higher risky money liquidity leads to higher oil prices. Further statistical analyses are made in the following sections.

[Panel A: Safe Money] US M2 & WTI Prices



[Panel B: Risky Money] VIX & WTI Prices



Source: FRB St. Louis for M@, CBOE for VIX and US EIA for WTI Futures Prices

Figure 1 - Money liquidity and WTI crude oil futures prices: Jan. 2000 ~ Dec. 2014

3. Data and methodology

This paper uses monthly crude oil market data and liquidity data over the periods of January 2000~December 2013.

The crude oil market data used consists of WTI futures prices, US oil inventory stocks (unit: 1,000 barrel), and US industrial production index. US oil inventory stock excluding SPR plays a role of excess oil supply over demand, and US industrial production is a proxy for oil demand as Kilian (2008), Ratti and Vespignani (2013 a, b, c) suggest. In addition, the liquidity data used in this paper consists of two types of money: US M2 (unit: Billion of US Dollar) as safe money liquidity and CBOE VIX as risky money liquidity.

Since VIX historically is more likely to increase when emerging markets are under crisis period (Matsumoto 2011), it is plausible to test the association between changes in VIX (=changes in emerging market liquidity) and oil prices movements.

[3] VIX is probably the best measure of risk premium at the global level. While VIX is a measure of volatility of S&P index and thus measures uncertainty as well, it is sufficient that VIX is highly correlated with the risk premium. Indeed, VIX is a known proxy for risk premium in the literature. (Matsumoto 2011, 10)

Table 1 provides basic statistical description on five variables during 2000~2013 and Figure 2 show the trend of movements. Since several variables, such as, WTI prices, oil inventory stocks, and M2, are not stationary for the sample period, this paper takes the first difference of all the variables for estimation model. Table 2 and Figure 3 finally provide the statistical description on the first difference of five variables and its stable time trend.

Table 1 - Summary of statistics

	WTI Prices	Invent. Stock	Indust. Prod.	M2	VIX
Mean	62.98	325,400.0	93.57	7,369.95	21.04
Std. Dev.	29.15	31,616.8	4.41	1,776.07	8.51
Maximum	137.63	395,514.0	101.55	1,0994.20	59.89
Minimum	19.09	268,954.0	83.73	4,649.90	10.08
Stationarity*	No	No	Yes	No	No

Note: *Stationary is checked by Augmented Dickey-Fuller test at the standard level of significance 5%

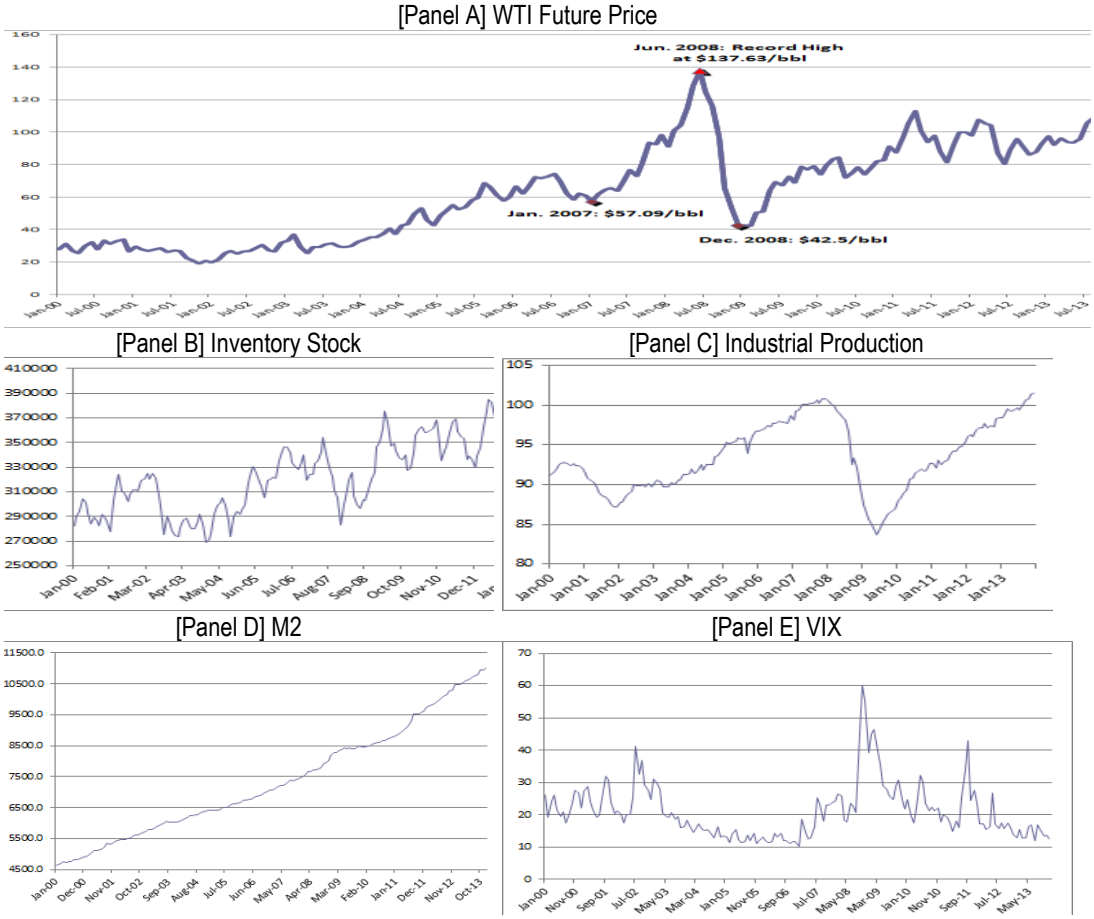


Figure 2 - Monthly Time Trend of the selected Variables: Jan.2000 ~ Dec.2013

Table 2 - Summary of Statistics of the First - differentiated variables

	Δ WTI	ΔStock	Δ Ind. Prod	Δ M2	Δ VIX
Mean	0.43	467.58	0.06	37.99	-0.08
Std. Dev.	6.14	9589.78	0.66	38.55	4.87
Maximum	13.25	25848	1.39	224.1	24.49
Minimum	-31.24	-25264	-4.06	-35.6	-18.43
Stationarity*	Yes	Yes	Yes	Yes	Yes

Note: *Stationary is checked by augmented Dickey-Fuller test at the standard level of significance 5%

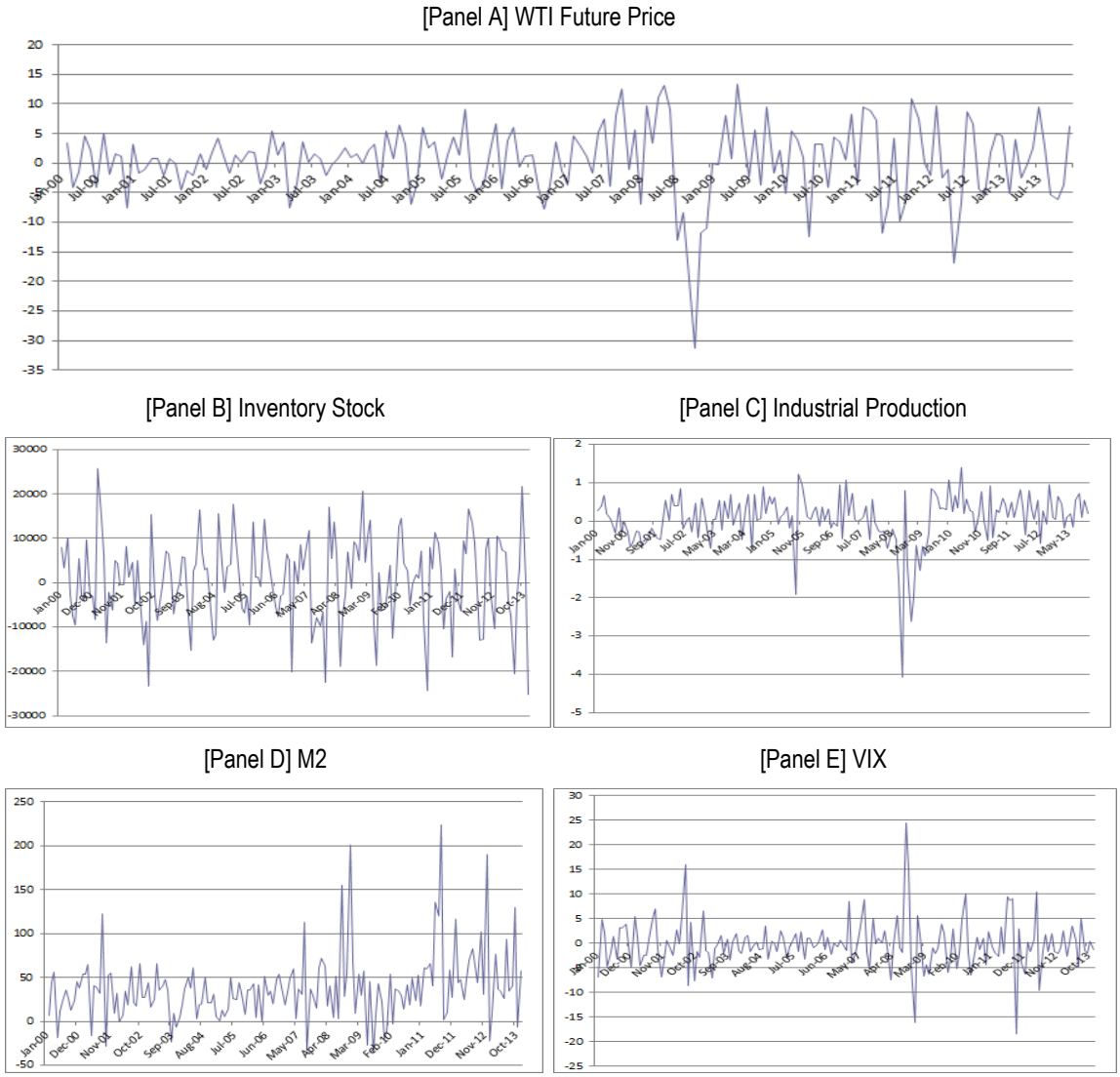


Figure 3 – Monthly Time Trend of the First-diff. variables: Jan. 2010 ~ Dec. 2013

For estimation, this paper uses the simple multifactor model as the following model which is basically consistent with Robe and Wallen (2015):

$$\Delta WTI_t = \alpha_0 + \alpha_1 \Delta STOCK_{t-1} + \alpha_2 \Delta IP_{t-1} + \alpha_3 \Delta M2_{t-1} + \alpha_4 \Delta VIX_{t-1} + \varepsilon_t \quad (1)$$

where: WTI is the WTI futures prices, STOCK - US inventory stock, IP - US industrial production, M2 - US M2, VIX - CBOE VIX, ε - error term.

Since these are all not correlated with each other as shown in Table 3, the estimation model is free from the multicollinearity problem. The subscription "t" tells the time, so "t-1" means the previous month in the monthly-based estimation model. Consequently, estimating the parameters, α_3 and α_4 enables to check the effect of liquidity on crude oil price changes with physical market fundamentals controlled.

Table 2 – Correlation matrix

	Δ STOCK	ΔIP	ΔM2	ΔVIX
Δ STOCK	1			
ΔIP	-0.072	1		
ΔM2	0.015	-0.281	1	
ΔVIX	-0.027	0.004	0.065	1

In addition, the liquidity parameters are re-estimated for the following sub-periods since it is notable that WTI prices excessively move from January 2007 to December 2008 as [Panel A] in Figure 1 displays above. During the short period, the prices rapidly rise and reach the record high at $137.63/barrel and suddenly fall down to $42.5/barrel.

Thus, comparative analyses across sub-periods with the notable period 2007~2008 will reveal the information that the liquidity effect on oil prices depends on the feature of oil price movement, for example, if oil prices move excessively or not.

4. Estimation results

Table 3 - Regression results

	2000~2013 [Entire Period]	2007~2008 [Turbulent Period]	2009~2013 [Gradually Rising-2]	2000~2006 [Gradually Rising-1]
Constant	0.345 (0.645)	0.173 (2.613)	1.420 (1.256)	0.120 (0.663)
$\Delta STOCK_{t-1}$	-5.3E-07 (2.74E-05)	-1.4E-05 (9.85E-05)	-4.3E-06 (5.5E-05)	7.1E-06 (2.61E-05)
ΔIP_{t-1}	2.163** (0.699)	5.659** (2.018)	-0.643 (1.534)	0.687 (0.847)
$\Delta M2_{t-1}$	-0.002 (0.011)	0.057 (0.056)	-0.010 (0.018)	0.008 (0.018)
ΔVIX_{t-1}	-0.411** (0.091)	-0.817** (0.279)	-0.291 (0.175)	-0.074 (0.110)
Adj. R^2	0.14	0.475	-0.007	-0.045
Obs.	166	23	59	82

Note: Numbers in parentheses are standard errors. Asterisks mean significance level (*: 95% significance level; **: 99% significance level)

Table 4 reports the results from the multifactor model for several periods by using the Ordinary Least Square (OLS). First of all, for the entire period, 2000~2013, it is found that two variables, oil demand and VIX, are statistically significant to explain oil price movements.

The result specifically explains that oil price movements are positively associated with oil demand measured by industrial production but negatively associated with VIX. Consistent with the conventional theory, the empirical result enables to draw a conclusion that more oil demand leads to higher oil prices through physical market and more risk money liquidity leads to higher oil prices through financial market.

Additional analyses for sub-periods suggest more interesting results. The significant variables, oil demand and VIX, on oil prices estimated based on the entire period above are not significant in two sub-periods, 2000~2006 and 2009~2013, respectively.

As shown in the 3rd and 4th column in Table 4, the variables are all statistically insignificant and even the model fitness is poor with very little R^2 values However, during the sub-period when oil price are turbulent, 2007~2008, these variables, oil demand and VIX, are highly significant with 99% level, and the model is well fitted with fairly high R^2 value, 0.475.

Therefore, these sub-periods analyses reveal that the role of VIX in explaining oil price dynamics is prominent when oil price movements are excessive. Yet, the role of financial factor is not very significant when oil price movements appear to be common.

Conclusion

This paper investigates the role of money market liquidity in explaining the crude oil price movements from 2000 to 2013 using a monthly-based linear regression model. The empirical results show that the WTI oil prices movements are positively associated with risky money liquidity measured by CBOE VIX.

Furthermore, it is found that the positive association is prominently significant when oil price excessively moves during 2007~2008 even though the positive association is not significant during other sub-periods.

These empirical results suggest implication that VIX plays an important role in explaining the crude oil price dynamics, in addition to oil market fundamentals. The role of the risky money liquidity should be considered much seriously as oil price movements are extremely volatile. In conclusion, the empirical finding that oil price movements are excessive for short time and explained by the money liquidity supports for an argument that oil is financialized and is not simply a resource commodity any more.

For a future research, it is meaningful to examine the shock of money liquidity on the crude oil price using an advanced structural time series model since standard results on this issue have been undertaken by recent studies like Alquist and Kilian (2010) and Ratti and Vespignani (2013 a, b, c).

Also, more specific modelling may make contribution to methodological development. For example, weekly-based modelling helps catching the instant effect of liquidity on oil prices in the future markets, or it helps to understand the link of two different markets, risky money market and global oil market when modelling the risky money market endogenously in the estimation model (1).

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References

[1] Alquist, R., and Kilian, L. 2010. What do we learn from the price of crude oil futures? *Journal of Applied Econometrics*, 25(4): 539–573. DOI: 10.1002/jae.1159

[2] Baks, K., Kramer, C.F., 1999. Global liquidity and asset prices: Measurement, implications, and spillovers. *IMF Working Paper* 99/168, Washington, D.C.

[3] Barsky, R.B., and Kilian, L. 2002. Do we really know that oil caused the great stagflation? A monetary alternative. In NBER Macroeconomics Annual 2001, *MIT Press, Volume 16 NBER Working Paper No. w8389.* Available at: https://ssrn.com/abstract=277299

[4] Belke, A., Orth, W., and Setzer, R. 2010. Liquidity and the dynamic pattern of asset price adjustment: A global view. (October 2009). *DIW Berlin Discussion Paper No. 933*. Available at: https://ssrn.com/abstract=1496862 or http://dx.doi.org/10.2139/ssrn.1496862

[5] Brana, S., Djigbenou, M-L., Prat, S. 2012. Global excess liquidity and asset prices in emerging countries: A PVAR approach. *Emerging Markets Review*, 13(3): 256-267.

[6] Choi, S. 2014 Causality between investor's sentiment and price movements: a case study of the NYMEX petroleum futures markets. *International Journal of Oil, Gas & Coal Technology*, 7(3): 229-243.

[7] D'Agostinon, A. and Surico, P. 2009. Does global liquidity help to forecast US inflation? *Journal of Money, Credit and Banking,* 41(2-3): 479-489.

[8] Ding, H., Kim, H.G., and Park, S. Y. 2014. Do net positions in the futures market cause spot prices of crude oil? *Economic Modelling*, 41: 177-190.

[9] Kilian, L. 2008. Exogenous oil supply shocks: how big are they and how much do they matter for the US economy? *The Review of Economics and Statistics*, 90(2): 216-240.

[10] Kilian, L. 2009. Not all oil price shocks are alike: Disentangling demand and supply shocks in the crude oil market, *American Economic Review,* 99 (3): 1053-69.

[11] Kilian, L. and Murphy, P. 2011. The role of inventories and speculative trading in the global market for crude oil, *Journal of Applied Econometrics*, 29(3): 454–478.

[12] Li, H., Kim, H.G., and Park, S.Y. 2015. The role of financial speculation in the energy future markets: A new time-varying coefficient approach. *Economic Modelling*, 51: 112–122.

[13] Matsumoto, A. 2011. *Global liquidity: Availability of funds for safe and risky assets*. International Monetary Fund, No. 11-136. - Business & Economics.

[14] Rueffer, R., Stracca, L., 2006. What is global excess liquidity, and does it matter? *ECB Working Paper* 696, Available at: https://ssrn.com/abstract=942737

[15] Ratti, R.A., and Vespignani, J.L. 2013a. Why are crude oil prices high when global activity is weak? *Economics Letters*, 121(1): 133–136.

[16] Ratti, R.A., and Vespignani, J.L. 2013b. Crude oil prices and liquidity, the BRIC and G3 countries. *Energy Economics,* 39: 28–38.

[17] Ratti, R.A., and Vespignani, J.L. 2013c. Liquidity and crude oil prices: China's influence over 1996–2011. *Economic Modelling*, 33: 517–525.

[18] Robe, M.A., and Wallen, J. 2015. Fundamentals, Derivatives Market Information and Oil Price Volatility. *Journal of Futures Markets*, 36(4). Available at: https://ssrn.com/abstract=2615807

[19] Sousa, J.M., and Zaghini, A. 2007. Global monetary policy shocks in the G5: a SVAR approach. *Journal of International Financial Markets, Institutions and Money*, 17(5): 403–419.

Problems and Prospects of Russian Pension System: A Comparison with Organisation for Economic Cooperation and Development Countries

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Abstract:

The aim of the article is to analyze the current status and trends of reforming pension system in Russia and compare them with indicators of OECD (Organisation for Economic Co-operation and Development) leading countries. The main methods used to achieve the objectives of the study are statistical and comparative analysis, in particular, of key indicators of the pension system in Russia and that of the EU countries, the USA, as well as the EEU. The article reveals new trends and identifies current problems and prospects of the public pension system, and proves the key role of private pension systems and voluntary plans to finance retirement income in the medium term. It has been proved that in the conditions of reforming the pension system, supporting the development of the market of private pension funds is an important issue, which in the future will be a key source of financing of retirement income and funds accumulated by private foundations can be used as a source of long-term investments, including those in priority infrastructure and innovative projects. Research materials may be used for the development and implementation of the state strategy of reform and develop the pension system in Russia, in this regard, they are of practical significance.

Keywords: investment resource in economy, pension system in Russia, private pension funds.

JEL Classification: G23, G28, H55.

1. Introduction

Problems of Russian pension system have been considered in recent years in a wide range of scientific publications of both Russian and foreign authors and international organizations. A comprehensive approach to the problem of reforming and developing the private pension system in Russia is contained in the OECD report "Developing a funded pension system in Russia. International Evidence and Recommendations", prepared in 2013 by an international team of authors in cooperation with the Russian economists.

The paper concludes that there is a need for public policy of supporting and stimulating incentives to develop private pension provision, which should become an additional source of financing retirement income. Also, the need to review the tax status of non-state funds has been determined to further stimulate people in participating in voluntary retirement plans. Certain aspects of the problem have been considered in "The Role of Funded Pensions in Retirement Income Systems. Issues for the Russian Federation" (Yermo 2012).

The author emphasizes that the development of voluntary pension plans in Russia will support and maintain the standard of living after retirement, but the current high tax deductions from wages and uncertainty over the future of the public pension system is a disincentive for employers to fund private foundations.

2. Concept headings

In 2015-2016 similar issues are reflected in the works of Russian economists: Batayev (2015), Gorlin (2014), Solovyov (2011), Sinyavskaya (2005). The key idea of the works is the development and improvement of funded pension component in the format of employees and employers' voluntary contributions with the maximum use of tax incentives.

At the same time, it is important to ensure the safety of pension savings formed earlier. The decision of the key issue of the Russian pension system – ensuring the growth of pensions – should be implemented through the optimization of the existing system.

In Russia, as in most developed countries a trend of population aging remains. The number of working-age population will significantly decrease over the next few decades. Low birth rates and increasing life expectancy are the main factors arising deficit of the pension system, which will only increase with retirement of baby-boom generation.

The structure of pension systems in most developed countries assumes an average 40-50% share of the state component in the provision of pensions, the rest 50-60% are private pension systems.

Currently, coverage of voluntary pension plans in Russia does not exceed 10% of the workers, which is quite low compared with the OECD standards. One of the options for the development of voluntary pension system can become a system of employees' automatic registration in Private Pension Fund (PPF), such a system was introduced in New Zealand in 2007 and in the UK in October 2012 (Yermo 2012).

Stimulating the development of private pension funds and voluntary pension insurance in Russia in the future will contribute solving the problem of increasing replacement rate. According to the recommendations of the International Labor Organization, pension should not be less than 40% of the total amount of lost income, for example, in the Netherlands this indicator is 90.5%, in Austria – 78.1%, the average for EU countries – 59% (Gross pension replacement rates 2014).

According to Rosstat (Federal State Statistics Service), Russia's replacement rate has never reached 40%. Until 2009, it was even less than 30%, in 2010 – 35.7%. In January-February 2016 the rate was at the level of 38%. According to the forecasts of the Committee of Civil Initiatives, the replacement rate, providing maintaining current structure of pension in Russia will decrease by 10% for 15-20 years (Kudrin 2016).

The aim of the article is to analyze the current problems of financing the pension system in Russia under reforming conditions, as well as prospects for transition from the current pension system to the model assuming a significant share of the participation of private pension funds.

Transition to the mixed financing of retirement income with the participation of both state and private pension systems allows significantly decreasing the deficit of the Pension Fund, reducing the fiscal burden on business and employees, and also attracting considerable resources on the financial market.

3. Results

The study identifies the key factors affecting the growth of imbalances in the pension system of Russia, and also gives recommendations for overcoming the problems arising from deficiencies.

In particular, reforming the principles and structure of pension provision at this stage, such as: raising the retirement age, optimization of the public pension fund costs, as well as the liberalization of the entire pension system, stimulation of development of voluntary pension insurance and the market of private pension funds – allows solving the problem of increasing the replacement rate, improve the current standard of living of pensioners.

Moreover, the liberalization of conditions of activity of private pension funds will allow using the funds accumulated by them facilities not only in financial markets but also attracting as long-term investments, for example, in infrastructure projects, because of a number of reasons uninteresting for private investors at the moment.

4. Discussions

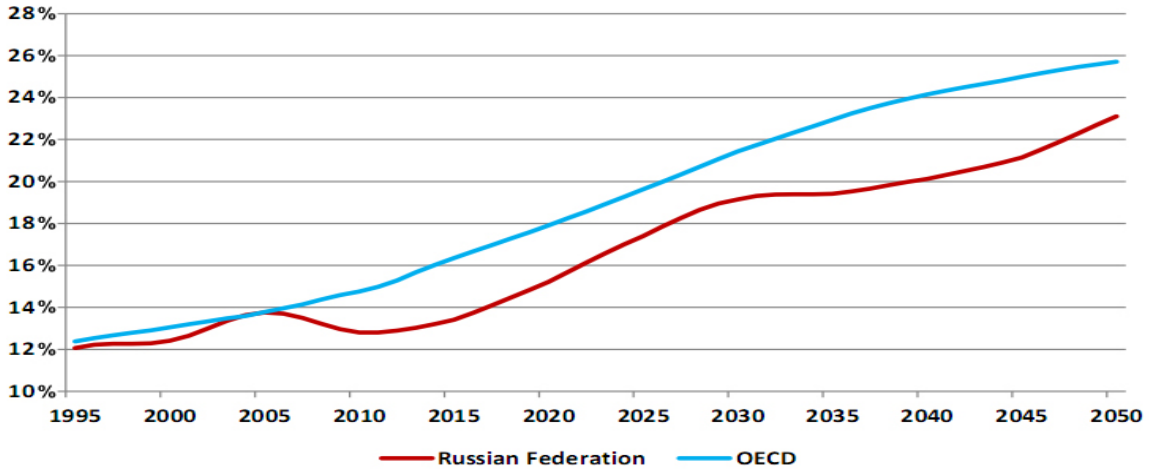
Number of those who receive pensions from the Russian Pension Fund in 2016 will amount to 43.2 million persons, including about 39 million people receiving pension insurance.

The number of the employed in Russia in May 2016 amounted to 71.8 million people. Thus, a substantial burden on the pension system (less than two employed per a pensioner) does not allow balancing the budget of the Pension Fund of the Russian Federation, which was in low supply for a long time, and the current amount of insurance contributions of employers cover only a little more than a half of total spending at sufficiently high tax rates.

The deficit is covered by transfers from the federal budget, which will amount to 3.2 trillion rubles in 2016 (about 46% of revenues). At the same time the official retirement age is one of the lowest in the world (60 years for men and 55 for women), while a significant increase in life expectancy has been achieved in the last decade.

In terms of average pensions and salaries in the countries of the Eurasian Economic Union, the current rates in US dollars have been decreased significantly as a result of the double devaluation of national currencies in Russia and Kazakhstan, as well as follow-less scale devaluation in Belarus, Kyrgyzstan and Armenia, related to the negative processes in the Russian economy (Figure 1).

Despite this fact, Russia and Kazakhstan remain leaders among the EEU countries in terms of the average pension, while, the highest ratio of the current pensions to wages – more than 41% – is in Belarus, 35% in Russia and Kyrgyzstan, 40% – in Kazakhstan, only 22%. – in Armenia



Source: http://www.apsf.ru/Ufs2016/srednie_zp_pens_2016.shtml

Figure 1 – The average size of pensions and salaries in the EAEC countries in USD, 2016

It should be noted that the indicators of the level of average pension in Russia and Kazakhstan before the crisis of 2014, associated with the fall in oil prices, approached the values of the Baltic States (Latvia, Lithuania, Estonia), which is more than twice less than in countries such as Germany, France and United Kingdom.

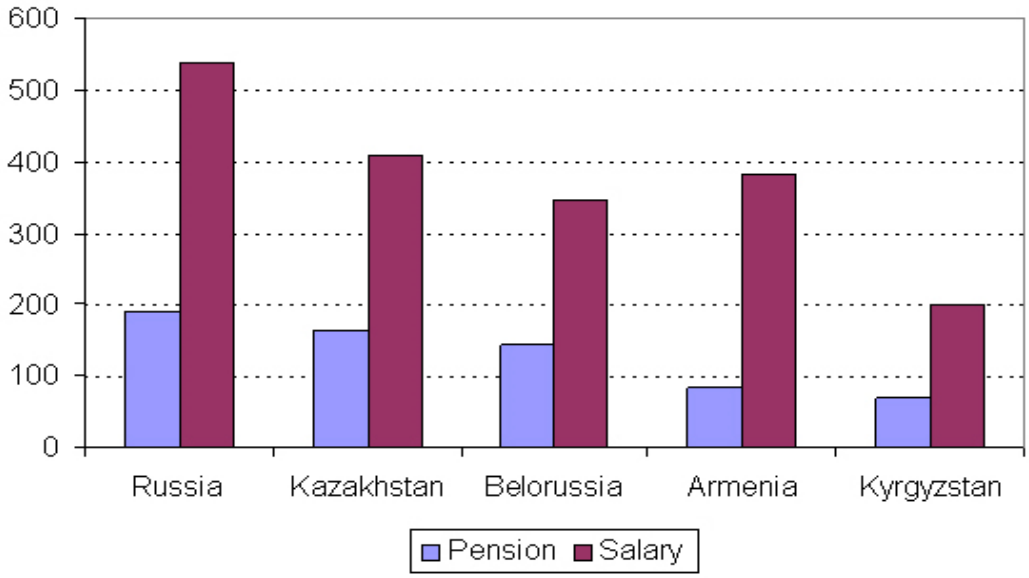
The total volume of investment portfolios of pension fund and all PPF was 4.8 trillion RUB (65.8 billion USD), or about 6% of GDP in 2015. For comparison, this rate was 14.3 trillion USD in the US, or 79.7% of GDP, 1.3 trillion USD and 178.4% – in the Netherlands, the average value of OECD countries – 84.5% of GDP, although in some countries, such as Germany, Belgium, Austria and Italy, the ratio of pension fund investment to GDP ratio is comparable with Russian values (Pension funds in figures of 2016).

Indicators of real return of investment of pension savings in 2014 in Russia were negative (-7.4%), primarily due to high inflation. In OECD countries, the level of profitability in 2014 ranged from 1.2% to 16.7%, and the average value was 5%. At the same time, due to the slow in inflation, decline slowed down in 2015, reaching -3.2%. In a number of OECD countries negative profitability indicators have also been considered, in particular in the United States (-1.7%), Poland (-4.0%) (Pension Markets in Focus for 2015).

One of the most promising options for balancing the Russian pension system is the development of private pension provision. Private pension funds are among the largest institutional investors and participants of financial markets of many countries. Assets accumulated by pension fund in some countries even exceed the size of the GDP, as well as a conservative investment policy aimed at minimizing risks and obtaining stable long-term income makes the PPF not only a key element of pension provision of citizens, but also an important factor in ensuring the stability of the entire financial system

In the medium and long term, in most developed countries the financial burden on pension systems will increase due to the influence of growth in life expectancy and declining birth rates, while short-term volatility in the financial markets is also one of the main reasons for the growth of pension fund deficits due to sudden fluctuations of investment rate of return.

In Russia, the statistics data point to the need to raise the retirement age. Despite the fact that life expectancy is below the standards of OECD countries, its expected increase in connection with the low birth rate will lead to a significant aging of the population in the coming decades. It is predicted that the ratio of the population aged over 65 years to the population aged 20 to 64 years will almost double in the period from 2010 to 2050 (Figure 2).



Source: Developing a funded pension system in Russia. International Evidence and Recommendations (OECD Publishing 2013).

Figure 2 – Old-age dependency ratios in the Russian Federation and the OECD: historical and projected values, 1995-2050

It is worth noting that the budget deficit of the Pension Fund of Russia in 2016 will amount to 175.1 billion RUB, while revenues of Pension Fund of the Russian Federation for 2016 are forecasted in the amount of 7.5 trillion RUB, 3.2 trillion RUB of which are transfers from the federal budget.

4.1. Reform of the Russian pension system

At the end of April 2016, the Russian Ministry of Finance prepared a new draft of the pension reform, consisting of six clauses. In particular, the Ministry of Finance proposes to equal the retirement age for men and women at 65 year level, increasing it in increments of 6-12 months a year.

The project also provides refusal to pay the pension, or at least its fixed part for employed pensioners. Another proposal is to set a single tariff of social insurance and to collect contributions to the pension fund not with salaries up to a certain limit, but with the entire salary. In fact, the Ministry of Finance proposes to increase in tax burden and to reduce social obligations that will allow in whole reducing the federal budget deficit.

The project also included a proposal to abolish the mandatory of funded component and to transfer it from the mandatory pension insurance system in the quasi-voluntary one while introducing incentives for voluntary savings. Ministry of Finance proposes to pass to the voluntary principle of funded contributions from 2019.

In reality, most pension savings of insured citizens will be small in that form in which a funded component exists at the moment, for workers with higher incomes – because of limited income restrictions falling under the insurance premiums.

Contributions to the Pension Fund of the Russian Federation in 2015, with the size exceeding the annual labor compensation fund in 711 thousand RUB amount to only 10%. For workers with low incomes, this is because of insignificance of the funded part that is due to low salaries.

The analysis of the distribution of the total funds allocated for wages and the average wage by 10% (decile) groups of workers in organizations in April 2015 illustrates the fact that 68% of workers in Russia, according to official data of Rosstat (Federal State Statistics Service), are paid less 52 thousand RUB per month.

This shows the urgent timeliness of tax incentives for participation in voluntary pension insurance programs for the citizens. After all, the social tax deduction is now given for an amount not exceeding 120 thousand RUB in the aggregate for the tax period, respectively, the maximum size of the refund is only 15,600 RUB a year. In addition, the yield on pension savings in NPF and management companies is often lower than inflation. And this is a serious problem. Thus, if we analyze the average annual yield of pension savings in Vnesheconombank and the PPF, then the comparison is not in favor of the latter (Rambler.Finances 2015).

Therefore, in addition to the state guarantees for the safety of pension savings, guarantees for the minimum yield and the development of special tools of the stock market, intended for the pension system, such as infrastructure bonds are also needed.

The reform of 2013, which provides a state guarantee for the safety of pension savings, PPF corporatization and expanding investment horizon for the PPF up to 5 years, will enable them to achieve greater profitability in the future than in previous years.

One of the priorities is the direction of PPF funds for long-term investment projects, including those in the agricultural sector. PPF advantage is that they are able to invest in securities in the long term, and receiving pension contributions, invest even in cases when the rest of the investors prefer not to do so. Due to this, PPF will contribute to the stabilization of the financial market, reducing its volatility and risks for all participants.

In view of the above mentioned the problem of effective use of private pension funds (PPF) facilities in the conditions of active reforms and the growth of private pension insurance market in Russia is becoming increasingly important. At the same time, it is important to develop state mechanisms to stimulate investments of pension funds in priority sectors, including infrastructure projects, as well as increase in investment transparency and protection of the rights of insured persons, the pension plans participants.

Currently, there are obstacles for investment of facilities of private pension funds in long-term projects, in particular, PPF cannot invest in innovative projects. At the same time, for example, in the US and other developed economies, pension funds are a major source of investment for such projects, which demonstrate the greatest return on the horizon of 5 to 10 years.

Therefore, one of the main goals of the pension reform in Russia should be the creation of conditions for the use of pension funds as long-term investments in the economy. The processes of liberalization of the legislation in the field of investment fund regulation should also play an important role in the development of the market of private pension funds.

Financial resources accumulated by PPF are an important source of investment in the economy. It is worth noting that the amount of pension savings in the management of Russian private pension funds at the beginning of 2016 amounted to more than 1.7 trillion RUB. At the same time, the system of guarantees of pension savings as of May 2016, consists of 38 PPF out of 118, the aggregate share of the assets of which amounted to 94.5% of the total volume of finance in the management of non-state funds (Deposit Insurance Agency).

The amount of pension reserves of PPF in the beginning of 2016 amounted to about 992 billion RUB. In relation to the GDP, the amount of finance of private pension funds in Russia is around 2.1%, compared to the Netherlands, which are the world leader in this index – 160.2%, 74.5% – in the US, while in Western Europe countries there are lower rates: 6.3% in Germany, 5.6% in Italy.

Table 1 shows the ranking of private pension funds in terms of assets formed after the transfer of the management of the funded part to the Russian Pension Fund on the basis of applications of insured persons.

Table 1 – Private pension funds rating by volume of pension savings, Jan. 2016

No	PPF	Pension savings (ths. RUB.)	Market share of compulsory pension provision
1	PPF Sberbank (JSC)	243,322,459	14.25%
2	PPF LUKOIL-GARANT (OJSC)	221,598,349	12.98%
3	PPF FUTURE (JSC)	163,923,833	9.60%
4	PPF Rosgosstrakh (OJSC)	129,382,598	7.58%
5	PPF Gazfond pension savings (OJSC)	113,774,606	6.66%
6	PPF VTB pension fund (JSC)	108,691,097	6.37%
7	PPF Electroenergetiki (JSC)	98,573,103	5.77%
8	KITFinance PPF (PJSC)	91,473,639	5.36%
9	PPF Promagrofond (PJSC)	77,536,475	4.54%
10	PPF StalFond (JSC)	63,291,744	3.71%
11	PPF European pension fund (JSC)	58,274,822	3.41%
12	PPF Naslediye [Heritage] (PJSC)	53,106,903	3.11%
13	IPPF Big (JSC)	33,869,267	1.98%
14	PPF Doveriye (JSC)	32,842,778	1.92%
15	PPF SAFMAR (JSC)	30,029,854	1.76%

Source: http://npf.investfunds.ru/ratings/7/

As it can be seen from Table 1, the share of the first 15 fund accounts for 89% of all accumulated assets, the leader at the moment is the PPF Sberbank with a share of over 14%, although other "players" also have a significant potential for growth, thus at the initial stage there are prerequisites for the formation of conditions of healthy competition between the PPF and the optimum development of private pension insurance market.

Among the funds-participants of guarantee system, currently, about half of savings are placed in corporate bonds (41%) and shares (8%). The share of bank deposits and current accounts amounts to 35%. The share of federal bonds is accounted to only 2% of the investment funds. The remaining funds are distributed between the sub-federal bonds (6%), mortgage bonds (4%), mortgage participation certificates (2%), accumulated coupon yield (1%) and special brokerage accounts (1%) (Metelitsa 2015). In general, distribution structure of the fund's portfolio by types of assets corresponds to the average performance of OECD countries with the exception of a sufficiently high value in terms of investment of pension funds in banking products. This is due, primarily, to the currently existing restrictions imposed by the Central Bank.

After a nearly two-year moratorium on the transfer of pension assets in the 2nd quarter of 2015 PPF and Management Companies, having concluded agreements with the Pension Fund of the Russian Federation, received pension contributions to the investment part of the state pension for the second half of 2013, and also participated in the redistribution of resources on the basis of transition campaign of 2013-2014.

Thus, the number of the persons insured in the PPF has increased by 6.1mln, up to 28.1 mln persons; that is 34.9% of the number of people forming pension savings. At the same time, the share of persons insured in the PPF compared to the number of people engaged in regular contributions to the funded pension system, according to our estimates, is approximately 50%. The number of persons insured in PPF, having significantly increased as a result of the transition campaign, shows both the high level of confidence in the system, and the reluctance of citizens to lose the funded part of the pension.

On the basis of information provided by specialized depositaries, the Bank of Russia conducts a detailed assessment of the investment structure. In particular, management accounting data provide a deeper understanding of both the industry and the rating structure of investment portfolios of PPF pension savings.

Among investments of pension savings in shares and corporate bonds, the most popular are securities of banks and financial institutions (leasing, factoring and other companies).

At the same time 29% of the amount of share portfolio and corporate bonds that make up the pension savings are presented by securities that do not have credit rating recognized by the Bank of Russia, but included in the quotation list of the top-level of at least one of the Russian stock exchanges, or secured by state guarantees. About 44% of the portfolio consists of securities with group "Ba" ratings and comparable with them. Another 19% are securities with group "B" ratings.

Managers of pension reserves when investing in shares and corporate bonds preferred securities of banks and other financial institutions, whose share in their portfolio is 69% (compared to 52% in a similar portfolio of pension savings). Thus, in terms of the sectoral structure, portfolio of shares and corporate bonds of pension reserves is less diversified than a similar portfolio of pension savings and therefore may carry greater risks.

With regard to the sectoral structure of investment portfolios of PPF, the leaders are shares and bonds issued by banks and financial institutions, which collectively amount to more than half of the portfolio (The Central Bank of the Russian Federation 2015).

The government is ready to change the investment rules for PPF to stimulate investment in long-term projects, so that more funds can be invested in shares, bonds and other instruments of the real sector of the economy, which in turn have a positive impact on economic growth. According to the Ministry of Finance, in the end it will bring up to RUB 350-400 bln annually on capital market. Unlike conventional bank deposits, life and investment cycle of pension money is 25 years on average, which allows effectively using them to finance infrastructure projects.

Currently, private pension funds, with longer liabilities than those of other banks, invest significant amounts in bank deposits, allowing them to neutralize short-term fluctuations in the financial market. To solve this problem, the restrictions from the Central Bank should be removed to create PPF of asset portfolios that they can hold to maturity.

This measure will allow changing the structure of the investment portfolio of pension funds in the medium term, reducing the share of banking products and increasing the number of funds invested in fixed income instruments, including bonds of the real sector companies. In general, the Central Bank pursues a policy of expanding the list of assets allowed for investment funds of PPF, and the removal of excessive restrictions.

The share of investment in the real sector of the economy is about 30% of the PPF. These include shares and bonds of nonfinancial sector enterprises, Vnesheconombank, as well as mortgage-backed securities. At the same time the share of investments in infrastructure projects accounts for about 10% (more than 90 billion. RUB). These projects are funded in part by virtually all PPF through investments in shares and bonds of companies in the fuel and energy complex, as well as implementing various infrastructure projects of other companies' bonds (Service of Bank of Russia for Financial Markets 2014).

The first successful examples of public-private partnership in the projects financed by the pension funds already exist. In particular, the project "Main road" for the construction of toll stations entering the Ring Road from the federal highway Moscow – Minsk, the project "Waste management", the purpose of which is the construction of waste treatment plants, as well as the project of a sports complex "Volga-Sport" in the Ulyanovsk region.

Standard rate of the expected return of a number of infrastructure projects is higher than the corresponding figures for federal loan bond and bank deposits, but these projects require a much higher risk, therefore should be carefully selected, including for possible changes in legislation.

Investments in infrastructure projects can generate returns high enough for pension funds and future pensioners, but the resulting rates depend on the quality of a specific project. On the other hand, the infrastructure projects are demanded by pension funds, as in the current environment, investment in the public market does not show the profitability of higher inflation. At the same time, similar projects need to be monitored by the regulator in order to avoid violations.

Among the PPF, surveyed by RAEX, 35% consider investing in the construction of road infrastructure the most attractive infrastructure investment, 29% expressed a preference for investment in the modernization of industrial facilities, 21% – investment in the extraction and processing of raw materials. At the same time investments in projects to build facilities for the processing and disposal of trash and household waste have been called attractive by 12% PF, and only 3% – in construction of sports facilities (Results of the online survey at the round table "The future of the pension market" 2015).

According to the quarterly review of the concession bonds market prepared by "INVESTINFRA" news agency, there is a positive experience of investing PPF funds in infrastructure projects through the instrument of concession bonds in Russia.

As of the 1st quarter of 2016 two PPF: PPF "GAZFOND" and CJSC Private Pension fund Naslediye [Heritage] were included in the top 3 infrastructure investors. This rating of infrastructure investors reflects the scale of investment activity through investment volume and the number of investment projects, return on investment, as an indicator of the effectiveness of investment decisions in the long term and evaluation of the expert community, as an estimate, reflecting the professionalism and quality of the selected investor in infrastructure projects.

Since 2010 about 70 billion rubles have been invested in various infrastructure projects. Relatively small amount of investment facilities of PPF in concession bonds is due to several reasons, including:

- specific risks of public-private partnership on the basis of concession agreements (long-term projects, non-financial scope of the project without a recognized indicators);
- lack of safeguards system of the rights of institutional investors (PPF), investing in concession bonds;
- lack of separation of concession bonds in the regulations as a financial instrument of the targeted long-term financing of infrastructure projects;
- lack of incentives for the placement of facilities of PPF in concession bonds compared with the placement of assets in bank deposits;
- lack of systematic, long-term and predictable policy concerning planning infrastructure development in the Russian Federation;
- deficit of trained quality infrastructure projects;
- lack of the system of incentives for the concession bonds.

All this leads to the fact that PPF investments in infrastructure are now taking place outside an attractive environment specially created for this that takes account of substantial scale projects, their capital intensity, and – most importantly – the long-term period (Two PPFs were included in the top infrastructure investors 2016).

Taking into account the special social status of PPF funds in solving the problem of their large-scale involvement in the financing of long-term infrastructure projects, it is advisable to create a system of incentives and measures that would, on the one hand, promote and protect PPF investments in the targeted way, and, on the other hand, create overall investment environment of appropriate quality for the preparation and implementation of infrastructure projects.

During the meeting, organized by the Ministry of Economic Development with the participation of the Central Bank and the Ministry of Finance with the representatives of the pension funds, the amount of investment of the largest PPF in corporate bonds of real sector companies selling long-term infrastructure projects was estimated at between RUB 5 and 15 bln per an issuer.

The PPF, as a rule, allocate funds into corporate bonds with a maturity of 10 years and a floating rate of return on the level of the consumer price index at a premium of 1.5% points. For a guide, it is offered to use federal loan bond rates with comparable maturities.

One of the key criteria for the PPF when allocating funds is to minimize the risk of volatility of return on debt securities. Therefore, funds prefer to invest in projects with a limited number of investors who go long, and also are interested in the possibility of monitoring the project implementation.

The issuing companies, as the source said, also confirmed their interest in attracting pension funds. Companies do not mind to attract long-term investments with floating rates, in this case either consumer price index, or a key rate of the Central Bank of the Russian Federation increased by 1-1.5% points is considered here as the basis for calculating rates. In turn, the issuing companies are also interested in attracting pension funds through the sale of debt securities with floating yield; either a consumer price index or the key rate of the Central Bank + 1-1.5% is considered as a basis for calculating the interest rate

In particular, according to Rostelecom estimates, the possible amount of borrowings from the PPF means to finance investment projects in 2015-2017 can make more than 100 billion RUB; Russian Railways estimates the potential amount of funding of investment projects, which can be covered by the pension funds at the level of 50 billion rubles annually during 2015-2017, in addition to the program of infrastructure bonds.

Conclusion

Significant costs incurred by the State Pension Fund of Russia, related to financing of current pensions as well as the low share of tax revenues in the structure of revenues of Pension Fund of the Russian Federation is due to several factors:

- low collection of payroll taxes due to high rates, when many small and medium-sized businesses actually evade taxes, paying “gray salaries”.
- poor budgeting resulting in a significant proportion of pension expenditure is covered by external sources that can create serious imbalances with significant and long-term drop in budget revenues, for example, currently associated with the fall of oil prices.

Building a balanced pension system in Russia, in particular, the public component is a priority that requires the reform of key principles of pension provision, such as: raising the retirement age, reducing costs of Pension Fund of the Russian Federation, increasing the share of tax revenues in the structure of pension income system. The development of voluntary pension plans in addition to the state pension will also solve the problem of increasing the replacement rate in Russia, to achieve improvement of living standards of pensioners.

The OECD key recommendations regarding Russia include an increase in the amount of income subject to pension contributions, reducing the categories eligible for early retirement, the use of single rates of contributions for all sectors of the economy, as well as a uniform retirement age and increase depending on increase in life expectancy. In addition, the further development of private pension provision and increasing the awareness of employees about the possibility and the need for retirement savings, in parallel with the improvement of the pension funds’ risk management systems in order to increase their profitability is considered as a promising area (Better Policies Russia: Modernizing the economy 2013).

The liberalization of pension legislation in the activities of private pension funds, along with the state support for the sector will accelerate the growth of this market, even with the low base effect. PPF assets can be a relatively cheap source of long-term investments in the Russian economy for infrastructure and high-tech projects. Income derived from such investment will enable emerging hedge short- and medium-term risks in the financial markets and ensuring stable rates of return funds. This model of financing pension schemes is applied in many OECD countries, including the United States.

Thus, to date the necessary conditions have been formed not only for the development of private pension funds market, which will contribute, in the first place, to the liberalization of the rules governing their investment activities, but also the inclusion of PPF in the investment processes of the real economy, where their assets are a popular source of financing in terms of monetary and credit contraction of the economy during the crisis. Incentives from the government investment in infrastructure projects will allow pension funds to implement effective long-term investment, and issuing companies to attract significant financial resources and guaranteed financing.

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References

[1] Batayev, A.V. 2015. Forecast of Russian Pension Fund deficit based on actuarial modeling. *Young Scientist*, 7(87): 349-355.

[2] Gorlin, Yu.M. 2014. Defects of the Current Pension Formula. *Economic Policy Journal*, 4: 98-115.

[3] Kudrin, A. 2016. Russia missed a good chance to raise the retirement age. *Alexei Kudrin Official Website*. Available at: http://akudrin.ru/news/rossiya-upustila-horoshiy-moment-dlya-povysheniya-pensionnogo-vozrasta

[4] Metelitsa, Ye. 2015. PPF invested a third of Russians savings in bank deposits. *RBC*. Available at: Available at: http://top.rbc.ru/finances/18/03/2015/55095f949a79471f81d72e3a.

[5] Sinyavskaya, O.V. 2005. How to Raise the Retirement Age in Russia? *Otechestvennyye Zapiski*, 3(24), Available at: http://www.strana-oz.ru/2005/3/kak-povyshat-pensionnyy-vozrast-v-rossii.

[6] Solovyov, A.K. 2011. *Retirement Insurance*. Textbook. Moscow: Norma.

[7] Yermo, J. 2012. The Role of Funded Pensions in Retirement Income Systems: Issues for the Russian

*** Better Policies Russia: Modernizing the economy. 2013. OECD Publishing.

*** Deposit Insurance Agency. Register of private pension funds - members of insured persons' rights system. Available at: http://www.asv.org.ru/pension/docs/participants_p_4.xlsx

*** Developing a funded pension system in Russia. International Evidence and Recommendations. 2013. OECD Publishing.

*** Gross pension replacement rates. 2014. Available at: https://data.oecd.org/pension/gross-pension-replacement-rates.htm#indicator-chart

*** Pension fund investments down slightly in 2015. 2016. Pension funds in figures. OECD Publishing.

*** Pension Markets in Focus. 2015. OECD Publishing.

*** Results of the online survey at the round table "The future of the pension market". 2015. Available at: http://raexpert.ru/researches/npf/2015_opros

*** Service of Bank of Russia for Financial Markets. 2014. Available at: http://www.cbr.ru/sbrfr/archive/fsfr/ffms/ru/index.html

*** The Central Bank of the Russian Federation. 2015. Overview of key performance indicators of non-credit financial institutions No. 2, 2nd Quarter of 2015.

*** The Deficit of the Pension Fund of Russia in 2016 Will Grow to 1.6 trillion rubles. 2015. Rambler. Finances. Available at: http://finance.rambler.ru/news/2015-11-10/defitsit-pensionnogo-fonda-rf-v-2016/

*** Two PPF entered the top infrastructure investors for the 1st quarter 201. 2016. PPF Invest funds. Available at: http://npf.investfunds.ru/news/60869

*** Federation. OECD Working Papers on Finance, Insurance and Private Pensions. Paris. OECD Publishing, 27.

Methodological Approaches to Study of Informal Employment

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Abstract

Under the modern conditions, the problem of informal economy and informal employment attracts more scientific and practical interest. Informal relations of employment are characterized by high level of uncertainty which requires full analysis and study, as well as development of adequate state policy aimed at reduction of its scales. The purpose of this research consists in study of methodological approaches to research of informal employment in the world and in the Russian Federation. In order to achieve the above goal, the economic & statistical methods of research, economic and comparative analysis, and method of sociological survey were used. Practical developments were based on complex & structural and expert approaches, methods of comparison and modeling. The performed research provides approached to determination of informal employment of population and methods of evaluation of its scale. A study of informal employment in Voronezh Oblast of the Russian Federation was performed, which allowed determining its level and causes. Positive and negative consequences of this phenomenon for Russia economy were described. Directions for reduction of informal employment were offered.

Key words: informal economy, population employment, informal employment of population.

JEL Classification: J23.

1. Introduction

The problem of informal employment became one of the key ones in studies of scientists from all over the world, as this phenomenon is faced by all countries, regardless of the level of their economic development. The scale of distribution of informal employment grows, so there are continuing discussions regarding its precise definition, causes of emergence, role in economic life of society, development of optimal state policy of regulation, and further perspectives of development.

For the first time, the phenomenon of informality in the labor market was mentioned in early 1970's. The founder of this new scientific direction is an English anthropologist K. Hart, who formulated and introduced the notion of informal sector (Hart 1973). K. Hart "invented" informal employment during field research of late 1960's in one of the underdeveloped countries of Africa, Ghana. The scientists found out that residents of the capital of Ghana didn't have any relation to the official economic system.

Economic system of underdeveloped countries was represented by cluster of small stores and shops that supplied locals with products of everyday use, without official registration and ignoring tax and other requirements of authorities to entrepreneurial activities.

According to Hart (1973), "informal employment is economic activities which take place beyond employment in large corporations of public and private sectors [of economy]. It initially appeared as a response to quick increase (proliferation) of self-employment and temporary employment in the cities of the third world, but later began to be studied as to [developed] societies, *e.g.*, Great Britain". Hart's invention was taken by other researchers and economists. In 1972, the International Labor Organization published the study of employment in Kenya (ILO. Employment, incomes and equality: a strategy for increasing productive employment in Kenya. Geneva, 1972). The ILO report explained differences between formal and informal sectors in the following way:

- Informal activities are peculiar for: a) simple entering [production], b) founding on own resources, c) family ownership of enterprise, d) small scale of activities, e) labor intensive and flexible technologies, f) skills acquired beyond the official school system, g) non-regulation and competitiveness of markets. Activities

of informal sector are usually ignored by government; they are rarely supported, often regulated, and sometimes even suppressed.

- Characteristics of activities in formal sector are quite opposite: a) entering [it] is difficult, b) founding on external resources, c) corporate ownership, d) large scale of functioning, e) capital intensive, often imported technologies, f) formally acquired skills, g) markets are under protectionist cover (with the help of tariffs, quotas, and trade licenses).

After the ILO's report, the terms "informal sector and "informal economy" became generally accepted in English literature. Scientists who studied Africa were supported by specialists on developing countries of Asia and Latin America.

Expansion of the research circle led to differences in realizing the object of the research. Thus, researchers of Africa, while defining informal economy, emphasized on such attributes as weak technical equipment and small sizes of enterprises.

Researchers of Latin America paid main attention to its illegal nature. Combination of both approaches allows formulating more general definition: informal economy is unregistered economic activities for production of usual goods and services, represented mostly by small and very small entrepreneurial entities. However, there are still discussions on the definition of main criteria of "informality".

Informal employment exists not only in underdeveloped countries. American researcher of the Soviet Union, Grossman (1977), published an article in 1977 on so called "second economy" in the USSR. This started a number of studies of independent economic activities in the team economy. In 1980's, scientists agreed that the Soviet regulated economy included economic system of a combined type in which informal production was no less important than official one.

In 1979, the article of American economist, E. Feig showed that informal employment also existed in developed countries of the West. The scientist calculated that "irregular economy" of the USA covered one third of official GNP*, i.e.,* approximately the same volume as informal employment in the countries of the "third world".

In late 1980's, there was shift in studies devoted to informal economy. A priority was given not to definition of informal economy but to understanding the reasons of emergence and its role in economic life of society. The monograph of a Peruvian economist de Soto "Another way", published in 1989, made a revolution in study of informal economy. The monograph emphasized revolutionary and progressive potential of informal economy.

However, as of now, there is no unified approach to definition of informal employment in scientific environment. There are a lot of definitions of informal employment that connect appearance of this form of employment to work in the informal sector of economy.

Two stages of research and determination of sense of economic category "informal employment" are distinguished, which are put in dependence on the level of labor market development. At the first stage, informal employment was defined as characteristics of informal sector of economy. At that, in the process of evaluation of scales and peculiarities of employment in this sphere, socio-economic factors of labor market functioning were not taken into account as it was just beginning to form in Russia. At the second stage, informal employment was viewed as a larger phenomenon within informal and formal sectors of economy depending on the level of lawfulness of social and labor relations.

In its turn, the International Labor Organization views informal employment as activities of small economic entities which produce and distribute goods and services and consist mainly of independent and self-employed manufacturers. They used the labor of their family members and wage labor.

According to the methodology used by the Federal State Statistics Service, informal employment is employment at an enterprise that does not have state registration as a legal entity (employed by individuals, self-employed, employed in households).

In our opinion, informal employment is all forms of employment that are paid; not registered formally; not accounted by statistics of organization and tax bodies; not regulated by legal acts and legal structures.

2. Research methods

Evaluation of scales of informal employment is a very difficult task, for there is no common opinion on understanding this phenomenon in scientific society.

The only set of international standards on this topic is the Resolution on statistics of employment in informal sector, passed in 1993 at the 15th International conferences of labor statistics. This Resolution is aimed for helping national statistics organizations in development of definitions, classification, and methods of collection of data on informal sector.

At the 2002 International labor conference, a decision was passed on necessity for supplementing statistics of employment in the informal sector by statistics data on informal employment. Employment in informal sector and informal employment are different notions. Informal sector means informal enterprises, and informal employment – informal jobs.

Thus, employment in informal economy could be defined as a sum of employment in informal секторе and informal employment beyond informal sector. In 2012, the ILO published a methodical guide on conduct of study of informal economy at the level of separate countries.

In the most general form, methods of evaluation of informal employment could be united into four groups:

- methods of specific indicators (related to evaluation of certain indicator received by direct or indirect method);
- method of soft modeling or evaluation of determinants (based on determination of a group of factors that influence parameters of informal labor relations and allow determining the contribution of each factor into volume of shadow economy);
- structural method (uses evaluation of contribution of each sphere and sector into total volume of illegal business);
- combined methods (combination of the above methods).

More authentic evaluation of informal employment is provided by the first group of methods that is divided into two large groups – direct and indirect. Direct methods are based on "use of information received by surveys, research, inspections, and analysis" (Bazyleva 2006). Direct methods are evaluation of shadow economy on the structure of consumption of households and evaluation of shadow economy for differences in revenues and expenses of a household.

Application of the method of evaluation of shadow economy for the structure of consumption of households is based on the fact that those participating on special surveys perform not the role of a manufacturer of seller of shadow goods or services but the role of consumer. With the use of such approach, most of respondents do not try to distort information on the volume of their consumption. In the combined structure of expenses of households, expenses satisfied by own revenues are determined, and benefits received as a gift from close environment and by means of revenues from shadow sector of economy are taken into account. The used methods of evaluation of shadow economy for differences in revenues and expenses allow determining the share of population which live beyond their means. There are two variants of realization of this method. In the first variant, households' expenses of which exceed the revenues significantly are determined. With existence of long tendency of excess and impossibility for explaining it by intra-family circumstances, the receipt of shadow income could be suspected.

The next step is calculation of difference between income and expenses and calculation of the share of households with this difference. Based on that, general excess of expenses over income is calculated for the whole selection.

The second variant of this approach is based on analysis of expenses for specific groups of goods and service. The groups of population that can receive shadow revenues are determined, as well as those that do not. Then, expenses of these population groups for corresponding goods and services are compared. Based on the received differences in revenues, the volume of shadow revenues is determined. These methods of evaluation are conventional, for difference of expenses and revenues could be caused not only by informal economic activities.

Let us view the group of indirect methods of evaluation of scales of informal economy. Indirect methods are balance method (method of differences), method of calculation by employment indicator (Italian method), monetary methods, method of technological coefficients, structural method, expert evaluations method, method of soft modeling (evaluation of determinants), sociological method, and mixed methods:

- Balance method (method of differences) consists in comparing the received and used resources, revenues, and expenses. The received differences are a foundation for determination of the volume of shadow economic activities.
  - Method of alternative calculations is based on difference between two means of calculation of GDP – by expenses and by revenues. The difference between GDP by expenses and GDP by revenues provides evaluation of sizes of shadow economy.
  - Evaluation of shadow economy for difference of total demand and total offer is built on the basis of finding balance between total demand and total offer.
- Method of calculation by the indicator of employment (Italian method). It supposes comparison of data on jobs represented in official statistics with the data of tax, legal, and other bodies.

- Monetary methods are based on the data on cash turnover in the country and its analysis. The basis is the statement that shadow transactions are served mainly with cash. Therefore, the more cash the economy needs, the larger its informal sector – with other terms being equal.
- During the use of the method of technological coefficients, potential and real GDP are compared.
- Structural method is based on operating information on scales of shadow economy in different spheres of production.
- Method of expert evaluations allows evaluating general tendencies in development of shadow activities. Precision of evaluation depends on the level of qualification of the expert – as he is the one determining methodology of evaluation.
- Method of soft modeling (evaluation of determinants) is based on distinguishing totality of factors that determine shadow economy and oriented at establishing its relative volumes.
- Mixed methods are a combination of various methods, used in various combinations.
- Sense of sociological method consists in "analysis of special norms by which illegal deals are conducted, and their distribution in society, as well as frequency of their application with conclusion of deals" (Feld 2010).

The above methods are difficult to realize in practice due to low accessibility of analyzed indicators and inhomogeneity of evaluation of this phenomenon. That's why the use of specific method in research is determined by object's specifics and goals of the research.

According to the latest estimates, non-agricultural employment in informal economy constitutes 82% of the total number of the employed in the countries of South Asia, 66% - in countries of Africa south of Sahara, 65% - in the countries of East and Southeast Asia (excluding China), 51% - in the countries of Latin America, and 10% - in the countries of Eastern Europe and Central Asia (MBT: Women and men in the informal economy: A statistical picture).

These average indicators represent huge differences between the countries. According to the recent data, obtained by the Statistics Department regarding 47 countries and territories, the share of the employed in the sphere of informal employment (excluding agriculture) varies in the countries of Latin America and the Caribbean from 40% in Uruguay to 75% in Bolivia; in Africa south of Sahara – from 33% in South Africa to 82% in Mali; in South and Southeast Asia (excluding China) – from 42% in Thailand to 83.5% in India; in West Africa and Middle East – from 30.5% in Turkey to 58.5% in West Bank and Gaza Strip.

In view of natural agriculture, the share of the employed in the informal economy is even higher that the indicators given in previous paragraph.

Most part of the employed in agriculture varies between the regions. For example, it is lower in the Caribbean and Latin America (18% of the total number of the employed) and in Eastern Europe and Central Asia (17%) than in the countries of South Asian and Africa south of Sahara, where more than half of the employed work in agriculture (54 and 57%, accordingly).

In most countries, for which the data as to the sex is available, more men than women are employed in non-agricultural types of activities on informal basis. In the countries of Africa south of Sahara, 74% of women (excluding agriculture) are employed informally, as compare to 61% of men; in the countries of Latin America and Caribbean – 54 and 48%, in the countries of South Asia – 83 and 82%; in the cities of China – 36 and 30%, accordingly. Feminization of poverty and discrimination as to sex, age, ethnic group, or disablement mean that the most vulnerable and poor groups of population usually end up in informal economy.

In all developed regions of the world, the share of independent employment in informal employment (excluding agriculture) is higher than employment on the basis of hire.

Self-employed workers account for one third of the total number of non-agricultural workers in the whole world, including 53% in countries of Africa south of Sahara, 44% in Latin America, 32% in Asia, and 31% in North Africa.The share of self-employed workers and helping members of family in the total number of employees consists 81% in the least developed countries, as compared to 59% in developing countries.

According to recent estimates, 38.6% of informal employees in the countries of Latin America and the Caribbean are hired help at enterprises, 10.9% - hired help in households, and 41.4% – self-employed workers (International labor conferences, 103rd session. Report V (I) Transition from informal to formal economy, 2014).

There is no unified opinion among Russian researchers or representatives of official structures regarding which categories of working population should be assigned to informally employed and how to measure the scale of this phenomenon. The problem of informal employment, which became a forced measure of survival for millions

of able-bodies citizens, appeared in Russia in late 20th – early 21st century, in the period of serious socio-economic transformations.

The Federal State Statistics Services assigns to the employed in the informal sector the persons who were employed in a production entity of informal сектора, regardless of the fact whether this work was full-time or part-time. A criterion for determination of entities of informal сектора is absence of legal entity status. The following employed belong to informal sector:

- in the sphere of entrepreneurial activities without start of legal entity, regardless of presence or absence of official registration;
- hired help with individuals and individual entrepreneurs;
- in farm household;
- in own household for manufacture of goods of agricultural industry and forestry, hunting and fishing for realization.

Thus, according to the methodology of the Federal State Statistics Service, all small and medium enterprises that do not have a status of legal entity, belong to informal sector even if they are officially registered as individual entrepreneurs and pay taxes. This fact explains significant scale of informal employment (one third of the total number of the employed) which is fixed by official statistics. According to studies of the Federal State Statistics Service, at the end of 2nd quarter of 2015, the number of informally employed constituted 21.2% of the total number of employed population (Table 1). The data of the Federal State Statistics Service shows that over 2006 – 2015 there was increase of the number of the employed in informal sector by 2,776,000 people, or 3.2%.

Table 1 - Dynamics of growth of informal employment in the RF

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of the employed in informal sector, thousand people.	12,656	13,570	13,950	13,489	11,582	12,921	13,599	14,096	14,386	15,432
Share of the employed in informal sector in total number of the employed in economy, %.	18.0	19.1	19.6	19.3	16.4	18.2	19.0	19.7	20.1	21.2

Source: compiled by the authors on the basis of the data of the Federal State Statistics Service.

Table 2 shows distribution of the employed in informal sector.

Table 2 - Share of the employed in informal sector, %

Year	Share of the employed only in informal sector	Share of the employed in informal sector and outside it	Including	
			full-time in informal sector	part-time in informal sector
2006	85.6	14.4	0.9	99.1
2012	90.4	9.6	1.2	98.8
2013	91.3	8.7	1.5	98.5
2014	91.3	8.7	2.2	97.8
2015	90.4	9.6	1.3	98.7

Source: compiled by the authors on the basis of the data of the Federal State Statistics Service.

The data presented in Table 2 shows vivid increase of the share of the employed only in informal sector by 4.8% and decrease of the share of the employed in informal sector and beyond it also by 4.8%. The work in informal sector is part-time for almost all the employed in it – 98.7 % in 2015. However, there are insignificant fluctuations in favor of increase of the share of the employed with full-time job in informal sector by 0.4 % from 0.9% in 2006 to 1.3% in 2015. Tendencies of growth of scales of informal employment are caused by consequences of crises of 2008 and 2014-2015 as informal employment is a means of adaptation to negative manifestations of decline in economy. Also, in our opinion, this tendency is a consequence of lack of targeted state policy of struggle with informal employment, including the one supposing measures aimed at small and medium business' leaving shadow economy.

At that, situation in view of regions of the Russian Federation is not the same. The first place among the subjects of the RF as to the scales of distribution of informal employment belongs to the North-Caucasian Federal District in which this indicator constitutes 45.3%. The smallest share of the employed in informal sector among the subjects of the RF belongs to the CFD and constitutes 13.7%. This situation became an initial point for conduct of research at regional level – in Voronezh Oblast.

3. Analysis results

In Voronezh Oblast, the number of informally employed constitutes 266 thousand people, *i.e.*, 23.9% of the total number of the employed population in the region.

For the purpose of detailed study of scale and causes of informal employment in Voronezh Oblast, Voronezh State University and the Department of labor and population employment conducted a sociological survey in the form of questionnaire (2015). 415 respondents took part in the survey. After processing of the data of the research, they received the following results. The number of informally employed - 100 people, or 24.1 % of the total number of the respondents. This indicator corresponds to the data of the official statistics. The survey showed that the number of informally employed men exceeds the number of informally employed women, and it covers mostly age groups 16 – 29 and 30 – 44 (Figures 1, 2).

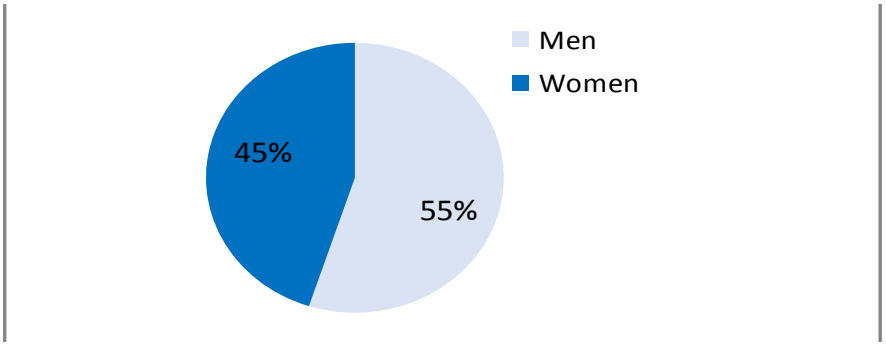

Figure 1 – Structure of informally employed as to sex, in %

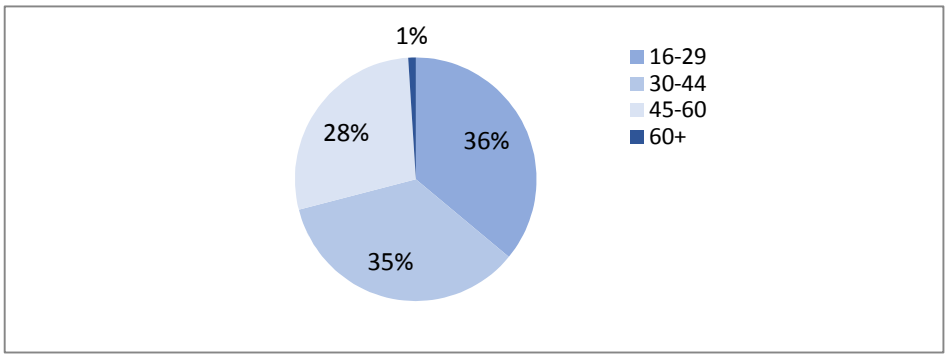

Figure 2 – Structure of informally employed as to age, in %

Among informally employed as to the level of education, 38% are people with higher education and 30% are people with secondary professional education (Figure 3).

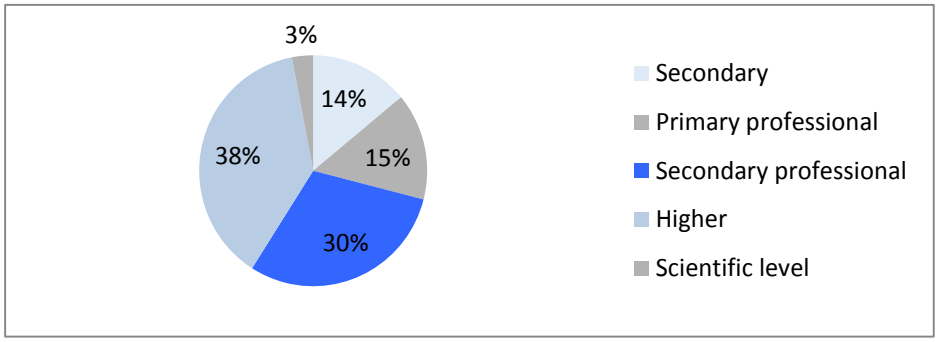

Figure 3 – Structure of informally employed as to the level of education, in %

According to the survey, 83% of informally employed have one unofficial job, 15% – two unofficial jobs, and 2% – three or more unofficial jobs. The largest number of informally employed is in the trade sphere - 21%, construction sphere - 12%, and transport and educational sphere - 7% (Figure 4).

Figure 4 – Distribution of informally employed for spheres of employment, in %

The study showed that of the total number of informally employed, 74% work without registration of labor relations, 7% conduct individual entrepreneurial activities without registration, 5% conduct individual entrepreneurial activities with registration, and 2% work on the basis of self-employment without a patent.

The main reasons that make people work unofficially are (Figure. 5):

- 29% of informally working respondents mentioned advantages of flexible schedule and high wages;
- 26% noted that it was an employer's initiative;
- 22% - impossibility to find official job.

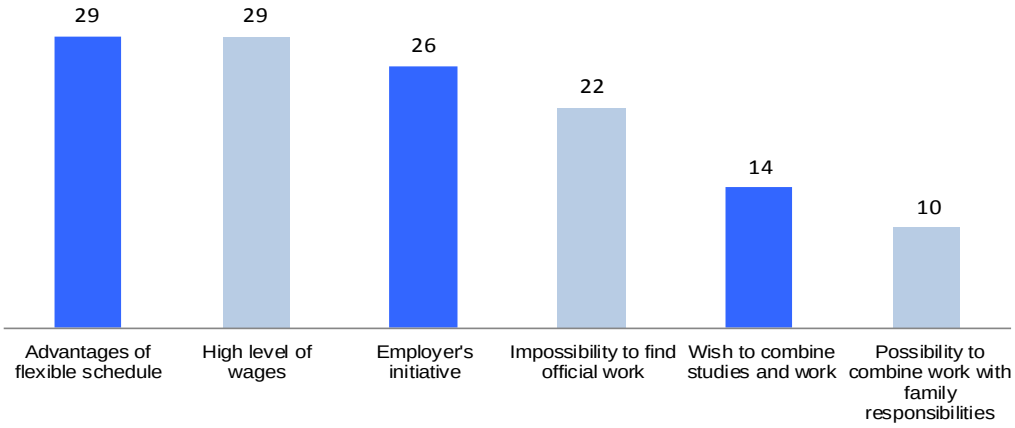

Figure 5 – Reasons for unofficial work, in %

It should be noted that 62% of the total number of informally employed would like to work officially, 22% are satisfied with everything and do not wish to change informal employment for formal, and 2% of the informally employed respondents could not provide an answer. Besides, 67% of the total number of informally employed care for social guarantees, but 33% do not care about them.

The received results show that scale of distribution of informal employment is rather large; it covers the sphere of trade and construction. The main reasons for distribution of informal employment are employees' wish to have higher wages and flexible employment, ad well as employer's wish to reduce expenses for personnel.

Of course, informal employment restrains the growth of unemployment and decline of the living standards of population, reducing tension in the labor market during crises. Informal employment allows filling non-prestigious jobs, it is an element of market self-regulation of economy (Khorev, Salikov and Serebryakova 2015).

Conclusion

For an employee, it is a real possibility to earn more, and for some people it is the only chance to survive under the difficult conditions. For an employer, informal сектор is saving on costs and possibility for existence under

the conditions of hard tax load. Informal employment allows using workforce more flexibly, which is attractive for employees and employers. However, informal employment creates a lot of social and economic problems.

The most serious economic problems include state's non-receipt into budget of significant assets due to organizations of informal sector hiding their revenues from taxes. According to Sberbank, the Pension Fund of Russia loses RUB 710 billion annually, and regional budgets lose RUB 420 billion, which leads to underfunding of social spheres and lack of investments. In healthcare, the shadow market accounts for one third of the whole market of paid services in Russia, which is more than RUB 100 billion per year.

Besides, informal employment restrains scientific and technical progress and hinders modernization of production due to the use of cheaper labor (Serebryakova *et al.* 2015). This leads to reduction of the possibility to control the quality of goods and services. Also, informal employment creates a threat of brain drain from the formal sphere and leads to reduction of labor force quality.

In our opinion, social consequences include social exposure of the informally employed due to abuse of power from employers and violation of labor law. Large scale of distribution of informal employment is the indicator of mistrust of population to state, i.e., formal, institutes.

Top-priority directions for reduction of informal employment in the region are:

- conduct of systemic changes aimed at creation of high-tech jobs;
- increase of the level of wages for budget sphere employees;
- improvement of laws in the sphere of regulation of flexible, remote, and other types of non-standard employment;
- optimization of taxation for entrepreneurs.

Realization of these measures is possible only within the framework of the social partnership system – both at regional and federal levels. According to Serebryakova and Volkova, "… it is necessary to develop a complex program of management of social development at regional level which would include not only description of the problem, for solving which it was formed, but program measures with specification of methods of improvement of social standards and specific measures for development of corresponding normative and legal basis" (Serebryakova and Volkova 2015), as "modern regional labor market is a complex dynamically changing system of relations, norms, and institutes in regional socio-economic system" (Azarnova, Popova and Leontyev 2013).

At the federal level, it is necessary to combine efforts of all level of state power and controlling bodies, as well as representatives of business societies for development of methods of accounting and struggle against informal employment, in view of national peculiarities of Russia and complexity of this phenomenon. At the regional level, evaluation of scale of informal employment requires adapting the considered methodological approaches in view of regional specifics.

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References

[1] Feld, L.P., and Schneider, F. 2010. Survey on the Shadow Economy and Undeclared Earnings in OECD Countries. *German Economic Review*. 11/2: (43): 109-149

[2] Grossman, G. 1977. The "Second Economy" of the USSR. *Problems of Communism*, 5: 25–40.

[3] Hart, K. 1973. Informal Urban Income Opportunities and Urban Employment in Ghana. *Journal of Modern African Studies,* 11/1: 61-90.

[4] Khorev, A.I., Salikov, Y.A., and Serebryakova, N.A. 2015. Conceptual Features of the Balanced Development of Business Organizations. *Asian Social Science.* 11/20: 22-29.

[5] Serebryakova, N.A., Salikov, Y.A., Kolomytseva O.Y., Pakhomova T.A., and Grishchenko N.V. 2015. Actual Issues of Planning of Well-Balanced Development of Innovative and Investment Activities. *Asian Social Science*. 11/20: 193-206.

[6] Azarnova, T.V., Popova T.V., Leontyev, A.N. 2013. Algorithm of analysis of dynamics of change of quality of functioning of labor market during realization of various strategies of quality management. *Bulletin of VSU, series Systemic analysis and informational technologies.* No. 2, July-December: 79-87.

[7] Bazyleva, M.N. 2006. New economy and informal labor relations [E-source]. *Problems of modern economy.* 1/2. – Available at: http://www.meconomy.ru/art.php?nArtId=937(Accessed: 16.03.16).

[8] Serebryakova, N.A., Volkova, S.A. 2015. Regional components of provision of growth of living standards of population (by the example of Voronezh Oblast). *Bulletin of Voronezh State University of Engineering Technologies.* 1/63: 229-235.

*** International labor conference, 2014. 103rd session. Report V (I) Transition from informal to formal economy, 8.

*** ILO. Employment, incomes and equality: a strategy for increasing productive employment in Kenya. 1972. Geneva, 6.

*** MBT: Women and men in the informal economy: A statistical picture.

*** Informal economy. Journal Economic theory of crime and punishment No. 2. Informal sector of economy abroad. Center for study of illegal economic activities: [E-source]. URL Available at: http://corruption.rsuh.ru/magazine/2/n2-04.shtml (Accessed: 14.03.16)

Analysis of the Wage Level Development in Slovakia and the Wage Gaps in the European Union

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Abstract:

The wage is a financial remuneration of the employee for work performed. The differences between the valuation of similar or comparable work in individual EU countries – within individual sectors and regions – are quite frequently discussed by the professionals and experts. The main aim of this paper is to examine the wage of employees in Slovakia (from the accession of Slovakia to the European Union to the present) on the one hand and on the other hand to compare the wage differences within the European Union and to find the position of the Slovak Republic within this group of countries. Cluster analysis of the European Union countries is made based on average and minimum net wages, and the EU countries are divided in groups with similar wage characteristics. The basic indicator used to divide the countries into clusters is the minimum wage. In the quantitative research are used the officially available statistical data mainly from the Statistical Office of the Slovak Republic and from the Eurostat databases.

Keywords: wage, average wage, minimum wage, cluster analysis.

JEL Classification: J31, J22.

1. Introduction

In many countries of Central and Eastern Europe the escalation in wage inequality and the very low wages lead to the rejection and to non-use of economically active population, to the growth in unemployment, respectively to the increased work abroad. The differences in wages are often caused by the level of education, age, qualification achieved, by the affiliation of the employer to the sector of the economy, by work experience, as well as by discrimination and not least by gender.

The wage has to fulfil a range of economic objective tasks. To conduct these tasks, it must comply with the expectations of employees – such as the level of social security for workers and their families, to have a feeling of fairness towards other employees, to have an understandable relation between the quality and quantity of work and the amount of wage. Furthermore, it should be indisputable that the increased effort and initiative will be reflected in the amount of wages (Bajzíková 2004).

Wages are the price of labour, which – in the conditions of market economy – depends primarily on the relation between the labour supply and demand (Šíbl *et al*. 1991). The employers are obliged to provide to their employees' wage for work performed, which is defined – in the 118 of Labour Code of the Slovak Republic – as pecuniary payment or settlement of monetary value (wages in-kind) provided by an employer to an employee for his work. In connection with the wages, the employer is obliged to calculate the wage, to realize the mandatory and other deductions, to pay for the employee the compulsory insurance, contributions and to create a social fund (Suhányiová and Fabian 2010).

With the concept of wage there are also directly related certain concepts such as *e.g*. gross wage, average wage, minimum wage, net wage, etc.

The gross wage, according to Máziková *et al.* (2013), is the total income from employment and from functional benefits. It includes tariff wage, remuneration for standby work, wage compensations for holidays and for obstacles to work, wage compensation for annual leave, wage supplements and other components provided by labour legislation or collective agreements in cash and in kind, which are calculated and paid to the employee after deductions.

The average wage is the sum of gross wages of certain groups of individuals divided by the number of individuals in this group, paid for a certain period. We can calculate the average wage in the enterprise, in the city/town, or in the national economy.

The net wage is the gross wage reduced by premiums for public health insurance and social insurance, which is payable by the employee, also reduced by the tax on income (advance payment), plus non-cash benefits provided by the employer (*e.g.* the contribution from the social fund, the employer's contribution to supplementary pension insurance, etc.) and the tax bonus on a child (Jakubek and Tej 2015). The net wage calculation procedure in Slovakia is shown in the following Table 1.

Table 1 – A simplified method of calculation of the net wage of an employee in Slovakia

Gross wage	
-	premiums for public health insurance and social insurance, which is payable by the employee
	- tax-free allowance
	+ non-cash benefits provided by the employer (*e.g.* employer's contribution to the supplementary pension insurance)
	= tax base (tax on personal income from employment)
-	tax on personal income from employment is calculated by multiplying the income tax base by the income tax rate applicable for that year
+	tax bonus on a child
-	the employee's contribution to the supplementary pension insurance
= net wage	
-	deductions from wages (e.g. to employees saving schemes, payments of loans, deductions due to execution procedures, alimony payments, etc.)
+	reimbursement for temporary work-disability paid by the employer by the 10th day of sick leave
= amount for payment (either in cash or to the employee's bank account)	

Source: own processing

In some countries, the minimum wage of an employee ensures the minimum level of the income of an employee for the work performed. The minimum wage is the lowest price of the work that the employer must provide the employee (Act of the Slovak Republic no. 663/2007 Coll. on Minimum Wage). It is a tool of social protection of employees. There are two types of minimum wage: 1) per hour and 2) per month. The minimum wage for employees paid per month and the minimum wage per hour is determined by the legislation in the individual countries. When editing the monthly minimum wage shall be taken into account the overall economic and social situation during certain time period, in particular the development of consumer prices, employment, average monthly wages in the economy of the country and subsistence minimum (Vlachynský *et al*. 2012).

2. Analytical view on the wage level in Slovakia

The average wage is one of the most watched statistical indicators. For our purposes, in this case, it's the average gross monthly wage in the national economy of the Slovak Republic in the framework of employees in permanent employment, *i.e*. full-time employees.

Table 2 – Average monthly gross wage of the employee in the period of 2004-2015

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Average monthly gross wage in Slovak	EUR	525	573	623	669	723	745	769	786	805	824	858	883
Index of nominal wages	%	110,2	109,2	108,0	107,2	108,1	103,0	103,2	102,2	102,4	102,4	104,1	102,9
Index of real wages	%	102,5	106,3	103,3	104,3	103,3	101,4	102,2	98,4	98,8	101,0	104,2	103,2

Source: own processing based on the data from the Statistical Office of the Slovak Republic, STATdat (2016 a)

In 2004, when the Slovak Republic joined the European Union, the average nominal monthly wage was in the amount of 525 EUR. The average wage in 2015 already amounted to 883 EUR, thus increased during the twelve years of almost 358 EUR, i.e. of 68%. The largest growth in the period in absolute numbers was in 2008, when the average nominal monthly wage increased by up to 54 EUR, in relative terms by 8.07%. On the other side, the lowest growth recorded in Slovakia was in 2011 by 17 EUR (2.2%). The growth was possible because of the stabilization of the economic and political situation, the inflow foreign direct investment and the overall regeneration of the Slovak economy. It takes into account labour productivity growth and a decline in unemployment. As for the

real wages, the highest growth was recorded year after joining the EU, *i.e.* in 2005. Despite the increase in nominal wages in 2011 and 2012 we can see a decline in real wages due to an increase in the price level, but after these years the real wage index has risen again.

It is expected that the indicator of the average wage will grow in 2016. It will be probably the first time in the history when the average monthly wage of Slovaks exceeds the level of 900 EUR. An increase of about three percent will bring mainly a restart of economic growth associated with the creation of new jobs.

Table 3 – The average wage and quantiles in 2015 (in euro)

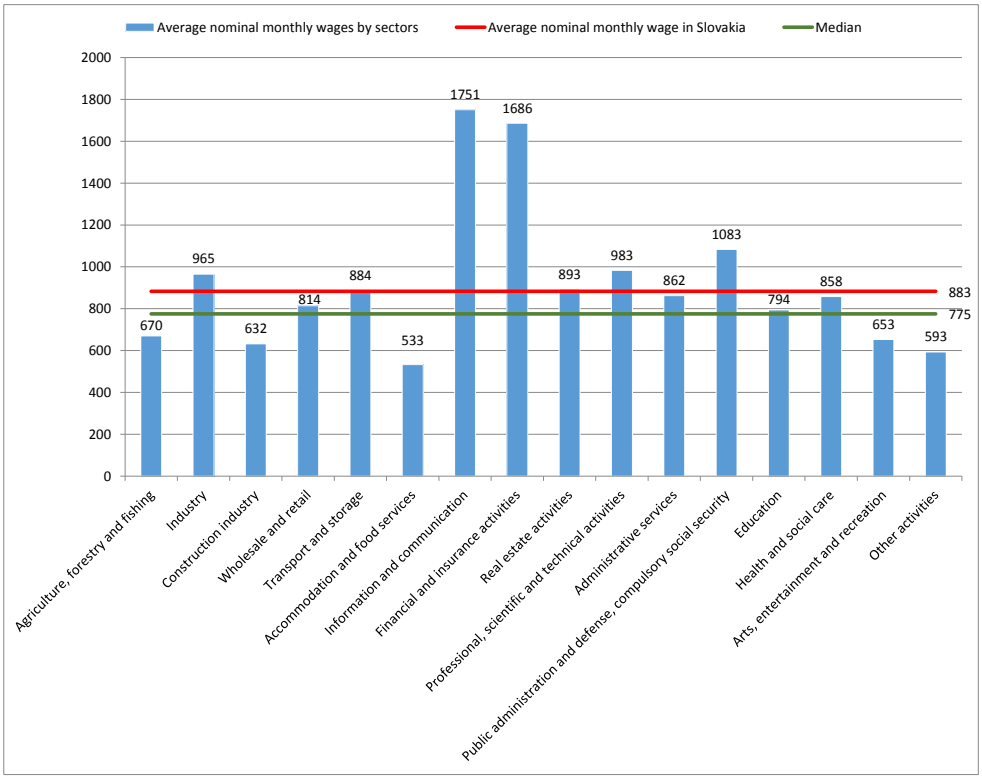
Year	Average monthly nominal wage	1st decile	1st quartile	Median	3rd quartile	9th decile
2015	883	420	553	775	1 092	1 574

Source: own processing based on the data from the Statistical Office of the Slovak Republic, STATdat (2016 b)

In this part of the paper, the term "average wage" means the arithmetic average of all salaries in the Slovak Republic. But the average wage in the economy does not tell us how many people have wages above average and how many below average.

The indicator of wages, which divides the employees into two equal large groups, is the median (dividing set of statistics on two equal parts). The median is the wage that is not reached by the 50% of employees and another 50% have higher wage. In 2015 this indicator was equal to 775 EUR, it means that 50% of Slovaks earned less than 775 EUR.

The "decile" divides the set of statistics on 10 equal parts. This indicator will help us to take a closer look at the marginal income groups. In 2015 – based on the data of the Statistical Office on the wage structure – the first decile was at the level of 420 EUR, it means that 10 % of Slovaks had income less than or equal to that amount. On the other side, the ninth decile of 1 574 euros will tell us that the top 10 % has earned this amount or even more – so that in 2015 only 10% of Slovaks had a gross wage higher than 1,574 euros a month. We can simply say that ten percent of the population with the highest income earned almost four times more than the same number of people with the lowest income. Quartile divides the set of statistics to 4 equal parts. Through this indicator, we can see that the average salary is closer to the third quartile than to the median. It follows that the average (or higher) wage is reached only by a quarter (or better said its closer to the third) of Slovaks and certainly not a half.



Source: own processing based on the data from the Statistical Office of the Slovak Republic, STATdat (2016 c)

Figure 1 – The average nominal monthly wages in 2015 by sectors (in euro)

It is generally known that in addition to the work itself and the region in which the employees work, the amount of the wage depends also on the company in which the employee is working, or on the sector in which the company operates. The wage gap between different sectors is very large. The average nominal monthly wage in individual sectors is higher than the average nominal monthly wage in Slovakia in the case of seven sectors, or let us say that in nine sectors is below the national average. As it can be seen in the Figure 1, we can also compare the wages with the median value, which is 775 euro. Below this value is the average wage of five sectors.

In the long term, the highest level of the average monthly wage is in the sector of "Information and communication", which was at the level of 1,751 euro in 2015, *i.e.* the double of the nationwide average wage. The second best-paid activities are the "Financial and insurance activities" at the level of 1,686 euros. At the third position, can be found the activities in "Public administration and defence". The lowest average nominal wage was in "Accommodation and food services", it means 533 euros. The "Other activities" were reached the level of 593 euros and the "Construction industry" was at the level of 632 euros. In comparison with the data of the Statistical Office of the Slovak Republic for the previous year (2014), the highest increase of wages was in the area of "Information and communication" (about +91 euros). The largest decrease was recorded in the sector of "Professional, scientific and technical activities" (by -68 euros).

The term "minimum wage" means the lowest possible wages that workers must be paid for full-time employment. Based on the statement of R. Fico – the Prime Minister of the Slovak Republic – made in the media on 04/01/2016, more than 113 thousand of Slovaks earn the minimum wage. The minimum wage protects all the employees regardless of employment status, of the work performed, of the results of the work made for the employee, of the form of remuneration, or of the solvency of employer. The level of the minimum wage is set out annually by the Regulation of the Slovak Government. Its level is at least equal to the: *actual monthly minimum wage* multiplied by the *index of annual growth of average monthly nominal wage of employees*, which is published by the Statistical Office of the Slovak Republic for the previous calendar year. But the average wage growth index for the previous year is only one of the four basic criteria which must be considered.

When deciding on the amount of the minimum wage the Government takes into account:

- Consumer prices (inflation index);
- Employment (and the level of unemployment);
- Average monthly wage in the Slovak economy (index of nominal monthly wages);
- The level of Living Wages (its relative growth should not be higher than the increase in the level of the Minimum Wage).

In addition to the above indicators the Government also takes into account the standpoints of the social partners (representatives of employers and employees).

Table 4 – The development of the minimum wage in Slovakia, as compared with the subsistence minimum and average nominal monthly wage in the period 2004-2016

	Subsistence minimum		Minimum wage		Average nominal monthly wage	
Year	EUR	Annual increase in %	EUR	Annual increase in %	EUR	Annual increase in %
2004	152		216		525	
2005	157	+ 3,29	229	+ 6,02	573	+ 9,14
2006	165	+ 5,09	252	+ 10,04	623	+ 8,73
2007	170	+ 3,03	269	+ 6,75	669	+ 7,38
2008	179	+ 5,29	269	-	723	+ 8,07
2009	185	+ 3,35	296	+ 10,04	745	+ 3,04
2010	185	-	308	+ 4,05	769	+ 3,22
2011	190	+ 2,70	317	+ 2,92	786	+ 2,21
2012	195	+ 2,63	327	+ 3,15	805	+ 2,42
2013	198	-	338	+ 3,36	824	+ 2,36
2014	198	-	352	+ 4,14	858	+ 4,13
2015	198	-	380	+ 7,95	883	+ 2,91
2016	198	-	405	+ 6,58	915 (forecast *)	+ 3,50

Note: forecast made by Makúch (2016)

Source: own processing based on the Regulations of the Ministry of Labour, Social Affairs and Family of the SR, which set out the level of subsistence minimum, and the Government Regulations of the SR, which established the minimum wages

The "subsistence minimum" is a socially recognized minimum level of personal income, below which the person is in the situation of material need. It reacts to the costs of living. Its importance is in setting out the scope for manoeuvring when searching for the optimal level of state involvement in solving social problems. The subsistence minimum – as an economic indicator – influences the calculation of the majority of social benefits; it is the basis, for example, in calculating the unemployment benefits, the social benefits, the personal tax-free allowance, the tax bonus per child, the parental allowance, the child allowance, the minimum alimony payments, and others. The level of the subsistence minimum is set out annually based on the growth rate of the net income per capita or based on the growth of the cost of living of low-income households – it is used the indicator that is lower. The level of the subsistence minimum will be not changed in the case if one of these two indicators is less than one or equal to one. This measure prevents the reduction of the subsistence minimum and related benefits. Since 2004, the minimum subsistence level increased by only 30% (46 euro). From 2013, this amount is frozen in the Slovak Republic, due to negative developments mainly in the indicator of the increase of the costs of living of low-income households.

The minimum wage in the period of 2004-2016 increased every year except 2008, when remained its level the same as in 2007. The stagnation was caused by the global economic crisis. The highest annual increase among the monitored years was in 2006 and 2009, when the minimum wage increased by 23 euro (10.04%) respectively by 27 euro (10.04%) compared to the previous year. In absolute terms, the highest increase was in 2015, by 28 euros. The difference between the minimum wage in 2004 and the current level of the minimum wage in 2016 is 189 EUR, thus it increased in the examined period by 87.5%. We can say that together with the wage growth are also increasing the labour costs; it results in higher costs for employers. High level of minimum wage causes an increase in unemployment, and vice versa, if the level is to low it causes a risk of decline in living standards of the population.

Although the minimum wage in Slovakia increased, the most problems seem not to be solved. The relatively low minimum wage is preferred by foreign employers. The labour force in our country is cheaper than in other – mainly western European – EU Member States.

The difference between the level of subsistence minimum and the level of minimum wage can encourage unemployed people to change their attitude to work, to increase their efforts to join the workforce.

Not all of the countries around the world have set a minimum wage. At the present time the EU has 28 member states, most of which have the minimum wage in their legislation. This is a total of 22 countries, of which the youngest in the minimum wage is Germany (from the 1st of January 2015). Several founding states of the EU have a long tradition of ensuring national minimum wage for the least paid workforce. On the other hand, several Member States – including Germany, Ireland, United Kingdom and many countries which joined the EU in 2004 or later – adopted the legislation on the minimum wage only recently, while six of the EU-28 Member States still do not have the national minimum wage (as for January 1, 2016), namely: northern states such as Sweden, Finland, Denmark, or our neighbouring country Austria and also southern countries as Italy and Cyprus. Cyprus government sets minimum wages for specific jobs. In Denmark, Italy, Austria, Finland and Sweden are the minimum wages set under collective agreements for a number of specific sectors.

Within the ranking of the 22 Member States – which have the minimum wage set by law – the Slovak Republic is in the sixteenth place in 2016 (Eurostat 2016). Among the top three countries with the highest monthly minimum wage are Luxembourg, Ireland and Netherlands. The lowest minimum wage is in Bulgaria.

3. Cluster analysis of the development of minimum wage in the member states of the European Union

One of the fundamental characteristics of time series is the average growth coefficient ($\bar{k}$). Among other indicators we used it to measure the development of minimum wage (in this chapter we use the net wage – after taxes) in selected European countries showed in Table 5.

$$\bar{k} = \sqrt[T-1]{k_1.k_2....k_{T-1}} \quad (1)$$

where: k_T is growth coefficient, T is the number of seasons.

Table 5 – Wage indicators in selected European countries (after tax wages – net wages)

Country	Minimum wage Average growth coeficient (2010 - 2016)	Average wage growth in % (2014 - 2015)	Average wage in EUR (2015)
Belgium	1,013243	6,934	2091
Bulgaria	1,097545	6,461	356
Czech republic	1,032553	8,366	765
Estonia	1,075401	-1,082	832
France	1,014702	2,385	2180
Greece	0,961998	18,526	1004
Netherlands	1,013393	1,019	2158
Croatia	1,009718	3,401	735
Ireland	1,009354	-1,456	2129
Lithuania	1,070936	3,676	544
Latvia	1,064702	7,321	601
Luxembourg	1,022467	-1,271	3148
Hungary	1,039916	21,705	645
Malta	1,014608	-7,059	1020
Germany	:	4,643	2154
Poland	1,053961	3,830	705
Portugal	1,018388	1,697	1002
Romania	1,110279	4,785	418
Slovakia	1,046688	2,983	704
Slovenia	1,048014	4,396	1092
Spain	1,004019	6,863	1734
United Kingdom	1,058102	-15,269	2253

Source: own calculations according to Reinis Fisher (2015) and Eurostat data

In average the minimum wage decreased in the season 2010 – 2016 only in one of selected countries, in Greece. Nevertheless, the decrease was not very significant. This was mainly due pressure from EU because of debt burden of Greece. The largest decline in average wage from 2014 to 2015 was recorded in United Kingdom (-15,3 %), on the other side the most significant increase was in Hungary (21,7%). In seven of selected countries has been the average wage in 2015 above two thousand EUR, in case of Luxembourg even above three thousand. The lowest average wage has been in 2015 on the level 356 EUR in Bulgaria.

3.1. Cluster analysis

Imputed variables were calculated according to Eurostat data. Research method is cluster analysis conducted in statistical software R 2.15.2. There are used two clustering methods – hierarchical agglomerative clustering and non-hierarchical clustering. Two imputed variables are the minimum wage in 2016 and the average growth coefficient of minimum wage from 2010 to 2016 in selected European countries. The objective of cluster analysis is to achieve such groups of states, which would be characterized by certain homogeneity. Cluster analysis sorts data into groups with the greatest possible similarity within the group and the largest difference between groups.

The basic methods of clustering we used were:

- *Hierarchical methods* are based on sequentially joining of clusters, their number decreases continuously until finally all clusters are combined into one. The result is graphically displayed as tree diagram respectively cluster dendrogram. Wards method involves an agglomerative clustering algorithm. It looks for groups of leaves that it forms into branches, the branches into limbs and eventually into the trunk. Ward's method starts out with *n* clusters of size 1 and continues until all the observations are included into one cluster. Ward's method use the Euclidean distance defined by the formula:

$$d_{ij} = \sqrt{\sum_{k=1}^{K} (x_{ik} - x_{jk})^2} \qquad (2)$$

where: x_{ik} is the value of „k" variable for i-th object
x_{jk} is the value of „*k*" variable for *j-th* object.

For calculated distance is than determined the rule of linking statistical units into clusters. There are „*p*" objects in the analyzed group, namely 22 countries in which are pursued „*k*" quantitative characters (2 variables), the distance d_{ij} between *i-th* element and *j-th* element is Euclidean distance. Preparing data file:

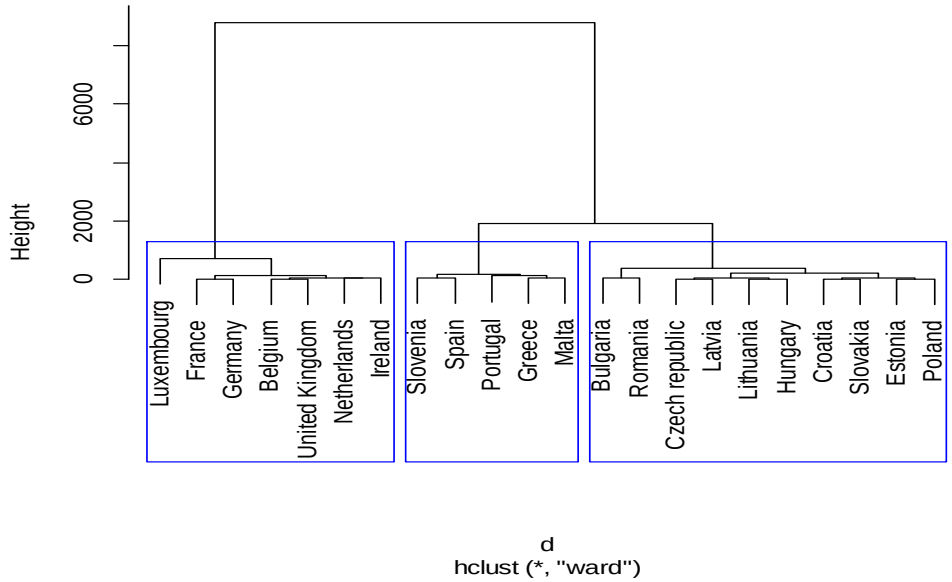
```
>data=read.csv2("wage.csv")
>data
Preparing data names:
>country=data$Country
>row.names(data)=country
```

In case there are missing values of variables in some countries. It is necessary to remove them from the dataset. If variables are in different units, it is necessary to implement scaling, which means unit conversion to a comparable level:

```
>p<-subset(data, select=c(minwage,avgrowthcoef))
>data<-p
>data<- na.omit(data)
>data<-scale(data)
```

Ward Hierarchical Clustering and display dendrogram:

```
>d<-dist(data,method="euclidean")
>fit<-hclust(d, method="ward")
>plot(fit)
>groups<- cutree(fit, k=3)
>rect.hclust(fit, k=3, border="blue")
```



Source: own processing

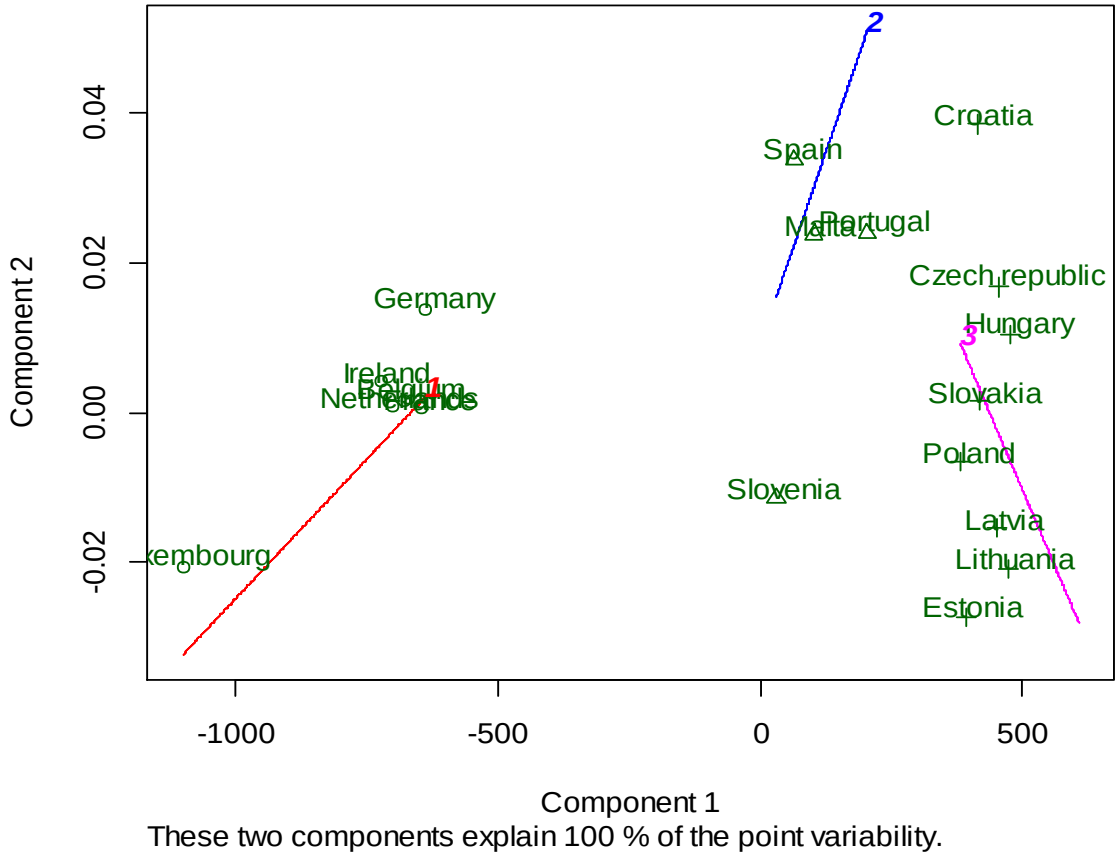
Figure 2 – Cluster dendrogram according Ward's method

In the dendrogram we can identify only 3 groups of countries with similar characteristics. These groups are highlighted.

- *Non-hierarchical methods.* If we consider two variables, clusters can be visualized by using non-hierarchical method K-means. On the basis of previous hierarchical method, it is considered the same number of clusters. K-means clustering is the most popular partitioning method. It requires the analyst to specify the number of clusters to extract. A plot of the within groups sum of squares by number of clusters extracted can help determine the appropriate number of clusters. There are two components, which explain 100 % of the point variability.

K-Means Clustering with 3 clusters:

```
>fit <- kmeans(data, 3)
>library(cluster)
>clusplot(data, fit$cluster, color=TRUE, shade=TRUE,labels=2, lines=0)
```



Source: own processing

Figure 3 – Scatterplot according K-means method

Cluster analysis fundamentally confirmed the intuitive breakdown of countries during working on the paper. There are three groups of similar countries. The most numerous one is group 3 where are mainly countries from Eastern and Middle Europe. There are mostly countries from Southern Europe in group 2 and countries from Western Europe in group number 1. Cluster analysis has showed that wage indicators in Europe are influenced among other things by geography and historical development of their political and economic systems.

Conclusion

In the national economy, the wage is a crucial source of livelihood for most of the households and it guarantees the social status. At the same time, it represents a major part of the national income. Regarding the employees, it is a motivating factor, it incentives to work. People´s decision-making between leisure and work is also influenced by the incentive function of wages and it is related to the absolute number of potential earnings.

The minimum wage should be set at the level that will ensure to the inhabitants of the country the minimum living standard conditions and it should be higher than the social benefits at the subsistence level. The minimum wage in the Slovak Republic is increasing every year – it is a natural consequence of the fact that when setting out the level of the minimum wage (set out by legislation) it shall be taken into account the overall economic and social situation in the country. The minimum wage in the country increased during the examined period by almost 90%, it is currently at the level of 405 euro.

Average monthly nominal wage increased by over 70% in the period of 2004-2015, while its annual growth rate has decreased compared to previous years. The lower wage growth could be a result of lower inflation respectively the general price level, which pulls down the nominal wage statistics. The real wage growth overtook the growth of the nominal wages in the recent past years. From the long-term perspective (also in the year 2015) the highest average nominal monthly wage was reached in the sectors of “information and communication” and “financial and insurance activities”, while the lowest is in the sector old “accommodation and food services”. Based on the forecast made by the Governor of the National Bank of Slovakia, the growth rate of the average monthly

wages will accelerate mainly due to the acceleration in labour productivity growth, the growth of inflation and the continued growth in demand in the labour market.

Similarly, as in the Slovak Republic we also evaluate the level of wages in the European Union. Not every EU citizen has the same size of the wallet. While the Luxembourgers reach the average wage of 3,000 euro, the Bulgarians must meet their needs with a monthly wage of less than 400 euro. Huge differences are most visible between western and eastern countries. Slovakia is among the countries that find themselves almost at the end of the ranking and does not reach the wages of Luxembourgers. In addition to the highest wages of Luxembourgers within the European Union they are also among the countries that have set the highest level of minimum wage. The lowest level of minimum wage is again in Bulgaria. Within the ranking of the 22 EU Member States – which have set the minimum wage – the Slovak Republic is on the sixteenth place in 2016.

In the paper, there have been made also a cluster analysis to find the countries with similar wage characteristics. Within the analysis, we have used the minimum net wage to identify the clusters and the countries. As a result, can be seen the division in three clusters, where the lowest minimum wage is in the countries mainly from the Eastern and Middle Europe – where it belongs also Slovakia. This cluster is also the biggest one.

Acknowledgements

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References

[1] Bajzíková, Ľ. 2004. *Systém odmeňovania (The remuneration system).* Bratislava: Ofprint.

[2] Jakubek, P. and Tej, J. 2015. Reform of financial administration in the Slovak Republic: reviews of participants. *Economic Annals-XXI (Ekonomicnyj Casopys-XXI),* 5-6(1): 33-36.

[3] Makúch, J. 2016. *Prognóza vývoja ekonomiky SR v roku 2016 (Prognosis of the Slovak economy in 2016.).* Bratislava: SOPK. Paper presented at conference on 28.1.2016. Available at: http://www.nbs.sk/_img/Documents/_Rozhovory/2016/Vystupenie_guverneraNBS_J.Makucha_Prognoza_vyvoja_ekonomiky_SR_v_roku_2016.pdf (accessed 26-07-2016).

[4] Máziková *et al.* 2013. *Účtovníctvo podnikateľských subjektov (Accounting of Business Entities).* Bratislava: Iura Edition, ISBN 978-80-8078-567-3.

[5] Šíbl, D. *et al*. 1991. *Malý slovník trhovej ekonomiky (Small Dictionary of the Market Economy).* Bratislava: ELITA, ISBN 80-85323-02-8.

[6] Suhányiová, A. and Fabian, Š. 2010. *Podvojné účtovníctvo podnikateľských subjektov (Double-entry Bookkeeping of Business Entities).* Prešov: Prešovská univerzita v Prešove, ISBN 978-80-555-0278-6.

[7] Vlachynský *et al*. 2012. *Finančný slovník výkladový (Financial Dictionary – Explanatory).* Bratislava: Iura Edition, ISBN 978-80-8078-469-0.

*** Act of the SR no. 311/2001 Coll. Labour Code, as amended

*** Eurostat 2016. *Wages and labour costs.* Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Wages_and_labour_costs (accessed 14-06-2016).

*** Government Regulations of the SR, which established the minimum wages, no. 525/2004 Coll., 428/2005 Coll., 540/2006 Coll., 663/2007 Coll., 422/2008 Coll., 441/2009 Coll., 408/2010 Coll., 343/2011 Coll., 326/2012 Coll., 279/2015 Coll.

*** Reinis Fisher 2015. *Average Salary in European Union 2015.* Available at: https://www.reinisfischer.com/average-salary-european-union-2015 (accessed 15-06-2016).

*** Regulations of the Ministry of Labour, Social Affairs and Family of the SR, which set out the level of subsistence minimum, no. 372/2004 Coll., 262/2005 Coll., 415/2006 Coll., 291/2007 Coll., 225/2008 Coll., 252/2009 Coll., 300/2010 Coll., 194/2011 Coll., 181/2012 Coll., 186/2013 Coll.

*** Statistical Office of the Slovak Republic, STATdat. (2016 a). *Priemerná mesačná mzda v hospodárstve SR (The average monthly wage in the national economy).* Available at: http://statdat.statistics.sk/cognosext/cgi-bin/cognos.cgi?b_action=cognosViewer&ui.action=run&ui.object=storeID(%22i94C7052B240A492FB3BE8C7A487D337B%22)&ui.name=Priemern%c3%a1%20mesa%c4%8dn%c3%a1%20mzda%20v%20hospod%c3%

a1rstve%20SR%20%5bpr0204qs%5d&run.outputFormat=&run.prompt=true&cv.header=false&ui.backURL=%2fcognosext%2fcps4%2fportlets%2fcommon%2fclose.html&run.outputLocale=sk (accessed 01-08-2016).

*** Statistical Office of the Slovak Republic, STATdat. (2016 b). *Hrubá mzda a popisné štatistické charakteristiky (Gross wages and descriptive statistical characteristics).* Available at: http://statdat.statistics.sk/cognosext/cgibin/cognos.cgi?b_action=cognosViewer&ui.action=run&ui.object=storeID(%22iFE32FBCAEB0F4E00A94321FB61D9FC04%22)&ui.name=Hrub%c3%a1%20mzda%20a%20popisn%c3%a9%20%c5%a1tatistick%c3%a9%20charakteristiky%20%5bnp1103rr%5d&run.outputFormat=&run.prompt=true&cv.header=false&ui.backURL=%2fcognosext%2fcps4%2fportlets%2fcommon%2fclose.html&run.outputLocale=sk (accessed 16-08-2016).

*** Statistical Office of the Slovak Republic, STATdat. (2016 c). *Priemerná mesačná mzda podľa odvetví (Average monthly wages by sectors).* Available at: http://statdat.statistics.sk/cognosext/cgi-bin/cognos.cgi?b_action=cognosViewer&ui.action=run&ui.object=storeID(%22i2F54CEABC9464EB6B9D47D7B63C86C2B%22)&ui.name=Priemern%c3%a1%20mesa%c4%8dn%c3%a1%20mzda%20pod%c4%bea%20odvetv%c3%ad%20%5bpr0205qs%5d&run.outputFormat=&run.prompt=true&cv.header=false&ui.backURL=%2fcognosext%2fcps4%2fportlets%2fcommon%2fclose.html&run.outputLocale=sk (accessed 01-08-2016).

*** WageIndicator 2016. *Minimum Wages in Germany with effect from 01-01-2015.* Available at: http://www.wageindicator.org/main/salary/minimum-wage/germany (accessed 28-01-2016).

Efficient Mechanisms of Oil and Gas Industry Development in the Northern Regions

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Abstract:

The article is devoted to scientific study and analysis of mechanisms of development of the oil and gas industry in the region and assessment of their social and economic efficiency. The authors identified common trends in the global oil and gas industry, highlighted the characteristics of the development of oil and gas sector of foreign countries, determined the usefulness of the approaches used in international practice, including regulation of the industry by the state, tough stance in defending national interests, experience in optimization of taxation of oil and gas industry, investment of oil and gas revenues in the national economy. The novelty of the study consists in the formulated and substantiated for the first time general principles of elaboration of efficient financial and economic mechanisms of development of the oil and gas industry in the region: regulatory, tax and investment mechanisms ensuring the further long-term development of the oil and gas industry of the Republic of Sakha (Yakutia). Developed mechanisms are universal and can be applied in other oil and gas regions.

Keywords: oil and gas industry, development mechanisms.

JEL Classification: G12, E31, O13, P18.

1. Introduction

Identification and study of the major issues and trends in the development of oil and gas markets of foreign countries that are competitors of Russia in the global oil and gas market, as well as the development trends of the global oil and gas industry as a whole, are a necessary condition for the formation of scientific concepts regarding the basic directions of increase of efficiency of functioning of modern Russian oil and gas industry as an integral part of the world industry.

Russian oil and gas industry management practices significantly differ from those used in foreign countries. For example, in countries with a liberal approach, private companies can develop deposits by themselves; direct state participation in oil and gas exploitation is absent or inconsiderable. Thus, it is reasonable to study the effective foreign experience in management and development of oil and gas market in order to use it in the Russian practice.

2. Literature review

The oil and gas industry is one of the most monopolized sectors. The USA energy policy is based on accelerated shale oil and gas production. Due to wide and active use of energy innovation (horizontal drilling and multi-stage hydraulic fracturing, three-dimensional modeling, and others) the country's hydrocarbon domestic

production growth has become very active. In the period from 2008 to 2013, the volume of hydrocarbon production from shale resources increased more than 4 times, and its share in the national production increased from 1/10 to 1/3, as a result, in the structure of the US oil consumption, the import share decreased from 56% to 47%, and gas import decreased from 13% to 6% (Ivanov 2015).

American oil and gas industry taxation experience is based on the rental approach. The main taxes of oil and gas companies in the US are rent payments, royalties, income tax, tax on gas production, fees for licenses, permits for drilling, laying of pipes, etc. (EY Global oil and gas tax guide 2015). At the same time, there is no mineral extraction tax (MET), which eases the profitability achievement. The main task of US tax policy is to stimulate subsoil users to maximize the oil and gas extraction in strict compliance with antitrust law. Thus, for small oil and gas companies the minimum rates are set, and they have a number of tax incentives and rebates. The large number of small oil refineries completely eliminates the problem of selling of crude oil extracted. For example, in Russia there are only 50, and in the US, there are more than 8000 small and medium-sized businesses in the oil industry (Korodyuk 2015).

Canadian system of subsoil use taxation is flexible: tax rates are regulated and there is a system of "tax holidays" and discounts. Royalties depend on oil prices, well capacity, oil quality, deposit types, extraction and transport costs, opening time. This mechanism encourages the search and exploration of new deposits and areas, increases in a consistent manner the efficiency of oil extraction. The oil production tax burden in the country is relatively high. Income tax is 40.8-45.8%, including federal tax: 28%, contributions to the provincial budget: 12.6-17.8% (Pavlenko 2013). The cumulative share of the state income from crude oil extraction, according to expert estimates consists 45-52%. Another major focus of regulation is the promotion of the domestic and foreign investment attraction.

The major oil-producing countries, oil export revenues are smoothly digested and absorbed by national economies and reallocated among the large population. In the Arab monarchies, the situation is different. Huge oil revenues have been absorbed by a small population (Bazaleva 2015). In terms of oil reserves, the Middle East is second to none. In recent decades, countries in the region have been among the top ten leaders of the world oil and gas production. Oil and gas industry is fully nationalized and controlled by the state through the state-owned oil companies.

The largest Middle East countries-oil exporters are very successful in the field of investment in the Western economy through targeted investments in the structure of multinational corporations and major international financial institutions (including the IBRD and the IMF). Gain from foreign investment is becoming an increasingly significant source of foreign exchange earnings (Bazaleva 2015). Thus, one of the strategic directions of the oil policy is the creation of the infrastructure of crude oil refining and marketing of petroleum products abroad through the acquisition of assets of foreign oil companies, which allows for efficient control over the full cycle of production, processing and marketing.

The experience of Norway is of practical interest: in this country, the oil and gas industry occupies the largest share in the structure of GDP, and is fully controlled by the state. Revenues from oil and gas industry in Norway come to the State Pension Fund, and then are invested in foreign securities. Norwegian Experience in optimization of taxation of oil and gas industry is a good example of the transition from the classical system to a taxation of financial results.

A strong point of the oil and gas complex of Norway is the selected management model, the main element of which has become the state regulation (Bazaleva 2015). The state originally developed an efficient program for the development of oil and gas complex; the correct objectives were set: national control and participation in oil projects, resource management rationality, high level of technological competence, long-term potential. Among the methods for achieving these goals, the following have been chosen: active attraction of foreign industry leaders and the rapid use of financial and intellectual resources for investment in crude oil production. Allowing foreign companies to get close to their reserves, Norway has obliged them to share their best technological practices and train local specialists. Also, multinational oil companies were required to contribute to the financing of the project engineering programs that enabled the country to solve a lot of research tasks (Bazaleva 2015).

Azieva considered foreign oil complex management experience: the author considered the practice of the use of various mechanisms of the oil and gas industry in various countries over a long time period. The history of the development of individual countries since the 1970s has been considered. The paper provides an overview of the current state of the oil and gas industry, but there was a little attention paid to the development of financial mechanisms (Azieva 2013).

In his works Ivanov analyzed oil and gas sector of the leading economies of the world, including the analysis of estimates on known oil and gas reserves, as well as the analysis of the dynamics of their prices. In general, this work is focused on the assessment of the current state of the global hydrocarbon energy and describes only the investment financial mechanisms of development (Ivanov 2015).

The works of Bazaleva considered regulatory mechanisms of development of Arctic deposits, and analyzed not only Russian but also foreign legislation. The article showed that in various foreign countries, the mechanisms of development of Arctic zone deposits are enshrined in legislation: for example, in Norway the revenues from oil and gas industry stimulate the Government Pension Fund of Norway, which makes both the state and the private sector to focus on the development of Arctic fields (Bazaleva 2015). For the moment, there are no such regulatory incentive mechanisms in Russia, but the author has offered several solutions.

Burutin (2013) considered the problem of taxation of the oil industry and its state regulation. The work describes the current problems of the oil industry taxation, its characteristics and has proposed the main directions for industry reforming, which can increase the cost-effectiveness of taxation, taking into account the focus on an optimal balance of interests of the state and subsoil users.

Gryaznukhina (2011) and Stepanova (2012) described the development prospects of oil and gas companies, taking into account peculiarities of the Republic of Sakha (Yakutia). The study analyzed the condition of the raw materials base of the Republic of Sakha (Yakutia), as well as its main problems, including the insufficient funding of geological exploration works.

In foreign literature, this issue has been widely discussed in the works by Bems and Filho Carvalho (2009). Espinoza and Senhadji (2011), Behar and Fouejieu (2016). These authors generally examined the impact of fiscal policy and the oil and gas sector refinancing rate. Also, the legislation of various countries having programs to support the oil and gas sector was considered. These works mainly describe the standard methods for the development and protection of the oil sector, but do not take into account the specifics of development of the Arctic and remote areas, which require special development mechanisms.

Thus, the approaches mentioned above are important for the further improvement of the oil and gas industry development mechanisms. These include the regulation of the industry by the state, tough stance in defending national interests, good practice of optimization of the oil and gas industry taxation, use of oil and gas revenues for the investment in the national economy, focus on innovative technologies, etc. The study and rational use of foreign experience will improve the efficiency of oil and gas complex of Russia.

The oil and gas sector of the economy is a complex economic combination of industries, which includes subsectors of exploration, preparation of deposits, oil and gas extraction, transportation and processing. At all stages of oil and gas selling, huge investments are requiring. Therefore, the main problem is the financing of these projects and the formation of efficient investment programs, which will require the development of efficient financial and economic development mechanisms.

3. Materials and methods

The most important condition for sustainable development and increase of the oil and gas industry efficiency is the development of efficient management mechanisms, as well as their improvement. The financial and economic mechanism is a combination of different methods, principles and tools.

Methods of construction of efficient financial and economic mechanism of oil and gas industry are the specific techniques and methods by which some elements of the mechanism are practically implemented, and the relationship and links between its subjects are identified. The classification of methods of construction of financial and economic mechanism is shown in Figure 1. In practice, to achieve the maximum efficiency of the mechanism, an optimal combination of methods is required. In terms of regulation of the financial and economic mechanism of the oil and gas industry, the state policy is determined by the peculiarities of the region in which it is implemented.

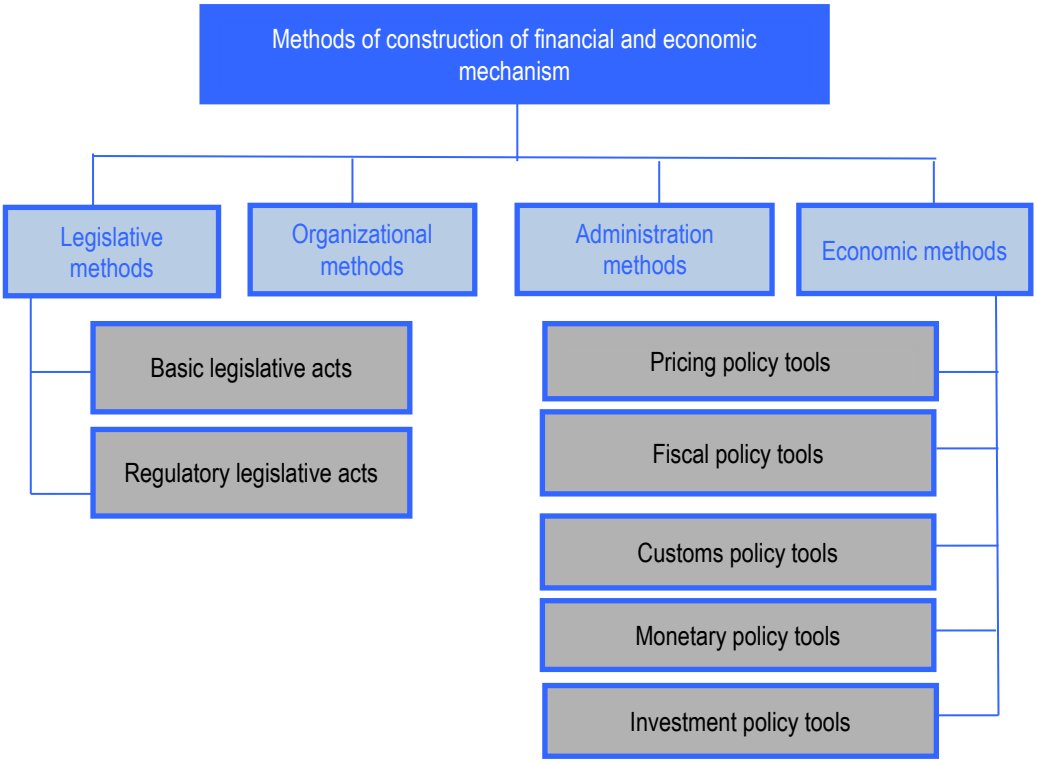

Figure 1 - Classification of methods of construction of financial and economic mechanism

Complex multi-level structure of the oil and gas sector, comprising the whole production and economic cycle from the geological exploration of oil and gas, development and production, transportation by pipeline networks to the end user, has identified a variety of different social relations that require complex legal regulation.

The legal framework of social relations in the oil and gas industry of the Russian Federation consists of the legislative acts general for all sectors of the economy, as well as of separate legal acts regulating specific aspects of relations. It should be noted that the gas industry is regulated by a special law containing uniform rules of legal regulation of the given sector: Federal Law "About gas supply in the Russian Federation", while there is no such laws in the oil industry.

Directions of development of oil and gas industry in the Republic of Sakha (Yakutia) have been defined till 2030 by the Energy Strategy of the Republic of Sakha (Yakutia) approved by the Resolution of the Government of the Republic of Sakha (Yakutia) on October 29, 2009 No.441. This strategic document is based on the strategic priorities of socio-economic development of the country, the provisions of the "Energy Strategy of Russia for the period till 2030"; it also takes into account the policy documents concerning the development of economy, fuel and energy complex of the Republic of Sakha (Yakutia), the Far East and Trans-Baikal area. The priorities include the creation of oil refining, gas processing and gas chemical industries and the implementation of the republican gasification program.

The main subsoil user's law that regulates organizational, legal, financial and economic aspects of subsoil use is the Law of the Russian Federation "On Mineral Wealth", adopted on February 21, 1992 that has been many times amended and modified since then.

Fiscal policy is a complex mechanism that is constantly changing for the state purposes. The complexity is also caused by and the fact that companies and individuals tend to seek a (legal) tax mitigation or (illegal) tax evasion. The Government has developed a wide range of mechanisms of acquisition of income from oil and gas sectors: from the nationalization of the oil and gas industry to the setting of tax rates (Kuzmin 2012). Taxation can be used as a mechanism to control the behavior of the market, companies, and influence the decision-making.

An important role in the system of financial and economic mechanism is played by investment. The main elements of the investment mechanism are: the market mechanism of regulation of investment activity of the enterprise; state legal regulation of investment activity; internal control mechanism, system of specific methods of investment activity control (Nikolaev 2014). There are many methods of construction of financial and economic mechanism implementing individual elements of mechanism, defining the relationship and links between its

subjects. In order to develop an efficient financial and economic mechanism, it is necessary to obtain the optimum combination of all methods and follow the principles stipulated and justified in this paragraph.

4. Results and discussion

The main results of the research are the development of financial and economic mechanisms: legal, tax, investment mechanisms, including the general principles of construction of financial and economic mechanisms formulated for the first time. Figure 2 represents the proposed general principles of construction of financial and economic mechanisms, distributed according to their importance and the degree of significance in relation to the financial and economic mechanisms. The proposed mechanisms are based on the alignment of the socio-economic interests of the population, economic entities, investors, consumers and the whole region. Problems identified in the field of legal regulation of the oil and gas industry require the improvement of legislation in the sphere of subsoil use and licensing system, that is, the oil and gas industry regulatory mechanism.

Table 1 of Appendix A shows the main deficiencies, regulatory mechanism for regulation of the oil and gas industry and the evaluation of the efficiency of the proposal regarding the modernization of the Law of the Russian Federation "On Subsurface Resources" of 21.02.1992 N 2395-1 (as revised on 13.07.2015 (as amended on 01.01.2016):

Thus, the proposed regulatory mechanism will ensure social and economic development of the region, increase the participation of the region in the development of oil and gas industry, and ensure environmental safety in the Republic of Sakha (Yakutia).

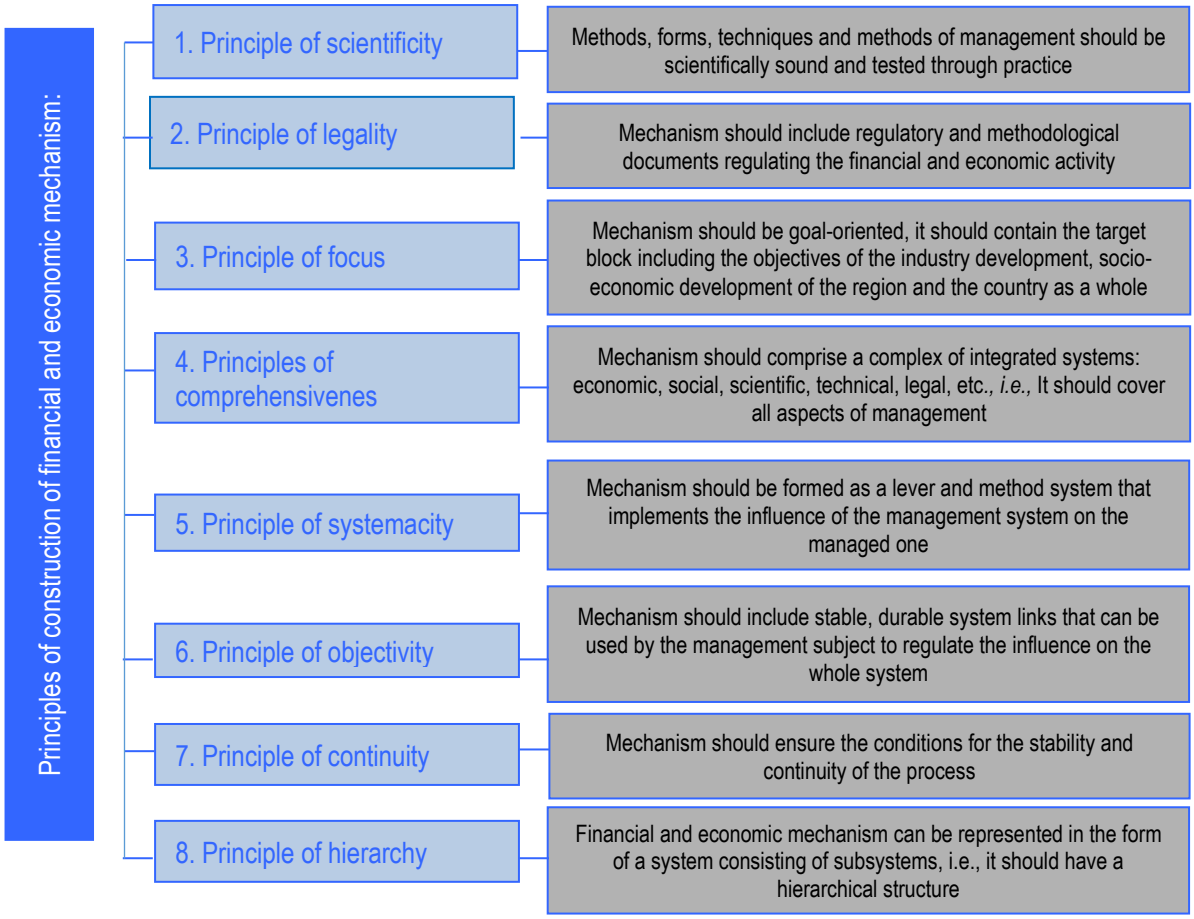

Figure 2 - General principles of construction of financial and economic mechanisms

Elaborated tax mechanism involves the transition from the MET to the tax system based on the financial result taxation (FRT), which will have a great influence on the entire oil and gas industry. Proposals on improvement of the tax mechanism are presented in Table 2 of Appendix A. We believe that when developing the oil and gas sector, attention should be given to the resolution of related issues, in particular, adjustment of the tax system so that it meets the interests of the specific regions. According to the results of the analysis of the existing tax system, most of the MET revenue goes to the federal budget and is returned in the form of grants or does not return at all.

At the same time, the tax on the extraction of oil and natural gas goes entirely to the federal budget, *i.e.* the Republic does not receive income from this tax.

Also, the analysis revealed significant problems in terms of the order of the MET calculation. Despite the modernization of the taxation legislation, the calculation of the MET on gas has become more complex and less transparent, and the calculation of the MET on oil is performed without account of a number of factors. Many experts believe that the MET has become obsolete and does not reflect the real situation on the market. MET is calculated from revenue, determined on the basis of the prices on raw materials, and, accordingly, the costs of the development and extraction of raw materials are taken into account. In addition to that, the movement of hydrocarbons to new regions, increased complexity of deposits and growing level of depletion of existing fields lead to a differentiation of costs of the development of different deposits, reduction of the profitability of investment projects and respectively to the augmentation of discounts. The fact that the current system has become obsolete is confirmed by almost annual review and the introduction of the lumped tax incentives for oil and gas producers.

In this case, it is important to study and adopt the foreign best practices. The experience of Norway and individual states in Canada is of interest, as they are widely using the financial result taxation in their fiscal systems. In addition, the Khanty-Mansiysk Autonomous Okrug came up with a proposal for transition to the taxation in the form of income tax from the crude oil sale.

Thus, this problem could be solved by the introduction of financial result tax (FRT), which would replace the MET. In contrast to the MET, which is calculated based on the volume and cost of the extracted raw materials, the FRT is calculated from the actual profits of the subsoil user from the sale of the extracted raw material. The essence of the FRT is that it will be imposed depending on the size of the company's profits with due account to the field development costs.

A significant part of funds of extractive industry companies is spent for exploration works requiring huge investments. By investing financial resources in the field exploration and development works, the companies shall pay the MET according to the volume of the extracted raw materials and as a result they are at a loss. Therefore, mining companies prefer not to take risks and get involved in proven reserve projects. Transition to the FRT-based taxation system will make it possible to take into account the dynamics of the world market conjuncture and field development economics, thereby will stimulate the development of both old and new fields. The FRT tax base is the difference between income from the sale of raw materials and the costs associated with their production, storage, delivery and capital costs. Tax rates for existing fields and new projects should be differentiated. For a new field, the progressive taxation can be applied depending on the project profitability.

Thus, the proposed tax mechanism will significantly reduce the tax burden on enterprises, since, unlike in the case with MET, it will take into account not only the volume of extracted raw materials, but also its production costs. Thus, it will stimulate the development of small and medium enterprises in the oil and gas industry, as in the initial stages of investment activities, they will not bear the tax burden and it will increase the level of competition and reduce the degree of monopolization in the industry.

Also, one of the main advantages of the introduction of this mechanism is the incoming of the tax revenue not only to the federal budget, as in the case of the current taxation system, but also to the regional one. Thus, the republic will receive funds for the development of the local oil and gas industry, the construction of the necessary infrastructure, the implementation of deposit development investment projects, the allocation of funds to the state gas infrastructure development program.

In order to form the Yakutia gas center, there is an increasing need to create in Yakutia a favorable investment climate in the oil and gas industry. To do this, it is important to create a self-sufficient and self-developing investment infrastructure. The assessment of the financial support of investment programs of the oil and gas industry of the Republic of Sakha (Yakutia) has shown that there are problems concerning both internal and external sources of finance.

Internal sources of financing, which are the main source of financial support, are generated by means of the tariffs for transportation of natural gas through long-distance gas distribution pipelines. Prescribed rates are subject to state regulation. Attraction of investment resources is complicated by the fact that the company carries out activities related to the socio-oriented ones: gasification of settlements in which the population and the amount of payments for supplied gas do not provide a lossless basis for local network services.

Thus, the need for an efficient mechanism of financial backing, in other words, the investment mechanism, which would ensure the flow of funds for investment projects, is quite justified. Designed investment mechanism of development of the oil and gas industry of the republic implies the creation of the investment fund of development

and modernization of the oil and gas industry of the Republic of Sakha (Yakutia), which would significantly expand the investment project financing.

The purpose of the creation of the oil and gas industry investment fund is to attract long-term extra-budgetary investments for realization of investment projects on development and modernization of the oil and gas industry in the republic.In order to attract long-term investments, it is necessary to use state guarantees of the Republic of Sakha (Yakutia), the collateral of the state property of the Republic of Sakha (Yakutia), the assets of oil and gas companies and long-term investment project objects.

Planning and control of the activities of the oil and gas industry investment fund of the Republic of Sakha (Yakutia) shall be carried out by the Government of the Russian Federation, the Ministry of Industry and Trade of the Russian Federation, the Government of the Republic of Sakha (Yakutia), the Ministry of Industry of the Republic of Sakha (Yakutia), the Ministry of Economy of the Republic of Sakha (Yakutia). Resources of the fund shall be used solely for investments in development and modernization of the oil and gas industry of the republic. That is, the creation of an investment fund of oil and gas industry of the Republic of Sakha (Yakutia) involves targeted use of funds.

Creation of an oil and gas industry investment fund will significantly expand the financing of investment projects in the industry. Potential sources of funding will be the following:

- Oil and gas companies own resources: depreciation allowances, net income, investment allowances, etc.
- Borrowed funds: bank loans, loans of financial institutions, foreign investors, etc., attraction of funds of individuals and legal entities on the terms of co-financing of investment projects; trade credit.
- Budget funds: public investments within the framework of the state program of gasification of settlements and gas supply securing in the Republic of Sakha (Yakutia).
- "RIC" JSC as an instrument of direct financing of investment projects.

The proposed scheme of financing sources and the modernization of the oil and gas industry of the Republic of Sakha (Yakutia) is shown in Figure 3.

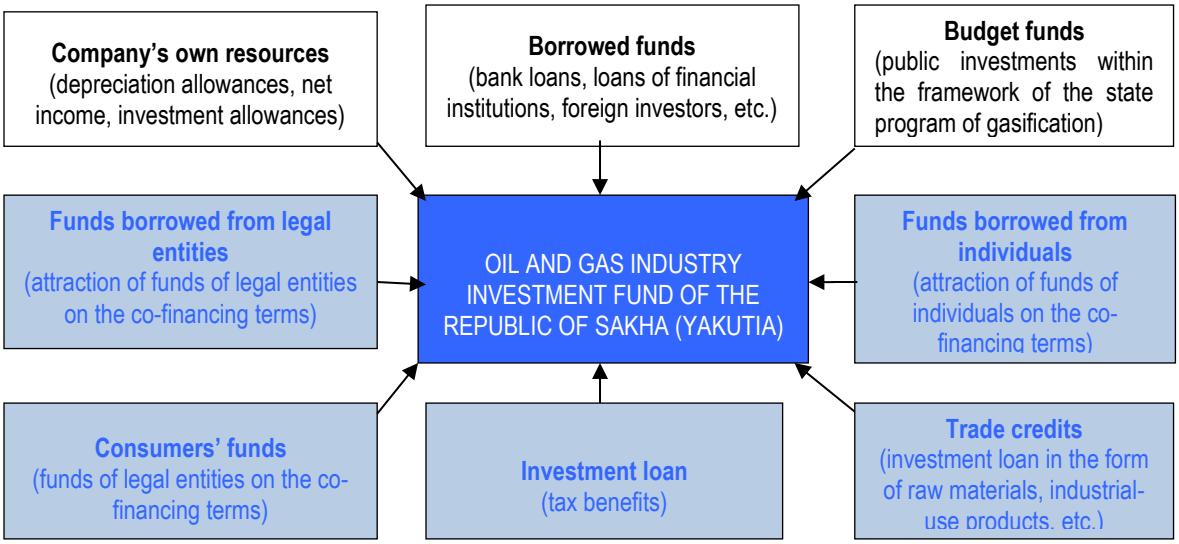

Figure 3 - The proposed scheme of sources of financing and modernization of the oil and gas industry of the Republic of Sakha (Yakutia)

Proposals regarding the development of efficient investment mechanism and the expected effect are shown in Table 3 of Appendix A.

Thus, the implementation of the developed investment mechanism will create a favorable investment climate in the oil and gas industry of the republic and increase the investment attractiveness of the industry. The performed gasification of settlements of the republic will increase the welfare of the population in rural areas and will improve working conditions, etc. In the longer term, the attraction of additional investment resources through the creation of the Investment Fund will make it possible to carry out projects on oil and gas processing plants construction.

By means of the proposed financial and economic mechanisms, the problems identified during the study of the problem will be eliminated and the long-term future development of the oil and gas industry of the Republic of Sakha (Yakutia) will be secured. The proposed financial and economic mechanisms of development of the oil and

gas industry of the Republic of Sakha (Yakutia) will contribute to the long-term and perspective development of the industry and the republic as a whole will create the conditions for the functioning of small and medium enterprises and will increase the level of competitiveness in the industry. At the same time, the proposed mechanisms take into account the socio-economic interests of the population, economic agents, investors and the whole region. Thus, the developed mechanisms will produce both economic and social positive effects.

In general, we can conclude that the developed mechanisms are efficacious. Their implementation will ensure the development of the industry, as well as socio-economic development of the republic as a whole. As shown by the analysis, the existing mechanisms are quite outdated and do not meet the requirements of the modern economy. We propose the financial and economic mechanisms, including the regulatory, tax and investment mechanisms that meet the requirements of the oil and gas industry existing in the country and the republic. These mechanisms are universal and can be applied in other oil and gas regions of the country.

Conclusion

Thus, based on the result of the research we can formulate the following conclusions:

- The study of theoretical and methodological approaches of financial and economic mechanisms of development of oil and gas industry has shown that at the moment the problem of the development of efficient financial and economic mechanisms in the region's oil and gas industry in understudied.
- The study of foreign experience of development of oil and gas industry has identified common trends in the global oil and gas industry development, highlighted the characteristics of the development of oil and gas sector of foreign countries, determined the relevance of approaches used in international practice, including the regulation of the industry by the state, tough stance in defending national interests, experience in optimization of taxation of oil and gas industry, use of oil and gas revenues for investments in the national economy, etc.
- The authors have identified the deficiencies of the Russian legislation in the sphere of subsoil use and licensing system, the imperfection of the current tax system regarding the oil and gas industry, the lack of efficient investment mechanism. Within this framework, the necessity of the development of economic and financial mechanisms for the development of oil and gas industry in the Republic of Sakha (Yakutia) has been justified.
- On the basis of the theoretical approaches of financial and economic mechanisms of the oil and gas development, the authors have formulated and substantiated general principles of financial and economic mechanisms.
- The following financial and economic mechanisms of development of oil and gas industry have been developed: regulatory, tax, investment mechanisms by which the long-term further development of the oil and gas industry of the Republic of Sakha (Yakutia) will be secured. The assessment of the efficiency of the developed mechanisms has shown that they will produce positive economic and social effect. Developed mechanisms are universal and can be applied in other oil and gas regions.

References

[1] Alveberg, L.J. 2013. (Ed.) *Facts the Norwegian Petroleum Sector*. Norway: Norwegian Ministry of Petroleum and Energy, Norwegian Petroleum Directorate. Available at: http://www.npd.no/Global/Engelsk/3-Publications/Facts/Facts2013/FACTS_2013.pdf

[2] Azieva, R.K. 2013. Foreign oil complex management experience. *Young Scientist*. 3: 189-195.

[3] Bazaleva, R.V. 2015. Foreign and Russian regulatory framework of development of Arctic deposits. *Petroleum Engineering*, 4.

[4] Behar, A. and Fouejieu, A. 2016. *External Adjustment in Oil Exporters: The Role of Fiscal Policy and the Exchange Rat*e, IMF Working Paper WP/16/107.

[5] Bems, R. and Carvalho, I. Filho. 2009. *Exchange Rate Assessments: Methodologies for Oil Exporting Countries*, IMF Working paper WP/09/281.

[6] Burutin, V.V. 2013. Issues of taxation of the oil industry and state regulation of its development. *Bulletin of the Saratov State Socio-Economic University*, 3.

[7] Espinoza, R. and Senhadji, A. 2011. *How Strong is Fiscal Multipliers in the GCC? An Empirical Investigation*, IMF Working Paper WP/11/61.

[8] Gryaznukhina-Stepanova, V.R. 2011. Problems and features of subsurface use in the oil and gas sector of the Republic of Sakha (Yakutia). *Issues of the Modern Economy*, 3: 222-225.

[9] Gryaznukhina-Stepanova, V.R. 2012. Analysis of the raw material base and prospects of development of oil and gas production industry in the Republic of Sakha (Yakutia). *Petroleum geology. Theory and Practice*, 7(3).

[10] Ivanov, A.S. 2015. Global energetics at the turn of the year 2015 under the pressure of hardening factors. *Drilling and Oil*. 01: 8-17.

[11] Korodyuk, I.S. 2015. Problems of application of foreign experience in state regulation of the oil and gas complex of Russia. *Bulletin of Irkutsk State Economic Academy.* 25 (1): 103-109.

[12] Kuzmin, T.G. 2012.*The economy of the investment project in the oil and gas industry: tutorial. Tomsk Polytechnic University*. Tomsk: Tomsk Polytechnic University Press.

[13] Nikolaev, M.A. 2014. Methodology of the construction of mechanism of control of investment activity in the region. *Bulletin of the Pskov State University. Series: Economic and Technical Sciences*, 4.

[14] Pavlenko, V.I. 2013. Regulation of the sphere of subsoil use in the Arctic countries (USA, Canada, Norway). *Arctic: Ecology and Economy*, 3: 50-57.

*** Act relating to petroleum activities: Act of 29 November 1996 No. 72, Section 3-3. Norwegian Petroleum Directorate. Available at URL: http://www.npd.no/en/Regulations/Acts/Petroleum-activities-act/.

*** Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle. 2008. Menlo Park: U.S. Geological Survey. Available at: https://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf.

*** EY Global oil and gas tax guide 2015. [Electronic resource]. Accessed at: http://www.ey.com/Publication/vwLUAssets/EY-2015-Global-oil-and-gas-tax-guide/$FILE/EY-2015-Global-oil-and-gas-tax-guide.pdf

*** Licensing rounds on the Norwegian Continental Shelf. Norwegian Petroleum Directorate. Available at: URL: http://www.npd.no/en/Topics/Production-licences/Theme-articles/Licensing-rounds/

*** *Petroleum Resources on the Norwegian Continental Shelf*. 2013. Stavanger: Norwegian Petroleum Directorate.

APPENDIX A

Table 1 - Regulatory mechanism of regulation of the oil and gas industry and the estimation of its efficiency

Problems	Proposed mechanism	Expected effect
The Law of the Russian Federation "On Subsurface Resources" of 21.02.1992 N 2395-1 (as revised on 13.07.2015 (as amended on 01.01.2016): - does not provide direct regulations requiring subsoil user to participate in socio-economic development of the areas in which the subsoil is developed	Amendment of article 12 of the Law of the Russian Federation "On Subsurface Resources", providing for the conclusion of an agreement between the subsoil user and the state authorities of the RF territorial entities and municipalities on participation in the socio-economic development of the territories, including the specification of the obligations of the subsoil user relating to his participation in socio-economic development of the territory	Ensuring the socio-economic development of the territory, in which the development of subsurface resources is carried out, including economic development, employment rate growth and human well-being improvement, development of social and transport infrastructure.
- does provide for tax revenues for the budget of the RF territorial entity, in which the activities are carried out, many enterprises are registered outside the Republic of Sakha (Yakutia)	Addition of the clause about transfer of the ownership of a part of federal property (the main oil pipelines) to regions in order to generate the financial resources of the Investment Fund	More active participation of the republic in the development of oil and gas industry
- the norms for preliminary approval of the land allocation prior auctions have been withdrawn, subsurface lands are located mainly on forestry fund lands, i.e. within the federal property, and acquisition of land of other owners, users is carried out without their participation	Addition of the principle of differentiation of subsoil plots of federal and regional significance	More active participation of the republic in the development of oil and gas industry
- regions do not have the right to control the allocation of the licensed areas for the development and production of various fossils	Restoration of the principle of joint jurisdiction regarding the subsoil plots with the delegation of some powers in the field of subsoil use concerning small fields to the regions	Delegation of authority to control the licensed areas
- tenders for the right to use subsurface area of federal significance may be carried out only in the form of auction	Granting the license for subsoil use on the basis of competition, rather than auction	Possibility to choose a subsoil user with the best characteristics, technology and the environment protection

Source: compiled by the authors

Table 2. Tax mechanism of development of the oil and gas industry and the estimation of its efficiency

Problems	Proposed mechanism	Expected effect
▪ The whole tax revenue from on oil and natural gas goes to the federal budget (lack of revenues to the regional budget)	▪ Introduction of a financial result tax (FRT), which will replace the MET and will enable the flow of revenue to both the federal and regional budgets (following the example of the income tax)	▪ Simplification of the administration of the current tax system, reduction of the number of lumped privileges and preferences; ▪ Increase in tax revenues to the consolidated budget of the Russian Federation from the highly profitable oil and gas fields; ▪ Flow of revenue to both the federal and regional budgets; ▪ Creation of fiscal stability, as the tight oil field commerciality will be secured even in case of low world prices, so, the tax will carry out not only fiscal function (as the MET does) but also stimulating one (FRT will stimulate subsoil users to extract tight oil);
▪ MET on oil does not takes into account the quality of raw materials, the complexity of the extraction of raw materials and the degree of depletion of deposits	▪ It is necessary to add to the Tax Code a clause on the differentiation of deposits according to the degree of depletion of fields, the complexity of raw material extraction conditions and the quality of the extracted raw material	
▪ MET on gas and gas condensate is unfixed (it is difficult for companies to forecast their budget and expenses), has a complex and	▪ For the FRT taxation base it is necessary to use the difference between the income from the sale of raw materials and the cost of their production. Thus, the FRT will take into account the expenses	

Problems	Proposed mechanism	Expected effect
non-transparent calculating procedure (information on many parameters is confidential, and their calculation is carried out by subsoil users themselves)	incurred by subsoil users during the extraction of raw materials and the amount of FRT payments will directly depend on the amount of raw materials extracted in a particular field within a particular period. For new and old deposits, the tax rate will be lower than in the case of the MET. Bigger amount of production will lead to a bigger contribution to the budget.	▪ Creation of additional incentives for holes drilling, as FRT will make it possible to halve the payback period for investments in field development, that will ultimately increase revenues comparing to the situation with MET; ▪ Possibility to take into account changes in production conditions in the process of exploitation of the deposit, i.e., its depletion (the tax gets decreased according to deposits depletion); ▪ Possibility to respond to changes in external economic conditions of production - the world prices (the lower the selling price is, the lower the tax is, and vice versa); ▪ Possibility to accurately predict the efficiency of investment projects, because it is a calculated value.
▪ It does not take into account the profitability of the objects, which creates prerequisites for bankruptcy or absorption of small and medium-sized producing companies by large ones	▪ FRT tax rate should be determined depending on the profitability	

Source: compiled by the authors

Table 3 - Investment mechanism of development of the oil and gas industry and evaluation of its efficiency

Problems	Proposed mechanism	Expected effect
▪ Insufficient financial resources for the implementation of the investment program of development of oil and gas industry	▪ Creation of the Investment Fund of Development and Modernization of the Oil and Gas Industry of the Republic of Sakha (Yakutia), the sources of funding of which will be: ▪ Internal resources of oil and gas companies; ▪ Borrowings: - Bank loans, loans of credit and financial institutions, foreign investors, etc.; - attracted funds of individuals and entities on the terms of co-financing of investment projects; - trade credit. ▪ Budget funds: public investment in the framework of the state program of gasification of settlements gas supply securing in the Republic of Sakha (Yakutia)	▪ Ensuring the long-term and perspective development of the oil and gas industry of the Republic of Sakha (Yakutia); ▪ Creating a favorable investment climate in the oil and gas industry of the Republic of Sakha (Yakutia); ▪ Ensuring a high-quality implementation of the state plan for the gasification of settlements and ensuring the reliability of gas supply of the Republic of Sakha (Yakutia), aimed at improving the level and quality of life, working conditions, improving the ecological environment, securing the reliability of operation of the gas transport system and settlements energy supply; ▪ Ensuring financing of investment projects of oil and gas industry of the Republic of Sakha (Yakutia), including the development of fields; ▪ Expanded financing of geological exploration works; ▪ Possibility to establish local oil and gas processing facilities on the territory of the Republic of Sakha (Yakutia)
▪ Attraction of investment resources is complicated by the fact that the company carries out activities related to the socio-oriented activities		
▪ Due to the fact that the profit is generated by means of the tariffs for transportation of natural gas established by the government, the internal sources of financing are directly dependent on government regulation.		

Source: compiled by the authors

The Link Between Trust and Prosperity

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Abstract:

In last two decades, trust, as a determinant of economic performance, gained a significant attention in social sciences. Many authors provided evidence of the impact of trust on macroeconomic growth. The paper amends the results of previous empirical studies, based on more recent sample, with new evidence of connection between trust and economic performance on long-term horizon. Thus, the association between level of trust and prosperity, and the interlink with other characteristics of countries economic environments, is investigated.

In this paper we worked with expectation of link between interpersonal/institutional trust and economic prosperity.

Keywords: interpersonal trust, institutional trust, prosperity, economic growth.

JEL Classification: A13, F43.

1. Introduction

Up to now, there are several studies in the field of economic development of the society, which show that the difference between long-term economic success and failure depends on the efforts of individuals to maximize their wealth.

Traditional models of economic growth of countries were based on "hard" inputs such as natural resources, physical capital, the frequency and changes in labour (Solow and Swan 1956) and later variables such as human capital were added (Barro 1991). However, even economists who held these "tangible" inputs pointed to the importance of trust as a determinant of significant differences between countries (Arrow 1972).

Francis Fukuyama (1995) made it clearer, when outlined the theory which interconnects moral and cultural characteristics of the countries with a level of trust and consequently the level of prosperity. Since then, many theoretical and empirical studies examining the link between trust and economic performance have been conducted (Putnam 1995, Knack and Keefer 1997, Zak and Knack 2001, Uslaner 2002, Algan and Cahuc 2014).

Trust can significantly contribute to economic performance on both, micro and macro level. On the micro level, social ties and interpersonal trust can reduce transaction costs, law contract enforcement or secure credit at the level of individual investors (Knack and Keefer 1997, Bacik *et al*. 2015). On the macro level, social cohesion can reinforce the democratization of management, increase efficiency, effectiveness and compliance with the ethical principles of public administration (Putnam 1993, Šoltés *et a*l. 2014, Gavurova *et a*l. 2014) and improve the quality of economic measures.

Hence, the aim of this paper is to provide additional empirical evidence on the link between trust and economic performance in long time horizon.

2. Trust

2.1. Definition of trust

Fukuyama (1995, 26) perceives trust as "expectation appearing in the community of common, honest, and cooperative behavior, based on commonly shared norms." Dehley and Newton (2003) defines trust as "faith to others that they will not harm you intentionally and knowingly if they can prevent it, and that they will take care of our interests." According to the authors Bhattacharya, Devinney and Pillutla (1998) trust is "expectation of positive (or negative) result that is based on the expected action of counterparty in the interaction characterized by uncertainty." Other definitions are provided by Deutsch (1973), Cook and Wall (1980), Carnevale a Weschler (1992, 473), Grunig a Hon (1999, 3), etc.

Trust can be divided into different types depending on the point of view. For the purpose of this paper trust will be divided according to the object of trust. From this point of view trust can be divided according to whom, resp. what is trusted. Authors (Cook and Gronke 2001, Putnam 2000, 137, Newton 1997, 578, Luhmann 2000) work with these three forms of trust - interpersonal (*i.e.* general) so called "thick" and institutional (systemic) trust. Interpersonal, *i.e*. the general trust is based on the daily interaction between people that do not know each other (Newton 1997, Williams 1988). On the contrary, so-called "thick" trust is based on closer ties within the family

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network. Institutional trust, resp. systemic trust represents trust in the institutions that organize the functioning of society (Cook and Gronke, 2001).

2.2. Link between trust and prosperity

To the knowledge about the development of individual's and its microeconomic and macroeconomic aspects has significantly contributed Francis Fukuyama (1995). On the macro level Fukuyama diversifies society into two types: societies with high and low level of trust. As the aim of paper is to analyze the link between trust and economic performance, we will focus on the studies which proved existence of this relationship. Within the empirical researches there are two streams with significant results. Both of them look at the trust from the view of general interpersonal trust among people, while using the results of World Value Survey. In the given empirical studies, the answers on question such as "Do you have trust to the other individuals?" are used and as indicator of trust the percentage of people expressing trust to the others is used.

To the authors focusing on the link between trust and prosperity belong Knack and Keefer (1997) that investigated the impact of trust, norms and associations (organizations) on economic performance on the sample of 29 market economies. They proved, that especially trust (but even norms) has an impact on the performance, and on the contrary, associations have none. Following this results, Roth (2007) conducted similar study on the newest data (1990-2005) and proved previous conclusions.

According to Fukuyama (1995) or Putnam (1993), trust in the economy is a constant component of the creation of business contracts. It is an effective means to reduce transaction costs at all levels of society relations - social, economic and political Fukuyama (1995). Under the transaction costs we understand "costs associated with the bank, insurance and financial operations, wholesale and retail exchange, and legal and accounting services" (North 1990, 28).

Trust can positively affect a problematic delegation of power, the so-called "Principal Agent Problem" in societies with higher level of trust (Notrh 1990, Dorčák *et al*. 2014). Trust also enables to solve collective problems by actors (Whiteley 2000, 451, Koblen *et a*l. 2013, Szabo *et al.* 2013). Whiteley (2000) and Putman (1995) point out that trust allows coordination and cooperation with the aim to achieve common benefit, solve dilemma of collective action, reduce the tendency to opportunism and egoism.

3. Methodology

3.1 Expectations

We can assume that communities with a high level of trust are able to implement effective organizational innovation and knowledge of the individuals at a higher level. Trust can also affect economic outcomes through macro- political channels, given that the sociability supports autonomous political institutions (Fukuyama 1995; Putnam 1993). Trust is characterized by relative stability (Uslaner 2002), therefore the countries with a higher level of trust, which in the long term horizon supported economic growth, have ultimately a higher level of prosperity. To this fact refer also Arrow (1972) that states that every economic backwardness or failure of the world can be explained by a lack of mutual trust.

The idea of a long-term effect of trust encourages authors such as Fukuyama (1995) and Mlčoch (2006) that combine the level of trust to the level of prosperity of society. Therefore, in this paper we analyse the long-term correlation of trust to macroeconomic indicators of countries. Therefore, we will work with following hypothesis:

We assume, that between the level of trust in the country and the level of prosperity a positive correlation is present.

3.2 Data used

To measure the level of interpersonal trust in the countries, secondary data obtained from surveys of the World Values Survey (2009) were used. For the needs of our research, we have processed the answers on the question: "Do you trust other people?" (respondents had 2 choices: Yes or No). In further analysis is under the level of interpersonal trust (trust in people) in the year "t" intended a percentage of people within the country in the year "T", who answered that people can be trusted. Mathematically speaking, the level of trust in the people is calculated as a share of the answers "people can be trusted" to the total number of responses in a given year in the given country.

It need to be mentioned, that WVS surveys are not carried out for each country for the continuous time period. In the most countries, the WVS survey are conducted for the last 30 years only twice, usually with more than 10-year gap between surveys. Only in a few countries the survey was done more than twice. Thus, in the

research unbalanced panel data have been used. The data covers the survey wave conducted from 2005 to 2009 – the choice for this time period was done due to no influence of trust shocks caused by economic crisis. Thus, the data provide the evidence of this economic relation in stable economic period.

For the measurement of economic performance, real gross domestic product per capita expressed in US dollars at constant prices of year 2005 will be used. When calculating GDP, PPP method (purchasing power parity) and expenditure approach is applied. This allowed us to compare the countries without the impact of size of country, inflation, based on the real exchange rate. The data are gained from database Penn World Table. In contrast with the level of trust, GDP is calculated every year.

3.3 Methods

To test the working hypothesis, following tasks are defined:

Working task 1: Reduce the number of indicators for measurement of institutional trust. Nonparametric Spearman's rho correlation test will be used, as this type of test examines the monotony of a relationship, not its linearity and is expected that the relationship between trust and the level of prosperity will not be linear.

Working task 2: Quantify the strength of correlation between the level of particular institutional trust and prosperity.

Working task 3: Quantify the strength of correlation between the level of interpersonal trust and prosperity.

Working task 4: Investigate the formation of observations of the link between interpersonal trust and prosperity.

In this complementary task, we will review a formation of cross-cutting observations on the graph representing the level of correlation between trust and prosperity, in both ways: visually and in the form of regression estimates curve.

4. Results

4.1 Institutional trust and the prosperity

When analyzing the connection between the institutional trust and prosperity, factor analysis was used (method of Principal Component Analysis, with Varimax Rotation method). Using this method, the two groups of trusts were differentiated: trust in the institutions that form the environment and trust in institutions overseeing compliance with standards. Based on our results, second group of organizations - the police and the judicial system, proved higher degree of correlation with the level of prosperity.

The assumption of a link between institutional trust and prosperity for the trust in the police is not rejected - a strong degree of correlation within all samples is found. This assumption is not rejected also for the trust in the judicial system as the trust and prosperity proved to have slightly positively correlation in most investigated samples. The trust in other institutions, *i.e*. Institutions forming environment, the results are not unambiguous. Only the sample of EU28 showed, that almost all (with the exception of trust in trade unions because of absence of significance) these institutional trusts are at least moderately correlated with levels of prosperity.

This phenomenon may be caused by the fact that by measurement of trust within institutions such as Government and Parliament the perceived trust may be strongly influenced by political views. These organizations are in a particular period represented by democratically elected Assembly, when the mandate is often obtained through an absolute majority. A significant part of society, one that did not vote for parties represented in the government (parliament), can be affected by the personal reservations against specific politicians what lead to a greatly dissipation of estimated trust. Trust in the justice system and the police are less distracted cause of the stability in orientation of the related organizations. Moreover, even if links to the political parties is present, is considerably smaller when comparing to the other type of institutions. Trust in people and trust in these organizations are strongly correlated, so credibility of environment is significantly related to the "game" conditions.

Table 1 - Interpersonal and institutional trust vs. Level of prosperity – correlation matrix

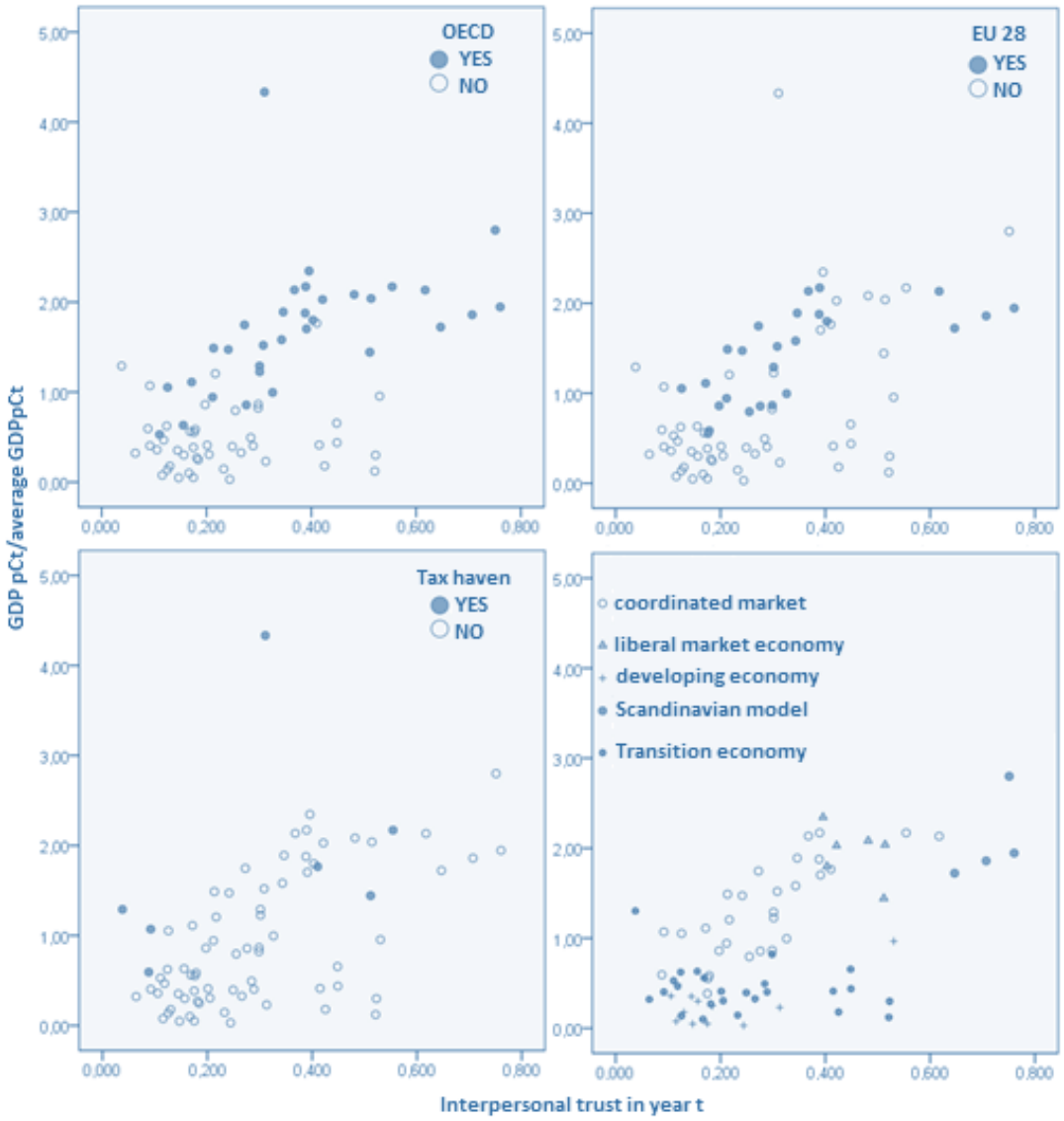
Spearman's rho		GDPpC to the sample average for year t			
		Whole Sample	OECD	EÚ28	Without tax haven
Trust in the people in year t	Correlation Coefficient	530***	702***	775***	554***
	Sig. (2-tailed)	000	000	000	000
	N	76	32	25	69
Trust in trade unions	Correlation Coefficient	070	312*	328	020
	Sig. (2-tailed)	551	082	109	872
	N	75	32	25	68
Trust in police	Correlation Coefficient	535***	505***	678***	520***
	Sig. (2-tailed)	000	003	000	000
	N	74	32	25	67
Trust in parliament	Correlation Coefficient	085	407**	682***	010
	Sig. (2-tailed)	471	021	000	933
	N	74	32	25	67
Trust in public administration	Correlation Coefficient	113	276	416**	041
	Sig. (2-tailed)	330	126	039	737
	N	76	32	25	69
Trust in government	Correlation Coefficient	-138	231	486**	-241**
	Sig. (2-tailed)	242	203	014	050
	N	74	32	25	67
Trust in justice system	Correlation Coefficient	236**	545***	707***	200
	Sig. (2-tailed)	048	001	000	110
	N	71	32	25	65

Note: * statistically significant at the level of confidence 0,10, ** statistically significant at the level of confidence 0,05, *** statistically significant at the level of confidence 0,01

Source: Author

4.2. Interpersonal trust and the prosperity

In the long-term link between level of trust and economic performance, an economic performance was measured by the level of prosperity. When using correlation analysis, an estimated relationship between interpersonal trust and prosperity was not rejected at any of the samples (strong degree of correlations on a sample of OECD: 0,702, on a sample of EU28 even 0,775, which according to Cohen is a very strong degree of correlation in social science research). Based on the results, our work hypothesis is not rejected. The level of trust is seen as a result of environmental credibility*, i.e.* his honesty, unwillingness to abuse short-term benefit opportunities. It is the result of moral and cultural level of society (Fukuyama 1995). Such an environment streamlines the implementation of the relations between economic agents through lower transaction costs, greater collective action, better delegation (also within the delegation of political power), etc. This all, has positive impact on the level of prosperity of the country in the long term horizon.

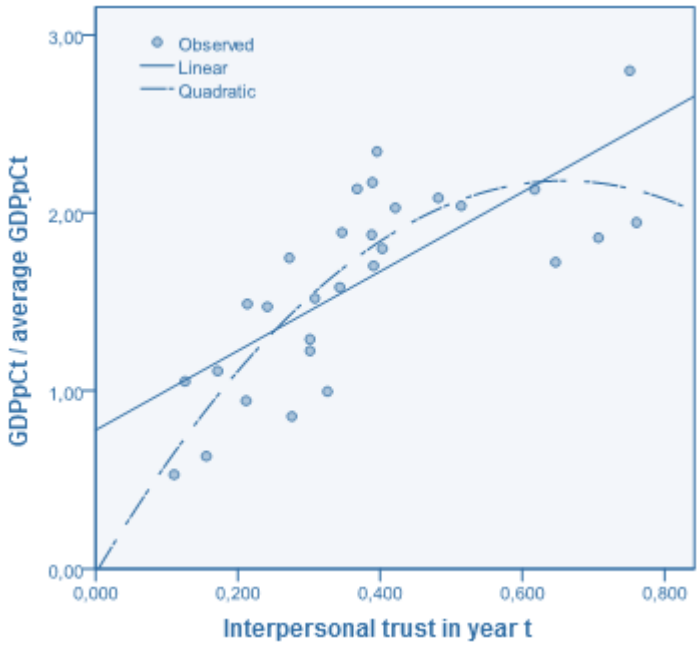


Source: Author

Figure 1 - Link between interpersonal trust and economic performance – A comparison

When analysing the formation of observations on a graph representing the relationship between interpersonal trust and prosperity a nonlinear dependence is visible. On OECD sample, it is clear, that up to the level of interpersonal trust around 0.4 increase in trust is accompanied by increased level of prosperity. However, behind this level we do not see this correlation anymore. Moreover, the level of trust around 0.6 leads to decreases of prosperity when comparing with the values obtained at the level of trust slightly below 0.4.

When comparing the particular countries, as can be seen, in the zone with values over 0,6 Scandinavian states are places, as expected. These countries lie in the zone in which, when compared to the liberal and federated countries, higher level of trust is linked with reduced GDP per capita. So, it seems, that through social systems achieved level of trust is reflected in less effective level of prosperity. The same conclusion proved Olson (1982), Putnam (1993 and 1995) and Roth (2009) when pointed out that the very high level of social protection of individuals and groups (mainly due to a greater influence of organizations protecting their rights) ultimately precludes the adoption of important reforms for further economic development. However, here comes the question, whether the relatively lower levels of prosperity at too high a level of trust is not caused by discouraging redistribution of income of individuals and companies.



Source: Author

Figure 2 - Linear and quadratic curve estimation of link between Interpersonal trust and Economic performance – OECD sample withou tax havens

Examplar results can be seen on the sample of EU28 countries and the not tax haven countries. In OECD countries´ sample (not including tax havens) we can see, that the quadratic curve gets higher determination coefficient (0,660) in comparison to linear relation (0.547) supporting this theory.

Table 2 - Curve estimations – relation between Interpersonal trust and Economic performance

Dependent Variable: GDPpCt / average GDPpCt								
Equation	Model Summary					Parameter Estimates		
	R Square	F	df1	df2	Sig.	Constant	b1	b2
Linear	547	32.610	1	27	000	779	2.229	
Quadratic	660	25.196	2	26	000	-027	6.704	-5.090
The independent variable is Interpersonal trust in year t.								

Source: Author

Based on less effective combination between trust and prosperity the model of the Nordic countries seems to be as inefficiently exploiting trust. However, as this point of view is static, it is questionable what a consequence will have the changes in the level of trust on a new equilibrium combination of trust and prosperity (in the US is recorded a steady decline in trust while on the contrary the Nordic countries have experienced increase).

Conclusion

The aim of this paper was to further explore the relationship between trust and economic performance within the long term horizon and thus enrich knowledge on new empirical evidence. To meet the objective, correlation analysis between trust (interpersonal and institutional) and economic performance was conducted. On all analyzed samples, we proved an existence of relationship between trust and economic prosperity. By other words, the countries with higher level of trust have higher rate of economic growth.

When analyzing the link between prosperity and institutional trust, trustworthiness of institutions overseeing the compliance with standards is proved to be significant, while other institutional trust showed ambiguous results. When analysing the formation of observations on a graph representing the relationship between interpersonal trust and prosperity a nonlinear dependence is visible. From all analysed countries, Scandinavian counties have significantly higher level of trust when comparing to the other economies. As showed, too high level of trust (as in case of Scandinavian countries) leads to a lower level of prosperity – this can be caused by too high force of social movement that can hinder the adoption of important reforms for further development (Olson 1982), but even by less work motivation due to the large redistribution of income in society. However, the question is if Scandinavia,

as well as liberal states can keep sustainability of their position. But this question can not be answered on the basis of currently available data, so it leaves open issue for further research.

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References

[1] Algan, Y. and Cahuc, P. 2013. *Trust and Growth,* in: *Annual Review of Economics*, 5: 521-549.

[2] Arrow, K. 1972, *Gifts and Exchanges*, in: *Philosophy and Public Affairs,* 1: 343-362.

[3] Bacik, R., Gavurova, B., and Fedorko, I., 2015. The Analysis of the Impact of Selected Marketing Communication Factors on the Online Consumer Behavior, *Journal of Applied Economic Sciences,* Volume X, 7(37): 999-1004.

[4] Barro, R. 1991. *Economic Growth in a Cross-Section of Countries*, *The Quarterly Journal of Economics,* 106: 407-443.

[5] Bhattacharya, R., Devinney, T. M., and Pillutla, M. M. 1998. *A formal model of trust based on outcomes*, in *Academy of Management Review*, 23: 459-472.

[6] Carnevale, D. G., and Weschler, B. 1992. *Trust in the public sector: Individual and organizational determinants*, in *Administration and Society*, Volume 23, 4: 471-494.

[7] Cook, J., and Wall, T. 1980. *New work attitude measures of trust, organizational commitment and personal need non-fulfillment*, in *Journal of Occupational Psychology*, 53: 39-52.

[8] Cook, T. E., and Gronke, P. 2001. *The Dimensions of Institutional Trust: How Distinct is Public Confidence in the Media?* [online]. Available at: http://www.reed.edu/~gronkep/papers.html. cited 05.04.2016

[9] Delhey, J., and Newton, K. 2003. *Who Trusts? The Origins of Social Trust in Seven Societies*, *European Studies*, 5: 93–137.

[10] Deutsch, M. 1973. *The resolution of conflict: Constructive and destructive processes,* Yale University Press.

[11] Dorčák, P., Pollák, F., and Szabo, S. 2014. *Analysis of the possibilities of improving an online reputation of public institutions,* in: *IDIMT-2014, Sept. 10–12. Poděbrady: IDIMT Networking Societies-Cooperation and Conflict 22nd Interdisciplinary Information and Management Talks,* pp: 275-281.

[12] Fukuyama, F. 1995. *Trust: The Social Virtues and the Creation of Prosperity*. Free Press.

[13] Gavurová, B., Štefko, R., and Bačík, R. 2014. The Analysis of Social Services' Structure in a Specific Region and its Significance for Health and Social Policy in Slovakia*, Polish Journal of Management Studies,* 10(2): 43-53. Available at URL: http://www.pjms.zim.pcz.pl/table-of-contents.php

[14] Gruning, J. E., Hon, L. C. 1999. *Guidelines for measuring relationships in public relations.* Retreived July 1, 2005. Available at: http://www.instituteforpr.com/pdf/1999_guide_measure_relationships.pdf. cited 05.12.2012

[15] Knack, S., Keefer, P. 1997. *Does Social Capital Havean Economic Payoff? A Cross-Country Investigation*, *Quarterly Journal of Economics*, 112 (4):1251-88.

[16] Koblen, I., Szabo, S., and Krnáčová, K. 2013. Selected Information on European Union Research and Development Programmes and Projects focused on Reducing Emissions from Air Transport*, Naše More - Our Sea,* International Journal of Maritime Science & Technology, University of Dubrovnik, Dubrovnik, Croatia.

[17] Luhman, N. 2000, *Vertrauen*, Stuttgart: Lucius and Lucius.

[18] Mlčoch, Ľ. 2006. *Ekonomie důvěry a společného dobra*. Praha: Karolinum. ISBN 80-246-1188-0: 195

[19] Newton, K. 1997. Social Capital and Democracy, *American Behavioral Scientist,* 40: 575-586.

[20] North, D. C. 1990. *Institutions, Institutional Change and Economic Performance,* Cambridge University Press. ISBN 0-521-39416-3 hardback; ISBN 0-521-39734-0 paperback.

[21] Ohlson, M. 1982. *The Rise and Decline of Nations: Economic Growth, Stagflation and Social Rigidities*, Yale University Press, 273 pages.

[22] Putnam, R. D. 1993. *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press.

[23] Putnam, R. D. 1995. *Bowling Alone: America's Declining Social Capital*, in: *Journal of Democracy*, 6: 65-78.

[24] Putnam, R. D. 2000. *Bowling Alone: The Collapse and Revival of American Community*, New York: Simon and Schuster Paperbaks. ISBN-13:978-0-684-83283-8.

[25] Roth, F. 2009. *Does Too Much Trust Hamper Economic Growth? KYKLOS*, 62(1): 103–128.

[26] Roth, F.M. 2007. *Social Capital, Trust, and Economic Growth — A Cross-Sectional and Panel Analysis*, Dissertation, Universität Göttingen: 153. Available at: https://books.google.ro/books?id=2lUOPwAACAAJ

[27] Šoltés, V., Balloni, A. J., Gavurová, B., and Šoltés, M. 2014. Economic Aspects of a Health System Electronization, *Laboratory Management Information Systems: Current Requirements and Future Perspectives.* USA: IGI Global, pp. 32-50. Available at http://dx.doi.org/10.4018/978-1-4666-6320-6.ch002

[28] Szabo, S., Dorčák, P., and Ferencz, V. 2013. The Significance of Global Market Data for Smart e-Procurement Processes, in: IDIMT-2013, Sept. 11–13. Prague: IDIMT - *Interdisciplinary Information and Management Talks*: 217-224., ISBN 978-3-99033-083-8.

[29] Uslaner, E. M. 2002. *The Moral Foundations of Trust*, Cambridge University Press. ISBN 0-521-81213-5 hardback; ISBN 0-521-01103-5 paperback

[30] Whiteley, Paul F. 2000. *Economic Growth and Social Capital,* in: *Political Studies*, 48: 443–466.

[31] Williams, B. 1988. *Formal Structures and Social Reality*, in: Gambetta, D. (Ed.). *Trust: Making and Breaking Cooperative Relations,* Oxford: Basil Blackwell Inc., New York: 3-13

[32] Zak, P. J., and Knack, S. 2001. Trust and Growth, *Economic Journal*, 111: 295-321.

*** World Values Survey Association 2009. *World Value Survey 1981-2008.*, Aggregate File Producer: ASEP/JDS Data Archive. Madrid, Spain. Retrieved from: www.worldvaluessurvey.org

Methodological Approaches to Identifying Parameters of Optimum Business Locations in the Regions of the Russian Federation

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Abstract:

The article is aimed at developing methodological foundations for quantitative evaluation of economic potentials in the Russian regions, undertaking approbatory calculations to determine its current level and the dynamic pattern as a basis for making decisions on optimum business locations in the RF regions. A methodological approach has been worked out and justified for evaluating the level of development and the attractiveness of the regions of Russia to enable business decision-making on entering new markets founded on the integrated indicator of economic health that integrates the local indicators of the regions taking into account their multiplicative nature.

A conclusion has been made that the Republic of Tatarstan, the Samara Region and the Nizhny Novgorod Region were leaders in 2012-2015 in terms of the economic health indicator. The Ulyanovsk Region and the Udmurt Republic have improved their standing in economic activities, while the Republic of Mordovia and the Penza Region have decreased their indices. The suggested methodology for evaluating the economic potential has been created based on the arrays of the official statistical data; it has been accommodated to all regions of Russia, and thus, it affords determining and evaluating promptly the economic health of any region in the Russian Federation.

Keywords: economic health, forecasting, integrated indicator.

JEL Classification: A12, B41, C15, C54.

1. Introduction

Structuring procedures have been used to determine the key indicators for the purposes of the integrated appraisal of the levels of social and economic development of the subjects of the Russian Federation. Local indicators, included in the sample under investigation, the degree of statistical homogeneity of the relevant metrics and the data integration for obtaining general quantitative estimation of economic health of the regions have been calculated and processed applying the economic-mathematical algorithm developed by the authors of this study based on economic and statistical methods. Diagnostic evaluations of the economic potentials of the territories, carried out based on the suggested methodology, make it possible for Russian companies to identify the correct vectors for their development in the regions of Russia, to develop the informed and well-justified strategic plans for entering the regional markets. To diagnose the current economic potential in the regions of Russia, regression and discriminatory models are applied together with the methods of scientific forecasting. However, the majority thereof takes considerable amount of time for making a well-justified conclusion on the attractiveness of a particular subject of the Russian Federation for locating the affiliated networks of companies and organizations, for arranging the networks of banking and insurance companies, for selecting a proper region to realize potential business interests. In this regard, developing economic-mathematical model for the express-analysis of regional economies and their economic potentials seems both opportune and currently important.

2. Main text

The objective of this study is to develop the model for evaluating economic conditions in Russian regions taking into account their specific features and enabling their prompt rating evaluations compared to other regions of the Russian Federation. Methodological basis of the research is represented by the conceptual assumptions on

the problem of evaluating economic potentials of the regions, by the works of the leading Russian and foreign scientists specialized in scientific forecasting.

Conceptual approaches to the problem of evaluating the state of the economy and to the problem of evaluating the economic potentials of the regions have been developed in a number of scientific works. A notable contribution to solving the problem under consideration has been made by both Russian and foreign scientists: Bates, Diamond, Fisher, Mitra *et al.* Over recent years, such Russian scientists as Chekulina (2011), Kiselev (2010), Mitsel (2016), Pavlova (2015), Rastvortseva (2011) *et al.* have published a number of articles dedicated to particular aspects of social and economic development of the regions, to organizational and economic tools for realizing their economic potentials, to comparative analysis of innovative activities in the subjects of the Russian Federation and to rating evaluations of the municipal establishments in the regions.

Analysis of economic literature showed that there is a great number of works dealing with the problem of evaluating the state of the economy and the economic potential in the Russian Federation as a whole and in its regions in particular. These works originated in the 20s of the last century. That period could be called "a golden decade" of Russian economic science. The economists then were busy solving the task of justifying the new economic policy, developing the models to upgrade the national economic mechanisms. It was during that period that the integrated indicators, among other economic indicators, were distinguished as metrics that provided reliable information about the existing qualitative trends of the economy.

The first practical experience in establishing the integrated indicator in Soviet statistics was represented by Unified Economic Indicator (UEI), developed in the 1920s. Its creation aroused considerable interest. Before that time, the discussion on this issue has had a long history and enjoyed vast literature; the unified indicators had been calculated and published in a number of foreign countries since the last quarter of the 19th century (Weinstein 1970).

Initially, in 1923, UEI used to be constructed of 26 primary economic indicators that were split in six groups. Due to the changes and the growing complexity of the national economy of that period, as well as due to the enhanced base of statistics, the informational basis of UEI has been modified, and, in 1925, it used to be calculated based on 35 primary indicators subdivided in 8 groups: "Prices", "Currency circulation", "Credit", "Trade", "Transport", "Heavy industry", "Light industry", "Labor".

The history and the cornerstone problems of developing integrated evaluations for the purposes of social and economic analysis have been considered in very much detail in the study published in 1970 belonging to Weinstein, one of the classics of Soviet economical science.

Estimating the validity of UEI structure, Weinstein noted that "...if the economic sense of the group indicators (group index-numbers) that characterize separate sectors of the economy has already been sufficiently defined, the cognitive significance of the unified indicator, covering heterogeneous elements, is not, on the face of it, quite clear. However, calculating this unified generalizing indicator seems to be logically viable and appropriate. In fact, it is not the heterogeneous elements proper, but only their relative alterations that are unified here, from which an average value is derived; and this average value, from the perspective of formal logic, does not differ from the average values derived from the relative alterations of other indicators" (Weinstein 1970).

The methodology for complex evaluation of the level of social and economic development of the territories of Russia, presented on the website of the Department of Regional Economy of the Ministry of Economic Development and Trade of the Russian Federation is of great interest because, in the first place, it has been regularly put in practice since 2001 as an officially recognized tool for monitoring social and economic conditions in the regions of Russia; the relevant proceedings of the monitoring are also located on this website. The integrated indicator of the level of social and economic development is calculated in the course of implementing the tree-stage procedure (On Federal special purpose program "Narrowing down differences in social and economic development of the regions of the Russian Federation").

The investigation shows that over the last decades, both domestic and foreign practices have been employing the models that use large number of variables for forecasting, that sometimes include over 50 different factors (Bates and Granger 1969). This approach was justified by Stock and Watson (Stock and Watson 2002), and initially, it was put into practice by different research centers. It should be noted that there were hardly any theoretical foundations at the time, notwithstanding the original interest revealed by the practical researchers and the attention of theoretical scientists, who, up to now, have been trying to create good theoretical basis for evaluating the models. It should be noted that these types of models with a large number of variables were initially used not in economics, but in biology (Ayvazyan and Mkhitaryan 1998), particularly, for the purposes of calculating the probability of a disease based on the set of the indicators characterizing an individual.

The analysis shows that the abovementioned study (Stock and Watson 2002) made great contribution to investigating the problems of forecasting. However, Stock and Watson also raised many other issues that have not been actually solved up to now. Principally, this is the case with the number of series used for creating the factors. How many series one should take to obtain the most precise forecast and how the changes in the number of series would affect the obtained evaluations of the factors? This question was addressed by Boivin and Ng (Boivin and Ng 2005). These authors made their best to understand whether the additional series of data should always be practical in factor models. In other words, is a situation possible when the inclusion of new series could deteriorate the quality of the forecast? It seems that, indeed, the large number of series could negatively affect the quality of the forecast. This is so, because the errors of the series do correlate with each other. If the true number of factors increases, the indicators start getting worse gradually. This is correct with any number of observations (Stock and Watson 2004).

This circumstance makes one think that, in the course of developing the model for determining the parameters of optimum business locations, one should rely upon limited number of factors. Complex evaluation of social and economic potential of the country and of its regions suggests that, first, there is a substantiated and scientifically proven system of indicators and, second, a statistical base is available. The indicator of social and economic potential should not only predetermine further development of the region, but it should also characterize the capability of the territory to generate, to implement and to propagate different types of innovations.

One of the efforts to develop the objectives of social and economic analysis, based on the official statistical data of Russian Federal State Statistics Service and the Bank of Russia, was to introduce, in academic circulation, such term as “economic health” that represents an integrated indicator founded on a number of indices calculated based on the statistical data (Zaernyuk 2010). Nevertheless, this indicator was meant to measure achievements across the whole of Russia from the perspectives of its economic growth and to evaluate stability and viability of the economy by eight basic metrics: “rate of economic growth, measured by the indicator of gross domestic product (GDP)”, “inflation”, “employment”, “value of money”, “stock market conditions”, “housing construction and sales”, “retail turnover” and “paid services”.

The key elements of this methodology prove the impossibility of its comprehensive application to the regions of Russia. While the official statistics of the Bank of Russia provides data on the bank credit interest rates for corporate clients and for retail segment, the statistics on the stock market conditions in the regions is completely missing. Apart from the above, it does not seem perfectly correct to use in the model the indicator of the gross domestic product, simultaneously taking into account the indicators that characterize the economy growth by the indices of housing construction, paid services and retail turnover.

The authors believe that the basis of the created express-model for evaluating the economic potential of the regions of Russia, aimed at helping companies and organizations enter the new regional markets and select optimum business locations, should be represented by the indicator that integrates a number of qualitative factors predetermining growth of the economy. Thereat, the authors proceed from the premises as follows.

Slower economic growth over several months or quarters could mean that the operating conditions for many businesses would become more complicated, as the consumers tend to spend less during the decline. As for the companies, under these conditions, they do not want to produce and to accumulate the products that would not be sold; they cut down outputs. When there is growth, the circumstances are different; people start spending a lot, as they are confident about their jobs and want to purchase more. Companies become more active.

The authors of this study are convinced that one of the most important indices taken for calculating the integrated indicator is represented by the inflation index. This index reflects the general increase in prices for goods and services, when the demand is higher than the supply. When low percentage of inflation is observed, this is a natural consequence of the economic growth. Under the conditions of inflation, the prices grow much faster than wages, and thus the consumers’ purchasing power decreases. High inflation rate is considered to be a bad phenomenon, as it does not only undermine the national currency, but also could lead to general disorder in the economy. Basic indicators of inflation are the consumer price index and the producer price index. Those indices are calculated based on comparing the available data on the previous year that show either faster or slower inflation rate.

The authors proceeded from the assumption that, in the course of calculating the suggested complex indicator for evaluating the economic health, the unemployment rate should also be accounted for. This should be done because low unemployment indicates that the supply on the labor market is lower than the demand. Based on the available estimations, the level of unemployment of four to seven percent is regarded as quite normal. The level of unemployment higher than ten percent is believed to be too high for the economy. When the unemployment

indicators are low, the businesses are affected considerably, as they have to increase wages. When the level of unemployment is high, the companies, as a rule, exercise tough employee policy in terms of wages, because people are aware that they would not be able to find new job any time soon.

3. Case studies

The indicators suggested by the authors of this study are the indicators of the conditions existing in the housing market, in retail sector and paid services, and the authors believe that these indicators directly affect the rate of economic growth; thus, including them into the unified integrated indicator is quite logical. Increased construction and sales make the economy healthier, while the decrease makes it weaker. Indeed, the houses are built by the companies and are purchased by people exactly when both of them expect the economy to keep being strong and sustainable, when there is confidence that the jobs are secure and the wages are sufficient.

Sustainable levels of retail sales and paid services, in the authors' opinion, reflect quite objectively the viability of the economy and testify of the high incomes of the population. Therefore, it is very important that the trends in these indicators should be observed. Under the conditions of growth in retail and paid services, many companies and firms start expanding the production, enhance shopping capacities, buying extra equipment and creating new jobs. Decrease in retail sales and paid services shows that the economy gets weaker.

The above mentioned methodological approach to evaluating "the condition of economic health" can be applied to the country as a whole, and can also be used comprehensively to evaluate the conditions of the economy in any particular region.

The indicator of economic health (IEH), suggested by the authors, is considered as an indicator that integrates the local indicators of the regions taking into account their multiplicative nature. This indicator is supposed to be determined using the geometric mean formula, applied in cases when there are "n" coefficients characterizing the growth; there at the individual values of the attribute are usually represented by the relative values of dynamics, placed as chain values and determined as a ratio to the preceding level of the created time series. The mean geometric value calculated in this way characterizes the mean factor of growth (Balinova 2005).

Another reason to justify the use of mean geometrical value was represented by empiric calculations, which proved that the mean geometric value showed the least spread in values as regards the average index calculated across the region as a whole, as compared to other power mean values: arithmetical mean, harmonic mean, root-mean-square and its structural mean values (mode and median). High spread in values of the indicators can negatively affect the practical calculations, narrow down the possibility to obtain correct and substantiated conclusions.

The theory of mathematical statistics says that the mean geometrical simple value is represented as follows:

$$\bar{x} = \sqrt[n]{x_1 \times x_2 \times x_3 \times \dots x_n}, \quad (1)$$

After transforming the abovementioned equation, it becomes possible to calculate the mean geometric simple value applying the formula as follows:

$$\bar{x} = \left(x_1 \times x_2 \times x_3 \times x_n\right)^{\frac{1}{n}}, \quad (2)$$

Taking into account the abovementioned methodological approach, it is suggested that the indicator of territorial economic health of the subject of the Russian Federation (subject region) should be calculated according to the equation as follows:

$$ITEH = \sqrt[6]{I_{ws} \times I_{ifa} \times I_{tg} \times I_{ps} \times I_u \times I_{isp}}, \quad (3)$$

or

$$ITEH = \left(I_{ws} \times I_{ifa} \times I_{tg} \times I_{ps} \times I_u \times I_{isp}\right)^{\frac{1}{6}}, \quad (4)$$

where: I_{vwc} — index of housing construction growth, I_{ifa} — index of investment in equity growth, I_{tg} — index of retail turnover growth, I_{ps} — index of consumer paid services growth, I_u — index of unemployment growth (decline), I_{isp} — index of inflation rate growth (decline).

The analytical activity suggests evaluating the dynamics of the integrated index of economic health of the region together with its components as follows: housing construction growth; retail turnover growth; consumer paid

services growth; unemployment growth (decline); inflation rate growth (decline). The approach to evaluating the integrated index founded on creating the non-simple and multiplicative models consists of several stages (see Table 1).

Table 1 – Chain of calculations for integrated indicator of economic health of region

No.	Indicator	Algorithm to calculate local indicators
1st Stage (collecting data for analytical calculations)		
1.	Works performed under economic activity type "Construction", mln. RUB	Statistical data for region (Russian statistical annual report 2015)
2.	Investments in equity by the subjects of the Russian Federation, mln. RUB	Statistical data for region
3.	Retail turnover by the subjects of the Russian Federation, mln. RUB	Statistical data for region
4.	Consumer paid services by the subjects of the Russian Federation, mln. RUB	Statistical data for region
5.	Level of unemployment, percent	Statistical data for region
6.	Consumer price index and producer price index by the subjects of the Russian Federation	Statistical data for region
7.	Population by the subjects of the Russian Federation (thousand persons)	Statistical data for region
2nd Stage (calculating local indicators)		
8.	Index of housing construction growth	I_{ws} = (line 1/ line 7) / *CIRF*
9.	Index of investment in equity growth	I_{ifa} = (line 2/ line 7) / *CIRF*
10.	Index of retail turnover growth	I_{tg} = (line 3/ line 7) / *CIRF*
11.	Index of consumer paid services growth	I_{ps} = (line 4/ line 7) / *CIRF*
12.	Index of unemployment growth (decline)	I_u = (CIRF / line 5)
13.	Index of inflation rate growth (decline)	I_{isp} = (CIRF / line 6)
3rd Stage (calculating the integrated indicator)		
14	Index of territorial economic health	*ITEH* = $(I_{ws} \times I_{ifa} \times I_{tg} \times I_{ps} \times I_u \times I_{isp})^{1/6}$

Note: CIRF – relevant indicator across the Russian Federation as a whole

An important constituent of the analysis is represented by the possibility to evaluate the conditions of the economy in the region, to compare its level of development with the current situation across the country. For this purposes, in the course of the analytical exercise, the authors recommend analyzing not only the dynamics of indicator ITEH in general, but also its components: index of housing construction growth (I_{vwc}); index of investment in equity growth (I_{ifa}); index of retail turnover growth (I_{tg}); index of consumer paid services growth (I_{ps}); index of unemployment growth (decline) (I_u); index of consumer price growth (decline) (I_{isp}).

Table 1 shows the results of calculating the local indicators and the resulting integrated indicator IEH based on those calculations over three years: 2012-2015 across all federal districts of the Russian Federation. Table 2 shows examples of the relevant indicators for 14 subjects of Privolzhsky Federal District of the Russian Federation.

Table 2 - Integrated indicator of economic health of subjects of Russian Federation in 2012-2015

Subject of the Russian Federation	Index of housing construction growth (I_{vwc})				Index of investment in equity growth (I_{ifa})				Index of retail turnover growth (I_{tg})				Index of retail turnover growth (I_{ps})				Index of retail turnover growth (I_{u})				Index of consumer price growth (decline) (I_{isp})				Index of economic health of region (*IEH*)			
	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015
Russian Federation including federal districts:	1.00	1.05	1.00	0,93	1.00	1.07	1.06	0,92	1.00	1.10	1.09	0,90	1.00	1.14	1.06	0,98	1.00	1.00	1.06	0,97	1.00	1.00	1.05	0,98	1.00	1.06	1.04	0,95
Central Federal District	0.92	0.92	0.98	0,99	0.87	0.92	0.95	0,97	1.26	1.26	1.28	0,89	1.24	1.25	1.26	0,98	1.77	1.67	1.68	1,60	0.96	0.97	0.95	0,94	1.13	1.14	1.16	1,04
Northwestern Federal District	1.43	1.33	1.41	0,91	1.23	1.10	1.06	0,91	0.96	0.94	0.96	0,90	1.17	1.10	1.10	0,98	1.38	1.28	1.27	1,19	1.08	0.98	0.91	0,98	1.20	1.11	1.11	0,97
Southern Federal District	1.13	1.25	0.99	0,84	1.03	1.15	0.98	0,82	0.92	0.93	0.95	0,92	0.89	0.94	0.98	1,04	0.89	0.85	0.84	0,85	1.00	0.98	0.96	1,02	0.97	1.01	0.95	0,91
North Caucasian Federal District	0.48	0.50	0.62	1,05	0.48	0.50	0.58	0,93	0.77	0.76	0.77	0,96	0.61	0.65	0.68	1,01	0.42	0.42	0.46	0,50	1.00	1.07	1.19	0,88	0.60	0.62	0.68	0,86
Privolzhsky Federal District	0.85	0.89	0.96	0,95	0.77	0.83	0.86	0,93	0.88	0.89	0.91	0,87	0.86	0.85	0.86	0,97	1.04	1.12	1.16	1,17	1.03	1.03	1.05	1,11	0.90	0.93	0.96	0,99
Ural Federal District	1.46	1.38	1.39	0,87	1.90	1.89	2.04	0,96	1.13	1.14	1.10	0,88	1.01	0.99	1.02	0,97	0.92	0.96	0.90	0,90	1.03	1.05	1.15	0,99	1.20	1.20	1.22	0,93
Siberian Federal District	0.78	0.76	0.76	0,85	0.86	0.80	0.81	0,83	0.81	0.80	0.78	0,88	0.74	0.74	0.74	0,97	0.77	0.76	0.74	0,73	0.99	1.07	1.06	1,11	0.82	0.81	0.81	0,89
Far Eastern Federal District	1.54	1.33	1.25	0,93	1.77	1.45	1.42	0,97	0.88	0.90	0.93	0,99	1.46	1.44	1.45	1,00	0.82	0.85	0.81	0,89	1.12	0.98	1.07	1,08	1.21	1.13	1.13	0,97

Note: Calculated by the authors based on Rosstat data: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1135087342078 Date accessed 30.04.2

Table 3 - Integrated indicator of economic health in regions of Northwestern Federal District of Russian Federation in 2012-2014

Federal Districts	Index of housing construction growth (I_{vwc})				Index of investment in equity growth (I_{ifa})				Index of retail turnover growth (I_{tg})				Index of retail turnover growth (I_{ps})				Index of retail turnover growth (I_{u})				Index of consumer price growth (decline) (I_{isp})				Index of economic health of region (*IEH*)			
	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015
Privolzhsky Federal District including	0.85	0.89	0.96	0,96	0.77	0.83	0.86	0,93	0.88	0.89	0.91	0,87	0.86	0.85	0.86	0,87	1.04	1.12	1.16	1,17	1.03	1.03	1.05	1,05	0.90	0.93	0.96	1,0
The Republic of Bashkortostan	0.84	0.82	0.85	1,00	0.66	0.70	0.76	1,00	1.05	1.08	1.06	0,88	1.05	1.00	1.05	0,95	0.90	0.95	0.98	0,92	1.06	1.08	1.02	1,02	0.91	0.93	0.95	0,98
Republic of Marij El	0.45	0.46	0.49	0,91	0.52	0.72	0.76	0,76	0.54	0.56	0.59	0,88	0.59	0.56	0.56	0,98	0.85	1.06	1.08	1,06	1.05	1.00	0.98	0,98	0.64	0.69	0.71	0,93
Republic of Mordovia	0.76	0.60	0.62	0,8	0.69	0.71	0.74	0,75	0.47	0.47	0.50	0,95	0.55	0.53	0.54	0,85	1.12	1.25	1.24	1,33	1.10	1.03	0.98	0,98	0.74	0.72	0.73	0,95
Republic of Tatarstan	1.89	1.85	1.92	1,00	1.40	1.46	1.52	1,00	1.14	1.13	1.12	0,87	1.19	1.15	1.17	1,01	1.34	1.38	1.33	1,4	1.03	1.03	1.18	1,18	1.31	1.31	1.35	1,07
Udmurt Republic	0.44	0.56	0.61	0,88	0.48	0.58	0.64	0,79	0.69	0.71	0.72	0,89	0.64	0.67	0.68	0,95	0.93	0.96	1.04	1,12	0.92	1.00	1.19	1,19	0.66	0.73	0.79	0,95
Chuvash Republic	0.56	0.67	0.71	0,89	0.60	0.52	0.49	0,93	0.59	0.59	0.59	0,91	0.66	0.64	0.63	0,98	0.93	0.96	1.04	1,12	1.14	1.03	1.05	1,05	0.72	0.71	0.72	0,99
Perm Territory	0.73	0.78	0.84	0,85	0.70	0.89	0.76	0,93	1.02	1.04	1.03	0,87	1.01	0.98	0.97	0,96	0.87	0.85	0.90	1,13	0.90	1.00	1.10	1,10	0.86	0.92	0.93	0,96
Kirov Region	0.42	0.47	0.52	0,80	0.44	0.48	0.47	0,82	0.67	0.69	0.70	0,92	0.69	0.71	0.72	0,94	0.77	0.98	1.02	1,06	0.96	0.94	1.00	1,00	0.63	0.68	0.71	0,93
Nizhny Novgorod Region	0.98	1.04	1.13	0,93	0.89	0.91	0.95	0,73	0.98	1.00	1.06	0,85	0.81	0.89	0.89	0,97	1.02	1.15	1.13	1,3	0.96	0.94	1.00	1,00	0.94	0.98	1.02	0,96
Orenburg Region	0.52	0.49	0.57	0,93	0.85	0.81	0.81	1,03	0.71	0.73	0.75	0,9	0.76	0.76	0.78	0,98	1.02	1.12	1.18	1,17	1.05	1.08	1.05	1,05	0.80	0.80	0.83	1,03
Penza Region	0.69	0.71	0.70	0,93	0.60	0.64	0.67	1,01	0.69	0.72	0.74	0,91	0.60	0.62	0.63	0,92	1.12	1.15	1.13	1,19	1.14	1.05	1.05	1,05	0.78	0.79	0.80	1,01
Samara Region	0.80	1.04	1.18	1,05	0.76	0.90	1.01	1,04	1.05	1.06	1.08	0,81	0.93	0.88	0.88	0,96	1.62	1.72	1.73	1,65	1.14	1.16	0.97	0,97	1.02	1.10	1.11	1,06
Saratov Region	0.54	0.57	0.58	1,01	0.54	0.54	0.57	0,90	0.65	0.65	0.67	0,91	0.65	0.63	0.62	0,89	1.02	1.06	1.13	1,19	1.10	1.05	1.05	1,05	0.72	0.72	0.74	0,99
Ulyanovsk Region	0.63	0.71	0.81	1,04	0.65	0.65	0.70	1,05	0.70	0.71	0.72	0,86	0.71	0.69	0.70	0,99	0.98	1.00	1.08	1,14	1.02	1.02	1.00	1	0.77	0.78	0.82	1,00

Note: Calculated by the authors based on Rosstat data: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1135087342078 Date accessed 30.04.2016.

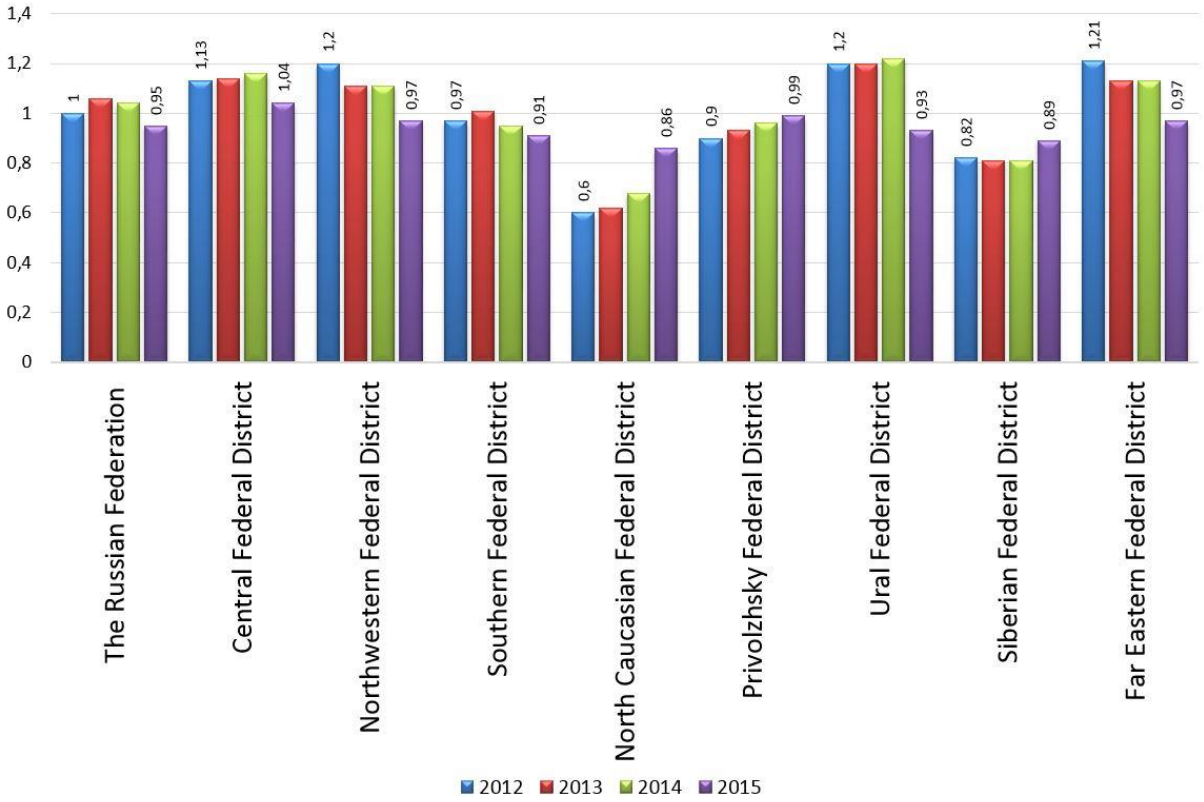

Figure 1 - Integrated indicator of economic health of the subjects of the Russian Federation in 2012-2015

The data given in Figure 1 make it possible to distinguish the leaders among the federal districts of the Russian Federation by the value of the integrated indicator of economic health. In 2015, higher indicators were observed in Central Federal District – 1.04 in Northwestern Federal District and Far Eastern Federal District – 0,97. The analysis of IEH dynamics affords identifying the federal district that increased (decreased) its level of development in terms of the evaluated parameters and the degree of the change. To estimate the effect produced on the integrated indicator IEH by each particular indicator included in the suggested model, the factor analysis, widely applied in analytics, can be recommended.

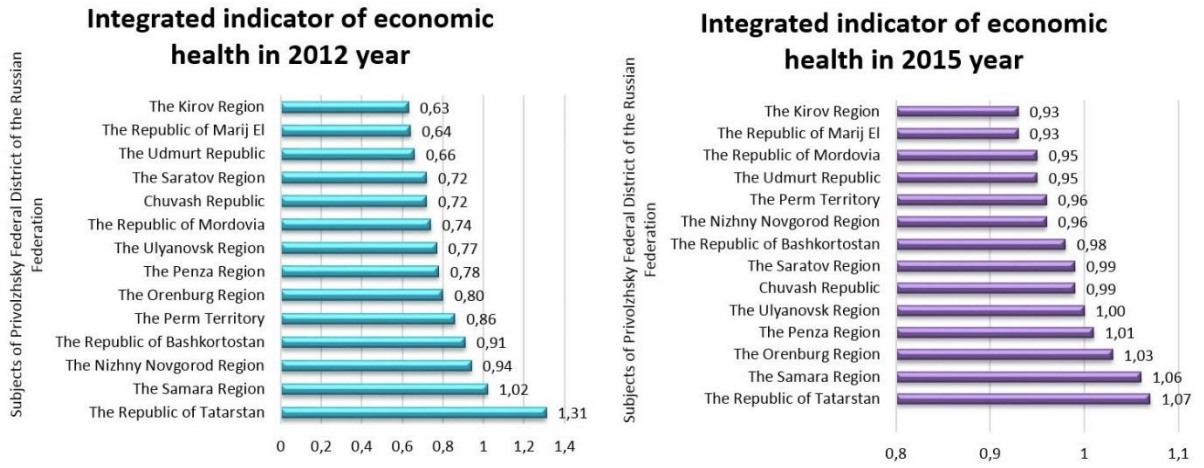

Figure 2 - Rating of subjects of Privolzhsky Federal District by indicator of economic health in 2012 and 2015.

Figure 2 shows that in 2012, similar to 2015, the leaders in terms of the indicator of economic health (IEH) in Privolzhsky Federal District were represented by the Republic of Tatarstan (IEH2012 = 1.31, IEH2015 = 1.07), the Samara Region (IEH2012 = 1.02, IEH2015 = 1.06), In 2015 the Orenburg and Penza regionshave improved their standing in economic activities, whilethe Nizhny Novgorod Region and the Republic of Bashkortostanhave decreased their indices.

The authors believe that the suggested integrated indicator IEH conforms to the fundamental principles applied to complex evaluation of the level of social and economic development of the regions: complex nature of evaluation, ensured by accounting for the most important components of the indicators of development of the regions of the Russian Federation; systemic nature of the evaluation, taking into account the interrelations existing between the basic indicators and the characteristics of regional development; validity of the initial data for selecting the basic indicators of regional development.

Conclusion

In a way, continuous monitoring of the economic indicators based on the current trends, including IEH, warrants businesses against being caught off balance. The results of the complex evaluation applying IEH could be very helpful in making and evaluating the efficiency of the decisions on business administration in different sectors of economy.

The suggested methods of evaluating the economic potential are acceptable for the conditions of Russia; they can be accommodated to all regions of the Russian Federation. The model has been developed based on the array of the official statistical data, which makes it possible to determine and to evaluate economic health of every territory of the Russian Federation in the most precise manner.

Based on the suggested methodology, evaluation of the economic potential of the regions of Russia can be performed by credit analysts of the banks to make the informed decisions on granting loans to the companies depending on the regions of their business locations. The conditions of development of the subjects of the Russian Federation could be evaluated by financial analysts, by the managers of the companies in the course of making well-judged managerial decisions.

Developed within the framework of this study, the model for the express-analysis of the economic potential of the regions of Russia will facilitate and expedite the decision-making process in the course of finding the optimum business locations, insofar as the obtained preliminary result is sufficiently precise and it does not take long.

Undoubtedly, the abovementioned methodological approaches do not claim to be a comprehensive algorithm for monitoring the attractiveness of the regions from the perspective of doing business; however, the authors of this study hope that these methods could make foundations for developing such an approach, and thus, they could be of some interest for both theoretical and practical experts in real business.

References

[1] Ananiev, A.N., and Zaernyuk, V.M. 2014. Procedural support of assessment of stability of non-bank crediting organizations in Russia. *Life Science Journal*, 11 (8s): 243-245.

[2] Ayvazyan, S.A., and Mkhitaryan B.C. 1998. *Applied Statistics and Econometrics fundamentals*. Moscow: Unity, pp. 515-590.

[3] Balinova, V. S. 2005. *Statistics in questions and answers*. TK Velbi, Prospect.

[4] Bates J.M., and Granger C.W.J. 1969. The Combination of Forecasts. *Operations Research Quarterly,* 20: 451-468. Available at: https://dx.doi/org/10.1057/jors.1969.103

[5] Bhushan, N., and Kanwal, R. 2004. *Strategic Decision Making: Applying the Analytic Hierarchy Process*. London: Springer-Verlag.

[6] Boivin, J., and Ng S. 2005. Understanding and Comparing Factor-based Forecasts. *NBER Working paper*, 11285. DOI: 10.3386/w11285. Available at: https://ideas.repec.org/a/ijc/ijcjou/y2005q4a4.html

[7] Chekulina, T.A. 2011. Organizational-economic toolkit implementing the region's innovation potential. *Socio-economic phenomena and processes,* 7: 177-181.

[8] Chernikova L.I., Faizova G.R., Kozhevnikova N.V., Aglieva V.F., and Safargaliev E.R. 2015. Role of State in Formation and Development of Tourist Cluster. *European Research Studies Journal*, 18(4): 207-218.

[9] Diamond, P.A., and Hausman, J.A. 1994. Contingent Valuation: Is Some Number better than No Number? *Journal of Economic Perspectives*, 8(4): 45-64.

[10] Egorova E.N., Kozhevnikova N.V., Faizova G.R., Kashipova G., Zinurova G. 2015). Factors of Functioning and Development of Tourist Clusters at Regional Level. *European Research Studies Journal*, 18: 87-98.

[11] Fisher R.A. 1970. *Statistical Methods for Research Workers*. 14th Ed. Edinburgh: Oliver and Boyd.

[12] Gorban, A.N., Sumner N.R., and Zinovyev A.Y. 2007. Topological grammars for data approximation. *Applied Mathematics Letters,* 20 (4): 382-386. Available at: http://dx.doi.org/10.1016/j.aml.2006.04.022

[13] Kenney, J.F. and Keeping, E.S. 1997. Linear Regression, Simple Correlation, and Contingency. *Princeton*, pp. 199-237.

[14] Kiselev, V.N. 2010. Comparative analysis of innovative activity of the Russian Federation. *Innovations*, 4: 44-55.

[15] Mitra, J., and Arzeni, S. 2008. From Unemployment to Entrepreneurship: Creating Conditions for Change for Young People in Central and Eastern European countries. Youth Entrepreneurship and Local Development in Central and Eastern Europe. Blokker P., Dallago B. (Eds.). Ashgate, Aldershot. Available at: http://repository.essex.ac.uk/id/eprint/4338

[16] Mitsel, A.A., and Herman, A.A. 2016. Mathematical model for evaluating credit rating of Russian regions. *The Economic Analysis: Theory and Practice*, 6 (405): 2-8.

[17] Pavlova, N.I. 2015. Methods of management of innovative activity in the region through an integrated performance indicator of growth of value added. *The Economic Analysis: Theory and Practice*, 33 (432): 56-70.

[18] Rastvortseva, S.N., Fauzer V.V., Karakchiev A.A., and Zalewski V.A. 2011. *Social and economic bases of innovative development of the region.* Moscow: Ekon-Inform.

[19] Saaty, R.W. 1987. The Analytic Hierarchy Process: What it is and How it is Used. *Mathematical Modelling*, 9(3-5): 161-176.

[20] Sachs, L. 1976. *Statistical estimation*. Moscow: Statistics.

[21] Stock, J.H., and Watson, M.W. 2002. Forecasting Using Principal Components from a Large Number of Predictors, *Journal of the American Statistical Association*, 97: 1167-1179.

[22] Stock, J.H., and Watson, M.W. 2004. *An Empirical Comparison of Methods for Forecasting Using Many Predictors*. Manuscript. Available at: http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.488.762

[23] Tabakh, A. 2009. Attractive subject. *Cbonds Review*, 6: 34-36.

[24] Tsallagova, L.M. 2013. The rating of the region's municipalities. *Management of Economic Systems: Electronic Scientific Journal*. Available at: http://uecs.ru/otraslevaya-ekonomika/item/2229-2013-07-03-08-16-09 (accessed May 8, 2016).

[25] Weinstein, A.L. 1970. Observation and representation of the dynamics of the national economy of the USSR. *Economics and Mathematical Methods*, 6 (2). Moscow: Publishing house "Nauka".

[26] Zaernyuk, V.M. 2010. Integral indicator for the socio-economic analysis. Features of growth and development of regional socio-economic systems: Sat. Articles VI All-Russian scientific-practical conference. Penza: RIO PGSKHA, 70-76.

*** *Default Study and Rating Transitions*. (2010). London: Standard & Poors. Available at: http://www.standardandpoors.com/ratings/articles/er/us/?assetID=1245207201119 (accessed May 8, 2016).

*** On Federal special purpose program "Narrowing down differences in social and economic development of the regions of the Russian Federation". RF Government Decree dated 10.11. 2001 No. 717/SZ RF. 10.22.2001. No. 43. It. 4100

*** Russian statistical annual report. Rosstat 2015. Available at http://www.gks.ru/wps/wcm/connect/rosstatmain/rosstat/ru/statistics/publications/catalog/doc_1135087342078 (accessed April 30, 2016).

Is It Possible to Develop Islamic Finance in Western European Countries?

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Abstract:

The article provides an overview of Islamic banking and finance in major Western European countries by evaluating the level of Islamic finance penetration and market maturity by product offerings, examines the recent growth of this industry. It also highlights the challenges faced by the Islamic finance in general and on specific Western markets in particular, such as the heterogeneous character of clients and potential clients, competition from conventional banks, a proper training and qualification in Islamic finance, an adequate promotion of financial instruments that are compatible with Shari'ah law, how to gain a strong and a respectable position in Western financial markets. On the other hand, Western European countries are looking for new sources of liquidity and financing by attracting liquidity from emerging markets, increasing the interest in finding alternative financial solutions, so, Islamic finance can be such an alternative, being inherently less prone to crisis because of its risk-sharing feature. The paper conclude that these past years have seen an increase in the participation of Western countries in Islamic financial services and this trend is set to continue in the future.

Keywords: islamic finance, islamic banking, sukuk market, islamic insurance, shari'ah-compliance, conventional bank.

JEL Classification: G15, G21, G22, G23.

1. Introduction

The main part of the paper is structured in four different parts which cover some areas of research as follows: the evolution of the Muslim population(using the latest statistical data), under the influence of the recent massive migration in Western European countries, as the main customer base for Shari'ah-compliant products and services; a brief overview of Islamic finance for a better understanding of the Shari'ah principles (Islamic law) that underline this industry, the market growth potential as a part of the global financial system; the presence of the Islamic finance in Western European countries – this part analyzes the main factors that cause, at different growing rates, the development of the Islamic Shari'ah-compliant financial services in different Western economies and whether there are opportunities to penetrate the conventional financial markets; in the fourth part of the article „The UK: The Leader Western Centre for Islamic Finance", the analysis highlights the leading role of the UK, among the Western countries, as the Europe's premier centre for Islamic finance, providing Islamic financial services for over 30 years, offering due to the government strong support, a huge potential of new opportunities for Islamic finance growing and development.

The analysis of all these aspects, based on very comprehensive statistics and on own graphic representations, leads to the main research objective of this paper which is to demonstrate that the development of Islamic finance is possible in a non-Muslim society.

2. The Muslim population in Western European countries

The spectacular growth prospects for the Islamic financial services industry not only in nations with majority Muslim populations, but also in other countries where Muslims are a minority, such as the United Kingdom and other European countries, is being fuelled by Muslim mass immigration.

Europe's Muslim population is projected to exceed 58.2 million in 2030, make up 8% of Europe's total population (Eurostat).

The rate of Muslim population migration has sharply accelerated lately, as part of the phenomenon of globalization, due to trade liberalization, to economic integration, to the opening of the labour market, the high birth rates among immigrant families, the colonial ties with Muslim world (Britain, France, and especially the Netherlands experienced large Muslim immigrations after the collapse of their empires).

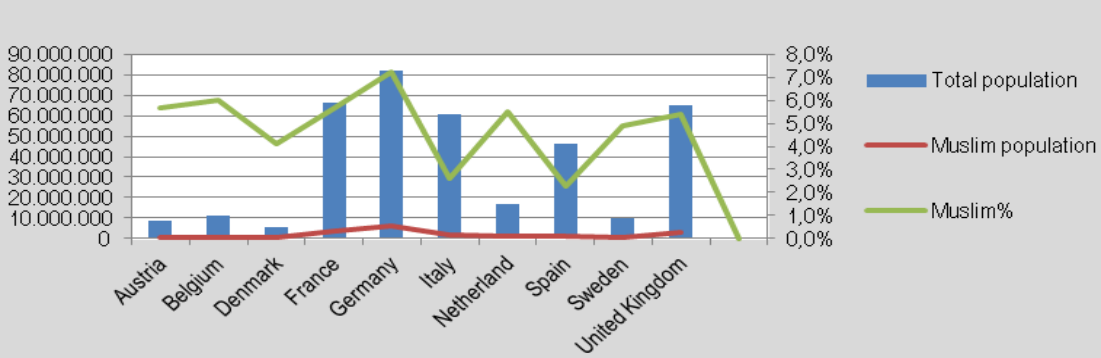
In the same time, the internal conflicts in countries of origin (the conflict in Syria continues to be by far the biggest driver of migration) and ongoing violence in countries such as Afghanistan and Iraq, the poverty and the hope of a better living standards, as well as the abuses in Eritrea, have expanded the number of displaced populations and refugees.

More than a million migrants and refugees crossed into Europe in 2015. According to the United Nations High Commissioner for Refugees, new arrivals, between January 2015 and March 2016, from Asia came largely especially from Syria (46,7%), Afghanistan (20,9%) and Iraq (9,4%).

According to Eurostat, EU member states received over 1.2 million asylum applications in 2015, a number more than double that of the previous year. Germany received the highest number of new asylum with more than 476.000 - 298.000 from Syria, 80.000 from Afghanistan, 60.000 from Iraq, 20.000 from Pakistan (Federal Statistical Office of Germany), but far more people, German officials said more than two million, have arrived in the country. Also, Hungary (177.130 applications by the end of December 2015), Sweden and Austria are top recipients of asylum applications per capita.

The most populated EU Member States continue to be Germany (82.2 million), France (66.7 million), the United Kingdom (65.3 million), Italy (60.7 million). Together, they account more than half of EU population. The Muslim population in these countries is around 14.2 million, representing 5,17% of total population.

The total European Muslim population, updating was done in February 2016, in the Western European countries specified in the figure below (Figure 1 –– Muslim population as a share of overall population in European main countries – 2016), is 17.9 million representing 4,8% of total population of these countries. The highest proportions of Muslims being in Germany (7,24% of total population, an increase of 672.000 or 46% above from the previous year), Belgium (6%), France (5,7%), Austria (5,7%), Netherlands (5,5%), the United Kingdom (5,4%), Sweden (4,9%), Denmark (4,1%), Italy (2,6%), Spain (2,3%), these countries continuing to remain the countries with the largest projected increase in number of Muslims.



Source: Author – representation based on data from Muslim Population World and Pew Research Centre database. Available at: http:// www.islamicpopulation.com/Europe/europe_islam.html

Figure 1 – Muslim population as a share of overall population in European main countries 2016

Thus, in the United Kingdom Muslims are expected to comprise 8,2% of the population in 2030; in Austria, Muslims are projected to reach 9,3% of the population in 2030, in Sweden 9,9%, in Belgium 10,2%, in France 10,3%, in Denmark 5,6%, in Italy 5,4%, in the Netherlands 7,8%; in Spain 3,7%. Western Europe, which includes France, Germany and the Netherlands, is expected to have the biggest numerical increase in the size of its Muslim population. The number of Muslims living in this part of Europe is projected to increase by 5.1 million, from 11.3 million in 2010 to 16.4 million in 2030. The Muslim share of Western Europe's total population is expected to increase from 6,0% in 2010 to 8,6% in 2030. (Pew Research Center)

3. Brief overview of Islamic finance

Taking into account the Muslim population statistics in Western European countries, presented above, we can say that European Union is emerging as a major center of Islamic finance which refers to the provision of financial services in accordance with Shari'ah (Islamic law). The principles, rules and fundamentals of Islamic economics and finance are derived from two primary sources, the Quran and the Sunnah.

Structured around a strict code of ethics that prohibits riba (the literal meaning of interest, also known as usury. According to Shari'ah terminology means an excess or unfair gain), gharar (risk or excessive uncertainty) and maysir (speculation and gambling), the mechanisms and concepts of the banking system were implied since the birth of Islam, even the term of "Islamic banking"(Arabic banking), is recent, becoming common in the 1960's, whereas the Islamic financial services industry began its rapid growth and expansion during 1980s and spread in the Western nations too, starting with the prominent Islamic banking and financial institutions such as Islamic Banking International Holding (Luxembourg) established in 1978, Dar-al-mal-al-Islami (Geneva) established in 1981, 'Al-Baraka' group established in 1982, Islamic International Bank of Denmark established in 1982 and Islamic Finance House (London) established in 1983.

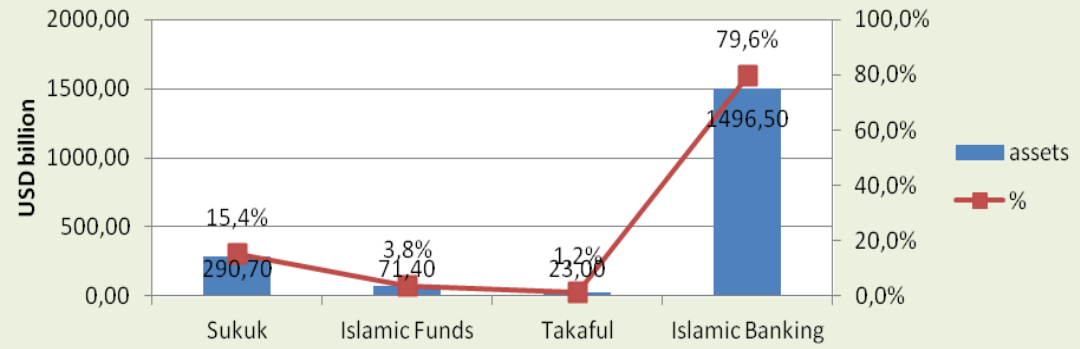
Apart from the above mentioned banks and institutions, a few other renowned international conventional banks that are offering Islamic banking services - Islamic windows - include Chase Manhattan, Citibank (Bahrain),

the Hong Kong and Shanghai Banking Corporation (HSBC), Union Bank of Switzerland (UBS), American Express Bank Ltd., American Bank, BNP-Paribas, Kleinwort Benson, Morgan Stanly, Goldman and Standard Chartered (Marifa's Practical Guide).

Today, Shari'ah-compliant financial assets are estimated at roughly US$2 trillion, covering bank and non-bank Islamic financial institutions, investment banks, capital markets, money markets and insurance ("Takaful" - as Mutual insurance, Takaful is a risk sharing entity that allows for the transparent sharing of risk by pooling individual contributors for the benefit of all subscribers), growing at 10-12% annually over the past decade (World Bank), even though it is still a small share of the global financial market, being still concentrated in the Gulf Cooperation Council (GCC) countries, Iran and Malaysia, and represent less than one percent of global financial assets (International Monetary Fund). The estimates of the current size of industry range from $1.88 trillion to $2.1 trillion, the expectations of market size being $3.4 trillion by end of 2018 and Sharia banking reaching $2.6 trillion by 2020 (the branch of Islamic finance that has seen the most growth). (Thomson Reuters).

Despite a fall (8,48%) in 2015 in total assets, (due to the evolution of the Iranian rial in particular), Islamic finance industry continue to have a high development potential.

As we can see in the figure below (Figure 2 – Islamic Finance Segments: Sizes of Sub-Sectors by Assets (USD billion, 2015), in 2015 the Islamic finance segments were sized by assets as follows:



Source: Author – representation based on data from Islamic Finance Market Size: IFSB Secretariat Working. Available at http://www.islamicfinance.com

Figure 2 – Islamic Finance Segments: Sizes of Sub-Sectors by Assets (USD billion, 2015)

Islamic finance currently encompasses mainly banking, Sukuk (Islamic bonds or Sharia bonds – an alternative to conventional bonds), insurance ("Takaful" – similar to mutual insurance) and investment funds, but the banking and Sukuk assets represent about 95% (79,6% and 15,4%) of the $1.8 trillion worth of Islamic finance assets.

After bank services, the most important second part of the Islamic finance is the Sukuk market, the equivalent of the conventional bond market, the most rapidly growing Islamic finance sector. At present, there are four major Sukuk listing domiciles, there are the London Stock Exchange, the Bursa Malaysia, NASDAQ Dubai and the Luxembourg Stock Exchange, even if the issuance is still concentrated in Malaysia – the largest Sukuk issuer in the world, with 67% of global issuances, and the majority of countries that form the Gulf Co-operation Council (GCC– Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates).

Even though the industry remains small compared to other sectors of Islamic finance, Islamic funds growth is estimated to $71.4 billion in 2016 from $52.3 billion in 2010. Saudi Arabia and Malaysia continue to remain the main players for the Islamic funds, contributing 41% and 24% of the global Islamic assets in 3Q 2015 (Thomson Reuters). In term of number of Islamic funds, Saudi Arabia has 18% and Malaysia 17,9% of the total market share (Standard & Poor's Rating Services 2015).

There are more than 50 Takaful (Islamic insurance) companies operaing in different countries. Takaful assets were $23 billion in 2015, represent 1,2% of total Islamic finance assets, meaning that Takaful market remains at a low level of development, Brunei (Takaful IBB Berhad), Iran (Iran Insurance Company) and Malaysia (Syarikat Takaful Malaysia Bd) being the largest markets.

According to Ernst & Young (E&Y) latest World Islamic Banking Competitiveness Report, although Islamic Banking still makes up only a fraction of the banking assets of Muslims, it has been growing faster than banking assets as a whole, growing at an annual rate of 17,6% between 2009 and 2013, and is projected to grow by an average of 19,7% a year to 2018 (The Economist 2014).

In 2015 from the total of 360 institutions that have reported assets, from 41 countries, 111 were conventional institutions with Sharia windows. An Islamic window is simply a window within a conventional bank via which customers can conduct business utilizing only Shari'ah compatible instruments or a department, division of a conventional bank offering Islamic financial services (Solé 2007). Therefore, while an Islamic Bank is a bank totally based on and run with Islamic principles, an Islamic window refers to services provided by conventional banks but based on Islamic principles.

In countries with majority Muslim population are found both conventional banks, that use interest, and Islamic banks. Until now there is no country in the world with a full Islamic banking system. Islamic banking differs from conventional banking system by the fact that debtors are forced to invest in companies with coverage in reality, making it prohibited financial speculation. Any funds paid should be linked to real goods. In this way banks are prevented from so-called "speculative bubble".

For a better understanding, the main differences between the Islamic and Conventional banking system are summarized in the Table 1 below.

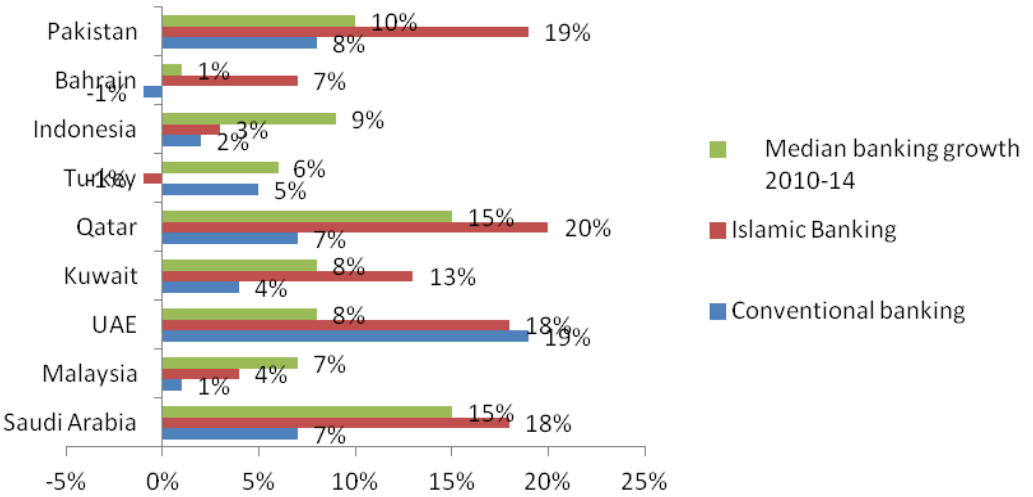
Table 1 – Difference between Islamic and Conventional banking

Islamic Banking	Conventional Banking
Money is not a commodity it is used as a medium of exchange and store of value. Therefore, it cannot be sold at a price higher its face value or rented out.	Money is a commodity besides medium of exchange and store value. Therefore, it can be sold at a price higher than its face value and it can also be rented out.
Profit on trade of goods or charging on providing service is the basis for earning profit.	Time value is the basis for charging interest on capital.
Islamic bank operates on the basis of profit and loss sharing. In case, the businessman has suffered losses, the bank will share these losses based on the mode of finance used (Mudaraba, Musharaka)*	Interest is charged even in case the organization suffers losses by using banks funds. Therefore, it is not based on profit and loss sharing.
The execution of agreements for the exchange of goods & services is a must, while disbursing funds under Murabaha, Salam & Istisna' contracts*	While disbursing cash finance, running finance or working capital finance, no agreement for exchange of goods & services is made.
Islamic banking tends to create link with the real sectors of the economic system by using trade related activities. Since, the money is linked with the real assets therefore it contributes directly in the economic development.	Conventional banks use money as a commodity which leads to inflation.

Source: Guide to Islamic Banking, available at: www.mib.com

Note: *Mudaraba – a partnership contract where one party provides the funds and the other one manages the project (Mudarib - skilled entrepreneur or managing partner), and who agree to the division of any profits made in advance; Musharaka – a flexible partnership contract between two or more parties who all contributed capital towards the funding of a project or asset. All parties sharing the risk and reward on the basis of the contributed capital; Murabaha – also known as Murabha, is a contract for purchase and resale and allows the customer to make purchases without having to take out a loan and pay interest; Salam – a sale contract in which the price is paid in advance at the time of contracting, against delivery of the purchased good/services at a specified future date; Istisna' – a contract that refers to an agreement to sell to a customer a nonexistent asset, which is to be manufactured or built according to the buyer's specifications and is to be delivered on a specified date at a predetermined selling price(Standard & Poor's Rating Services 2012).

In many majority, Muslim countries, Islamic banking assets have been growing faster than conventional banking assets, due to higher capitalization of the Islamic banks and their better asset quality. In the graphical representation below (Figure 3 – The comparative evolution of the Islamic banking assets and the Conventional banking assets and median banking growth between 2010 and 2014 in major Muslim countries), we can see its higher growth rate as compared to conventional banking despite the challenges in Turkey, where Islamic and conventional banks financially performed in a different way.



Source: Author – representation based on data from The World Bank database, available at http://www.worldbank.org

Figure 3 – The comparative evolution of the Islamic banking assets and the Conventional banking assets and median banking growth between 2010 and 2014 in major Muslim countries

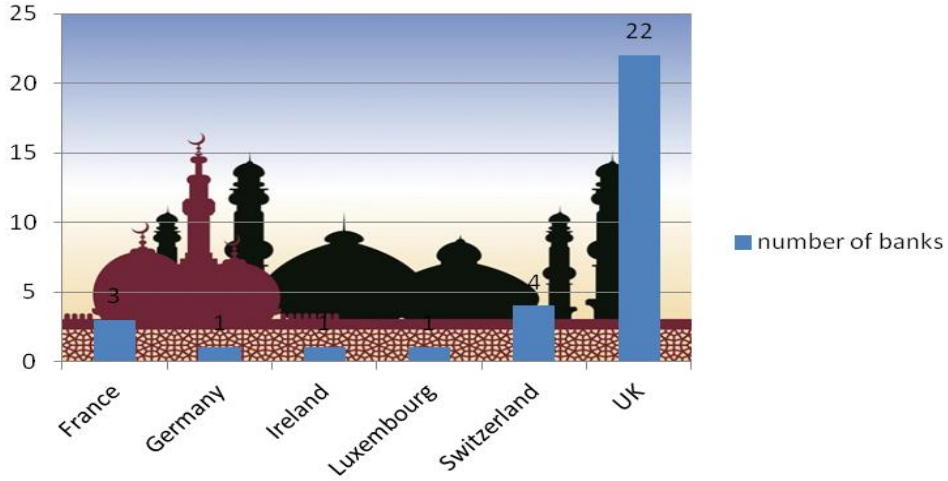
However, despite this growth, Islamic finance assets are still concentrated in the Gulf Cooperation Council (GCC) countries, Malaysia and Iran. Based on $1.88 trillion, Islamic finance assets represented in 2015, less than 1 percent (0,66%) of the global financial market of $294 trillion in assets (The World Bank).

4. Islamic finance in Western European countries

The growth and the development of the Islamic finance industry in Western countries has mainly been driven by a number of factors such as:

- The Muslim population growing, population which will not abandon its basic values of traditional culture (common language, religious traditions);
- On this basis, an increase in demand for Shari' ah-compliant products;
- Higher tendency of European Muslims for saving than those of other populations;
- There is also a clear increase in the number of conventional and non-Muslim clients utilizing Islamic finance;
- Governments and regulatory authorities are looking to make the appropriate regulatory and legal reforms that would strongly support the Islamic finance industry model;
- A large number of academic institutions offering a range of specialist courses and qualifications in Islamic finance;
- Financial Market Infrastructure and the quality of financial market regulation;
- The existence of a large number of Islamic banks in Western countries and conventional financial institution which started to incorporate the Shari'ah-compliant products into their financing practices or opening up "Islamic windows";
- Increasing business relationships between Europe and Islamic countries, the business environment including economic policy;
- Western countries are looking for new sources of liquidity and financing by attracting liquidity from emerging markets;
- The increased interest in finding alternative financial solutions following the financial crisis. Islamic finance can be such an alternative, being inherently less prone to crisis because of its risk-sharing feature;
- Shari'ah-compliant institutions are trying to engage their customer base in new ways and new markets.

Islamic banking has become the fastest growing segment of the international financial system. This tendency is manifested also in the Western financial system. There are Islamic banks (Figure 4 – Islamic banks in Western countries. Number located in each country) and Islamic Investment Companies in the West as well, as in the United Kingdom, Germany, France, Denmark, Switzerland, Luxembourg. Also, large and famous banks such as HSBC, Citibank have opened Islamic banking windows, contributing to the rapid development of the Islamic finance industry. Many other Islamic non-bank financial institutions, such as insurance companies, were also established under the name of Takaful companies.



Source: Author – representation based on data from The CityUK; Islamic Finance 2015, p. 10. Available at http://www.thecityuk.com

Figure 4 – Islamic banks in Western countries. Number located in each country

Islamic banking is facing some great challenges in Western countries because the financial system is more favourable to conventional banking. The historical and political links of France with the Middle East coupled with a local over 5 million Muslims, should give France the opportunity to hold a unique position in the Islamic finance industry. However, has not made much progress in developing Islamic finance in the domestic market, due to, among other factors, the absence of political support. The main fully Shari'ah-compliant bank is Chaabi Bank, a subsidiary of French Moroccan bank, offering Shari'ah-compliant financing operations, through its 17 branches across France (Grassa and Hassan 2015).

The first French Sukuk was launched in 2011, in the French fast food sector, with a value of €5 million ($6 million). By 2012, there was seven Shari' ah-compliant funds with total assets under management (AuM) $69.2 million (Grewal 2013), and by December 2014, French Islamic fund assets represented 0,24% of total European Islamic fund assets.

However, the universal banks that dominate the French banking system, more stable and much diversified, provides a favorable development for Shari'ah-compliant banking products. At the same time, France creates appropriate regulatory and legal reforms that facilitate provision of Islamic financial products. In a strong economy like the one of Germany, the decrease of the financial sources due to global crisis, requires finding new sources of funding and this industry represents a major source of liquidity and finance, determining the future role of Islamic finance in the country's economy.

In 2010, Kuveyt Turk, one of the largest banks in Turkey - part of Kuwait Finance House, opened an office in Mannheim, Baden-Wuerttemberg, focused not only the Muslims living in Germany but the entire German market. In 2015, the bank obtained from the Federal Financial Supervisory Authority full banking license, with permission to offer banking services in Germany, according to Shari'ah principles. KT Bank AG is the wholly-owned subsidiary by Kuveyt Turk with its headquarters in Frankfurt and branches in several other German cities such as Berlin and Cologne.

Also KTB's license allows it to collect deposits and investment funds in Germany that will be transferred to profit and loss share (PLS – is the method utilized in Islamic banking to comply with the prohibition of interest) accounts in depositors and investors' names in Turkey.

It was in Germany that the first Sukuk issuance took place in Europe. In 2004, a €100 million quasi government Sukuk, structured as Sukuk-Ijarah, was issued in the federal state of Saxony-Anhalt in Germany (Jaffer 2016).

FWU AG Group (Forschungsgesellschaft für Wettbewerb und Unternehmensorganisation mbH), is an entrepreneurial financial services group headquatered in Munich, being a pioneer in developing the Takaful industry in Europe and also in the Middle East. In 2012, FWU AG Group issued the first seven-year Sukuk issuance by a German corporate, totaling $55 million, being the largest issuance of European Corporate, using the most commonly Sukuk structure, that of Sukuk al-Ijara (an Islamic sale and lease-back contract).

In 2013, the company had issued a $20 million five-year Islamic bond backed by insurance policies, using a wakala structure (Wakala Sukuk or Sukuk al-Wakala, there are certificates representing ventures or business activities managed on the basis of an agency contract). FWU's Wakala Sukuk carries a profit rate of 7% and are

used to fund a set of re-Takaful transactions for its Luxembourg-based unit. Wakala Sukuk are certificates representing ventures or business activities managed on the basis of an agency contract.

Luxembourg is recognised as one of the leading European centres for Islamic finance and also as a leading non-Muslim hub for Shari'ah-compliant investment funds, being the 2nd largest investment fund center in the world. In 1978, Luxembourg hosted the first Islamic finance institution to establish in a Western country. In 1983, the first Shari' ah-compliant insurance company (Takaful) in Europe was established in Luxembourg and in 2002, 16 Sukuk have been listed, Luxembourg becoming, in this way, the first European stock exchange to list a Sukuk. In 2010, around 45 regulated Shari'ah-compliant investment funds and sub-funds have been established in Luxembourg. In September 2014, Luxembourg was the first sovereign issuer of Sukuk in the eurozone, totaling £200 million ($233 million) with an annual fixed income of 0,436% for investors and with a promise of buy-back after five years.

According to the Thomson Reuters last report (Thomson Reuters 2015), Luxembourg holds 12,21% (there were 111 Islamic funds with total assets worth $3.4 billion) of total funds under management (number of total funds-909), the third position in the Top 10 Islamic Fund Domiciles by number of Funds, after Malaysia and Saudi Arabia, which hold 69% of total Islamic funds under management.

The customer base in Western countries is not necessarily restricted to Muslim population. Other customers may be attracted by the Islamic financial products. All these non-Muslim countries are looking to make the appropriate regulatory and legal reforms, following the example of Great Britain, that would facilitate provision of these kind of financial products, and also Shari'ah-compliant institutions are trying to engage their customer base in new ways and new markets. In these conditions, Shari'ah-compliant financial services continue to develop in Western European countries at different growing rates.

5. The United Kingdom - The Leader Western centre for Islamic Finance

The UK's extensive financial services capability, a government strong support for Islamic finance and also a widescale programme of professional education and training in Islamic Finance (with four professional institutes and nearly 70 universities and business schools that offer qualifications in Islamic Finance, the UK is a global leading provider of sector specific education and research), make London – the biggest financial market in the world – the capital of Shari'ah-compliant finance in the West and a major hub for Islamic finance on a global scale.

According to the latest IFCI (Islamic Finance Country Index) scores and ranking, the UK have huge potential to become global player in the industry even it is a country with no more 3.5 million Muslims - only 5,4% of the total population of 65.3 million in 2016, which according to estimates will reach 6.3 million in 2040 and 7.7 million in 2050, representing 9,4% and 11,3% of the total population (Eurostat), and even also if the country score and rank is lower with one position in 2016 than 2015 (rank 15 from 48 countries, of which 44 countries with predominantly Muslim population. For the first time Malaysia, has surpassed Iran that ranked number 1 for six years, from 2011 to 2015, and has emerged as the global leader in IBF – Islamic Banking and Finance).

Table 2 represents the Adjusted IFCI Scores for 2016, for the United Kingdom, Switzerland, France and Germany, based on data presented in the World Islamic Banking Competitiveness Report 2016 (Ernst & Young 2016).

Table 2 – Adjusted IFCI Scores for 2016

Countries	IFCI Score 2016	IFCI Score 2015	IFCI Rank 2016	IFCI Rank 2015	Changes
United Kingdom	5.96	6.13	15	14	-1
Switzerland	1.97	2.10	26	24	-2
France	0.80	0.81	38	38	0
Germany	0.62	0.59	40	40	0

Source: World Islamic Banking Competitiveness Report 2016, 52

In Europe, the UK is the first country that started Islamic Banking changing their regulatory system in according with Shari'ah Law. Starting with the introduction of Murabaha transactions, the Islamic Finance first came to UK in the 1980s. Al Baraka International, launched in1982, was the first UK Islamic bank.

According to Islamic Finance Report presented at the 12th World Islamic Economic Forum (WIEF), there are currently 22 Islamic banks in the UK, six of them are fully Sharia-compliant banks licensed to operate in the UK (with assets totalling $3.811 billion at the end of November 2015), providing products which prohibit interest payment and investment in alcohol or gambling firms, in accordance with Islamic Shari'ah law, more than in any other country in Europe, while the others are conventional banks Islamic windows, offering Islamic finance services. There are presented in table below (Table 3 – Islamic Banks in The UK - 2016).

Table 3 – Islamic Banks in the UK - 2016

No	Fully Sharia-compliant banks
1	Abu Dhabi Islamic Bank (ADIB)
2	Al Rayan Bank
3	Bank of London and The Middle East
4	Gatehouse Bank plc
5	European Islamic Investment Bank
6	Qatar Islamic Bank UK (QIB UK)
Conventional banks Islamic windows	
7	ABC International Bank
8	Ahli United Bank
9	Alburaq
10	Barclays
11	BNP Paribas
12	Bristol & West
13	Citi Group
14	Deutsche Bank
15	Europe Arab Bank
16	IBJ International London
17	J Aron & Co
18	Lloyds Banking Group
19	Royal Bank of Scotland
20	Standard Chartered
21	UBS
22	United National Bank

Source: TheCityUK, The UK: Leading Western Centre for Islamic Finance November 2015. Available at: http://www.thecityuk.com

Abu Dhabi Islamic Bank (ADIB) is one of the largest retail banks in the UAE and its international presence includes Egypt, Sudan, Iraq, Qatar, Saudi Arabia, and the UK, initiating operations in London since 2012, being established to bring the bank's services to clients in the UK. ADIB was the first UAE-based Islamic financial institution to receive a banking operations license from the UK Financial Services Authority and to offer a full range of services to individuals. ADIB UK provides a variety of products and services including accounts such as ADIB diamond current and savings accounts, offers solutions tailored to provide Savings and Time Deposits choices, express transaction processing, real-estate financing arranged in the UAE for property purchases in London up to £3.5 million and up to 70 per cent of property value, and property search and property management assistance (Abu Dhabi Islamic Bank).

The Islamic Bank of Britain (IBB), created in 2004 as a wholly Sharia compliant retail Islamic bank, was a pioneer of British Retail Islamic banking for ten years, a flagship institution for the British Islamic finance industry, developing the largest range of Shari'ah-compliant retail financial products in the UK. These include Shari'ah compliant mortgage alternatives, the Home Purchase Plan (HPP) and Buy to Let Purchase Plan (BTLPP), current account and savings accounts. The Bank was also the first to introduce Shari'ah compliant business banking to the UK, offering a wide range of institutional and business banking products and services, including Commercial Property Finance. Several of the Bank's products remain unique in the UK's retail financial market (Islamic Bank of Britain).

Since December 2014 changes its name to Al Rayan Bank. The rebrand follows IBB's acquisition earlier in the year by Masraf Al Rayan, the fifth largest Islamic bank in the world and the second largest bank in Qatar. With a £100 million capital investment from its new parent company, the bank has begun to strengthen its product offering and widen its appeal to a broader range of customers, having five branches and around 50,000 customers, considered to be the second fastest growing fully Shari'ah-compliant istitution in terms of total assets ($m1,012.46) (The Banker 2015). According to Global Finance magazine, Al Rayan Bank was declared the Country Winner in 2015 in the UK and the Regional Winner for Europe in 2016.

Bank of London and the Middle East Plc ("the Bank" or "BLME"), is an independent wholesale Shari'ah compliant UK bank based in the City London, designed as a bridge between European, especially UK, and Middle

Eastern markets, having the aim of becoming the market leader in Islamic finance. Since launching on 5 july 2007, BLME has become the largest Islamic bank in Europe by balance sheet, profit and breadth of service. The bank offers financial services in three core areas: wealth management, corporate banking and treasury. In 2012 BLME participated in the first renewable energy deal in the UK funded by Islamic finance, launched an asset-based lending offering support SMEs and acted as co-lead arranger on a Murabaha financing agreement for a biodiesel plant in the UK.

In 2013 BLME was awarded Best Islamic Bank in Europe by Global Finance magazine and also is reportedly the largest independent Islamic bank in Europe. Its consolidated total assets exceeded £1.3 billion in 2015 (up from £807 million in 2011, £1.039 billion in 2012, £1.234 billion in 2013), but at a lower level compared to 2014 when total assets were £1.382 billion (Bank of London and Middle East). Despite the unsatisfactory financial results, last year ended with an increase in total operating income of 13% compared to 2013, reaching £63.3 million (£43.0 million in 2011, £52.2 million in 2012, £56.0 million in 2013 and £65.0 million in 2014), and group operating profit before tax of £8.4 million. Since its inception in July 2007, the bank has provided more than £500 million worth of lease finance, £250 million worth of property finance and £250 million in financing to small and medium enterprises.

Gatehouse Bank, founded in 2008, is a Shari'ah-compliant wholesale investment bank based in the City of London, operating in capital markets, real estate, asset finance, treasury business and Sharia advisory services. Also as part of GHB's continuing strategy to diversify funding sources, March 2015 saw the launch of a new retail internet based deposit product for longer term funding ("Milestone Savings") (Gatehouse Bank). In 2012, the Bank completed seven new acquisitions (five in the UK, two in the US) and made two successful disposals.

Total assets of the Bank increased from £224.138.404 in 2013 to £263.541.340 in 2014 and £261.252.359 in 2015 (Gatehouse Bank), and the Bank's profit before tax for the year amounted to £4.131.755 (£4.032.479 in 2013). Gatehouse Bank has reported an income increase by 20 % for December 2014 to £15.455.058 (£12.909.255 in 2013) (Gatehouse Bank). Wealth Management income increased by 237% to £2.6 million while Treasury income grew by 479%, year on year, to £3.9 million, drivenby investments in listed equities and investment grade Sukuk markets. The bank manages $1.7billion real estate assets across the US and UK. In December 2012, the bank issued the UK's first ever real estate backed sterling Sukuk Al-Ijarah.

The European Islamic Investment Bank (EIIB) has its headquarters in London being listed on the AIM market of the London Stock Exchange (EIIB: LSE) and is regulated in the UK by the Bank of England Prudential Regulation Authority and the Financial Conduct Authority. EIIB is the first Shari'ah-compliant investment bank to be authorised in the UK, but is authorised as an investment firm rather than a bank. The firm offers its customers Shari'ah-compliant treasury and capital markets, asset management, private banking, trade finance, correspondent banking and advisory and corporate finance services. For EIIB and also for the rest of the Britain's Islamic banks, is esential to expand the services that can be offered to their customers meeting the requirements of them (European Islamic Investment Bank).

Qatar Islamic Bank UK (QIB UK), authotized since 2008, is the UK subsidiary of Qatar Islamic Bank (QIB), one of the world's leading Islamic banks, awarded as "Islamic Bank of the Year" in Qatar and the Middle East, by The Banker magazine. QIB achieves net profit of QAR 1.055 million for six months' period ended 30th June 2016, representing a growth of 18% over the same period of 2015. Total Assets of the Bank has increased by 15% compared to June 2015, at QAR 135 billion (Qatar Islamic Bank UK). QIB UK offers a range of Shari'ah-compliant financing and investment products for both Islamic and non-Islamic clients alike, services including trade finance, private equity and asset management.

Most of major banks have opened "Islamic windows." The importance of institutions with Sharia windows is growing as some of the largest financial institutions, such as Citibank, UBS Group, Barclays and Lloyds and Standard Chartered Bank, are focusing on Islamic finance in both the wholesale and retail areas. Offering products that are competitive on price and service could help to generate business not only from Muslims with a preference for Shari'ah-compliant services, but also from Muslims and other customers that currently use conventional banking services.

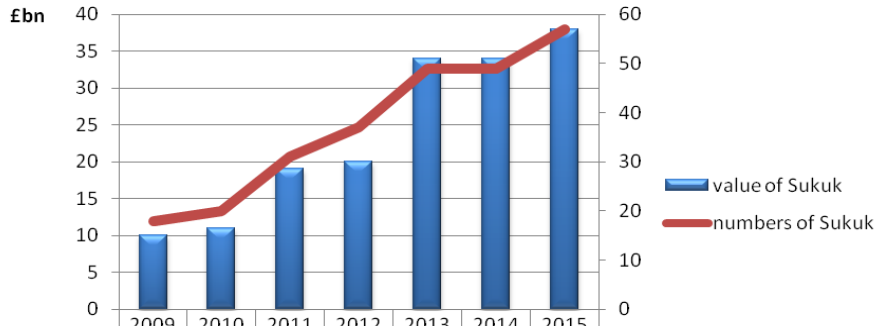
Over 16 commercial banks have considered opportune to offer Islamic financial products responding in this way to the growing demand on the part of the Muslim population and also to the increasing interest of Islamic investors to penetrate the Western European capital markets, in their attempt to diversify its own investment portfolio. Conventional banks can sell Shari'ah-compliant products because Islamic law does not require that the seller of the product must be Muslim or that its other services also be Islamic.

For example, Barclays Bank became the first bank which launch Islamic banking products in Kenya, targeting thousands of its Muslim customers, who can now get the services through the La Riba Current Account, designed to address the sensitivities of customers who adhere to the Muslim faith. Also, these new products and

services are responding not only to the needs of about 8 million Kenyan Muslims who had no access to banking products: *We encourage non-Muslims to use it too. Just as we accept deposits from people without regard to their faith*, Managing Director of Barclays Bank, Adan Mohamed, said.

The United Kingdom has a strong interest in the development of the Sukuk market (Islamic Bond - Sukuk is the most popular Islamic financial instrument and is structured to comply by not paying interest), which started in 2007, and has continued to grow fast. The Sukuk market is an essential part of the Islamic finance market. Thus, on 25 June 2014, the UK Government became the first Western government to issue sovereign Islamic bond, over 11,5 times oversubscribed with very strong demand and orders totalling around £2.3 billion. This issue was priced at the same level as the equivalent UK Gilts of similar maturity - UK government bonds - at 2.036% pa. The British government sold £200m of Sukuk, maturing on 22 July 2019, to investors based in the UK and in major global hubs for Islamic finance. The UK sovereign Sukuk use the Al-Ijara structure, the most common structure for sovereign Sukuk and will be underpinned by rental income from three central government office properties, which will remain in government ownership during the lifetime of the Sukuk.

The London Stock Exchange is the largest exchange for Sukuk listings. As we can see in the Figure 5 below, since 2009 the total number of Sukuk listings increased continuously. In 2015, 57 Sukuk bonds with a total value of $38 billion, had been listed on the London Stock Exchange, marking the UK's growing role in Shari'ah-compliant finance.



	2009	2010	2011	2012	2013	2014	2015
value of Sukuk	10	11	19	20	34	34	38
numbers of Sukuk	18	20	31	37	49	49	57

Source: Author – representation based on data from Sukuk bonds on the *London Stock Exchange 2015/Statistics*; available at http://www.statista.com>...>Banks&Financial Services

Figure 5 – Sukuk bonds traded on London Stock Exchange 2009-2015

London is also a major centre for the issuance and trading of Sukuk, trading with an estimated 70% of secondary market turnover. In this way, the UK continues to secure its position as the leading Western center for Islamic finance.

Conclusion

Islamic finance has become an important part of the international financial system over the last decade, despite its low share of the global financial market, being one of its components with the fastest growing trend. Even if remains mostly localised in the Middle East and Far Eastern Asia, at different rates of growth, Shari'ah-compliant financial services continue to develop in various Western European countries, according to the changes in how the market for Islamic finance is maturing.

The main problems that Islamic banks face in Western countries are the competition from conventional banks, how to make a transparent Islamic banking system, how to promote policies and financial instruments that are compatible with these, how to increase the number of its clients - Muslims and also non Muslims, to make them aware of the merits of the Islamic banking, how to gain a strong and a respectable position in the banking sector of these countries, how to determine the conventional banks with Shari'ah-compliant activities to report Shari'ah-compliant assets and activity separately, and not least, how to ensure and promote a proper training and qualification of the banking staff. On the other hand, conventional banks are increasingly becoming interested in entering the market of Islamic financial products. They are offering products specifically designed to attract Shari'ah-compliant investors, the sizeable customer base for its Islamic activities and, at the same time, continuing to servicing its conventional customers.

Conventional banks can sell Shari'ah-compliant products because Islamic law does not require that the seller of the product must be Muslim or that its other services also be Islamic. It does require that the product or

service be in compliance with Shari'ah guidelines. In this context, the current trends indicate that Islamic banking will increase its penetration of conventional system allowing both Islamic and conventional financial institutions to co-exist.

Considering all the issues listed in this article, we can conclude that the Islamic finance industry will continue to expand in these nontraditional markets, Islamic finance having the potential to perform an active role in Western financial markets.

References

[1] Grassa R., and Hassan, K. M. 2015. Islamic Finance in France: Current State, Challenges' and Opportunities. *International Journal of Islamic Economics and Finance Studies*, 1(1): 74-84. Available at: http://ijisef.org/index.php/IJISEF/article/download/13/13

[2] Grewal, B. K. 2013. Overview of the Islamic Financial Landscape: Globally and in Europe. KFH Research Ltd. Kuwait Finance House, (April 9, 2013): 6-8. Available at: http://www.assaif.org/content/download/33613/182480/file/EVE00196%20-%20Session%201%20-%20Ms%20Baljeet%20Kaur%20Grewal.pdf

[3] Jaffer, S. 2013. Sukuk: from a niche instrument to a global financial alternative. *World Commerce Review* (June 2013): 87. Available at: http://www.worldcommercereview.com/publications/article_pdf/731

[4] Solé, J. 2007. Introducing Islamic Bank into Conventional Banking Systems. *International Monetary Fund Working Paper*, WP/07/175: 8. Available at: http://www.hkimr.org/uploads/seminars/224/sem_paper_0_256_juan-sole-islamic-banks-wp-07-175.pdf

*** Ernst & Young. 2016. World Islamic Banking Competitiveness Report 2016; 52. Available at: http://www.ey.com/Publication/vwLUAssets/ey-world-islamic-banking-competitiveness-report-2016/$FILE/ey-world-islamic-banking-competitiveness-report-2016.pdf

*** Eurostat database. 2016. Migration and Migrant Population Statistics. Available at: http://ec.europa.eu/eurostat/statistics

*** Eurostat database. 2016. Population and population change statistics. Available at: http://www.ec.europa.eu/eurostat

*** Federal Statistical Office of Germany (Destatis). 2016. Immigration and net immigration peaked in 2015. Available at: https://www.destatis.de/EN/FactsFigures/SocietyState/Population/Migration/Migration.html

*** International Monetary Fund. 2015. The IMF and Islamic Finance. Available at: http://www.imf.org/external/themes/islamicfinance/

*** Islamic finance: Big interest, no interest. 2014. *The Economist*, 13(9): 1. Available at: http://www.economist.com/news/finance-and-economics/21617014-market-islamic-financial-products-growing-fast-big-interestnointerest

*** ISRA & Zawya. 2015. Islamic Funds IndusTRY: 2015 Review & Outlook. Available at: http://www.mifc.com/index.php?ch=28&pg=72&ac=159&bb=uploadpdf

*** Marifa's Practical Guide. 2016. Islamic Banking and Finance: Principles and Practices. Available at: https://www.islamicbankers.files.wordpress.com/2014/09/marifas-practical-guide-to-islamic-banking-and-finance.

*** Official website of Abu Dhabi Islamic Bank (ADIB). Available at: http://www.adib.co.uk/solutions.html

*** Official website of Bank of London and Middle East plc (BLME). (2015). Bank of London and The Middle East plc. Annual Report and Accounts December 31, 2015. Available at: https://www.blme.com/media/1498/blme-plc-financial-statements-31-december-2015.pdf.

*** Official website of European Islamic Investment Bank plc (EIIB). Available at: http://www.eiib.co.uk

*** Official website of Gatehouse Bank plc. 2013, 2014, 2015. Gatehouse Bank plc. Financial Reports 2013, 2014, 2015. Available at: http://www.gatehousebank.com/about-us/corporate-governance/financial-report

*** Official website of Islamic Bank of Britain (IBB). 2013. Islamic Bank of Britain. Annual Report and Financial Statements 2013. Available at: http://www.alrayan.bank.co.uk/Annual/Report/annual_report_2013.pdf

*** Official website of Qatar Islamic Bank UK. 2015. Financial Report 2015. Available at: http://www.qib.com.qa/en/investor-relations/financial-reports.aspx

*** Pew Research Center. 2011. The Future of the Global Muslim Population: projections for 2010-2030. Pew Forum of Religion and Public Life. Available at: http://www.pewforum.org/interactives/muslim-population-graphic/

*** Standard & Poor's Rating Services. 2012. Islamic Finance Outlook 2015. Glosary of Islamic Finance Terms;

*** Standard & Poor's Rating Services. 2015. Islamic Finance Outlook 2015: 2. Available at: https://www.ribh.files.wordpress.com/2015/09/islamicfinanceoutlook2015.pdf.

*** The Banker. 2015. Top Islamic Financial Institutions Report 2015: 11. Available at: http://www.thebanker.com/content/download/161219/6363500/file/Top%20Islamic%20Financial%20Institutions.pdf.

*** The World Bank. 2015. Financial Sector. Available at: http://data.worldbank.org/topic/financial-sector

*** The World Bank. 2015. Global Islamic Finance Development Center. Available at: http://www.worldbank.org/en/programs/global-islamic-finance-development-centre (accessed August 13, 2016).

*** Thomson Reuters Report. 2015. Global Islamic Asset Management Outlook Report 2015. Available at: http://cpifinancial.net/news/post313281/thomson-reuters-release-global-islamic-asset-management-outlook-report (accessed September 8, 2016)

*** Thomson Reuters Report. 2015. State of the Global Islamic Economy Report 2015. Available at: http://www.dinarstandard.com/state-of-the-global-islamic-economy-report-2015 (accessed September 8, 2016): 97. Available at: https://ribh.files.wordpress.com/2012/09/islamicfinanceoutlook2012.pdf.

Assessment of Global Competitiveness: Stocktaking and Methodical Approaches

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Abstract:

The article deals with the notion of 'country competitiveness' which has been described by various authors retrospectively from A. Smith and D. Ricardo to the modern studies of M. Porter, C. MacConell, S. Brue, C. Flynn and the analytics of the World Economic Forum (WEF), certain conclusions were made about evolution of this notion. The article also concerns the methods determining the index of global competitiveness proposed by the WEF and the dynamics of BRIC (Brazil, Russia, India and China) country ratings from 2004 to 2014. Here the causes and factors that drove the positional changes of these countries within the considered rating were analyzed as well as the interconnection of the twelve main components of the competitiveness with the global competitiveness level (by WEF estimation) along with the competitiveness of goods, services of BRIC countries, growth of the GNP and the dynamics of citizens' quality of life. The rating data for the global competitiveness of BRIC countries for a period of 8 years was compared and the conclusions made were such that the WEF methods that have been governing the calculation of global competitiveness level can be erroneous.

Keywords: competitiveness, rating, global competitiveness level, World Economic Forum, BRIC countries, gross national income.

JEL Classification: C58, G17, O22.

1. Introduction

Globalization and nationalization of the social and economic processes, scientific-and-technological advance, mobility of labor and capital, IT-zation of society, tailing of external borders and the evolution of the united trade space have led to major changes within economies. These processes place demands on the top-management of large-, middle- and small-sized businesses due to absolutely new and qualitative changes in the area of state and local administration, etc. The necessity of quick adaptation to changes of both external and internal environment, new market conditions as well as the ability to generate and implement new practical ideas means that there is significant call for management (of various levels) to master modern methods and management tools. Their use is primarily necessary to provide competitiveness and improve the search for competitive advantages. Furthermore, to retain competitiveness, highly developed countries now have to forecast external changes and be ready for the moment they occur.

Today the notion of 'competitiveness' is widely and actively used in economic and political references. Competitiveness as it is may not be considered unambiguously by a static group of values or be described by a single set of characteristics. It is a multi-aspect and multi-leveled abstract, representing both the most important benchmark and the most important comparison parameter of the development level and dynamics of certain enterprises, regions and countries.

2. Literature review

Despite the continuous development of theoretical approaches to the evaluation of international competitiveness, their multi-criteria nature, consistency and feasibility along with certain analytical tools torment the logics and the results of international competitiveness investigations. It is this overriding factor that prompted this article and corresponding study.

Development of international competitiveness is based on the theory of comparative advantages of national economies: abundance of natural resources, favorable geography, climate, infrastructure factors, etc. During post-industrial development, new factors of competitiveness evolved within the market environment based on the achievements of scientific and technological advances and innovations on all aspects of value creation. The so called 'natural' comparative advantages are static, they are not perpetual, and no one can reproduce them where as competitive advantages are dynamic and are bound to innovations, development of human capital, intellect and have limitless potential.

Today among the current methods for assessing country competitiveness the most competent are the global competitiveness rating - World Economic Forum (WEF, Davos, Switzerland) and the international competitiveness rating of the International Management Development institute (IMD, Lausanne, Switzerland). This study provides an analysis of the methods for rating global competitiveness from WEF and the conclusions drawn from the evidence. The analysis and assessment of the international competitiveness IMD and its comparison with the global competitiveness rating from WEF will be presented in a series of subsequent articles.

Historically, the term 'competitiveness' has been under constant review in an attempt to be 'clarified' and improved along with the ever-changing goals, priorities and conditions of the world economy. We deem that the content of the term 'country competitiveness' should have been represented by the following sequence of approaches:

- "No extension of foreign trade will immediately increase value in a country, although it will powerfully contribute to an increasing mass of commodities, and, therefore, the amount of entertainments. Since the value of all foreign goods is measured by the quantity produced by our land and labor, which is given in exchange for them, we should have no greater value, if by the discovery of new markets, we obtained double of quantity of foreign goods in exchange for a given quantity of ours." (Ricardo 1817, 146). "It has indeed been contended, that the great profits which are sometimes made by particular merchants in foreign trade, will elevate the general rate of profits in the country and that the abstraction of capital from other employments, to partake of the new and beneficial foreign commerce, will raise prices generally and thereby increase profits. It has been said, by high authority, that less capital being necessarily devoted to the growth of corn, manufacturing of cloth, hats, shoes, etc. while the counties demand the same, the price of these commodities will be so increased and that the farmer, hatter, clothier and shoe-maker will have an increase of profits, as well as the foreign merchant." (Ricardo 1817, 147)
- "The ability of the French economy to get the better of foreign countries in the sale of its goods (Piatier 1955, 143).
- "… a country becomes more or less competitive if, as a result of cost and price developments or other factors, its ability to sell on foreign and domestic markets has improved or deteriorated" (Balassa 1962)
- "…if two countries produce two goods and use two factors of production (say, labor and capital) to produce these goods, each will export the good that makes the most use of the factor that is most abundant" (Ohlin 1967).
- Competitiveness includes both efficiency (reaching goals at the lowest possible cost) and effectiveness (having the right goals). It is this choice of industrial goals which is crucial. Competitiveness includes both the ends and the means towards those ends (Buckley 1988).
- A nation's competitiveness depends on the capacity of its industry to innovate and upgrade. Companies strive for advantage against the world's best competitors due to pressure and challenge. They benefit from strong domestic rivals, aggressive home-based suppliers and demanding local customers. As the basis of competition has shifted more and more to the creation and assimilation of knowledge, the role of the nation has grown. Competitive advantage is created and sustained through a highly-localized process. Differences in national values, culture, economic structure, institutions and histories all contribute to competitive success (Porter 1990, 74).

- The ability to produce goods and services that meet the test of international markets while citizens earn a standard of living that is both rising and sustainable over the long-run (Council on Competitiveness 1992, 2).
- Competitiveness is relative and not absolute. It depends on shareholder and customer values and financial strength which determines their ability to act and react within the competitive environment as well as the potential of people and technology in implementing the necessary strategic changes. Competitiveness can only be sustained if an appropriate balance is maintained between these factors which can be of conflicting nature (Feurer 1994, 49).
- Competitiveness implies elements of productivity, efficiency and profitability. But it is not an end in itself or a target. It is a powerful means to achieve a rising living standard and increased social welfare - a tool for achieving targets. Globally, by increasing productivity and efficiency in the context of international specialization, competitiveness provides the basis for raising peoples' earnings in a non-inflationary way (Ciampi Group 1995, 3).
- The ability of a country to achieve sustained high rates of growth in GDP per capita (World Economic Forum 1996, 19).
- Competitiveness is the degree to which a nation can, under free trade and fair market conditions, produce goods and services which meet the test of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long-term (OECD 1996).
- Competition - the capability of producing goods/services at an international quality standard that can compete at international markets, resulting in a continuous increase in the welfare of a nation (Council on Competitiveness 1998).
- The competitiveness of a country is essential for the welfare of its citizens. It means output growth and high rates of employment in a sustainable environment. In a fast-moving world economy, one of the keys to competitiveness is adaptability. An economy is adaptable if it can accumulate and re-deploy resources rapidly in pursuit of new opportunities, while, at the same time, fully exploiting existing competitive strengths. Adaptability is crucial not only for the growth prospects of a country but also for its resilience to economic shocks. For an economy to be adaptable to rapid changes of technology and tastes, it should combine macro-stability with micro-mobility (EU Commission Report 1999, 1).
- Competitiveness is a field of Economic knowledge, which analyses the facts and policies that shape the ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people (IMD's Yearbook 2014, 493).
- Sustainable competitiveness - a set of institutions, policies and factors that make a nation productive over the longer term while ensuring social and environmental sustainability. Social sustainability, in turn, is defined as the institutions, policies and factors that enable all members of society to experience the best possible health, participation and security; and that maximize their potential to contribute to and benefit from the economic prosperity of the country in which they live. Environmental sustainability - the institutions, policies and factors that ensure efficient resource management to enable prosperity for present and future generations (WEF the Global Competitiveness Report 2014–2015, 55).

Such scholars as Mill (1848), Marshall (1879), Keynes (1919), Galbraith (1975), Schumpeter (1982), *et al.*, have also been engaged in the question of competitiveness of countries and regions. The content of the concept of "competitiveness" and estimates of competitive success evolved from a basic set (land, capital, natural resources, labor) proposed in the 18th century Smith (1776), through the idea of increasing productivity using specialization (Ricardo 1817) and the concept of comparative advantages on costs and prices prevailing in the mid-20th century (Piatier 1955, 143, Balassa 1962 and Ohlin 1967). Modern multi-criteria ratings of global competitiveness (WEF 2014, IMD 2014) now include hundreds of indicators and characteristics.

The development of globalization, that is happening in conditions of increasingly frequent world economic crises, has resulted in the need to assess the competitiveness of affected participants by international exchange countries in terms of the conquest of high positions in the world market, increase profitability of national economies and the ability to ensure a high quality and standard of a given population's living (Council on Competitiveness 1992, 2, Ciampi Group 1995, 3; World Economic Forum 1996, 19; OECD 1996 *et al.*).

In recent years, the competitiveness of countries began to be recognized not as a goal but as a means of achieving productivity and social stability in the long term, the most important driving factors of which are knowledge, innovation, and human and technological potential (Porter 1990, 74 and Feurer 1994, 49).

As nations grow in complexity through development there is a dramatic effect on the expansion of the concept of competitiveness. The general recognition of the importance of sustainable development in all spheres of hu man activity has contributed to the awareness of the criteria for comparative evaluation of countries in all levels of development. Today, a country's competitiveness it is not only the ability to prevail in the international market and provide financial welfare but also its ability to deal with future competitiveness which along with economic stability should take into account social and environmental factors directly affecting the welfare of a given nation. Appropriate selected evaluation criteria are used by the analytical group of the World Economic Forum which use these concepts and criteria to evaluate sustainable competitiveness which is in turn used to rank the global competitiveness of countries (WEF The Global Competitiveness Report 2015–2016, 4).

3. Methodology

The Global Competitiveness Index (GCI) of the World Economic Forum is calculated based on 114 parameters combined into the following: Institutions, Infrastructure, Macroeconomic environment, Health and primary education, Higher education and training, market efficiency of goods, Labor market efficiency, Financial market development, Technological readiness, Market size, Business sophistication and Innovation. These are collectively known as the 12 Pillars of Competitiveness. The first 4 pillars relate to being Factor driven (their combined share in calculating the GCI rankings is 36.4%), 6 pillars relate to affecting factors which are Efficiency driven (50%) and two which are Innovation driven (13.6%). 34 parameters are calculated on the basis of public statistics (external debt, budget deficits, life expectancy and other results based on the research of UNESCO, IMF, WHO), and the rest according to the Executive Opinion Survey, which takes into account more than 14 thousand executives from medium and large companies.

All countries who participate in the ranking are segregated by stages of economic development. The criterion for the distribution is a measure of GDP per capita. However, to determine the stage of development of countries with a high dependence on mineral resources a second criterion is using which measures the degree of dependence of a country's development of the main influencing factors (Table 1).

Table 1 - Sub index weights and income thresholds for stages of development

Parameters	Stage of development				
	Stage 1: Factor-driven	Transition from stage 1 to stage 2	Stage 2: Efficiency-driver	Transition from stage 2 to stage 3	Stage 3: Innovation-driven
GDP per capita (US$) thresholds*	<2,000	2,000-2,999	3,000-8,999	9,000-17,000	>17,000
Weight for basic requirements	60%	40-60%	40%	20-40%	20%
Weight for efficiency enhancers	35%	35-50%	50%	50%	50%
Weight for innovation and sophistication factors	5%	5-10%	10%	10-30%	30%

4. Discussion and results

During the study, we have analyzed the Global Competitiveness Index of the largest emerging markets, that of BRICS countries, for a period covering the last 10 years (Table 2).

An analysis of the parameters for these countries indicates that they are currently developing very unevenly. The results indicate that the leader among the BRICS countries, for improving its ranking, is China. Over the period studied the number of countries within the ranking system has increased by 23 with China improving its score by 20 positions showing not only sustainable growth but stability as well. As of 2015/2016, China occupies 28th place overall. Holding second position from the BRICS sample studied is the Russian Federation occupying 45th place overall. During this period the Russian Federation has shown unstable growth patterns, as can be seen by the fluctuations in the data panel, however it should be noted that for last 2 years the Russian Federation has improved its ranking by 19 positions. This became possible due to some improvements related to the efficiency of market of

goods and services, using information and communication technologies and an increase in the competitiveness of companies.

So, the competitive advantages of Russia are the high level of education of the population, developed infrastructure and the market size. The situation in Russia (as it was at the end of 2014) has been improved to a great extent by macroeconomic indicators (low levels of government debt, budget surplus, a wide coverage of higher education and a significant amount of the domestic market). However, there are factors that hinder the Russian Federation in its ability to use its competitive advantages: underdeveloped financial market, the low efficiency of goods market and state institutions. Due to the fact that in the 2015 - 2016 Report statistical data for 2014 has been used – the effects of the sanctions imposed by Western Europe, Canada and the USA, and also the influence of inceptive structural crisis in Russia, have not been taken into consideration for this rating (Table 2).

Similar to the dynamics of Russia in the ranking of global competitiveness is that demonstrated by Brazil until 2013. During the analyzed period of 10 years (since 2003 to 2013) Brazil, as well as Russia, retained it overall position (57th overall).

At the same time, it should be stated that in 2014 Brazil had tremendous loss in rating caused by both internal and external economic factors. For one year, the overall shift of 18 positions ranged Brazil from a high of 57th to a low of 75th place. The process of overall shift for Brazil was not smooth as it was for Russia.

The other BRICS countries represented in the ranking show extremely negative trends. As can be seen by the 2005-2006 rating, both India and South Africa hold significantly favorable positions in their group, however, by 2014-2015 rating it can be seen that they have significantly lost their positions: South Africa has dropped down from 40th to 49th place and India from 45th to 71st.

Forecasting with the exponential smoothing method for the period up to 2019-2020 allows us to draw conclusions that partly differ from the conclusions drawn on the basis of traditional methods of analysis (Figure 1). Using this method of leveling removed any jump-like processes and gives an overall trend impression. So, when we look at the forecasting for the period up to 2019-2020 not only does China's keep its position of leader it also highlights a sustained upward trend throughout the period studied leaving its approximate place in the world ranking of around 20th position.

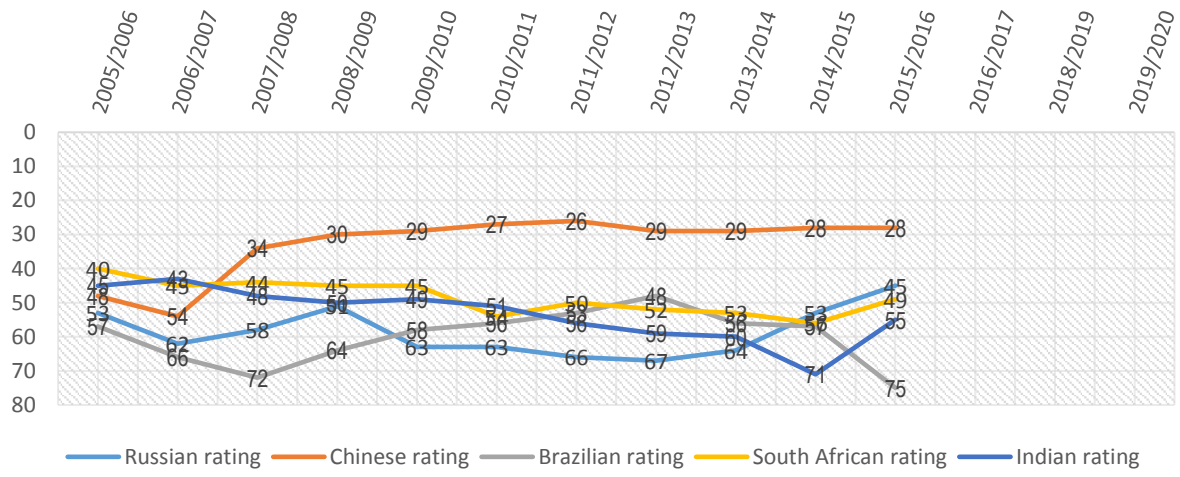

Figure 1 – Rating of BRICS countries for the period from 2005-2006 to 2015-2016 and their forecasting using the method of exponential smoothing for the period up to 2019-2020

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Table 2 – The respective positions of BRICS countries in the global competitiveness ranking compiled by the World Economic Forum

Parameters	Year											Ranking shift 2015/2016 to 2008/2009	Ranking shift 2015/2016 to 2005/2006
	2005/ 2006	2006/20 07	2007/20 08	2008/20 09	2009/20 10	2010/20 11	2011/20 12	2012/20 13	2013/20 14	2014/2 015	2015/ 2016		
Total number of ranked countries	117	125	130	134	133	139	142	144	148	144	140	6	23
Ranking of RF	53	62	58	51	63	63	66	67	64	53	45	6	8
Ranking of China	48	54	34	30	29	27	26	29	29	28	28	2	20
Ranking of Brazil	57	66	72	64	58	56	53	48	56	57	75	-11	-18
Ranking of SA	40	45	44	45	45	54	50	52	53	56	49	-4	-9
Ranking of India	45	43	48	50	49	51	56	59	60	71	55	-5	-10

Source: WEF Global Competitiveness Reports, 2005-2016.

From the BRICS studied the trend shows that Russia, Brazil and South Africa will take places behind China by 2019-2020. According to the forecast South Africa and Russia will show equal loss at approximately 55-60 place overall, whereas India will continue to lose its potential and fall into the range lower than 70th place in the ranking.

The level of global competitiveness of a country is not an end in itself. Improving a country's position in the ranking of global competitiveness using indicators of the 12 Pillars of Competitiveness should affect an increase in the competitiveness of goods, works and services and therefore to increase the reach of these products both domestically and abroad, which ultimately should lead to an increase in the level and quality of a population's life (Figure 2).

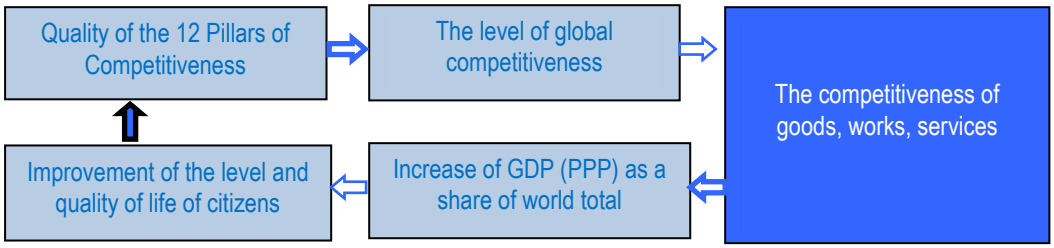

Figure 2 – Interrelation of the level of global competitiveness and GDP (PPP) as share of the world total

On the basis of our conclusion it should be observed that there is a correlation between the levels of global competitiveness of countries by GDP (PPP) as a share of world total of this country or at least correlated with GDP (PPP) per capita. To see this correlation, we analyzed data on GDP (PPP) as a share of world total and GDP (PPP) per capita (US$) for BRICS countries for a period covering the last 8years and relate them to their level of global competitiveness (Table 3). The data presented in Table 3 allow us to conclude that the hypothesis of a correlation between the level of global competitiveness and GDP (PPP) as share of the world total for BRICS countries formulated by us is not observed.

Table 3 – GDP (PPP) as a share of the world total and GDP (PPP) per capita (US$) for BRICS countries

Country	Parameters	YEARS								2015/2016 to 2008/2009
		2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	
Russia	GDP (PPP) as share of world Total	3,18	3,30	3,05	3,00	3,02	3,02	2,94	3,30	0,12
	GDP (PPP) per capita (US$),	9.075	11.807,00	8.694,00	10.437,00	12.993,00	14.247,00	14.819,00	12.926,00	1,42
China	GDP (PPP) as share of world total	10,83	11,40	12,52	13,61	14,32	14,92	15,40	16,32	5,49
	GDP (PPP) per capita (US$),	2.461,00	3.315,00	3.678,00	4.382,00	5.414,00	6.076,00	6.747,00	7.589,00	3,08
Brazil	GDP (PPP) as share of world Total	2,81	2,86	2,87	2,94	2,91	2,83	2,79	3,02	0,21
	GDP (PPP) per capita (US$),	6.938,00	8.197,00	8.220,00	10,816,00	12.789,00	12.079,00	11.311,00	11.604,00	1,67
South Africa	GDP (PPP) as share of world Total	0,72	0,72	0,70	0,71	0,70	0,70	0,69	0,65	-0,08
	GDP (PPP) per capita (US$),	5.906,00	5.693,00	5.824,00	7.158,00	8.066,00	7.507,00	6.621,00	6.483,00	1,10
India	GDP (PPP) as share of world Total	4.58	4.77	5.06	5.40	5.65	5.63	5.83	6.84	2,26
	GDP (PPP) per capita (US$),	978	1016	1031	1265	1389	1492	1505	1627	1,66

We have simplified the results obtained in our study in Table 4.

Table 4 - Change of the main indicators - the ranking of global competitiveness, GDP (PPP) per capita (US $) and GDP (PPP) as a share of the world total 2008/2009 to 2014/2015 for BRICS countries.

No	Country	Change in global competitiveness ranking between 2008/2009 and 2015/2016	GDP (PPP) per capita(US$), ratio 2008/2009 to 2015/2016	Change of GDP (PPP) as a share of the world total 2008/2009 to 2015/2016
1	Russia	6	1.42	0.12
2	China	2	3.08	5.49
3	Brazil	-11	1.67	0.21
4	South Africa	-4	1.10	-0.08
5	India	-5	1.66	2.26

The significant increase of GDP (PPP) per capita (US$) within 8 years of almost 3 times simultaneously with an increase of GDP (PPP) as a share of the world total of 5,49% resulted in China moving only 2 positive positions within the ranking. During this same period, India shifted 5 and Brazil - 11 negative positions while lowering GDP (PPP) per capita and increasing GDP (PPP) as a share of the world total by 2.26% and 0,21% respectively. In this way from the BRICS studied the countries occupying the lowest position in rating in last 8 years demonstrate almost the best growth trends (except China) increasing GDP (PPP) per capita and GDP (PPP) as share of world total.

Conclusions

Research has shown the absence of correlation between the level of global competitiveness and GDP (PPP) as a share of the world total. This allows us to formulate the following theses:

- the data presented in the statistics of some countries needs to be clarified and corrected to give a more complete picture of the economic situation;
- the methodology of the World Economic Forum by which the calculation of global competitiveness levels is made can produce distorted results.

Even assuming that the statistical data for some countries need to be adjusted it remains unclear why China's ranking position, characterized by stable dynamics of the studied parameters, has increased by 2 positive positions. This would be possible only if the growth of the world economy was not less than 7% per year.

At the same time, the rating of India, with a similar dynamic of parameters, has decreased by 21 positions. Of course, we assume that the increase in the ranking of individual countries is due to an increasing GDP (PPP) per capita (US$). This is seen mainly in raw material producing countries. GDP growth is supported by favorable situations in the world raw materials commodity markets. However, as the practice of recent years shows, it does not involve improving the global competitiveness of a country in the long term and generates even more dependence on the factors of raw materials exports such as price and volume. As can be seen, the statistics confirm the favorable dynamics of GDP and consumption. In this case the dynamics of consumption structure will be directly correlated with changes in the composition of imports because funds received for raw materials, to the greatest extent, are sent to finance the short-term growth of in-country acquisitions of imported goods and are not involved in the realization of long-term economic development goals such as modernization and innovative development.

Therefore, it is necessary to continue research in this area to promote growth for the formation of proposals to adjust the assessment methodology of the global competitiveness ranking system of WEF.

References

[1] Balassa B. 1962. *Recent Developments in the Competitiveness of American Industry and Prospects for the Future*. Factors Affecting the United States Balance of Payments, compilation of studies prepared for the Subcommittee on International Exchange and Payments of the Joint Economic Committee Congress of the United States, Washington: U.S. Government Printing Office. Available at: http://www.worldcat.org/title/ recent-developments-in-the-competitiveness-of-american-industry-and-prospects-for-the future/oclc/10737849

[2] Buckley, P. J. *et al*. 1988. Measures of International Competitiveness. A critical Survey. *Journal of Marketing Management*, 4 (2): 175-200.

[3] Drucker, P. 1981. *Toward the Next Economics and Other Essays.* New York. Harpercollins. Available at: https://www.amazon.com/Toward-Next-Economics-Drucker-Library/dp/1422131556

[4] Feurer, R., Chaharbaghi, K. 1994. *Management Decision*. Available at: http://www.emeraldinsight.com/loi/md

[5] Fujita, M., Krugman, P., Venables, A. 2001. *The Spatial Economy: Cities, Regions and International Trade* London. Cambridge, Mass; London: MIT Press. Available at: http://www.worldcat.org/title/spatial-economy-cities-regions-and-international-trade/oclc/860306993

[6] Galbraith, J.K. 1975. *Money: whence it came, where it went.* Boston. Mass.: Houghton Mifflin Company: 324

[7] Keynes, J. 1919. *The Economic Consequences of the Peace*, New York.: Harcourt, Brace, and Howe, Inc. Available at: http://socserv2.socsci.mcmaster.ca/econ/ugcm/3ll3/keynes/pdf%26filename%3Dpeace3.pdf

[8] Marshall, A. 1987. *The pure theory of foreign trade and the pure theory of domestic values*, Los-Angeles. Augustus M Kelley Pubs.

[9] McConnell, C., Brue, S., and Flynn S. 2014. *Economics: Principles, Problems, & Policies*, *(McGraw-Hill Series in Economics).* New York: McGraw-Hill/Irwin.

[10] Mill, J. 1848. *The Principles of Political Economy: with some of their applications to social philosophy*. Boston. Adamant Media Corporation. Available at: http://eet.pixel-online.org/files/etranslation/original/Mill,%20Principles%20of%20Political%20Economy.pdf

[11] Ohlin, B. 1967. *Interregional and International Trade: Economic Studies*. Harvard University Press; Revised edition (January 1, 1967).

[12] Piatier, A. 1995. L'économie française est-elle compétitive? *Politiques Etrangères*, April-May: 141-171.

[13] Porter, M.E. 1990. *The Competitive Advantage of Nations*, Harvard Business Review, March-April. Available at: https://www.clustermapping.us/sites/default/files/files/resource/The%20Competitive%20Advantage%20of%20Nations%20HBR.pdf

[14] Ricardo, D. 1817. *On the Principles of Political Economy and Taxation*. London: John Murray. Available at: http://socserv.mcmaster.ca/econ/ugcm/3ll3/ricardo/Principles.pdf

[15] Schumpeter, J. 1982. *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle.* Transaction Publishers.

[16] Smith, A. 1776. *An Inquiry into the Nature and Causes of the Wealth of Nations*. Oxford University Press. Available at: http://www.ifaarchive.com/pdf/smith - an inquiry into the nature and causes of the wealth _of_nations[1].pdf

*** Competitiveness Advisory Group, (Ciampi Group). 1995. *Enhancing European Competitiveness.* First report to the President of the Commission, the Prime Ministers and the Heads of State, June.

*** *IMD's World Competitiveness Yearbook.* 2014. Available at: http://www.imd.org/

*** OECD. 1996

*** The competitiveness of European industry. Report. 1999. *Working document of the services of the European Commission. Communication from the Commission to the Council, to the European Parliament, to the Committee of the Regions and to the Economic and Social Committee COM*, Belgium.

*** The US Competitiveness Policy Council. *Building a competitive America*. 1998. Report to the President and Congress, March.

*** *World Economic Forum*. 1996. Global Competitiveness Report.

*** *World Economic Forum.* 2014. Global Competitiveness Report 2014-2015, Available at: http://www.weforum.org/reports/global-competitiveness-report-2014-2015

*** Washington, D. C. 1992. The US Competitiveness Policy Council. *Building a competitive America*. The First Report to the President and Congress, Competitiveness Policy Council.

Growth Agglomeration Effects in Spatially Interdependent Latin American Regions

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Abstract:

We investigate the effect of agglomeration on regional growth in Latin America, using panel data and spatial panel data techniques. By exploring the role of development in the agglomeration-growth relationship, we find evidence of the Williamson's hypothesis: agglomeration growth effects are magnified in less-developed regions. Moreover, we measure how the economic growth of one region can affect its neighbouring regions´ economic growth. The results of the Spatial Autoregressive model show that international connections of Latin American regions are beneficial to obtain positive spatial effects of agglomeration. Nevertheless, spatial effects are stronger within countries. This finding points out the strong border effects in Latin America.

Keywords: agglomeration economies, spatial interdependence, Latin America, urbanization, development.

JEL Classification: R11, O18, O54.

1. Introduction

From theoretical approaches based on urban economics and the link between growth theory and economic geography, there exists a strong positive correlation between agglomeration and growth (Martin 1999, Ottaviano 2001, Baldwin and Forslid 2000). However, the positive relationship may change due to different factors. The common explanation of reduced effects or even negative effects of agglomeration on growth is related with congestion effects. Another aspect, less studied in the literature, lies on the role of the level of development of countries in explaining the agglomeration-growth relationship. Little attention has been dedicated to such a factor (Venables 2005 and Duranton 2007) most likely due to the implicit assumption that the experience of developed countries can be translated to that of developing ones (Chauvin *et al*. 2014). However, the empirical evidence provided by Williamson (1965) shows that the degree of agglomeration is higher at earlier stages of development than at later stages. Accordingly, the effects of agglomeration on growth are more pronounced in countries with low levels of development (Brülhart and Sbergami 2009).

This paper investigates how agglomeration impacts on growth and whether the mechanisms of agglomeration are related with the level of development. To answer these questions, we use sub-national data of Latin American countries. The remainder of this paper is organized as follows. In section 2, the context of spatial disparity of Latin American countries is described. In section 3 we present the data, the strategy estimation and the results. Section 4 concludes.

2. The context of inequality in Latin America

Lately, Latin America has experienced a continued economic expansion. During the last decade, the average growth rate[1] has increased from 2.4% in 2000, year in which several countries faced both internal and external crisis, to 5.8% in 2005 and 6.5% in 2010, reflecting one of the best signs of recovery after the world recession in 2008. During the period 2004-2010[2], these countries recorded an annual growth rate of 5.5% in average.

Within countries, the economic scenario is very heterogeneous. Few domestic regions concentrate most of the economic activity. Overall, capital regions alone or together with no more than two regions account for most of the Gross Domestic Product (GDP) of each country. For instance, the capital region of Peru, alone represented 52% of the total GDP; in Chile, the capital region accounted for 48%; in Ecuador, only two regions recorded 54%; and in Colombia three main regions produced 52% of the total GDP. In general, spatial concentration at regional level is a common pattern in Latin America.

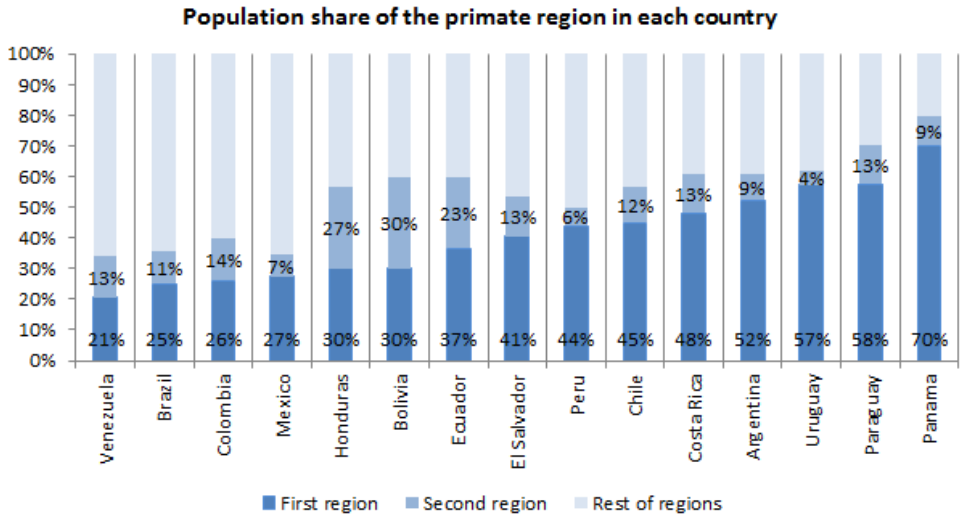
Such a spatial configuration has been the result of a sequence of historic events. It was first formed in concordance with Indian settlements (Aztec, Maya and Inca empires). Then, colonizing countries, mainly Spain and Portugal, promoted already established settlements that become political and economic centres (Atienza and Aroca 2012; Massiris-Cabeza *et al.* 2012). Globalization was another key factor that reinforced the spatial

[1] These statistics were obtained using data from the Economic Commission for Latin America and the Caribbean (ECLAC). They correspond to the 10 biggest countries of South America, Mexico and Panama.

[2] The average on countries is taken since 2004 in order to avoid years of crisis in some of them.

concentration in few regions where sources of comparative advantage of countries were located. Along time, those geographically advantaged regions have improved their urban infrastructure conditions. Thus, the process of urbanization has been different across regions within countries. The primacy of politically and economically favoured regions has been enhanced. As shown in Figure 1, Panama, Paraguay, Uruguay, Argentina, Chile and Peru concentrate more than 40% of their total urban population in their primate regions.

In other countries, urban population has been concentrated in the main region and secondary regions, for example Bolivia, Ecuador, Honduras, Colombia, Venezuela and Brazil.[3]



Source: ECLAC database on National Population Censuses.

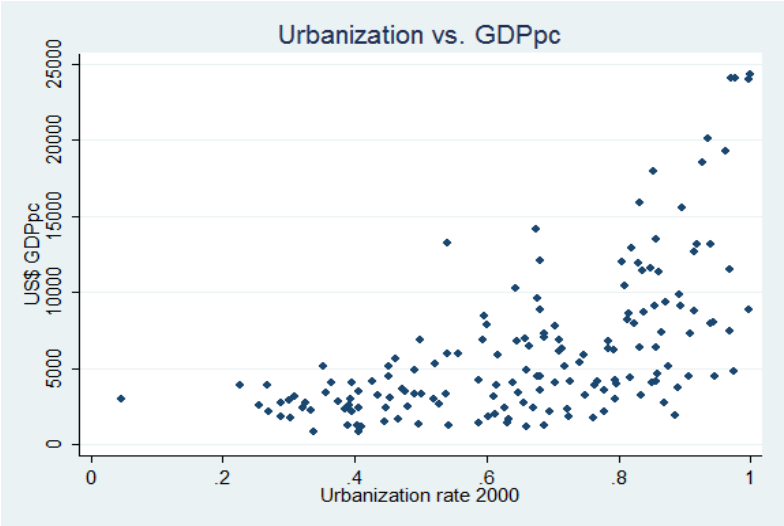
Figure 1 – Percentage of urban population in primate regions, 2000

It is also argued that the trade policy of Import Substitution Industrialization[4] (ISI acronym is spanish) played an important role in reinforcing regional concentration and primacy within countries. The reason is that the increase of industrial activity in main cities has attracted great flows of internal migration from rural areas towards urban areas (Atienza and Aroca 2012).

Spatial disparities have been accentuated not only in the economic aspect but also in the social aspect. The provision of services, access to health, education and technology differ across space. In economic terms, at a country level, the GDP per capita of the wealthiest region is 8 times as large as the poorest region. In social terms, some regions within countries have more than 60% of their population in poverty situation. Regions with high levels of urbanization, commonly the favoured ones, provide high levels of wealth. As we can observe in Figure 2, the correlation between urbanization rate and GDP per capita is positive (the correlation coefficient is 0.37 and it is significant) at regional level.

[3] In Bolivia, there exists a system with two main regions: La Paz and Santa Cruz. Ecuador has two main urban centres: Guayas and Pichincha. Honduras also has two main regions: Francisco Morazan and Cortes. In Colombia, the two main regions are Cundinamarca and Antioquia. Venezuela has a two-region urban system with the State of Miranda whose main city is Caracas and the State of Zulia whose main city is Maracaibo. Finally, Brazil was initially a urban system with three-main-regions: Sao Paolo, Rio de Janeiro and Minas-Gerais. However, Rio de Janeiro and Minas-Gerais have decreased their share of the total urban population.

[4] In the decades of the fifties and sixties, most of Latin American governments adopted the ISI policy which consisted in replacing foreign industrialized imports with domestic production.



Source: ECLAC database on National Population Censuses and National Accounts of each country

Figure 1 – Urbanization and Gross Domestic Product per capita

The analysis presented throughout this section reveals a high degree of spatial concentration within Latin American countries. The next section 3 is devoted to determine to what extent agglomeration affects growth of Latin American regions.

3. Estimation of the effects of agglomeration in Latin American regions' growth

Because spatial disparities are present not only in economic terms but also in social terms, the study of agglomeration effects in Latin American regions merits special attention. Nevertheless, empirical evidence devoted to these countries is scarce. The main reason is the lack of consolidated data. The present study surpasses such an issue, being the first attempt to analyse the impact of agglomeration on Latin American regions' growth. This study focuses on data at regional level for two reasons. First, the heterogeneity between regions can be taken into account. Second, the study of agglomeration economies entails geographical interactions which are more evident at a rather small spatial scale. The geographical proximity between economic agents promotes more immediate and dynamic connections. Thus, externalities of agglomeration are more likely to be observed within regions.

3.1. Data

We use regional information of 166 regions of 8 countries: Argentina, Bolivia, Chile, Colombia, Ecuador, Mexico, Peru and Panama[5]. The inclusion of more variables reduces the sample to 87 regions of three countries: Colombia, Ecuador and Mexico. Hereinafter, we refer to the first database as A and to the second database as B.

We built a panel database for the period 2000-2009. Since the process of agglomeration takes time, we believe that the annual variation is not enough to explain growth (Gardiner *et al*. 2011, Bosker 2007, Brülhart and Sbergami 2009). Hence, we use a three year-period database: 2001-2003, 2004-2006 and 2007-2009. The main sources of information are the National Statistical Institutes of each country. In particular, we obtained regional series for real GDP, population by age, surface area, education level of population and government expenditure.

The second data source is ECLAC (Economic Commission for Latin American countries) from which we obtained the Gross Domestic Product (GDP) at the regional and industrial level[6] and urbanization rates at regional level[7]. The geographical coordinates were collected from the tool of geo-localization GeoHack Wikimedia Toolserver Wiki.

Given that national currencies vary across Latin American countries, we standardize the measure of nominal GDP to real GDP using the Purchasing power parity (PPP) conversion factor of 2000 of the World Bank,

[5] Data at sub-national level is limited in some Latin American countries. The countries that do not account for regional information of National Accounts are Costa Rica, El Salvador, Guatemala, Haiti, Honduras, Nicaragua and Venezuela.

[6] Data on industries is used to compute the industrial specialization index of each region.

[7] The database of urbanization contains information until 2000. We updated it with information on recent population censuses of countries. We impute an intermediate value of urban population between the last census and the recent census using an annual growth rate. The rational behind this computation is that urbanization is an increasing process over time. This allows capturing the effect of urbanization in the dynamic economic growth rate, using three-year period data.

International Comparison Database.[8] Another data issue that we face is the difference in the procedures[9] measuring urban population in each country. We consider that the variety of procedures constitutes a robustness test since if a pattern is observed despite the diversity of measures, the result would be more persuasive.

3.2. Estimation strategy

Using both databases, we estimate the impact of agglomeration on regional growth of Latin America. A parsimonious model of agglomeration is estimated using sample A and an extended model including more variables using sample B. The general specification of the model is:

$$\Delta y_{i,t+k}/y_{i,t} = \alpha + \psi \ln y_{i,t} + \gamma\, agglom_{i,t} + X_{i,t}\beta + \mu_i + \xi_t + \varepsilon_{i,t} \quad (1)$$

where: $\Delta y_{i,t+k}/y_{i,t}$ is the growth rate[10] of per capita GDP of region *i* between time *t* and *t* + 3[11], $y_{i,t}$ is the initial per capita GDP of region *i* and its associated coefficient estimate ψ is generally interpreted as the conditional convergence parameter in panel models (Barro and Sala-i Martin 1992; Arbia and Piras 2005).

If the coefficient estimate is negative, poor regions tend to grow faster than rich ones and convergence takes place[12]. $agglom_{i,t}$ is the level of agglomeration of region *i* at time *t*. It is proxied by two indicators: urbanization rate and population density. The vector $X_{i,t}$ includes additional explanatory variables, such as the level of education of region *i* at time *t* which is measured by gross school enrollment ratio in tertiary education; the role of government in region *i* at time *t* measured by the share of public investment in regional GDP[13]; and industrial specialization[14] of regions which is computed using the formula:

$$spe_i = max_j \frac{GDP_{ij}/GDP_i}{GDP_i/GDP}$$

where: *i* refers to the region and *j* refers to the industry. It is calculated at each time *t*. μ_i represents the non-observed regional-specific effects, ξ_t represents the time-specific effects[15] and $\varepsilon_{i,t}$ is the idiosyncratic error term which is independent and identically distributed with mean zero and constant variance. The parsimonious model estimates the parameters α, ψ and γ. The extended model includes the parameters in β.

Since the level of agglomeration, agglom $_{it}$, is likely to be correlated with regional characteristics μ_i such as geography or historic factors of development (commonly not observed), the assumption of uncorrelated errors in Ordinary Least Squares estimation is violated. Then, the OLS estimator will be both biased and inconsistent. In order to obtain consistent and efficient estimates, a panel model with fixed effects is adequate. It allows controlling for unobserved heterogeneity.[16]

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[8] The PPP factor measures the number of units of a country's currency required to buy the same amount of goods and services in the domestic market as U.S. dollar would buy in the United States. Thus, it allows transforming the GDP in national currencies to dollars in real terms, which are comparable.

[9] Overall, there are three general methods to establish the urban character: i) localities with more than 2000 inhabitants, ii) definition (i) combined with the provision of public services and urban conditions, and iii) capital cities constitute urban areas; the areas outside capitals are considered rural.

[10] It is worth noting that we do not use GDP in levels because of two reasons. First, we would deviate from the theoretical literature that focuses on the effect of agglomeration on growth and not in economic performance. Second, the relationship between urbanization and GDP in levels is potentially endogenous.

[11] We use the logarithmic formula to calculate the growth rate. $\Delta y_{i,t+k}/y_{i,t} \cong \ln y_{i,t+k} - \ln y_{i,t}$

[12] It is worth noting that only three periods are taken into account. Then, the results of convergence do not show a long-run equilibrium. It is interpreted as the convergence of regions to their own steady states.

[13] It is the annual average of three years in each period.

[14] We compute the indicator of specialization based on seven aggregated sectors: 1. the primary sector, 2. the manufacturing sector, 3. the market services sector, 4. public services 5. Wholesale and retail trade, 6. Electricity, gas, and Water supply; and 7. Construction.

[15] By including time fixed effects for periods 2001-2003 and 2007-2009, we control the effects of internal and external crisis. Between 1999 and 2002, external and internal crisis have occurred: the Asian crisis in 1998, the Brazilian crisis in 1999 (Brazil is not included in our analysis), the Argentinean crisis in 2000-2001 and the Ecuadorian crisis in 1999. In 2008, world crisis took place.

[16] In the case where μ_i is assumed to be fixed and the remainder disturbances are stochastic with ε_{it} independent and identically distributed with mean zero and a constant variance, the fixed effects model is an appropriate specification. The second case

Another issue to be considered when estimating the effect of agglomeration on growth is the endogeneity from reverse causality. Indeed, it has been well documented that the relationship between the two is bidirectional (Martin 1999, Ottaviano 2001, Baldwin and Forslid 2000). To deal with reverse causality, the method of instrumental variables might be appropriate. It consists in finding a third set of variables *z* which has to be relevant and valid (Combes and Lafourcade 2012). Geological variables are commonly used to correct the endogeneity issue of agglomeration (Combes *et al.* 2008). The instrument that we use is altitude[17]. According to the difference-in-Sargan statistic[18], we cannot reject the null hypothesis that urbanization rate is exogenous (sample A: C-statistic=0.009, p-value=0.925; sample B: C-statistic=0.10, p-value=0.747). Then, we discard this estimation strategy.

3.2.1 Spatial data issues

When using spatial data, a general characteristic is the interaction between spatial units. In our case, there might be spatial dependence because one region's growth can affect neighbouring regions' growth. In the empirical literature, this issue has been considered (Ciccone and Hall 1996, Ciccone 2002, Crozet and Koenig 2008, Bosker 2007), however not systematically. We test the spatial dependence using the Cross Dependence (CD) test proposed by Pesaran (2004)[19] for panel data models and the test proposed by Moran (1948), the so-called Moran's I test[20]. To deal with the presence of spatial dependence, we estimate a model including a spatial lag of the dependent variable as follows:

$$\Delta y_{i,t+k}/y_{i,t} = \alpha + \psi \ln y_{i,t} + \gamma\, agglom_{i,t} + \rho \sum_{j=1}^{N} w_{ij} \Delta y_{i,t+k}/y_{i,t} + X_{i,t}\beta + \mu_i + \xi_t + \varepsilon_{i,t} \qquad (2)$$

where: ρ is the spatial dependence coefficient associated with the spatial lag of the dependent variable, w_{ij} are the elements of a spatial weight matrix that represents geographical relationships between regions and $\varepsilon_{i,t}$ is the error term.[21]

In our model, three specifications of the spatial weight matrix are tested: k=1 nearest neighbours-based matrix, distance weight matrix and Gabriel-method-based weight matrix. These weight matrix specifications are explained in more detail in Section 3.3.2. The methodology used is the Maximum Likelihood Estimation because it provides minimum variance unbiased estimators. Given that our database is not large, the computational problems that this method could cause are ruled out. A specific-to-general approach is used. We start with a non-spatial panel model and then we test whether the model needs to be extended with spatial interaction effects.

3.3 Results

3.3.1 Non-spatial panel models

In Table 1, we present[22] the fixed effects panel model estimations using two measures of agglomeration: urbanization in columns (1, 3) and population density in columns (2, 4). We show the results for both samples A and B. The standard errors of the coefficients are robust to heteroskedasticity. According to the Hausman test (bottom of Table 1), the assumption that non-observable individual effects are not correlated with explanatory variables does not hold true and fixed effects model is preferred.

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is to assume that μ_i is random where the individual effect is characterized as random. In order to choose between fixed effects model or random effects model, the Hausman test will be used. (For more details about the Hausman (1978) test, see Baltagi, 1995.

[17] We use the average altitude of the capital city in each region.

[18] Under the null hypothesis, the suspected variable can be treated as exogenous. The test statistic is distributed as chi-squared with degrees of freedom equal to the number of regressors tested.

[19] The Pesaran's CD test is based on average of pair-wise correlation coefficients of the OLS residuals from the individual regressions in the panel, and it is used to test for cross section dependence. Through the investigation of the small sample properties of the test, it is shown that the test is appropriate for small samples. Furthermore, the Pesaran's CD test does not require a priori specification of the spatial matrix.}

[20] The Moran's I is a global index of spatial correlation that indicates the degree of similarity between geographical units. The index ranges between -1 (dissimilar values are closer) and 1 (similar values are closer).

[21] In order to know whether this specification using the spatial lag of the dependent variable is appropriate, the spatial dependence after the regression has to be ruled out.

[22] Outlier observations are eliminated. They are Campeche (Mexico), Buenos Aires (Argentina), CABA (Argentina) and El Beni (Bolivia).

Table 1 - Non Spatial Panel models using sample A and sample B

	(1) Urb A	(2) Popd A	(3) Urb B	(4) Popd B
Urb	0.634 (2.883)***		1.067 (2.456)**	
Ln Population density		0.172* (1.912)		0.111 (0.882)
Initial GDPpc	-0.160 (-3.772)***	-0.149 (-3.457)***	-0.262 (-3.251)***	-0.219 (-2.542)**
yearcris09	-0.104 (-15.126)***	-0.111 (-13.720)***	-0.106 (-12.419)***	-0.105 (-11.938)***
yearcris01	-0.144 (-9.571)***	-0.142 (-10.155)***	-0.137 (-5.174)***	-0.145 (-6.045)***
Constant	1.014 (3.383)***	0.782 (2.511)**	1.654 (2.981)***	1.535 (3.032)***
N observations	486	486	258	258
N regions	162	162	86	86
Region-specific effects	Y	Y	Y	Y
F	133.0	136.0	110.1	98.52
p-value F	0.000	0.000	0.000	0.000
R2	0.563	0.560	0.599	0.584
Hausman test	28.99	38.67	29.77	25.08
p-value	0.000	0.000	0.000	0.000

Note: *t* statistics in parentheses *p<0.10, **p<0.05, ***p<0.01.

All estimations show a positive and significant effect of agglomeration on economic growth after controlling for region-specific effects and time-specific effects. Both proxies of agglomeration yield to similar results in terms of the coefficient sign; but the effect is not significant when using population density. One interpretation of this result might be that urbanization rate is a better measure of agglomeration because it ensures a structure with appropriate conditions to generate agglomeration externalities and in turn, economic growth.

The coefficient estimate of the GDP per capita at the initial year of each period shows the beta convergence conditional on the level of agglomeration. The speed of convergence[23] is about 6% per year when using urbanization and 5% when using population density. These results are larger compared to the Serra *et al.* (2006)'s estimates of convergence which range between 1% and 2%. They conditioned the convergence rate only with regional characteristics. Hence, regions reach their steady states much faster if the level of agglomeration is taken into consideration.

Finally, the assumption that economic growth outputs across regions are independent might not hold true because regions are very likely to be connected to each other, specially within countries. Then, we test the spatial dependence in the model using the Cross Dependence (CD) test proposed by Pesaran (2004) for panel data and the Moran's I test [24]. For the latter, we use three spatial matrices: 1 The *k=1*-nearest neighbours (W k1), 2 the neighbourhood based on Gabriel method (W g) and 3 the distance weight matrix (W d)[25]. The first matrix implies that each region has only one neighbour. The second matrix implies more neighbouring regions than the former. The third matrix relates all regions with each other according to the distance between them.

In Table 2, the CD Pesaran's test shows that outputs of regions are spatially correlated in both samples A and B. Likewise, the Moran's I reports global spatial correlation using any of the spatial matrices. We address this issue by estimating our specification (2) using spatial panel data techniques.

[23] The speed of convergence is calculated as: $s = -\ln(\psi + 1)/k$ where *k* is equal to 3 period in our case. (Bosker, 2007)

[24] The Moran's I statistic is computed as in Anselin (1995):

$$I = \frac{\sum_{i=1}^{N}\sum_{j=1}^{N} w_{ij}(y_i - \bar{y})(y_j - \bar{y})}{\frac{1}{N}\sum_{i=1}^{N}(y_i - \bar{y})^2 \sum_{i=1}^{N}\sum_{j=1}^{N} w_{ij}}$$

[25] Other spatial configurations are included in the analysis of spatial correlation between Latin American regions in Section 3.3.2.

Table 2 – Spatial dependence tests

Test	Sample A		Sample B	
	Statistic value	p-value	Statistic value	p-value
CD Pesaran test	15.025	0.0000	7.023	0.0000
Moran's I (W k1)	period1 = 0.422 period2 = 0.438 period3 = 0.437	0.0000 0.0000 0.0000	0.223 0.288 0.348	0.048 0.016 0.005
Moran's I (W g)	period1 = 0.43 period2 = 0.399 period3 = 0.439	0.0000 0.0000 0.0000	0.235 0.181 0.225	0.006 0.024 0.008
Moran's I (W d)	period1 = 0.149 period2 = 0.146 period3 = 0.168	0.0000 0.0000 0.0000	0.053 0.043 0.049	0.030 0.056 0.039

3.3.2. Spatial panel models

In the literature, only few studies analyse the spatial interdependence between Latin American countries. By examining the knowledge spillovers and their channels of diffusion in South America, Guevara and Autant-Bernard (2015) show that the level of productivity in one country generates indirect effects in other countries' productivity. They state that the spatial dependence is driven by both physical proximity and trade intensity between countries. Ramirez and Loboguerrero (2002) show that spatial dependence is significant in a worldwide regression. Notwithstanding, the results for Latin America show no significance of the spatial dependence term. Blanco (2011) focuses on the role of spatial interdependence in the Foreign Direct Investment in Latin America. Her results show that the spatial correlation is not significant.

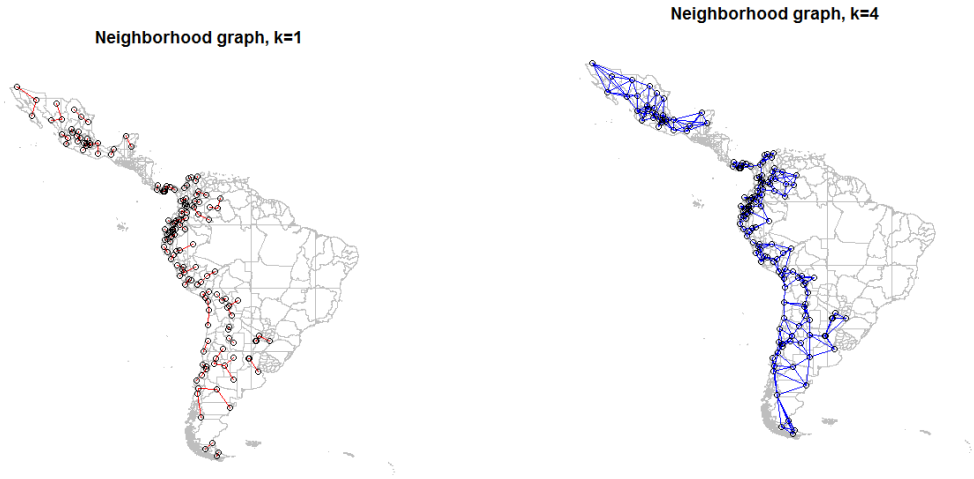
In our case, it is crucial to look at the intensity of spatial interconnections between Latin American countries because they could influence the effects of agglomeration on growth. To this end, two types of spatial configuration between Latin American regions are considered.

A. High interaction between countries implying international connections of their domestic regions. In this configuration, the link of country *x* and country *y* immediately implies relationships between domestic regions of both countries.
B. Low interaction between countries implying weak international connections of regions. In this configuration, the link between domestic regions in the same country is high. But the link of domestic regions of different countries is lower.

It is worth noting that pairs of regions of the same country tend to have a stronger connection than pairs of regions of different countries due to geographical proximity. These are the so-called border effects (McCallum, 1995). They are related to country-specific tariffs and differences between national currencies.

To construct the weight matrices[26], we use the coordinates of capitals of each region and eliminate islands (Galapagos-Ecuador and San Andres-Colombia). We apply the *k*-nearest neighbours' method and the Gabriel method[27]. We use the inverse of row standardized matrices as suggested by Anselin (1988). The *k*-nearest neighbours' criterion implies that region *i* is considered as neighbour of region *j* if their distance is equal, or less than equal, to the minimum possible distance that can be found between region *i* with all other regions. This definition ensures that each spatial unit has the same number *k* neighbours. For instance, allowing *k=1* implies that each region has one neighbour; allowing *k=4* implies that each region has four neighbours. The resulting graphs using such a methodology are shown in Figure 3.

[26] We use the software R to create the spatial weight matrices.
[27] This method was proposed by Gabriel and Sokal (1969).



(a) k = 1 (b) k = 4

Figure 3 - k-nearest neighbours configuration

In case A of high interaction, we use the spatial weight matrix setting *k* to the maximum. In sample *A*, there are 160 regions. Then, each region can have at most 159 neighbours. Thus, we set *k=159*. The elements w_{ij} of such a matrix represent the distance between region *i* and *j* where every region *i* is connected to all other regions $i \neq j$. This spatial weight matrix is noted as (W d).

In case B of low interaction, we use the nearest neighbour- based spatial weight matrix, *k=1*. It is noted as (W k1). We also define a spatial weight matrix to illustrate pure border effects by assuming that regions from different countries do not interact at all. To do so, the connections in (W d) of regions of country *x* with those of country *y*, $x \neq y$ are set to *0*. The resulting matrix (W beH) connects all domestic regions within countries but does not connect international regions. The high intensity of connections of domestic regions is represented by *H* in (W beH).

Using the Gabriel's method, we construct a spatial weight matrix noted as (W g). Such a matrix connects countries through their frontier regions. Thus, it also represents the case A of high interaction but to a lesser extent than the spatial matrix (W d). The connectivity graph is shown in Figure 4. We also use this method to construct another weight matrix of pure border effects. To do so, we proceed as in (W d). The resulting weight matrix (W beL) reflects less number of connections of domestic regions within countries than in (W beH). Low intensity of domestic connections is represented by *L* in (W beL).

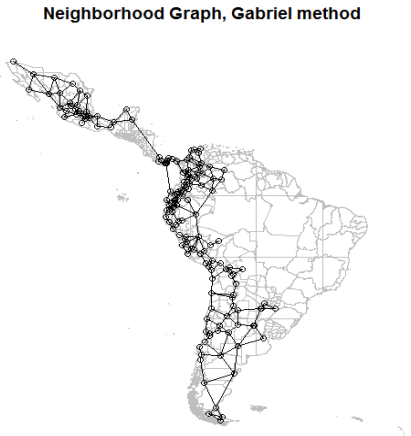


Figure 4 – Gabriel method graph

To sum up, spatial weight matrices reflecting high interaction are: (W d), interpreted as quasi-complete regional interaction; and (W g) interpreted as moderate regional interaction.

Spatial matrices reflecting low interaction are: (W k1), interpreted as the configuration of lowest regional interaction; (W beH), interpreted as pure border effects with high level of domestic connections; and (W beL) interpreted as pure border effects with moderate level of domestic connections. It is worth noting that all matrices illustrate the border effects definition because the intensity of connections decreases with distance between regions.

Before presenting the results, it is worth noting that the presence of the spatial autoregressive parameter in our model produces indirect effects that come from geographical proximity. Thus, the total effect of the changes in the explanatory variables has two components: the direct effect or local effect and the indirect effect or spatial effect. These effects come from the matrix of elasticities Ξ. In the case of the estimate coefficient of agglomeration, we have the following matrix.

$$\Xi_Y = \hat{\gamma}(I - \hat{\rho}W)^{-1} \quad (3)$$

The direct effect of agglomeration in region *i* on its economic growth is represented by the *i, i*th element from the diagonal of matrix Ξ. The indirect effect of agglomeration of region *j* on economic growth of region *i* is represented by the *i,j th* element of such a matrix.

Table 3 shows the results[28] using the aforementioned spatial weight matrices; in column (1), the distance matrix (W d) representing the configuration of high regional interaction, in column (2), the matrix based on the Gabriel method (W g) representing the moderate regional interaction, in column (3), the matrix based on k nearest neighbour with k=1 (W k1) representing the configuration of low regional interaction. The results regarding border effects with high intensity of intra-connection (W beH) are shown in column (a) and border effects with low intensity of intra-connection (W beL) in column (b). Both direct and indirect effects are presented.

Firstly, we observe that Latin American regions have a positive and highly significant effect of urbanization in their economic growth after controlling for spatial dependence. The coefficient estimate of the direct effect is stable across all spatial configurations. It is slightly lower than the coefficient estimate of the panel model (see Table 1). The reason could be that a part of the total effect is attributed to spatial interactions between regions.

The spatial effects of urbanization are significant. It indicates that urbanization in one region brings benefits for growth of its neighbours. It could be indirectly related to knowledge spillovers among regions. Urban conditions in one region would allow knowledge diffusion towards neighbouring urbanized regions thank to geographical proximity.

The spatial effect of urbanization decreases as the level of regional interaction is lower. Thus, the highest indirect effect of urbanization is observed when using the distance weight matrix (W d), and the lowest effect when using the k=1 nearest neighbours-based matrix (W k1). Regarding spatial configurations with border effects, the indirect effects of urbanization are larger in the framework of high intensity of internal connections (W beH) than in the framework of low intensity of internal connections. The more interconnected the regions, the higher the spatial growth effects of urbanization.

The total effect of the coefficient of convergence is close to the panel model's estimate. The contribution of indirect effects coming from geographical proximity between regions to convergence is small but significant. Besides, those spatial effects vary depending on the spatial configuration used. The proximity between regions matters for the process of convergence as stated by Serra *et al.* (2006).

The spatial autocorrelation coefficient is statistically positive and significant for all models. It assesses the extent to which one region's growth affects the economic growth of other regions. The degree of spatial autocorrelation increases with the level of connections that spatial weight matrices reflect. For instance, the value of ρ is high when using the distance weight matrix (W d), which exhibits a quasi-complete regional interaction and it is low when using the *k=1* nearest neighbour matrix (W k1), which exhibits low regional interaction between Latin American regions. We consider that the model using (W g) spatial weight matrix which links South America with Mexico is appropriate because in trade terms, Mexico is one of the ten largest export destination countries of South America accounting for 3% of total exports; and it is one of the ten largest import origin countries representing 3.8% in total imports (Guevara and Jarrin 2011).

[28] After including the spatial dimension in regressions, the residuals do not present spatial dependence in most of the models according to the Moran's I test shown in Appendix A.

Table 3 – SAR Model with Parsimonious specification - Database A

	(1)	(2)	(3)	(a)	(b)
	(W d)	(W g)	(W k1)	(W beH)	(W beL)
Direct effects Urb	0.598 (3.332)***	0.594 (3.274)***	0.641 (3.508)***	0.580 (3.224)***	0.572 (3.159)***
initial GDPpc	-0.167 (-5.779)***	-0.161 (-5.510)***	-0.165 (-5.621)***	-0.165 (-5.690)***	-0.159 (-5.486)***
yearcris01	-0.120 (-12.389)***	-0.124 (-13.035)***	-0.129 (-13.635)***	-0.121 (-12.761)***	-0.123 (-12.965)***
yearcris09	-0.0818 (-10.546)***	-0.0865 (-11.476)***	-0.0934 (12.656)***	-0.0763 (-9.521)***	-0.0845 (-11.200)***
Spatial P	0.403 (6.054)***	0.225 (5.797)***	0.134 (4.677)***	0.610 (6.478)***	0.245 (6.324)***
Variance σ_e^2	0.00173 (15.481)***	0.00172 (15.383)***	0.00176 (15.404)***	0.00171 (15.448)***	0.00169 (15.365)***
Indirect effects Urb	0.446 (2.573)**	0.166 (2.845)***	0.0975 (2.892)***	0.261 (2.708)***	0.162 (2.832)***
initial GDPpc	-0.125 (-3.256)***	-0.0448 (-3.989)***	-0.0251 (-3.817)***	-0.0741 (-3.693)***	-0.0451 (-4.145)***
Total effects Urb	1.043 (3.170)***	0.760 (3.262)***	0.738 (3.496)***	0.840 (3.181)***	0.734 (3.155)***
initial GDPpc	-0.292 (-4.935)***	-0.205 (-5.457)***	-0.190 (-5.591)***	-0.239 (-5.396)***	-0.204 (-5.450)***
N observations	480	480	480	480	480
N regions	160	160	160	160	160
Region-specific effects	Y	Y	Y	Y	Y
R2	0.585	0.584	0.581	0.587	0.585
Hausman test	16.40	16.67	17.88	17.74	17.45
p-value	0.00580	0.00516	0.00310	0.00330	0.00372

Note: t statistics in parentheses *p<0.10, **p<0.05, ***p<0.01

Regarding the analysis of border effects spatial configurations, interesting insights are drawn. By eliminating connections of regions from different countries and keeping the internal connections (W beH), the spatial correlation coefficient ρ is large, even larger than the coefficient estimate of (W d) where all regions are connected. It means that the interdependence between regions within one country is much higher than between regions of different countries. Similarly, the spatial autocorrelation coefficient of (W beL) is higher than that of (W g).[29] Based on these results, we confirm that border effects are significant in Latin America. The aspects that could explain this result are related to the diversity of national currencies across countries and the scarce infrastructure across frontiers.[30]

3.3.2. Spatial panel model, Williamson's hypothesis

Now, we turn to the analysis regarding the role of the level of development of regions in the agglomeration-growth relationship. Based on the literature (Williamson 1965, Henderson 2000, Davis and Henderson 2003, Brülhart and Sbergami 2009, Henderson 2003), we presume that the effect of urbanization on growth might be different between regions according to their level of development. Since transport and communication infrastructure is scarce at low levels of development, activities concentrate in the region that provides better conditions (Brülhart and Sbergami 2009). Conversely, at high levels of development, better transport connection would promote dispersion.

[29] Recall that (W beL) is based on the spatial configuration of (W g). For that reason, we compare the results between these two matrices.

[30] Recently, UNASUR has proposed an Initiative for the Integration of South America regarding infrastructure (IIRSA). The planning of such a project started in 2000 and its implementation in 2005. Hence, the outcomes of said initiative are not tangible yet. In this regard, one direction of future research is the assessment of the implementation of infrastructure projects proposed by IIRSA in modifying the strength of border effects. To this end, spatial weight matrices using actual flows of trade or road density would be appropriate instead of spatial weight matrices based on geographical distance used here.

In order to test the Williamson's hypothesis, the econometric strategy is to run various simulations[31] using sub-samples built out of cut-offs according to the level of development (the initial per capita GDP). Put differently, we look at the changes of the effect of urbanization on growth at different levels of development. Through this exercise, the threshold at which the effects of urbanization on growth reach their maximum could be identified. Such a threshold is US$5700 of per capita income.[32] Likewise, we attempt to determine the threshold at which urbanization effects become negative. According to simulations, negative effects seem to appear at US$10,500 of per capita income. This value is close to the threshold identified by Brülhart and Sbergami (2009) at US$10,000 in a worldwide analysis at the country level.[33]

Based on our threshold of US$5700, we split the sample A into more developed regions and less developed regions. The group of high-developed regions contain 29 regions from Mexico (total 31); 12 from Chile (total 13); 12 from Argentina (total 22), 8 from Colombia (total 33), 1 from Peru (total 24) and 2 from Panama (total 9). The rest of regions of those countries and Bolivian (total 8) and Ecuadorian (total 21) regions are classified into the group of less developed regions.[34]

Table 4 presents the results of Spatial Autoregressive models for each group of regions: low-developed regions (column 1) and high-developed regions (column 2).

The results confirm the Williamson's hypothesis claiming that positive agglomeration effects on economic growth increase up to a certain threshold of development level. The total effect of urbanization for low-developed regions is significant at low stages of development whereas at later stages, agglomeration does not impact on economic growth. Hence, most of Bolivian, Ecuadorian, Colombian, Peruvian and Panamanian regions enjoy increasing benefits of urbanization. Conversely, most of Mexican, Chilean and Argentinean regions face decreasing benefits of agglomeration, still positive but not significant.

The conditions of development might produce specific mechanisms that provoke such differences. One of those conditions could be the urbanization rate itself. At low income levels, the pace of urbanization is rapid (Henderson 2003). In our sample, low-developed regions record an average growth rate of urbanization of 5.8% between 2001 and 2007[35] whereas high-developed regions have a lower average growth rate of urbanization of 2.3% in the same period. The difference between those means is statistically significant (t statistic= 13.64, p-value=0.000).

We also analyse other variables that account for conditions of development of each country. Such variables are most likely to be part of fixed-specific effects in the models as they represent characteristics of development that are not assumed to abruptly change in a short period of time. According to our threshold, most of regions of Mexico, Chile and Argentina are classified in the group of high-developed regions of Latin America. In terms of education, Mexico and Chile stand as countries with the highest shares of working population with master's degree.[36] The countries with the highest ratios of research and development expenditure over GDP are Argentina (0.48%) and Mexico (0.43%) followed by Chile (0.43%) and Ecuador (0.39%). Regarding transportation infrastructure, Panama (34.6%), Mexico (32.8%) and Argentina (29.4%) record the highest percentages of road paved.[37] In short, Mexico, Chile and Argentina are commonly the countries with the best indicators in terms of development. The high values of those macroeconomic variables implicitly reflect the enormous development of their internal markets. A process of rapid agglomeration surely took place in those markets which, in turn, induced further agglomeration. The progress is such that one can reasonably ask whether the benefits of agglomeration might be reaching their limits. According to our results, most of regions of these countries face non-significant effects. Conversely, it seems that the other countries with low levels of development are in a certain stage in which

[31] An alternative econometric strategy would be to introduce an interaction term between urbanization and the level of development. However, such an interaction term implies high collinearity with urbanization rate and the estimates are no longer efficient. In order to avoid multicollinearity, the database is divided in sub-samples according to the initial per capita GDP of regions. Then, we run the regression using a sub-sample of regions that have an income level less/higher than a certain value and we look at the effect of urbanization for those regions.

[32] It is noteworthy that Henderson (2000) found that primacy generates negative effects on growth. The annual growth rate losses from excessive primacy increases until a level of income of US$4900.

[33] The results of simulations are shown in Table 7 of Appendix B.

[34] The total of regions corresponds to the regions of study without outliers.

[35] These statistics corresponds to sample A divided into groups of developed and developing regions.

[36] The indicators are 0.087\% for Mexico and 0.11\% for Chile in 2009. The information is obtained from the database of Network of Indicators of Science and Technology (RICYT acronym in spanish).}

[37] The information corresponds to 1999 and the source of the data is the World Development Indicators of the World Bank.}

their embryonary local infrastructure, markets, human capital and other development conditions promote an ongoing process of agglomeration which produces positive effects for growth.

Furthermore, there are indications that negative effects might emerge at higher levels of income than US$10,500. Notwithstanding, the negative effect of urbanization is weak and not significant. Therefore, Latin American regions do not yet face strong negative effects.

Table 4 – Spatial panel models for low-developed and high-developed regions

	(1) (W g) Low-dev	(2) (W g) High-dev
Direct effects: Urb	0.682 (2.462)**	0.350 (1.286)
initial GDPpc	-0.177 (-4.955)***	-0.102 (-3.034)***
yearcris01	-0.142 (-10.574)***	-0.0815 (-8.180)***
yearcris09	-0.0849 (-6.136)***	-0.0810 (-10.002)***
Spatial: P	0.235 (4.536)***	0.287 (6.074)***
Variance: σ_e^2	0.00214 (11.904)***	0.000766 (9.712)***
Indirect effects Urb	0.201 (2.359)**	0.143 (1.412)
initial GDPpc	-0.0513 (-3.124)***	-0.0406 (-2.407)**
Total effects: Urb	0.897 (2.845)***	0.504 (1.487)
initial GDPpc	-0.230 (-4.512)***	-0.145 (-2.687)***
N observations N regions Region-specific effects R2 Hausman test p-value	288 96 Y 0.552 12.69 0.0264	192 64 Y 0.753 7.583 0.181

Note: t statistics in parentheses *p<0.10, **p<0.05, ***p<0.01

3.3.3 Extended Spatial Panel Model

The following extended model includes a set of observable control variables, X_i, using sample B. To recall, sample B contains information on 85 regions[38] of Colombia, Ecuador and Mexico over the period 2001-2009.

In concordance with growth theory, we include the enrolment ratio in tertiary education, public investment and level of industrial specialization. The first variable measuring the mass of educated population could entail collinearity with urbanization since access to education would improve with urbanization. The willingness of families to invest in education would increase in urban areas where schools and universities facilities are located. Indeed, the correlation coefficient between education and urbanization is high and significant (0.6320). Thus, we might think that tertiary education encloses the effects of agglomeration that bears benefits for growth. In order to test this hypothesis, we conduct an estimation in two stages. In the first one, we regress education on the level of urbanization and in the second one, the resulting predicted values are introduced in the extended model.
In Table 5 the estimations with both variables urbanization and tertiary education are presented in column 1 and the estimation in two stages is presented in column 2.

[38] Sample B initially has 87 regions but 2 island regions (Galapagos from Ecuador and San Andres from Colombia) and 1 outlier region (Campeche from Mexico) are eliminated.

Table 5 – Spatial Autoregressive Extended Models

	(1)	(2)
	Extended (W g)	Extended (W g)
Direct effects: Urb	0.343 (1.272)	
y hat educ		0.667 (4.725)***
initial GDPpc	-0.375 (-7.065)***	-0.323 (-7.120)***
Inv_GDP	0.193 (3.368)**	0.216 (3.843)**
Tertiary_educ	0.506 (3.831)**	
IER	-0.0453 (-3.120)**	-0.0489 (-3.499)**
Spatial: ρ	0.304 (6.161)***	0.295 (5.918)***
Variance: σ_e^2	0.00116 (11.077)***	0.00119 (11.083)***
Indirect effects: Urb	0.139 (1.165)	
y_hat_educ		0.263 (3.241)**
initial GDPpc	-0.152 (-3.736)**	-0.127 (-3.833)**
inv_GDP	0.0771 (2.799)**	0.0842 (3.180)**
Tertiary_educ	0.205 (2.810)**	
IER	-0.0184 (-2.586)**	-0.0192 (-2.945)**
Total effects: Urb	0.482 (1.252)	
y_hat_educ		0.930 (4.568)***
initial GDPpc	-0.526 (-6.541)***	-0.450 (-6.617)***
inv_GDP	0.270 (3.412)**	0.300 (3.904)***
Tertiary_educ	0.711 (3.712)**	
IER	-0.0637 (-3.095)**	-0.0681 (-3.498)**
N observations N regions Region-specific effects Time-specific effects R2 Hausman test p-value	252 84 Y Y 0.692 26.78 0.000771	252 84 Y Y 0.691 20.01 0.00556

Note: t statistics in parentheses *p<0.10, **p<0.05, ***p<0.01

The urbanization rate is no longer significant after controlling for more variables and spatial autocorrelation (see column 1 of Table 5). By contrast, the second model shows that urbanization drives growth through education. This means that education constitutes a channel of agglomeration economies in these countries. The intuition is that urban areas host university facilities so population move there to invest in human capital. Thus, urbanization generates positive effects on education, which in turn, drives economic growth.

Moreover, the effects of educated labour force spill across regional borders. The mass of educated workers in one region impacts on its neighbours' growth. Those spatial effects represent the so-called knowledge spillovers.

The intuition regarding this positive growth effect of education on neighbouring regions is the following. When a new product, resulting from research and development investment, is created in one region, neighbouring regions would have access to it due to geographical proximity. Thus, the economic growth of neighbouring regions is positively affected.

The public investment has a positive impact on economic growth of regions through two main aspects: the improvement of life quality of population and the development of better transport and communications infrastructure. Public investment in basic services, such as education and health improves living conditions which allow working-age population to access to the labour market. Specialized workers would increase productivity and economic growth. Moreover, investment in communication and transportation infrastructure induces higher growth by increasing productivity. Regarding spatial effects of public investment, they are significant and account for almost 45% of the total effect. Given that the indivisible facilities funded by public investment cannot be used in more than one region, we presume that significant spatial effects come mainly from social investment such as education and health.

The concentration of production in few sectors seems to be detrimental for regional growth. The negative effect could be due to the nature of the sector of specialization. If the sector in which one region specializes does not entail potential technological progress, its effect on growth would be negligible. Besides, if the main sector is volatile, external shocks can significantly reduce its performance. In this sample, many regions specialize in the primary sector, manufacturing and public services and very few regions specialize in service industry. Then, the negative average effect may come from the first three sectors. We presume that the primary sector is very likely to bear potential negative effects due to its high volatility. In order to test this hypothesis, we distinguish the effect of different sectors. According to the results shown in the Appendix C, the regional share in primary sector brings negative effects for growth. By contrast, the effect of the specialization in Construction is statistically positive.

By bringing together the effects of human capital and public investment, the speed of convergence increases. Now, the regions of the three countries converge at rates of 16% when using skilled labour force and 9% when using urbanization. The factor that could explains such a change is the presence of spatial effects between regions. As mentioned before, a region that spills over its knowledge will affect its neighbours' growth. Likewise, there exist positive spatial effects of public investment. Thus, regions would converge more rapidly to their steady states.

Conclusion

The current study responds to the claim of extending the knowledge base about the effects of agglomeration for developing countries by looking at sub-national regions in Latin America. Therein, we have been able to distinguish the specific effect of regions within countries instead of attributing a general effect to a whole country.

One of the conclusions is the clear evidence that agglomeration is of significant importance for the economic growth of Latin American regions. However, the effects vary across regions. As Williamson (1965) argued, the key element of the differences is the level of development. According to our results, at low stages of development less than 5,700 dollars per capita income, the effects of urbanization are magnified.

Then, the effect of urbanization decreases until a threshold of 10,500 dollars per capita income, at which negative effects might appear. Notwithstanding, those negative effects are weak and not significant, suggesting that Latin American regions do not yet face strong negative effects.

Additionally, Latin American regions are spatially interdependent. The spatial effects have a large geographical scope. They are low in the immediate neighbourhood and high at a larger distance. The intensity of spatial effects is high within countries which points out the strong border effects in Latin America. Lastly, we could identify a channel of agglomeration economies: education. Urbanization impacts growth through human capital. Besides, such an effect diffuses across space. Likewise, public investment produces positive direct and indirect spatial effects. Those elements together make regions to converge more rapidly to their steady states.

Careful interpretation of the results is requested since the temporal dimension of the sample is rather small. In addition, the definition of agglomeration using urbanization does not take into account the industrial composition of regional economies. The consideration of such an element is a complementary topic to be investigated. Lastly, regional integration defined by geographical distance is limited. Although spatial weight matrices based on distance illustrate general spatial configurations, they cannot shed light on the evolution of spatial patterns. Using spatial weight matrices based on trade flows or road density would provide promising results regarding the evolution of economic integration. However, using such matrices entails potential endogeneity in the model. This issue could be addressed following Qu and Lee (2015) who provide an adequate method for estimating spatial models with endogenous spatial weight matrices.

References

[1] Anselin, L. 1988. *Spatial econometrics: Methods and models*. Kluwer, Dordrecht. ISBN: 978-90-481-8311-1 (Print) 978-94-015-7799-1 (Online)

[2] Anselin, L. 1995. Local indicators of spatial association-LISA. *Geographical Analysis,* 27(2): 93-115.

[3] Arbia, G. and Piras, G. 2005. Convergence in per-capita GDP across European regions using panel data models extended to spatial autocorrelation effects. *Technical report, Instituti di Studi e Analisi Economica*, Working paper 51. Available at: http://lipari.istat.it/digibib/Working_Papers/WP_Arbia_Piras_n51_2005.pdf

[4] Atienza, M. and Aroca, P. 2012. Es la concentración un problema para el crecimiento de América Latina? (In english: Is the concentration an issue for Latin American growth?). *Technical report, Universidad Católica del Norte Chile.*

[5] Baldwin, R. E. and Forslid, R. 2000. The core-periphery model and endogenous growth: Stabilizing and destabilizing integration. *Economica*, 67(267): 307-324.

[6] Baltagi, B. 1995. Econometric Analysis of Panel Data. *John Wiley Sons*, 1st Edition. Available at: https://jrvargas.files.wordpress.com/2011/01/wooldridge_j_2002_econometric_analysis_of_cross_section_and_panel_data.pdf

[7] Barro, J. R. and Sala-i Martin, X. 1992. Convergence. *Journal of Political Economy*, 100(2): 223-251.

[8] Blanco, L. 2011. The impact of spatial interdependence on FDI in Latin America. *Technical report, Pepperdine University, School of Public Policy Working Papers*, Paper 27. Available at: https://works.bepress.com/luisa_blanco/3/

[9] Bosker, M. 2007. Growth, agglomeration and convergence: A space-time analysis for European regions. *Spatial Economic Analysis,* 2(1): 91-110.

[10] Brülhart, M. and Sbergami, F. 2009. Agglomeration and growth: Cross-country evidence. *Journal of Urban Economics,* 65(1): 48-63.

[11] Chauvin, J. P., Glaeser, E., Tobio, K. 2014. *Urban economics in the US and India*. Harvard University. Available at: https://www.scribd.com/presentation/59978593/Prof-Ed-Glaeser-Urban-Economics-in-the-US-and-India

[12] Ciccone, A. 2002. Agglomeration effects in Europe. *European Economic Review*, 46(2): 213-227.

[13] Ciccone, A. and Hall, R. E. 1996. Productivity and the density of economic activity. *American Economic Review,* 86(1): 54-70.

[14] Combes, P. P., and Lafourcade, M. 2012. Revue de la littérature académique quantifiant les effets d'agglomeration sur la productivité et l'emploi. (In english: Literature review about agglomeration effects in productivity and employment.). *Report, Societe de Grand* Paris. Available at: http://www.parisschoolofeconomics.com/lafourcade-miren/SGP.pdf

[15] Combes, P. P., Duranton, G., Gobillon, L., and Roux, S. 2008. Estimating agglomeration economies with history, geology and worker effects. *Technical report, Serie des Documents de Travail du CREST,* Institut National de la Statistique et des Etudes Economiques. Available at: https://halshs.archives-ouvertes.fr/ halshs-00347451/document

[16] Crozet, M. and Koenig, P. 2008. Arbitrage cohesion-croissance: Une analyse des régions europennes (1980-2000) (In english: The cohesion vs growth trade-off: Evidence from EU regions). *Revue Économique,* 59(2): 331-340.

[17] Davis, J. C. and J. V. 2003. Evidence on the political economy of the urbanization process. *Journal of Urban Economics*, 53(1): 98-125.

[18] Duranton, G. 2007. From cities to productivity and growth in developing countries. *Working Paper tecipa-306,* University of Toronto, Department of Economics. Available at: https://www.economics.utoronto.ca/public/workingPapers/tecipa-306.pdf

[19] Gardiner, B., Martin, R., and Tyler, P. 2011. Does spatial agglomeration increase national growth? Some evidence from Europe. *Journal of Economic Geography*, 11(6): 979-1006.

[20] Guevara, C. and Autant-Bernard, C. 2015. Technological interdependence between South American countries: A spatial panel data growth model. *Revue d'Economie Régionale et Urbaine*, 2(1): 181-209.

[21] Guevara, C. and Jarrin, S. 2011. Modelo Gravitacional de Comercio para America del Sur. (In english: Gravity Model for South America). *Editorial Academica Espanola.*

[22] Henderson, J. V. 2000. The effects of urban concentration on economic growth. *Technical report, National Bureau of Economic Research Working Paper* 7503. DOI: 10.3386/w7503

[23] Henderson, V. 2003. Urbanization and economic development. *Annals of Economics and Finance*, 4(2): 275-341.

[24] Martin, P. and Ottaviano, G. 1999. Growing locations: Industry location in a model of endogenous growth. *European Economic Review*, 43: 281-302.

[25] Martin, P. and Ottaviano, G. I. P. 2001. Growth and agglomeration. *International Economic Review*, 42(4): 947-968.

[26] Massiris-Cabeza, A., Espinoza-Rico, M. A., Ramirez-Castaneda, T., Rincon-Avellaneda, P., and Sanabria-Artunduaga, T. 2012. *Procesos de ordenamiento en América Latina y Colombia* (In english: Planning processes in Latin America and Colombia). Universidad Nacional de Colombia. Available at: http://www.ihs.nl/fileadmin/ASSETS/ihs/IHS_Publication/IHS_SINPA_Paper/SINPA_22_Steinberg_F__2002__Strategic_Urban_Planning_in_Latin_America.pdf

[27] McCallum, J. 1995. National borders matter: Canada-U.S. regional trade patterns. *American Economic Association,* 85(3): 615-623.

[28] Moran, P. 1948. The interpretation of statistical maps. *Journal of the Royal Statistical Society, series B,* 37(1): 243-251.

[29] Pesaran, H. M. 2004. General diagnostic tests for cross section dependence in panels. *Technical report, University of Cambridge, Working Papers 0435.* Available at: http://repec.iza.org/dp1240.pdf

[30] Qu, X. and Lee, L.-f. 2015. Estimating a spatial autoregressive model with an endogenous spatial weight matrix. *Journal of Econometrics*, 184(1): 209-232.

[31] Ramírez, M. T. and Loboguerrero, A. M. 2002. Spatial dependence and economic growth: Evidence from a panel of countries. (May 2002). *Borradores de Economia Working Paper* No. 206. Available at SSRN: https://ssrn.com/abstract=311320 or http://dx.doi.org/10.2139/ssrn.311320

[32] Serra, M. I., Pazmino, M.-F., Lindow, G., Sutton, B., and Ramirez, G. 2006. Regional convergence in Latin America. Issues 2006-2125. *Issues 6-125 of IMF working paper*. *Volumes 6-125 of IMF working paper: International Monetary Fund.* Western Hemisphere Dept, 29 pages.

[33] Venables, A. J. 2005. Spatial disparities in developing countries: cities, regions and international trade. *Journal of Economy Geography*, 5(1): 3-21.

[34] Williamson, J. G. 1965. Regional inequality and the process of national development: A description of the patterns. *Economic Development & Cultural Change*, 3(4): 1-84.

APPENDICES

A. Spatial dependence test

In Table 6, we present the test of spatial dependence for estimations shown in section 3.3.2. According to the Moran's I test, the null hypothesis of no spatial correlation is not rejected for most of periods *t*. However, when using the spatial weight matrix (W k1), spatial correlation remains in periods p1 and p3. In the case of matrices (W g) and (W beL), spatial correlation has been considerably reduced. There is absence of spatial dependence in the residuals after the estimations using the distance weight matrix (W d).

Table 6 - Moran's I test for SAR models Sample A

Period	(W d) I (p-value)	(W k1) I (p-value)	(W g) I (p-value)	(W beH) I (p-value)	(W beL) I (p-value)
P1	-0.014 (0.337)	-0.195 (0.027)	-0.069 (0.183)	-0.023 (0.339)	-0.056 (0.248)
P2	-0.003 (0.421)	-0.078 (0.233)	-0.008 (0.488)	-0.007 (0.369)	-0.005 (0.492)
P3	-0.016 (0.303)	-0.266 (0.004)	-0.175 (0.008)	-0.051 (0.132)	-0.175 (0.011)

B. Definition of the threshold of development

In order to determine the threshold of the level of development at which the effects of urbanization are maximized, we run some simulations. We split the database by income levels. For instance, at an income level of US$4000, we keep regions under such a value and we estimate the model. We look at the parameter estimates and so on. According to the results, the maximum effects of urbanization on growth are reached between US$5500 and US$6000 of per capita income.

Table 7 shows the results when setting the parameter of the level of development lower than US$5000, lower than US$5700, lower than US$6000 and lower than US$7500. The maximum coefficient is reached at US$5700 of per capita income. Likewise, we identify the threshold at which the coefficient estimate of urbanization becomes negative.

Table 7 - Simulations, level of development threshold

Period	(1) < 5000	(2) < 5700	(3) < 6000	(4) < 7500	(5) > 10500
Urb	0.640 (2.132)*	0.683 (2.365)*	0.671 (2.366)*	0.648 (2.438)*	-0.0471 (-0.084)
Initial GDPpc	-0.170 (-3.091)**	-0.174 (-3.274)**	-0.171 (-3.261)**	-0.161 (-3.255)**	-0.280 (-5.715)***
Yearcris01	-0.176 (-7.804)***	-0.169 (-7.815)***	-0.169 (-7.849)***	-0.160 (-8.106)***	-0.107 (-4.409)**
Yearcris09	-0.0915 (-7.451)***	-0.0921 (-8.187)***	-0.0937 (-8.664)***	-0.0979 (-10.308)***	-0.1000 (-7.409)***
Constant	1.074 (2.960)**	1.087 (3.111)**	1.070 (3.124)**	1.001 (3.035)**	2.794 (3.674)**
N observations N regions F p-value F R2	270 90 41.31 (0.000) 0.529	288 96 45.24 (0.000) 0.521	300 100 48.47 (0.000) 0.522	354 118 73.82 (0.000) 0.525	75 25 94.00 (0.000) 0.776

Note: t statistics in parentheses *p<0.10, **p<0.05, ***p<0.01

C. Specialization in different sectors

In Table 5, the effect of industrial specialization is negative. In Table 8, we estimate the specific effect of each sector on growth. The results show that specialized regions in primary sector have a significant and negative effect on their growth. On the contrary, specialization in construction brings positive effects on growth which indicates that investment in capital is beneficial. The coefficient estimates of other sectors are not significant at 5% level.

Table 8 - The effect of specialization in different sectors

Period	(1) Primary	(2) Manufacturing	(3) Services	(4) Pub. Adm.	(5) Retail	(6) Elect, water	(7) Construction
Urb	0.584 (1.085)	0.628 (1.215)	0.635 (1.237)	0.589 (1.075)	0.538 (0.953)	0.654 (1.249)	0.790 (1.668)*
Primary	-0.0302 (-1.692)*						
Manufacturing		0.0200 (0.465)					
Services			-0.0200 (-0.299)				
Public Adm.				0.0244 (0.655)			
Retail					-0.0480 (-0.747)		
Elect., water supply						-0.0157 (-1.278)	
Construction							0.0499 (1.738)*
initial GDPpc	-0.469 (-3.459)**	-0.486 (-3.498)**	-0.487 (-3.446)**	-0.481 (-3.551)**	-0.490 (-3.482)**	-0.494 (-3.538)**	-0.485 (-3.832)**
inv GDP	0.409 (2.508)**	0.408 (2.438)**	0.412 (2.400)**	0.427 (2.305)**	0.443 (2.255)**	0.405 (2.424)**	0.398 (2.949)**
tertiary educ	0.716 (2.526)**	0.724 (2.525)**	0.721 (2.535)**	0.715 (2.542)**	0.732 (2.553)**	0.731 (2.546)**	0.683 (2.973)**
R2	0.689	0.683	0.683	0.684	0.685	0.686	0.705

Note: t statistics in parentheses *p<0.10, **p<0.05, ***p<0.01

Process Approach to Managing Real Investment Projects Focused on Import Substitution of Products

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Abstract

The goal of this research is to study possibilities to apply the process approach to managing real investment projects focused on import substitution of products in the organizations that use traditional methods of management within the structural and functional approach. In order to achieve the set goal, comparative analysis of basic aspects of structural and functional and process approach to managing enterprises was made. As a result, basic differences, advantages and disadvantages of every approach were defined. The article offers an algorithm of the process management of real investment projects focused on import substitution of products adapted for applying within the structural and functional approach to managing an enterprise. This algorithm is specifically peculiar of the opportunity to get advantages from using the process management of projects in organizations that by various reasons do not have an opportunity to implement the process approach to managing, as a whole. According to the research results, the possibility to manage real investment projects focused on import substitution of products with the use of elements of the process approach in organizations managed with the use of principles of structural and functional management was estimated. The efficiency of managing real investment projects was comprehensively estimated, including survey of 80 large and medium-sized agricultural organizations of the West Siberia that implement investment projects and are focused on a structural and functional system of management.

Key words: process approach, real investment projects, import substitution, business processes, management efficiency.

JEL Classification: E22, E27, E29.

1. Introduction

The process approach as a tool of management is rather wide-spread and is successfully applied in many sectors of economy. Issues related to managing projects is considered in works of many Russian and foreign authors. They cover various aspects of the problem, including the essence of the process approach to management and its principal differences from a traditional structural and functional approach, the use of the process approach in managing investment projects and real investment projects, estimation of the efficiency of projects management, management of separate characteristics of projects, etc.

The essence of the process approach to managing and its comparison with other approaches are reflected in the works of Bushuev (2005), Golovkova and Shushliapina (2016), Mazura, Shapiro, and Olderroge (2003), Khamidova (2008) and Rudakov (2012) *et al.,* devoted their works to applying the process approach in managing innovational projects and real investment projects. Issues related to estimating the efficiency of projects management are considered in the works of Lapygin (2011) and Pigalov (2011).

In their works Melenevskaya and Dziuba (2015), Nardin, Pomogaev and Nardina (2015), Petuhovskiy, Stukach, Kolychev, Levkin, Pomogaev, *et al* (2015) analyze issues related to managing separate characteristics of projects, including those focused on import substitution of products including a financial component, personnel, risks and value of projects.

In spite of a considerable number of works devoted to the problem of applying the process approach in managing real investment projects and an increase in the interest of the Russian management to the tools of the

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process approach when implementing investment projects, enterprises of medium-sized and small business in Russia are still focused mainly on structural and functional management of projects. In particular, it is also stipulated by the fact that in order to successfully apply the process approach to managing real investment projects, it is necessary for the organizations that implement investment projects to be managed by using the process approach and its elements. When implementing investment projects whose products are focused on internal markets, the applied management approaches do not play a significant role. The main thing is for the results of the project implementation to comply with the investors' expectations. If the products of the investment project are supposed to be exported or used as import substitution on the internal market, issues related to the efficiency of projects management become extremely actual, because the process approach to management allows to reveal internal reserves, and to involve them in the economic turnover for increasing the efficiency of the organization activity (Nardin, Pomogaev, and Nardina 2015).

The goal of this research is to study possibilities to apply the process approach to managing real investment projects focused on import substitution of products in the organizations that use traditional methods of management within the structural and functional approach. The necessity to make researches in this area is stipulated by the fact that applying elements of the process approach, when implementing real investment projects focused on import substitution of products, considerably increases the quality and efficiency of managing projects. Besides, it is fundamentally important when the strategic investor takes a decision about entering the project. In addition, revealing internal reserves of the organization and involving them in the economy turnover are among additional factors of increasing the competitiveness of the products meant for substituting foreign analogues. Herewith, in the practice of the Russian and foreign management there are no developed tools that allow to combine a structural and functional system of enterprise management and process management of the investment projects implemented at the enterprise.

The achievement of the set goal assumes solving of the following tasks:

- To define key requirements to the methodology of the process management of real investment projects focused on import substitution of products in the organizations that apply a structural and functional approach to management,
- To develop algorithms to manage real investment projects focused on import substitution of products with the use of elements of the process approach, and
- To estimate the efficiency of using the offered algorithms as compared to the traditional approaches to managing real investment projects.

2. Methodology

In order to achieve the set goal, a comparative analysis of basic aspects of structural and functional and process approach to managing enterprises was made. As a result, basic differences, advantages and disadvantages of every approach were defined. According to the results of the conducted analysis, the key functions of management were stipulated. Their fulfillment as applied to real investment projects focused on import substitution of products with the use of tools of the process approach will contribute to an increase in the efficiency of the projects implementation.

Then an algorithm of the process management of real investment projects focused on import substitution of products is adapted for applying within the structural and functional approach to managing an enterprise. This algorithm is specifically peculiar of the opportunity to get advantages from using the process management of projects in organizations that by various reasons do not have an opportunity to implement the process approach to managing, as a whole.

In conclusion, the possibility to manage real investment projects focused on import substitution of products with the use of elements of the process approach in organizations managed with the use of principles of structural and functional management was estimated. The efficiency of managing real investment projects was comprehensively estimated, including survey of 80 large and medium-sized agricultural organizations of the West Siberia that implement investment projects and are focused on structural and functional system of management.

3. Results

3.1 Comparative analysis of structural and functional and process approach to management

The essence of the structural and functional approach to management lies in distinguishing separate structural subdivisions in the organization and assigning specific functions to them. As a result, every subdivision fulfills specific functions, and the aggregate of functions of all subdivisions of the organization makes up the general functions of the enterprise (Drozdova and Vorobyov 2015). The process approach to management assumes the

representation of the enterprise as an aggregate of the business processes implemented in it, but not separate structural subdivisions (Golovkova and Shushliapina 2016).

Table 1 shows a comparative analysis of the specified approaches to management.

Table 1 - Comparative analysis of structural and functional and process approaches to management

Parameter to compare	Structural and functional approach	Process approach
Increase in the efficiency of using resources within the whole enterprise but not separate structural subdivisions	-	+
Non-doubling of management functions	-	+
Areas of responsibility accurately assigned for separate performers, non-availability of indistinct areas of responsibility	-	+
Absence of problems related to defining the contribution of separate employees as the result of the enterprise activity	-	+
Accurately established vertical of decisions taking	+	-
Relatively low expenditures when implementing and improving the management system	+	-

The results of the conducted analysis showed that both management approaches had their advantages and disadvantages. Structural and functional approach is easier for understanding and implementing in organizations. Its implementation does not require additional special knowledge in the area of management. Savvy specialists can easily implement this approach to management at any enterprise. Herewith, the larger the enterprise is, the more obvious disadvantages peculiar of this approach to management become. That is exactly why other approaches to management, including the process approach, started occurring and developing as economic relations developed and the effect of the scale occurred in the economy.

The use of the process approach is the most efficient at large and medium-sized enterprises whose scales of activity decrease the efficiency of taking decisions within the structural and functional approach. Obvious advantages of the process approach include the absence of the boundary areas of responsibility when several subdivisions or employees respond for the same works; increase in the efficiency of using resources within the whole enterprise but not a separate division, and a number of other advantages.

Thus, it is reasonable to implement the process management in large organizations whose scales of activity considerably decrease the efficiency of taking management decisions within the structural and functional system of management. As applied to real investment projects focused on import substitution of products, efficient use of the process approach is also stipulated by the scales of the project: the higher the number of the project members is, the more difficult their functions are, and the more positive effect will be achieved when applying elements of the process management. Besides, the competent use of the process approach will allow to considerably increase the efficiency of using resources within the operational activity on the project. It will act as an additional factor of increasing the competitiveness of the project product.

3.2. Algorithm of process management of investment project of the real investing in organizations with a structural and functional system of management

Classical approach to managing an enterprise (Drozdova and Vorobyov 2015) assumes the fulfillment of the following functions: planning, organization, regulation, and control. The fulfillment of the above functions within the process approach as applied to the management of real investment projects focused on import substitution of products assumes the representation of the investment of the project as an aggregate of business processes. Herewith, hereinafter a business process is interpreted as an aggregate of the interrelated organizational and management measures. When taking them, the managed transformation of resources takes place in order to obtain the target result. Depending on the specificity of the organization activity and specificity of the implemented investment project, the set of business processes may differ. However, all of them are conditionally divided into two groups: basic and secondary.

Within implementing real investment projects focused of import substitution of products, the basic business processes are those that, after their implementation, result in a ready product or generated funds. Additional business processes are focused on providing smooth functioning of business processes. However, it does not mean that when implementing an investment project, they are less important as compared to the basic ones. In the organizations that implement a structural and functional approach to management, the process fulfillment of basic functions of management within implementing real investment projects focused on import substitution of products may look as follows.

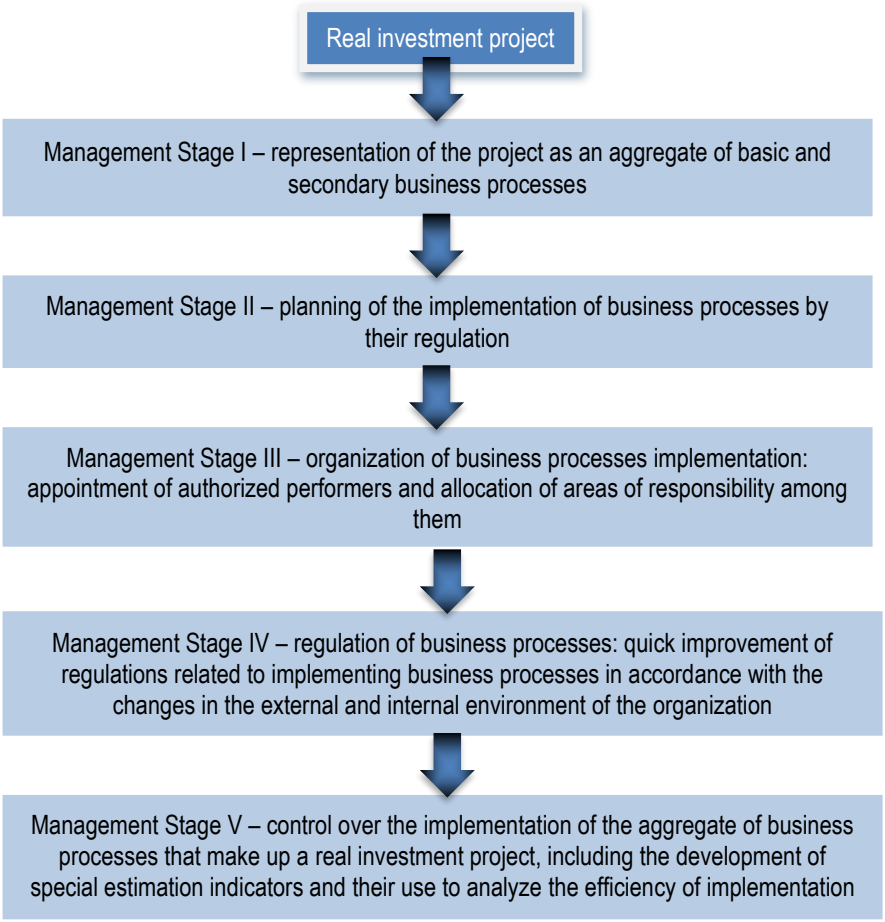
Planning of the implementation of any business process within managing the real investment project must start with its regulation*, i.e.* defining the succession of operations to be performed for achieving the final goal of the process. The more accurately the business process is regulated, the higher is the possibility to obtain the target results when implementing it. Consequently, the possibility to successfully implement the investment project as a whole increase.

The organization of performing the business process assumes defining its members and allocation of areas of responsibility among them. In this case the use of the entity subdivisions and their functions, while implementing a real investment project, may bring the problems peculiar of managing the organization within the structural and functional approach: doubling of management functions, "indistinct" areas of responsibility, decrease in the efficiency of using resources within operational activity, etc. That is why the process approach of the real investment project assumes the appointment of the chief manager for every distinguished business process and accurate list of performers with the allocation of areas of responsibility.

The regulation of business processes within implementing real investment projects assumes specific impacts when implementing them. They are focused on specifying the performed operations, correction of a set of operations included in business processes in order to increase their efficiency and achieve the target result. The regulation is carried out by periodical re-consideration of the approved regulations of the implementation of business processes. Especially it is urgent for the investment projects focused on import substitution of products because in addition to the impact of internal factors these projects undergo a considerable impact of external economic and external political factors.

Control over the implementation of business projects and analysis of their efficiency must be performed with the use of the aggregate of the estimation indicators. They allow to correlate the target and the obtained intermediary and the final results. Herewith, it is necessary to refuse from the tools of internal estimation of efficiency accepted in the organization, because within the structural and functional approach these tools are focused mainly on the estimation in the context of separate structural subdivisions. The use of traditional tools of estimating the activity as applied to business process performed within implementing investment projects can give a corrupted result because these business processes will be simultaneously implemented by several structural subdivisions. As a result, the subdivisions activity will be estimated, and not the estimation of the efficiency of implementing of separate business processes and their aggregate.

Figure 1 demonstrates the offered algorithm of managing business processes within implementing investment projects in the organizations that use a structural and functional system of management.



Note: the figure is made according to the results of the authors research

Figure 1 - Algorithm of managing business processes within implementing investment projects in organizations applying structural and functional system of management

3.3. Estimation of the possibility to implement the offered algorithm of managing real investment projects

In order to estimate the possibility to perform the process management of real investment projects in the organizations with the structural and functional system of management, the authors surveyed 80 large and medium-sized agricultural organizations of the West Siberia. The goal of the survey was to define potential possibilities of the efficient use of the process approach to managing investment projects focused on import substitution of products. Within the survey, respondents were offered to answer a number of questions that characterize various stages of the process management of projects in accordance with Figure 1. The results of the survey allow to make the following conclusions:

- above 40% of the respondents are not ready to implement business processes because in organizations even within the structural and functional approach to management there are no regulatory documents for separate operations performed by structural subdivisions. Consequently, if the operation is walk-through, passes through several structural subdivisions, and is a basic or secondary business process, all the more such operation is non-regulated
- above 50% of the respondents periodically face the problem of assigning areas of responsibility of separate subdivisions and performers within implementing various operations even within the structural and functional management. Before implementing elements of the process approach to management, such organizations must accurately allocate areas of responsibility within and between subdivisions. On the contrary, this problem will considerably decrease the efficiency of the investment project implementation
- about 60% of the surveyed organizations specified the problem related to regulating the performed operations. It ambiguously points to certain problems in the management system. The lack of accurate

regulation of the performed operations within the implementation of investment projects will have a negative impact on their efficiency

- above 70% of the respondents have difficulties with estimating the functions fulfilled by subdivisions and separate employees within the structural and functional approach to management.

It means that the implementation of real investment projects by such organizations will inevitably cause the corrupted estimation of the implemented business processes if the system of estimation indicators is not reconsidered and adapted.

Thus, approximately 30% of the surveyed organizations have an opportunity to apply the process approach to managing real investment projects. The rest 70% of organizations must perform considerable preparation works within the implementation of elements of the process management of investment projects.

4. Discussion

The obtained results allow to estimate the reasonability of applying the process approach to managing real investment projects in organizations which implement the structural and functional approach to management. Herewith, a number of issues remain open, including the efficiency of applying the process approach to management for separate organizations and reasonability of its use within managing separate real investment projects. When discussing these issues, it is necessary to mean the following.

In the practice of management there are several approaches to managing organizations, including traditional – structural and functional, situational, project, and process approach, as well as their numerous modifications. The availability of such diversity of approaches to management shows their feasibility and specific advantages over the rest. On the contrary, we would face the situation when one approach which is the most efficient dominates in management. That is why it is necessary to take the decision about the selection of an approach to managing the organization or separate investment projects prudently by analyzing all advantages and disadvantages of various management tools.

The key advantage of the process approach is an accurate definition of business processes and distinguishing areas of responsibility among performers. As a result, doubling management impacts are excluded. It inevitably causes the economy of organizational, financial, and material and technical resources used within the implementation of business processes. The main disadvantage of this approach includes the complexity to implement it in the existing system of management, because it requires cardinal re-consideration of functions, powers and status of the organization employees. Such transformations inevitably cause the tension within the team and at the first stage it can have a negative impact on the results of the organization activity. However, the negative impact has a temporary nature and is entirely compensated by the increase in the efficiency of resources use. Herewith, the larger the enterprise is, the more apprehensible positive effect from the performed transformations is. Economic efficiency of the process approach implementation in the organization can be defined before the direct beginning of transformations. The essence of this method is in the following: at the first stage the invited specialist makes express analysis of the current system of management and reveals internal reserves of the organization that cannot be involved in the economic turnover within the existing system of management. Then approximate amount of expenditures for implementing the process approach to management is defined. These expenditures are correlated with the positive effects that will be obtained by the organization when transferring to the process management. If expenditures are entirely covered by the obtained positive effect, the organization management must consider the possibility of implementing elements of the process approach in the current system of management.

Conclusion

The conducted researches showed that in separate cases the process management of real investment projects could considerably increase the efficiency of their implementation. The algorithm of process management offered by the authors allows to implement elements of the process approach as applied to separate investment projects in organizations with structural and functional system of management. Herewith, it was also revealed that far from all enterprises that implemented investment projects were ready to implement elements of the process approach to management. That is why in order to efficiently apply the offered algorithm, it is necessary to prior reveal how the organization that implements the investment project is ready to implement separate elements of the process approach.

Solving of this issue requires the development of the methodology that would allow to define the current level of the business processes management in the organization. The methodology must allow to make analysis in any organization even if in the process of its management the methodology of the process approach is not applied.

That is why the methodology must be universal and understandable even for specialists who are unfamiliar with the process management. Besides, the analysis of efficiency of managing processes in organizations is an analysis of the internal environment. The information about it is referred either as to the "restricted" category or a commercial secret. The methodology must take into account this peculiarity and allow to obtain true results in respect of all restrictions.

It is reasonable to conduct further researches within applying the process approach to managing real investment projects in this area.

References

[1] Agureev, I.E., and Bogdanov, S.G. 2013. Innovatsionny menedgement i upravlenie innovatsionnymi proektami [Innovational Management and Investment Projects Management]. *Modern Problems of Economic and Social Development*, 9: 136-137.

[2] Bunkovskiy, D.V. 2014. Protsessny podhod v upravlenii investitsionnymi proektami [Process Approach in Managing Investment Projects]. *Actual Problems of Law, Economy and Management*, 10: 18-21.

[3] Bushuev, S.D. 2005. Razvitie system znaniy i tehnologiy upravleniya proektami [Development of Knowledge Systems and Projects Management Technologies]. *Projects and Programs Management*, 2: 31-43.

[4] Danchenko, E.B. 2011. Strategicheskoy upravlenie biznesom cherez prizmu upravleniya innovatsionnymi proektami i programmami [Strategic Management of Business Through Managing Innovational Projects and Programs]. *Eastern-European Bulletin of Leading Technologies*, 1(6) (49): 31-33

[5] Demidenko, M.A. 2012. Model upravleniya innovatsionnym proektom v kontekste obshchey sistemy upravleniya predpriyatiem [Model of Managing Innovational Project in Context of General System of Enterprise Management]. *Bulletin of the Rostov State Construction University*, 16: 153-154.

[6] Drozdova, E.A., and Vorobyov, A.F. 2015. Evolutsiya protsessnogo i funktsionalnogo podhodov kupravleniyu, preimushchestva ih kompleksnogo ispolzovaniya dlia biznesa [Evolution of Process and Functional Approaches to Management, Advantages of their Comprehensive Use for Business]. *APRIORI: Humanities*, 4: 1-15.

[7] Golovkova, A.S., and Shushliapina, G.G. 2016. Protsessny podhod k upravleniyu deyatelnostyu predpriyatiya [Process Approach to Managing Enterprise Activity]. *Bulletin of the Belgorod University of Cooperation, Economy and Law,* 1(57): 177-186.

[8] Khamidova, V.M. 2008. Soderzhanie protsessno-orientirovannogo podhoda k upravleniyu organizatsiey [Content of the Process-Oriented Approach to managing Organization]. *Bulletin of the Astrakhan State Technical University*, 4: 70-74.

[9] Lapygin, Yu.N. 2011. Otsenka effektivnosti proektnogo upravleniya [Estimation of Project Management Efficiency*]. Economic Analysis: Theory and Practice*, 15: 50–53.

[10] Mazur, I.I., Shapiro, V.D., and Olderroge, N.G. 2003. *Upravlenie proektami* [Projects Management]. Moscow: Ekonomika, 245.

[11] Melenevskaya, Ya.V., and Dziuba, T.V. 2015. *Model vzaimosviazi protsessov upravleniya znaniyami, upravleniya riskami i upravleniya tsennostiyu v proektah* [Model of the Interrelation of Processes Related to Knowledge Management, Risks Management and Management of Value in Projects]. Fundamental and Applied Sciences Today in the Proceedings of V International Conference, 30-31 March 2015, In North Charleston, USA.

[12] Nardin, D.S., Pomogaev, V.M., and Nardina, S.A. 2015. Prospects for Import Substitution of the Equipment in Forming Machine Utilization Systems in the Agriculture of Siberian Federal District. *International Journal of Economics and Financial Issues*, 5: 320-325.

[13] Petukhovskiy, S.L., Stukach, V.F., Kolychev, N.M., Levkin, G.G., Pomogaev, V.M., Nardin, D.S., and Semchenko, V.V. 2013. Harakteristika logisticheskoy infrastruktury agrarnogo sektora ekonomiki Omskoy oblasti [Characteristics of the Logistic Infrastructure of the Agrarian Sector of Economy of the Omsk Region]. *Bulletin of the HR Policy, Agrarian Education and Innovations*, 10-12: 63-72.

[14] Pigalov, V. 2011. Sekrety uspeshnogo upravleniya proektnoy komandoy [Secrets of Successful Management of Project Team]. *BOSS: Business, Organization, Strategy, Systems*, 7: 64–65.

[15] Rudakov, A.A. 2012. Sravnitelny analiz traditsionnoy metodologii proektnogo upravleniya i gibkogo upravleniya innovatsionnymi proektami [Comparative Analysis of Traditional Methodology of Project Management and Flexible Management of Investment Projects]. *Economy and Entrepreneurship*, 6(29): 292-294.

[16] Sharova, A.A. 2011. Primenenie protsessno-orientirovannogo podhoda i sistemy sbalansirovannyh pokazateley dlia realizatsii kompleksnoy sistemy risk menedgementa na predpriyatii [Applying Process-focused Approach and System of Balanced Indicators to Implement Comprehensive Risk-Management System at Enterprise]. *Economy in Production*, 2: 67-73.

[17] Shumakova, O.V., Kryukova, O.N. 2016. Methodological Aspects of Forming the Vegetable Micro-cluster, and its Influence on Sustainability of the Industry. *Journal of Internet Banking and Commerce*, 21: 2-19.

[18] Shumakova, O.V., Blinov, O.A., Khrabrykh, S.L., Mozzherina, T.G., and Kryukova, O.N. 2016. Disclosure of Assets of the Agricultural Enterprises in the Financial Reporting under International Financial Reporting Standards. *International Journal of Economics and Financial Issues*, 6: 172-178.

[19] Shumakova, O.V., O.V. Kosenchuk, and Blinov, O.A. 2015. Resource Personnel Center as an Effective Element of Agrocluster. *Actual Problems of Economics*, 11: 305-313.

[20] Simonenko, N.N. 2014. Uslugi po upravleniyu innovatsionnym proektom [Services on Managing Innovational Project]. *Fundamental Researches*, 6-5: 1014-1017.

[21] Slushkina, Yu.Yu. 2010. Protsessny podhod k razrabotke investitsionnyh resheniy v sootvetstvii so standartom PMI [Process Approach to Developing Investment Solutions in Accordance with PMI Standard]. *Problems of Modern Economy,* 4: 135-139.

[22] Sologub, E.Yu. 2013. Opredelenie optimalnogo metoda realizatsii proekta po vnedreniyu protsessnogo podhoda i sovershenstvovaniyu protsessov [Defining Optimal Method of Realizing Project on Implementing Process Approach and Improvement of Processes]. *Production Organizer*, 3(58): 38-42.

Estimation Threshold Inflation in Indonesia

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Abstract:

The purpose of this paper is to re-examination about relationship between inflation and economic growth in Indonesia. This paper is based on annual panel-data set including 30 provinces in Indonesia for period 2011-2015. The results of this study indicate that there is a non-linear relationship between inflation and economic growth because there is a structural break point in that relationship. PCSE SUR is used to analyze threshold inflation level in Indonesia. Inflation rate which under the threshold of 4.64% is still a positive influence on economic growth. Meanwhile, the inflation rate above the inflation threshold, will be a negative influence. This result as same as result with using white cross-section coefficient covariance robust with cross-section weight, just different at standard error. Inflation targeting which monetary policy by Bank of Indonesia is below threshold inflation since 2012. This policy is good news for keep economic growth positively increase but Indonesia must take fast decision for monetary policy if inflation is above threshold inflation level.

Keywords: inflation, growth, inflation targeting framework, threshold level of inflation.

JEL Classification: E31, O40, E58, C13.

1. Introduction

The high-persistent economic growth is the main condition necessity for the sustainability of economic development and improve welfare. Mainstream of economist and policy maker think to create the high-persistent economic growth with stable inflation rate. Inflation is needed to stimulate economic growth, but too high inflation is bad to economic growth. The relationship between inflation and growth is very interesting to be examined because it is still a debate in economist, especially about the existence of inflation threshold. Inflation threshold in this paper is defined as the rate of inflation which still has positive impact on economic growth. Indonesia is one of developing country whose orientate economic development to pursuit of high growth. Thus, Indonesia should know the inflation rate must be maintained to pursue economic growth. Inflation threshold can be used as a reference for the inflation rate should be maintained.

Furthermore, inflation target in Indonesia which called as Inflation Targeting Framework (ITF) by the central Bank of Indonesia is an interesting discussion. Inflation target which does not match with inflation threshold would be a harmful condition for economic growth because it can make inflation is too far from threshold. Therefore, the conformity between the inflation target and inflation threshold in Indonesia is important to investigate.

2. Literature review: Growth and inflation

The relationship of economic growth and inflation is still debated in the scientific literature. Moreover, some economic theory also gives a different opinion about the relationship between inflation and economic growth. Such as in Classical and Endogenous Growth theory which does not specifically describe relationship of both but it implicitly indicates a negative relationship. Keynesian theory using AS-AD framework stated that there is no permanent trade-off between inflation and economic growth, which means that inflation could impact positively or negatively on output or economic growth. Monetarist found there is no direct relationship of both or there is no relationship between inflation and economic growth (neutral). In addition, the theory of Neo-Classical and Neo-Keynesians concluded that the relationship of inflation and economic growth cannot be explained with certainly because it can affect positively, negatively, or neutral, see Gokal and Hanif (2004), Than (2015).

Generally, previous studies about inflation and economic growth can be classified into two, linear model and non-linear model. The studies that using linear models provide varying results. Researchers who investigate about relation between inflation en economic growth found positive relationship (*e.g.,* Lucas 1973, Malik and Chowdhury 2001), neutral (Dorrance 1963, Cameron, Hum, and Simpson 1996) and negative (De Gregorio 1993, Bruno and Easterly 1998, Gokal and Hanif 2004, Barro 2013, Madurapperuma 2016).

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Research using non-linear relationship model show that there is structural break point in the relationship between inflation and economic growth. In a non-linear relationship model, the direction of the relationship between inflation and economic growth may change depend on inflation rate. First research that stated there is a non-linear relationship between inflation and economic growth are Fischer (1993) and Sarel (1996). They found structural break point. After that, other researchers start to explore this study with estimate the value of the structural break point. The term structural break point known as inflation threshold. The study, among others Khan and Senhadji (2001) found threshold inflation for developed country is 1-2% and developing country is 11-12%. Espinoza, Prasad, Leon (2010) found for all group country (except for advance countries) is 10%. Kremer, Bick, and Nautz (2013) found 2% for industrialize countries and 17% for non-industrialize countries. Vinayagathasan (2013) found 5.43% for 32 Asian countries. Baglan and Yoldasz (2014) found 12% threshold inflation for developing countries. Then, Ayyoub (2016) found 13.48%, 14.48%, 15.37%, and 40% for aggregate GDP, industrial, services and agriculture sectors respectively.

The study included Indonesia as an observation by Khan and Senhadji (2001), Espinoza, Prasad, and Leon (2010) found that as a developing country, Indonesia has a level of threshold inflation above 10%. Baglan, and Yoldasz (2014) found 12% threshold inflation for developing countries. In this study, the hypothesis is non-linear relationship between inflation and economic growth in Indonesia. From these study, Khan and Senhadji (2001), Espinoza, Prasad, and Leon (2010), Baglan and Yoldasz (2014), we found that as developing country Indonesia have threshold inflation above 10%, but Thanh (2015) found threshold level for developing countries in Asia region lower than those for other developing countries. Thanh (2015) stated threshold inflation for ASEAN-5 (include Indonesia) is 7.84%. Vinayagathasan (2013) also found threshold inflation for Asian countries is 5.43% where Indonesia include as observation. From these study is suspected Indonesia level threshold inflation may be lower again with current economic condition tend to be stable and low inflation policy.

Furthermore, there are four studies that examine relationship between inflation and economic growth in Indonesia. Chowdhury and Siregar (2004) using the quadratic equation and find the threshold value of inflation in Indonesia at 20.50%. The interpretation is inflation positive effect on economic growth when its value is below 20% and will have a negative impact if the value exceeds 20%. While the results of the estimation using threshold vector autoregression (TVAR) conducted by Chowdhury and Ham (2009) concluded threshold inflation in Indonesia is between on 8.50 to 11%. Widaryoko (2013) using a model of Hansen in 2000 found that inflation threshold in Indonesia at 9.53%. Winarno (2014) uses a dynamic panel threshold models found inflation threshold value exists for Indonesia and the estimated threshold regression model shows the threshold value is 4.62%. Different level threshold inflation may have caused by the range data observed, because in 1970-1997 Indonesia was not applied low inflation policies and after 1999 Indonesia started using low inflation policy.

The Opinions by Sepehri and Moshiri (2004), Kremer, Bick and Nautz (2013) stated that the study of inflation and economic growth should be the focus in the country, because the economic structure of each country is different. In addition, there are studies examining the same country but get different results for different time period. That is likely due to economic structure of the country has changed over time. Therefore, this paper will use different method and up-to-date data for estimate threshold inflation in Indonesia in newest condition.

3. Methodology

Model is used for estimate inflation threshold in this paper is model developed by Mubarik (2005) with modified. Modification of the model makes estimation inflation threshold can be using panel dataset 30 provinces in Indonesia for period 2011-2015. Three variables such as economic growth, inflation, and population are used in this model with the addition of a dummy variable for inflation threshold value.

Estimated inflation threshold in Indonesia is determined by the following model:

$$GROWTH_{it} = \beta_0 + \beta_1(INF_{it}) + \beta_2 D_{it}(INF_{it} - k) + \beta_3 GPOP_{it} + \varepsilon_{it} \quad (3.1)$$

Economic growth, inflation and population growth are compute as:

$GROWTH_{it}$ =100 * DLOG(Y_{it})

INF_{it} = 100 * DLOG(P_{it})

$GPOP_{it}$ = 100 * DLOG(POP_{it})

where: Y_{it} - real GDP at constant price 2010, $GROWTH_{it}$ - economic growth, INF_{it} – inflation, POP_{it} – population, $GPOP_{it}$ - population growth, P_{it} - consumer price index, k - threshold level of inflation, ε_{it} - error term.

Dummy variables (D_{it}) are defined as follows:

$$D_{it} = \begin{cases} 1, 100 * \mathrm{DLOG}(\mathrm{Y}_{it}) > \mathrm{k} \\ 0, 100 * \mathrm{DLOG}(\mathrm{Y}_{it}) \leq \mathrm{k} \end{cases}$$

With notation k is a representation of the threshold level of inflation in this model, the relationship between economic growth and inflation can be broken down into: (i) Low inflation is represented by β_1; (ii) High inflation is represented by $\beta_1 + \beta_2$. Eq. (4.1) can be decomposed to obtain interpretation of $\beta_1 + \beta_2$, and the formulations as follows:

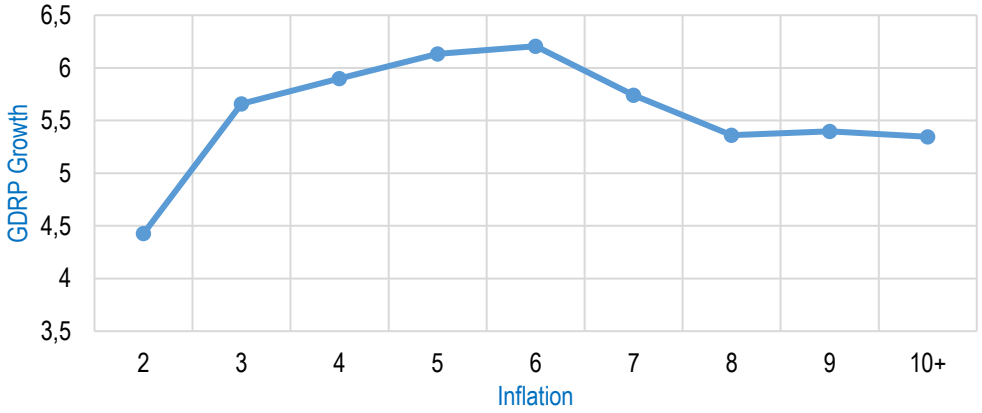
$$GROWTH_{it} = \beta_0 + \beta_1(INF_{it}) + \beta_2 D_{it} INF_{it} + \beta_2 D_{it} k + \beta_3 GPOP_{it} + \varepsilon_{it} \quad (3.2)$$

$$\frac{d\ GROWTH}{d\ INF} = \beta_1 + \beta_2 D_{it} \quad (3.3)$$

The impact of inflation rates on economic growth are different between high and low inflation rates. Impact low inflation rates on economic growth can be expressed in value of β_1, while high inflation rates can be represented by value of $(\beta_1 + \beta_2)$. Value of threshold inflation are represented by value of optimal k. The value of k is given arbitrarily for the estimation in the model in this study, the optimal k is obtained by finding that value that minimize the residual sum of square. Therefore, the optimal threshold level is that which minimize the sequence of residual sum of square (Mubarik 2005).

4. An overview of Inflation and growth

In previous study in literature review relationship between inflation and economic growth is very diverse. Therefore, it is important to confirm abound the relationship of both in Indonesia. This paper using chart as a tool to ensure relationship between inflation and growth in Indonesia. Mubarik (2005) provide an example to see kind of relationship between inflation and economic growth through plot of data. First step to establish the plot of data is sort inflation from smallest value to largest value in the given sample. Second, whole data is formed into groups by choosing numbers that represent a group with a value of inflation are below. For example, inflation is less than 1% represented the inflation rate of 1% and then inflation rate of more than 1% until 2% will be represented by the figure of 2%, and so on. Furthermore, calculate economic growth averaging in each group that have been formed from grouping of inflation data. Therefore, it can be formed graph plot data between average economic growth and inflation numbers that represent the group. Obtained the following results:



Source: Badan Pusat Statistik (BPS) Indonesia

Figure 1- Average GDRP growth to inflation

In Figure 1 provides an illustration of the relationship of inflation and economic growth in Indonesia. Inflation have a positive effect to economic growth until 6% and then turn out to be negative effect when inflation exceeds 6%. Based on Figure 1 shows that there is structural break point (threshold) on relationship between inflation and economic growth. Analysis from graph provides an overview of indication that there is a non-linear relationship between inflation and economic growth. In addition, graph above indicate inflation threshold is at 6% because change direction of the relationship at that rate. However, value of inflation threshold needs to study by statistical methods to provide valid results.

5. Estimation result inflation threshold

This study using annual dataset on real GDP at constant price 2010, Consumer Price Index (CPI) based on 2012, and population for the period 2010-2015. Data obtained from publication economic and trade data of Badan Pusat Statistik (BPS) Indonesia.

Non-linear estimation model is used to search threshold value of inflation because there is structural break point (threshold) in relationship between inflation and economic growth. Based on figure 1 there is structural break point at 6% because under 6% inflation have positive relationship, but if inflation rate excess 6% their negative relationship. This study using panel analysis regression with dummy variables to catch threshold value of inflation. Fixed effect model (FEM) selected by formal test (Chow and Hausman test) than other model estimation. Moreover, a suitable model used is the FEM with Seemingly Unrelated Regression (SUR) because residual variance is heteroscedastic and there is cross-sectional correlation. Existence of cross sectional correlation couldn't be separated from the fact that inflation between provinces is interrelated. Estimation FEM SUR using Feasible Generalize Least Square (FGLS) can't to compute while N large and T small (N>T) so that require Robust Coefficient Covariance to handled. Robust Coefficient Covariance used is Panel Corrected Standard Error (PCSE) so that the estimation threshold level of inflation using FGLS can be done.

Table 1. Estimation of non-Linear Model (Dependent variable: Growth rate of GDRP)

K	Variable	Coefficient	t-Statistic	Adjusted R^2	RSS
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
3	INF D*(INF-3)* GPOP C	0.3179* -0.3201* 9.0089* -10.8262*	4.2509 -3.8922 18.6234 -12.4543	0.863405	74.98843
4	INF D(INF-4) GPOP C	0.2195* -0.2456* 8.7558* -10.2356*	5.1287 -4.7305 16.5355 -10.9655	0.866836	73.27394
4.2%	INF D(INF-4.2) GPOP C	0.2118* -0.2458* 8.7466* -10.2117*	5.6757 -5.2756 16.0974 -10.7110	0.867266	72.68383
4.4%	INF D(INF-4.4) GPOP C	0.2174* -0.2638* 8.7470* -10.2472*	6.6974 -6.4884 15.8894 -10.6072	0.869547	72.20150
4.6%	INF D(INF-4.6) GPOP C	0.2190* -0.2784* 8.7576* -10.2849*	7.4702 -7.7446 15.7864 -10.5271	0.870493	71.87884
4.62%	INF D(INF-4.62) GPOP C	0.2188* -0.2794* 8.7583* -10.2869*	7.4774 -7.8025 15.7692 -10.5099	0.870523	71.85539
4.64%	INF D(INF-4.64) GPOP C	0.2182* -0.2798* 8.7588* -10.2866*	7.4602 -7.8349 15.7456 -10.4867	0.870476	71.84699
4.66%	INF D(INF-4.66) GPOP C	0.2172* -0.2797* 8.7588* -10.2846*	7.4245 -7.8482 15.7165 -10.4585	0.870385	71.84973
4.8%	INF D(INF-4.8) GPOP C	0.2092* -0.2779* 8.7611* -10.2690*	7.0643 -7.8138 15.5248 -10.2669	0.869714	71.90141

K	Variable	Coefficient	t-Statistic	Adjusted R^2	RSS
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
5%	INF	0.1931*	6.3556	0.867593	71.99503
	D(INF-5)	-0.2696*	-7.3964		
	GPOP	8.7438*	15.1649		
	C	-10.1914*	-9.9129		
6%	INF	0.1466*	5.2974	0.874398	72.36406
	D(INF-6)	-0.2773*	-7.7216		
	GPOP	8.9028*	14.9697		
	C	-10.3297*	-9.7030		
7%	INF	0.0844*	3.3333	0.867414	71.89538
	D(INF-7)	-0.2429*	-5.0778		
	GPOP	9.0004*	13.8528		
	C	-10.2707*	-8.8121		
9%	INF	0.0244*	1.1308*	0.861001	74.63403
	D(INF-9)	-0.1529*	-2.7383*		
	GPOP	8.9408*	16.6377*		
	C	-9.9280*	-10.2556*		

Note: Significant at 1%.

Inflation Threshold level obtained in this study is 4.64% with an indicator minimum residual sum of square as shown in Table 1. Estimates at the threshold level of inflation obtain following equation:

$$\widehat{Growth}_{it} = -10.2866 + 0.2182\ (INF_{it}) + -0.2798\ D_{it}(INF_{it} - k) + 8.7588\ GPOP_{it} \quad (5.1)$$

In the estimation eq. (5.1) shows coefficients of all independent variables have a significant effect on economic growth. Estimation of coefficient β_1 and β_2 are significant so it can be interpreted as effect of inflation on economic growth. In addition, the residual has normal distribution and assumptions of no-multicollinearity was fulfill. While Assumption of Homoscedastic and autocorrelation already handled by FGLS estimation.

According to Reed and Ye (2011), using a cross-section weight and coefficient covariance robust white cross-section can handle problem of heterogeneity and cross-sectional correlation in data. Therefore, to estimate the threshold level of inflation in Indonesia can also use white cross-section robust coefficient covariance. This is because the data used to estimate the threshold level of inflation in Indonesia have problem of heterogeneity and cross-sectional correlation. The results of estimation threshold level of inflation in Indonesia by using PCSE and white cross-section is no different, amounting to 4.64%. In addition, there is little difference in the value of the standard error of the estimator obtained but all variables remain significant effect.

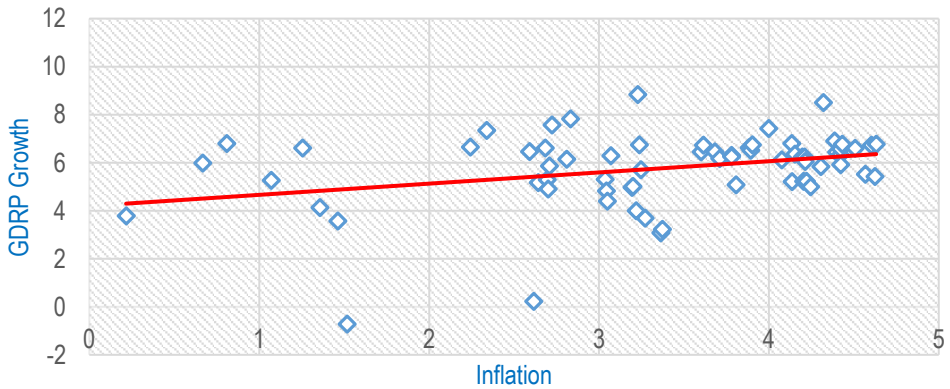


Figure 2 - Inflation below threshold level

Inflation below threshold level have positive effect on economic growth as seen on positive coefficient of ($\hat{\beta}_1$). P-value on ($\hat{\beta}_1$) show that for low inflation (k≤4.64) there is significant relationship at 1% between inflation and economic growth. Increase in inflation that below the threshold of 1% point could boost economic growth 0.2182%. Figure 2 shows that observed data below threshold has a positive relation inflation to economic growth.

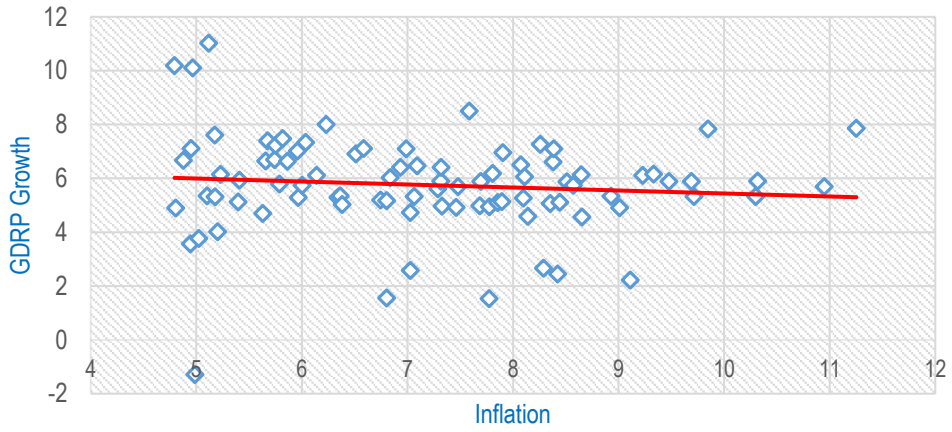


Figure 3 - Inflation above threshold level

Instead inflation that exceeds the threshold level of inflation have negative impact on economic growth. It looks at the added coefficient $\hat{\beta}_1$ and $\hat{\beta}_2$ are negatively by -0.0616. Relationship between inflation and economic growth significant at low and high inflation. Increase in the inflation rate above the inflation threshold of 1% point will decrease the economic growth rate of 0.0616%.

Figure 3 which illustrates a data plot of economic growth and inflation above the inflation threshold can also be seen in negative relationship. While population growth had a positive influence on economic growth.

Threshold inflation Indonesia in this study 4.64% is lower than threshold inflation for developing countries 11-12% Khan and Senhadji (2001), all countries group except advance countries 10% Espinoza, Prasad and Leon (2010), 12% for developing countries Baglan and Yoldasz (2014). Thus, this study has some conclusion with Thanh (2015) where stated threshold level in ASEAN is lower than other developing countries. It may be caused by the fact that ASEAN have adopted consistent policy leading to low and stable inflation rate it makes ASEAN economic growth have high and sustained (Cheng 1999). Macroeconomic policies have been, on balance, more consistent overtime in ASEAN countries. Therefore, the ASEAN countries (include Indonesia) are generally considered to have had low inflation rates relative to order emerging market (Jiranyakul and Opiela 2010) (Thanh 2015).

This study also concludes that threshold inflation is lower tham previous study (except study by Winarno 2014). Chowdury and Siregar (2004) stated inflation above 20.5% may cause negative impact inflation on growth, Chowdury and Ham (2009) stated the inflation threshold is 8.5-11%, and threshold inflation from study Widaryoko (2013) is 9.53%. Different result about threshold inflation may cause data are used in these studies. Winarno (2014) stated the threshold inflation is 4.62%, the result is similar with this study. It may cause Winanrno (2014) using data 2002-2012 so may not different with data are used in this study about macroeconomic condition. This result shows that threshold inflation in Indonesia may be different depend on time period of study. It may cause by central bank of Indonesia since 2005 using Inflation Targeting Framework which low inflation policies in long-term.

6. Inflation targeting framework and inflation threshold

Main purpose long-term monetary policy in Indonesia is keeping low inflation rate. For reach that purpose, Bank of Indonesia using Inflation Targeting Framework (ITF) for make target inflation must reach for every year. So, inflation rate be expected are controlled fall in range inflation target. Appropriate Inflation Targeting from ITF was set by Central Bank of Indonesia with inflation threshold level must be examine. If inflation target is appropriate with inflation threshold level, it will have positive impact on economic growth in Indonesia. That is can be done with comparing the inflation target by the inflation threshold level.

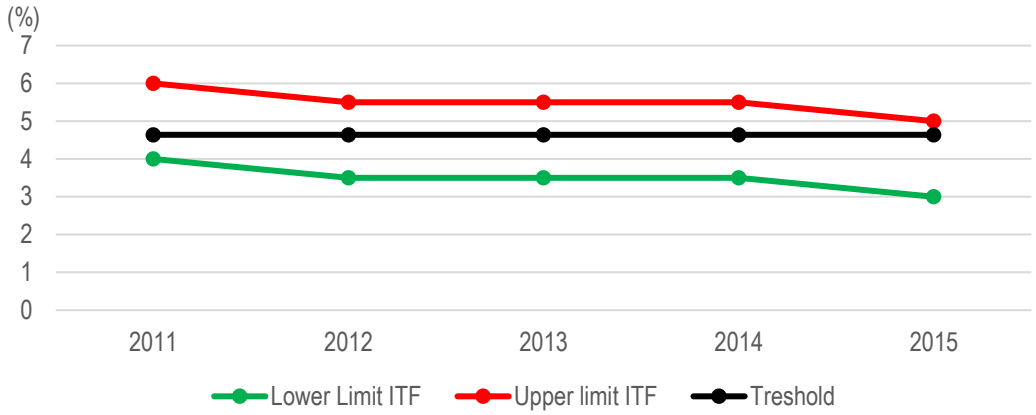


Figure 4 - ITF and inflation threshold

Figure 4 shows from 2011 to 2015 there are three times change inflation target toward a lower level. On 2011 Central Bank of Indonesia (BI) set inflation target at 5% ± 1%, 2012 until 2014 inflation target was 4.5%, and 2015 become 4%. Figure 4 also shows that the estimated threshold of this research into the ranges of inflation target. At the beginning of the description, expectations of inflation are the inflation threshold value that gives the most optimal positive impact on economic growth that is inclusive. Therefore, the rate set by the Bank ITF today it is considered in line with expectations that economic growth can grow optimally.

Seen that the ITF policy is reach low inflation in long-term so every year Bank of Indonesia decrease target inflation. In 2011, the rate of inflation targets still relies above the threshold value of inflation. But in 2012-2014, the inflation target has been under the threshold value of inflation. As well as in 2015, the upper limit of the inflation target is already close to the value threshold inflation so that the government's target of keeping inflation at least below the upper limit. Indonesia should be more rigorous in keeping inflation to remain within the inflation target range, especially not pass the threshold value of inflation. This is good news because monetary policy is correct for keep from negative impact inflation on economic growth because inflation above threshold. Indonesia must wary if inflation rate above threshold inflation, it may cause economic growth decrease because negative impact inflation.

Conclusion

Empirical analysis shows that there is non-linear relationship between inflation and economic growth in this study. Therefore, it indicates there is a structural break point (threshold inflation). Estimation of inflation threshold in Indonesia is 4.64% and inflation above this threshold is becomes harmful to growth. This inflation threshold is appropriate with Inflation Targeting Framework (ITF) by Central Bank of Indonesia, so this policy should be implemented to make high-persistent economic growth. Government of Indonesia should be alert when the inflation rate is going past the threshold of inflation, as occurred in 2013 and 2014 in the amount of 8.38% and 8.36%. This is to avoid the negative impact of inflation could hamper economic growth. Inflation in Indonesia which has a tendency to fluctuate and twice missed the target inflation. Therefore, the inflation rate should be strictly controlled in order to at least be in the range ITF or below the inflation threshold value 4.64%.

References

[1] Ayyoub, M. 2016. Inflation-Growth Nexus in Developing Economies: New Empirical Evidence from a Dis-aggregated, *Working Paper Department of Economics Johannes Kepler University of Linz,* No. 1602. Available at: http://www.econ.jku.at/papers/2016/wp1602.pdf

[2] Baglan, D., Yoldasz, E. 2014. Non-linearity in the Inflation-Growth Relationship in Developing Economies: Evidence from a Semiparametric Panel Model. *Economics Letters,* 125 (1): 93–96.

[3] Barro, R. J. 2013. Inflation and Economic Growth, *Annals of Economics and Finance,* 14-1: 85–109.

[4] Bruno, M. and W. Easterly. 1998. Inflation Crises and Long-Run Growth, *Journal of Monetary Economics*, 41: 3-26.

[5] Cameron, N., Hum, D., Simpson, W. 1996. Stylized Facts and Stylized Illusions: Inflation and Productivity Revisited, *The Canadian Journal of Economics / Revue Canadienne d'Economique*, 29(1): 152-162.

[6] Cheng, M.Y. 1999. *The transmission mechanisms of inflation: An empirical study on the ASEAN economies. PhD thesis,* Universiti Pertanian Malaysia. Available at: http://psasir.upm.edu.my/8248/

[7] Chowdhury, A., Ham, R. 2009. Inflation targeting in Indonesia: searching for a threshold, *The Singapore of Economic Review,* 54(4): 645-655. Available at: http://dx.doi.org/10.1142/S021759080900346X (accessed August 20, 2016).

[8] Chowdhury, A., Siregar, H. 2004. Indonesia's monetary policy dilemma: Constraints of inflation targeting, *The Journal of Developing Areas*, 37(2): 137-153.

[9] De Gregorio, J. 1993. Inflation, taxation, and long-run growth, *Journal of Monetary Economics,* 31: 271-298.

[10] Dorrance, G. 1963. The effect of inflation on economic development, *IMF Economic Review,* 10(1): 1-47.

[11] Espinoza, R. A., Prasad, A., Leon, M.H. 2010. Estimating the Inflation-Growth Nexus - A Smooth Transition Model, IMF *Working Paper* WP/10/76: 1-22. Available at: https://ssrn.com/abstract=1578674

[12] Fischer, S. 1993. The role of macroeconomic factors in growth, *Journal of Monetary Economics*, 32: 485–512.

[13] Gokal, V., and S. Hanif. 2004. Relationship Between Inflation and Economic Growth, *Working Paper* Economics Department Reserve Bank of Fiji 2004/04. Available at: http://rbf.gov.fj/docs/2004_04_wp.pdf (accessed May 10, 2016).

[14] Jiranyakul, K., Opiela, T.P. 2010. Inflation and inflation uncertainty in the ASEAN-5 economies, *Journal of Asian Economics*, 21(2): 105–112.

[15] Khan, M., Senhadji, A.S. 2001. Threshold Effects in the Relationship between Inflation and Growth, IMF *Staff Papers* Volume 48, No. 1. Available at: https://www.imf.org/External/Pubs/FT/staffp/2001/01a/khan.htm

[16] Kremer, S., Bick, A., Nautz, D. 2013. Inflation and growth: new evidence from a dynamic panel threshold analysis, *Empirical Economics,* 44(2): 861-872.

[17] Lucas, R. E. 1973. Some international evidence on output-inflation tradeoffs, *The American Economic Review*, 63(3): 326–334.

[18] Madurapperuma, M. W. 2016. Impact of inflation on economic growth in Sri Lanka, *Journal of World Economic Research*, 5(1): 1-7. DOI: 10.11648/j.jwer.20160501.11

[19] Malik, G., Chowdhury, A. 2001. Inflation and economic growth: Evidence from four South Asian countries, *Asia-Pacific Development Journal*, 8(1): 123-135.

[20] Mubarik, Y. A. 2005. Inflation and growth: An estimate of the threshold level of inflation in Pakistan, *SBP-Research Bulletin*, 1(1): 35–44.

[21] Reed, W. R., Ye, H. 2011. Which panel data estimator should I use? *Applied Economics*, 43(8): 985-1000.

[22] Sarel, M. 1996. Nonlinear Effects of Inflation on Economic Growth, IMF *Staff Papers,* 43(1): 199-215.

[23] Sepehri A., Moshiri, S. 2004. Inflation-growth profiles across countries: evidence from developing and developed countries, *International Review of Applied Economics*, 18(2): 191–207.

[24] Thanh, S. D. 2015. Threshold effects of inflation on growth in the ASEAN-5 countries: A Panel Smooth Transition Regression approach, *Journal of Economics, Finance and Administrative Science,* 20(38): 41–48.

[25] Vinayagathasan, T. 2013. Inflation and economic growth: A dynamic panel threshold analysis for Asian economies, *Journal of Asian Economics*, 26: 31–41.

[26] Widaryoko, N. 2013. *Inflasi dan Pertumbuhan Ekonomi: Pendugaan Ambang Batas Inflasi di Indonesia*. Magister Thesis, Institut Pertanian Bogor. Available at: http://repository.ipb.ac.id/handle/123456789/66584

[27] Winarno, T. 2014. *The Dynamics Relationship Between Inflation and Economic Growth in Indonesia: A Regional Thresholds Approach*. Paper presented at Bank Negara Malaysia Economics Research Workshop, Kuala Lumpur, Malaysia, December 1, 2014. Available at: http://www.bnm.gov.my/documents/conference_vol/2014_Econs_Research/Paper3The_Dynamic_Relationship_between_Inflation_andEconomic_Growth_in_Indonesia.pdf

Models and Methods for Evaluating Operational and Financial Reliability of High-tech Enterprises

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Abstract:

New tools should be developed for evaluating financial, economic and scientific reliability of businesses. The provided analysis of the existing methods for evaluating financial, economic and scientific activities of the companies engaged in high-tech projects shows that they are mostly focused on investigating separate aspects of high-tech businesses and fail to provide any possibility to apply the whole aggregate of the conventional evaluation methods. To ensure comprehensive reliability evaluation of the contractor companies, the method has been developed that helps obtaining unambiguous evaluations with the limited amount of the input data. The evaluation considers both financial-economic and scientific-production components of reliability. The financial and economic component of reliability is understood as the ability of the company to fulfill its economic plans. Scientific and production component is its ability to perform works on regular basis in conformity with the customer's terms of reference if the customer fulfills own financial obligations. The developed model and the suggested methodology allow integrating both qualitative appraisals of business efficiency and quantitative indicators of practical operations. The suggested models and methods use more precise measuring scales (as compared to conventional tools) to select the most reliable companies for innovative projects, for incorporation or for credit-related purposes.

Keywords: contractor reliability; modeling; high-tech project; science and production risks; engineering and production risks; high-tech enterprise; financial standing; audit; performance evaluation; expert evaluation.

JEL Classification: L16, L60, G17, O25.

1. Introduction

One of the component indicators of science-technology and engineering-production risks is represented by reliability of the high-tech enterprises (HTE) that are contracted for the implementation of innovative projects of different kinds (Bishop 2012, Bohnert *et al.* 2015, Platon *et al.* 2014, Gerasimov *et al.* 2014, Glazirin 2012, Kachalov 2012, Morris and Langari 2016, Putyatina and Putyatin 2013, Razova 2013, Zheglova 2015). In the course of selecting a contractor and awarding a contract for the project execution, the reliability indicator helps, first, engage in the project only those companies that, all other things being equal, are the most reliable and, second, select the most rational model for the project contract price (Burenok *et al*. 2012, Vilenskiy *et al*. 2015).

It should be noted that the principle of consistency (complexity) in evaluating HTE reliability stipulates that solving the problem of ensuring the required level of practicability of the plans for developing high-tech products is only possible with the efficient system of the relevant models, methods and modern organizational-economical mechanisms. Thereat, it should be taken into account that many such scientific and practical instruments are already available, serving to solve other tasks related, in some way or other, to improving the level of economic and technological security of the state and

society. Therefore, the task of an investigator is to identify the efficient institutional instruments that would be practicable in achieving the set tasks and to develop proposals for its modification.

Evaluating reliability of a company should be based on the analysis and should take into account the indicators that characterize the economic sustainability of the companies participating in fulfilling the production plans. As a rule, these indicators are represented by the indicators of scientific-production and financial-economic activities of the enterprise (Kleiner 2008). Today, the methods for evaluating the companies are basically reduced to implementing several types of models, including the most widely used probability models (like Altman models), ranking and auditing models.

2. Literature review

In recent years, different aspects of identifying and evaluating the risks occurring in the process of production and financial activity of the high-tech companies as well as the methods for risk mitigation, elimination and prevention have been studied in the works of a large number of both Russian and foreign authors (Bertoni *et al.* 2015, Peide *et al*. 2010, Liu *et al*. 2010, Yicen 2016, Liu *et al.* 2016, Wang *et al.* 2016).

The problem of evaluating competitiveness of a high-tech enterprise as an indicator of its operational and financial reliability has been investigated by such authors as Yanrong, Yu, Kang *et al.* (2011). The analysis of the contractor companies engaged in the project implementation at the stage of the preliminary evaluation and based on mathematical modeling has been described in the work belonging to the collective body of scientists and experts that includes Movahedian, Khanzadi, Dabirian, Kalhor *et al.* (2012).

The issues of analyzing manufacturing capabilities and the production reliability of the companies engaged in the project implementation, occurring at the stage of preliminary evaluation and during identification of the risks related to the failure to fulfill the contracted project activities, have been considered based on mathematical modeling in the studies belonging to Rashvand, Majid, Pinto *et al*. (2015).

The problem of the justified selection of the companies contracted for the purposes of the project implementation, taking into account the results of the analysis of their operational, financial-economic and executive reliability together with estimations of the levels of the associated risks has been studied in works of N. Ibadov, where the author applies the method of fuzzy preference ordering to select the contractors for the project (Ibadov 2015), in works of Ahari and Niaki (2014) who make use of fuzzy neural networks, in studies of Safa, Shahia, Haasa *et al.* (2015), where the attention is paid to the problems of investigating the competitive environment.

It should be noted that such models as probability, ranking and auditing models for evaluating reliability acquired the widest application and popularity; therefore, it is worthwhile that their peculiar features, their capabilities and disadvantages should be considered in more detail.

Probability model – Altman model (Altman 2008) makes use of discriminant function formed applying multiple discriminant analysis to the sample of corporations. The objective of this analysis is to accumulate statistical data on the sample of firms and to build a line (discriminant function) that subdivides all the firms under analysis into the groups that correspond to their financial standing. Further on, if the analyzed company comes into some certain area, this may be an indicator for the customer to identify the financial standing of a company. The parameters of the discriminant function are calculated by the method of statistical data processing for a definite sample of companies. Altman, upon applying multiple discriminant analysis to the sample of corporations, obtained discriminant function Z that was represented as follows:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5, \quad (1)$$

$$P_b = \begin{cases} very\ high, & when \quad Z < 1.8 \\ high, & when\ 1.8 < Z < 2.7 \\ possible, & when\ 2.7 < Z < 2.9 \\ very\ low, & when \quad Z > 2.9 \end{cases} \quad (2)$$

where: P_b is probability of bankruptcy of the company; X_1 – ratio of working capital to total assets; X_2 – ratio of undistributed reinvested profit to total assets; X_3 – ratio of earnings before interest and taxes to total assets; X_4 – ratio of market value of owner's equity to debt capital; X_5 – ratio of sales revenues to total assets.

The possibility to use such model in the course of developing and implementing the production plans is limited, insofar as the multiple discriminant analysis is affected by the peculiar features of the relevant industry;

therefore, a separate sample of companies and, consequently, a separate discriminant function should be generated for each sector of the economy.

Ranking model. This is the model for formulating a comparative rank-based evaluation of the business activity of an enterprise, of its profitability and its financial standing. It usually includes the following stages (Steven 2014):

- collecting and processing analytically the initial data over the period under consideration;
- justifying the system of criteria and indicators to be used for the purposes of the rank-based evaluation of the business activity of the enterprise, its profitability and its financial standing; and also, classifying these indicators, calculating the integrated indicator (criterion) for the ranking evaluation;
- ranking (ordering) the companies according to their ranks.

In its final representation, the resulting algorithm of the comparative ranking evaluation of the business activity of the company, of its profitability and financial standing can be described as a five-stage sequence of operations:

- initial data are written down as a matrix (a_{ij}) where the lines fix the numbers of the indicators (*THE* = 1, 2, 3,..., *n*), and the columns fix the companies that are being compared (*j* = 1,2,3,..., *m*);
- maximum value is determined for each indicator and is put in the column of the matrix. It is to characterize the conditional benchmark company (*m*+1);
- all original elements of the matrix (a_{ij}) shall change according to the equation as follows:

$$x_{ij} = \frac{a_{ij}}{\max\limits_{j} a_{ij}}, \tag{3}$$

where x_{ij} – standardized indicators of financial-economic and operational standing of *j*-enterprise.

- ranking score is calculated for each company under analysis according to the equation below:

$$R_j = \sqrt{K_1 x_{1j}{}^2 + K_2 x_{2j}{}^2 + \ldots + K_n x_{nj}{}^2} \tag{4}$$

,

where: R_j – ranking score of *j*-enterprise; K_i – weight factors for each *i*-indicator;

- the companies are ranked (prioritized) in order of their descending ranking scores. Thereat, the highest rank will be given to the enterprise with the lowest value of *R*.

In practice, the data on financial-economic and operational activities of the enterprises, at the stage of developing plans under the current changes in their legal status (partial or full privatization, corporatization, etc.) and under the conditions of the competitive struggle usually represent sensitive information. Therefore, the planners have in their possession just limited amount of data on the basic indicators of financial-economic and operational activities of the company.

Modified (improved) method of audit and expert evaluations. For the purposes of evaluating reliability of the high-tech enterprises, who implement science-driven projects, there is a method that makes it possible to obtain unambiguous evaluations of reliability of the companies under the conditions of a limited set of data on their financial-economic and operational activities. This method is founded on complex application of a modified (improved) methodology of audit and expert evaluations of financial-economic and operational activities of the enterprises. At the same time, the audit methodology can be used separately, provided that all required data are available (Cao *et al*. 2015, Chou 2015, Earnhart and Leonard 2016, Jespersen *et al*. 2016, Persakis and Iatridis, 2016).

The most objective high quality evaluation of THE can be obtained by conducting a complex independent audit of its operational and financial-economic activities. Modern audit includes accounting control, financial analysis and inspection of all types of businesses and is carried out by the independent groups of highly qualified experts.

The objectives of audit include not only expertise and evaluation of financial-economic standing of HTE together with thorough inspection of all its accounting reports, but also the estimation of profitability of the equity shares, financial solvency, cost-effectiveness, financial sustainability, asset turnover, capital-labor ratio and labor efficiency. The initial data for audit inspections are represented by standardized and typical forms of reports.

Some indicators should be particularly distinguished among the indicators that affect the stability of HTE most seriously: financial solvency, economic sustainability, capital-labor ratio, capital (fixed) assets and funds.

Quite precise evaluation of the company's reliability can be represented by the specific ratio of investments in the assets that predetermine its scientific, technological end economic potential. The assets that characterize the quality and the size of the company's potential are defined as the sum of the net book values of all fixed assets. Specific ratio of financial investments in science and technology related assets (*BU*) are calculated as a ratio of operational assets (*AP*) to the whole amount of the available funds in the company (*CP*):

$$BU = AP / CP \quad (5)$$

Generalized condition of all funds can be characterized by deterioration factor (KI) that is calculated according to the equation as follows:

$$KI = CI / CH \quad (6)$$

where: *CI* is the sum of deterioration of all fixed assets; *CH* – original costs of the assets.

Capital-labor ratio (*F*) determines the share of the fixed assets value that is accounted for one employee of the enterprise. This indicator is found according to the equation as follows:

$$F = CH / Y \quad (7)$$

where: CH – original costs of fixed assets, Y – average headcount of employees.

In order to find the factor of capital-labor ratio (*KF*), indicator *F* should be normalized relative to the average capital-labor ratios of HTEs with similar company profiles (*FC*):

$$KF = F / FC = CH \times FC / Y \quad (8)$$

Until now, the criteria of the company's financial solvency were represented by absolute liquidity ratio (ratio of short-term financial investments and monetary funds to short-term debt), which value should not be lower than 0.2; interim debt to equity ratio (ratio of short-term financial investments and monetary funds to short-term debt) that should not be lower than 0.7; total coverage ratio (ratio of all current assets to short term liabilities) that should not be lower than 2.0.

These standard criteria assumed the stable structure of the available current assets (short-term financial investments and monetary funds: circa 10%; accounts receivable: 25%, stock: 65%). However, the number of such companies has considerably decreased lately. As a rule, due to the high share of accounts receivable, the stock proves to be less than a half of the current assets, and the share of the short-term financial investments and monetary funds is by far less than 10%. Under the conditions of the changing structure and amounts of the current assets in different periods of the company's operations, it becomes impossible to determine the company's financial solvency criteria by the values of its interim debt to equity ratio or by its absolute liquidity ratio.

Therefore, another method of solvency evaluation should be applied that is founded on comparing the values of total and actual coverage ratio.

Total coverage ratio (*OKP*) is calculated according to the equation as follows:

$$OKP = (MOC + DZ + DC) / KZ \quad (9)$$

where: *MOC* is the sum of stock (inventory), *DZ* – accounts receivable, *DC* – short-term financial investments and monetary funds, *KZ* – short term liability (debt) of the company.

To justify the sufficiency of the calculated factor, it should be compared with the value of total coverage ratio (*NOKP*) which is typical for this company and which should be calculated according to the equation as follows:

$$NOKP = (MOCD + BDZ + KZ) / KZ \quad (10)$$

where: *MOCD* is the sum of stock taking into account the potential contract; *BDZ* – uncollectable receivables.

Hence, the financial solvency criterion is introduced:

$$OKP - NOKP \geq O \quad (11)$$

To determine the company's sustainability by the whole aggregate of the suggested indicators, the convolution of these indicators should be calculated. Conventional multi-objective convolution tools should be applied for the purpose. It is also possible to use another method for generalizing the criteria that would not require employing any mathematical tools. Its principles are as follows. First, check condition (11). If this condition is not

met, the reliability of the company shall be determined by the financial solvency indicator K_n:

$$Kn = KP \times OKP / NOKP \quad (12)$$

where: *KP* is an empirical factor that implies the attitude of the decision maker toward risk (0.1 – in case of complete risk aversion, 0.9 – in case of strong proclivity for risk).

While using this method, the values of other indicators should also be considered. Applying deterioration factor and capital-labor ratio, it becomes possible to create an integrated indicator of capital-labor ratio that accounts for capital assets deterioration (*KFI*):

$$KFI = (1 - KI) \times KF = \frac{\left(1 - \frac{CI}{CH}\right) \times CH}{Y \times FC}. \quad (13)$$

The next step in solving the problem is the analysis of indicators *BU* and *KFI*. Foreign practices of analyzing operational and financial activities of HTE widely apply the decision matrix methods to solve similar problems. Thus, the suggested methodology makes it possible to evaluate the reliability of the company by executing formalized procedures based on standardized accounting reports and based on some generally available statistical data.

3. Methods

The methods of the investigation are founded on developing and applying the tools for the expert evaluation of business reliability. It is a well-known fact that audit is an expensive and laborious activity that makes for engaging highly qualified specialists. Under the conditions of unpredictability and fast developing economic situation both in this country as a whole and in the industrial companies in particular, the customer would have to undertake audits every 1-2 years which is hardly practicable. Another way to obtain the evaluations of the activities of the companies is to apply the expert evaluation method. The experts should be represented by highly qualified specialists that are familiar with the companies under analysis. With their accumulated experience in cooperating with these enterprises, they are in position to provide sufficiently objective evaluations of the conditions in the companies. However, the experts usually provide their judgments in the form of qualitative evaluations. Using these evaluations, it is possible, by way of pair-wise comparison, to obtain the company's reliability rank (*i.e*. relative to other companies). Nevertheless, the method of pair-wise comparison becomes hardly applicable in cases with a large number of the objects of evaluation (companies) due to the disproportionally fast growth of the number of individual pair-wise comparisons. Besides, the ranking scores do not make it possible to judge on the absolute values of reliability. In many practical cases, the experts cannot be aware about the situation in the company that is used as a benchmark and can only evaluate the one they presently consider.

In this case, it seems advisable that the experts should be offered to use several indicators (attributes) of the companies by which they could unambiguously estimate the reliability of these companies. Thereat, it is preferable that the evaluated attributes themselves should be easy to understand and, though small in number, should reflect adequately the situation in the company under analysis.

With such expert evaluations, it seems advisable to consider both economic and science-production components of reliability. The economic component of the company's reliability is understood as its ability to carry out financial-economic and operational activities on regular basis and to the scope stipulated by the contract, provided that the customer fulfills one's financial obligations (Marincev 2012). For practical purposes, the idea of "economic reliability" has been subdivided in four levels: the highest, high, average, low.

Each level of reliability is defined based on the attributes as follows: F1 – no delinquent payments of finance and lending liabilities owed to third parties (companies) and state authorities; F2 – delinquent payments of finance and lending liabilities owed to third parties (companies) and state authorities; F3 – no financial debts to the employees; F4 – financial debts to the employees; F5 – presence or absence of financial debts to the employees; F6 – obligatory export orders; F7 – no obligatory export orders; F8 – presence or absence of export orders.

The belonging to one of the abovementioned levels of reliability is determined by the relevant combination of attributes Fl, l = 1,…,8 , *where* l – number of attributes (Table 1).

Table 1 – Economic reliability of the contractor company engaged in the project implementation

	Level of reliability			
	The highest A_1	High A_2	Average A_3	Low A_4
Conditions determining reliability level of the company	No delinquent payments of finance and lending liabilities owed to third parties (companies) and state authorities F_1			Delinquent payments of finance and lending liabilities owed to third parties (companies) and state authorities F_2
	No financial debts to the employees F_3		Financial debts to the employees F_4	Presence or absence of financial debts to the employees F_5
	Export order F_6	No export order F_7	Presence or absence of export order F_8	

According to Table 1, each level of economic reliability can be characterized as follows:

- the highest – A_1, with simultaneously available attributes F_1, F_3, F_6;
- high – A_2, with simultaneously available attributes F_1, F_3, F_7;
- average – A_3, with simultaneously available attributes F_1, F_4, F_8;
- low – A_4, with simultaneously available attributes F_2, F_5, F_8.

Science and production component of reliability of an organization (company) is understood as its ability to perform works on regular basis in conformity with the customer's tactical and technical terms of reference, provided that the customer fulfills one's financial obligations.

Conventional subdivision of science and production component of an organization (company) into reliability levels is similar to that of economic reliability and is represented in Table 2.

According to Table 2, each level of scientific and production reliability can be characterized as follows:

- the highest – B_1, with simultaneously available attributes T_1, T_5;
- high – B_2, with simultaneously available attributes T_2, T_5;
- average – B_3, with simultaneously available attributes T_3, T_6;
- low – B_4, with simultaneously available attributes T_3 and T_7 or attribute T_4. Generalized reliability indicator of the company is determined by the value as follows:

$$K_H = \min_v (A_v, B_v) \quad (14)$$

where v is reliability degree index.

Table 2. - Scientific and production reliability of the contractor company engaged in the project implementation

	Level of reliability			
	The highest $в_1$	High $в_2$	Average $в_3$	Low $в_4$
Factors determining reliability level of the company	Typical domestic and export orders were fulfilled over the year preceding to the contract and (or) will be fulfilled within the period of the contract T_1	Typical domestic or export order was fulfilled over the year preceding to the contract and (or) will be fulfilled within the period of the contract T_2	Typical domestic or (and) export order was (were) fulfilled over the year preceding to the contract and (or) will be fulfilled within the period of the contract T_3	No typical domestic or (and) export order was (were) fulfilled over the year preceding to the contract and (or) will be fulfilled within the period of the contract T_4
	Typical order was fulfilled on schedule and without any claims from the customer T_5		Typical order was fulfilled with minor claims from the customer and (or) there were delays that exceeded the contracted schedule (by not more than 20%): T_6	Typical order was fulfilled with major claims from the customer and (or) the contracted schedule was exceeded considerably (by more than 20%): T_7

The choice of this reliability indicator seems to be well justified under the circumstances, because the reliability of the company should always be evaluated based on the indicator with the lowest value. The obtained reliability values are of linguistic nature and they can be used for the purposes of the generalized evaluation of the situation in the contractor company. Besides, the results provided by the experts (as qualitative judgments) may not coincide with those obtained in the course of the audit (as quantitative indicators). To prevent the abovementioned collisions, a methodological approach to complex evaluation of business reliability has been developed.

4. Results

Based on the suggested methods for expert evaluations of HTE reliability, it is now possible to calculate the complex evaluation. This task shall be reduced to the following: *n* companies shall be considered; and, based on the analysis and evaluations of different kinds of data obtained in the course of the audit and expertly, the real reliability of the company under consideration shall be evaluated from the perspectives of contracting this company for the project implementation.

The formal difference between the results of the expert evaluation of the company and the data from its production and financial reports is actually the difference between the applied measuring scales used for presetting the indicators of business reliability. It is suggested that the following methodological approach should be applied for joint processing. Nonparametric frequency distribution function is built.

$$p^{v}(x)=\frac{n_1^{v}(z)}{n}, \qquad (15)$$

where: $n_1^{v}(z)$ is the number of enterprises that are evaluated by *v*-indicator not better than *z*; *n* – total number of the companies under consideration; $p^{v}(z)$ – frequency of occurrence of this event; *z* – a number that expresses either rank or the absolute value of *v*-indicator.

To align the scales (Figure 1), it is sometimes practicable to replace the absolute scale with the interval scale and to regard the counting numbers of the intervals as ranks. In this case the processing is of a consistent nature. When the number of ranks increases, the precision of reliability identification by listing the companies and by comparing their properties becomes independent on the initial data representation method and tends to one and the same limit value.

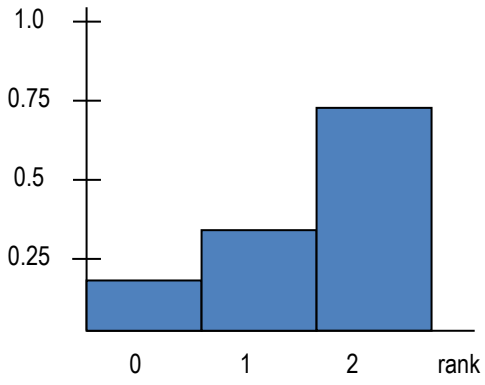

Figure 1. - Interval (rank) function of classification of companies by their reliability

Thus, if the measuring scale is binary, i.e. if it has only two classes, then, on entering zero class, reliability equals to $\frac{n_0}{n_0+n_1}$, where n_0 is the number of the objects in zero class; and, on entering the first class, reliability equals to 1. If the measuring scale consists of 3 values, then, on entering zero class, reliability equals to $\frac{n_0}{n_0+n_1+n_2}$, on entering the first class, reliability equals to $k_{н}=\frac{n_0+n_1}{n_0+n_1+n_2}$ and, finally, on entering the second class, reliability equals to 1.

If there is no other available information, then the values of the indicator are measured by a two-point scale

(present, absent). As more detailed information becomes available, the number of gradations should be increased.

The most favorable situation is observed when the evaluation of the indicator is of quantitative nature. In this case the values of the indicator for the group of companies under consideration are placed in ascending order and are split in the required number of groups (5 - 6). The companies that appear in the first group from the bottom get 0 score for this indicator; the next group gets 1 point and so on.

The physical sense of this indicator is as follows:

- if the company gets the highest scores for all indicators, then its reliability is equal to 1;
- if, even by one of the indicators, the company proved to be strictly worse than all other companies, then its reliability is equal to 0;
- if the company gets the highest scores for all indicators, but appears behind *A* companies by one indicator, then its reliability equals to $\left(1-\frac{A}{n-1}\right)$, i.e. the worst case evaluation is decisive.

5. Discussions

There are different processes intrinsic to the market economy, including the processes of integrative nature (mergers and acquisitions that occur as a consequence of continuous reformation of the structures of economic agents aimed at responding adequately to changing macroeconomic environment). This process is reflected in the high-tech industry and it takes shape of different institutional changes (Trzcielinski 2015).

In order to understand integration processes effectively from theoretical and practical perspectives, it is worthwhile specifying the essence of such widely used term as HTE reliability. Entity-based approach to formulating this idea makes it possible to suggest the interpretation as follows below. Within the framework of the undertaken investigations, reliability of HTE should be understood as an aggregate stability relative to the external and internal threats and risks of the strategic research and development organizations, design and engineering companies and of the production companies that develop and manufacture the science-driven and high-tech products.

This proprietary formulation of the idea of HTE reliability is one of the key elements of the methodology for developing programs and plans to create the modern economy of knowledge, to develop the system for managing high-tech businesses and to re-engineer the high-tech industry sector, insofar as this definition encompasses everything that follows:

- it is clearly focused on the management system (its structure, composition, equipment, the procedures to maintain operability) and, consequently, it can be precisely described both quantitatively and qualitatively;
- it makes it possible to formulate the idea of minimal reliability, going further to define the minimal admissible need for funding and other resources to maintain HTE operations;
- it helps bringing potentially hazardous operation beyond the scope of consideration; as those facilities, should be owned by the state (for example, export oriented companies, or those focused on meeting the general needs of national economy).

The novelty and the originality of the suggested definition of HTE reliability implies that reliability should be evaluated through consequent implementation of the stages that follow: determining the structure and the composition of the prospective system for creating science-driven and high-tech products; separating the part of the system to be upgraded; formulating the tasks (list of objectives) for developing the upgraded part of the system; identifying the enterprises that would perform the tasks (activities); short-listing the enterprises (creating the nucleus of the most reliable HTE).

The peculiar feature of this scheme is that those reliable enterprises that are supposed to create science-intensive and high-tech products should be shortlisted only when the program of HTE development would clearly define the activities on design and manufacturing. This nucleus should unite only the companies and the activities that would feature the lowest value of the risk associated with fulfilling the science-driven order and that would possess the highest evaluated reliability. Thereat, the forms of incorporation of these enterprises can be different and are of no great consequence.

State owned enterprises in high-tech sector can be represented by a limited set of plants, state-owned scientific centers and state-owned unitary strategic companies that are not, within a certain period, subject to privatization. This is explained by the fact that some production facilities are not always profitable, and some of them are even planned as loss-making.

By contrast to conventional models and methods and given all stated above, the group of HTEs that possess the required level of reliability and stability should be considered as an aggregate of strategic, systemically important

enterprises and organizations established with the basis on the state owned high-tech industrial sector and on the mixed ownership joint stock companies. These systemically important enterprises (organizations), apart from high reliability, should also possess a number of specific and principally important characteristics as listed below:

- key (leading) part in creating the final examples (complexes, systems) of the high-tech products at all stages of their life-cycles;
- sustainable system of cooperative interrelations between the contractor companies that create such examples (complexes, systems), taking into account regional and territorial aspects;
- high export potential that could ensure financial and economic stability even under the conditions of insecure funding;
- developed scientific capabilities, technological and production basis, double-purpose technologies.

Thus, the process of creating reliable complex of HTEs, founded on the methods developed by the authors of this study, will help optimizing considerably the options of the plans by narrowing down the number of the considered potential contractors, and, at the same time, it will help mitigating the science-technological and production-technological risks by contracting more reliable companies for high-tech project implementation purposes. In the nearest future, such companies should become drivers for the production integration processes.

Meanwhile, one of the most important economic methods here is represented by practical implementation of contract-based competitive relations that make it possible to regulate the competitive environment in science-intensive high-tech sector at macro-level, and, at micro-level, to place the science-driven orders with the companies who are in position to fulfill them in the best possible way from economic and technological perspectives.

In all, the reform of the science-driven and high-tech industry should be implemented in line with the current legislation and taking into account the specific features of HTE, associated with the necessity to ensure the following: securing deliverables for federal needs, including government contracts and mobilization orders; protecting the developed intellectual products and state secrets in the course of activities; meeting qualification requirements to managerial personnel of the companies which should be confirmed by the certificates that give rights to manage the companies that develop and produce competitive science-driven high-tech products.

Conclusion

Thus, the developed model and the suggested methodological approach to evaluating the reliability of each company from any aggregate under consideration makes it possible to integrate both qualitative evaluations provided by the independent experts on the level of the efficiency of the company from the perspectives of reliability in fulfilling the project and quantitative indicators of scientific-production and financial-economic activities obtained as a result of an independent audit inspection. In this case, the integral standing of the company is characterized by the vector in the space of phase coordinates that are represented by quantitative and qualitative indicators. The principal value and advantage of the suggested methodological mechanism are that it gives the possibility to determine reliability of the company even under the conditions of extremely scarce number of phase coordinates (for instance, with two coordinates), under the conditions when the objective information is either missing or confidential (sensitive). In the end, it enables the customer to make the informed decision on contracting the companies possessing maximum reliability indicators for fulfilling the scheduled activities.

An important area for further investigations in this subject matter can include the efforts to determine the degree of up-to-date actuality of the products created by the company, which should be performed for the time interval that corresponds to the preset period of the long-term planning. It is deemed advisable that the principle indicators for this evaluation should be as follows: operative significance of the item (complex) of science-driven high-tech products that characterizes the importance of the solved scientific and technological, economic or social task and the contribution made by this item to solving this problem; the degree of conformity of the tactical and technical features of the item (complex) to operational and tactical requirements and to the levels of the best foreign counterparts; the level of employing the state-of-the-art achievements in science and technology; availability of the existing industrial facilities capable of producing this item and its component parts.

The necessity to resolve current antagonism that exists between the deterministic approach to planning the development of science-driven and high-tech sector and the increased uncertainty of the processes of economic support in implementing the scientific-technological, industrial and socio-economic strategies makes for generating a new concept founded on the essential principle that the implementation of such plans should be controlled, based on evaluating and managing the risks occurring as a result of the factors of scientific-technological, production-technological and financial-economical nature. Economic aspect of such support implies minimization of the consequences of the unfavorable situations that lead to lower efficiency of the companies in the course of fulfilling

their objectives. Economical component makes it possible to minimize the amount of funds wasted in case when such unfavorable event occurs.

In the course of developing the models and methods for evaluating reliability of science-driven high-tech enterprises the analysis and scientific generalization have been performed for the domestic and foreign methodological and organizational tools available for solving the set objective, which showed that the works developed in this country and abroad in the area of reliability evaluation are basically of fragmentary nature and are focused on some particular aspects of HTE activities; although different methods are applied to planning the development of science-driven and high-tech industry, there has never been a complex systemic approach to engage all the aggregate of conventional evaluation methods.

The developed methodological mechanism makes it possible to determine reliability of the company under the conditions when the objective information is missing or when it is not easily accessible.

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References

[1] Ahari, R., and S. Niaki. 2014. Contractor Selection in Gas Well-drilling Projects with Quality Evaluation Using Neuro-fuzzy Networks. *IERI Procedia*, 10: 274-279. Available at: http://dx.doi.org/10.1016/j.ieri

[2] Bertoni, F, A. Croce, and M. Guerini. 2015. Venture capital and the investment curve of young high-tech companies. *Journal of Corporate Finance*, 3: 159-176. DOI: 10.1016/j.jcorpfin.2015.08.012

[3] Bishop, N. 2011. Plant Reliability through Essential Asset Monitoring. *Refinery Operations*.1-3. Available at http://www2.emersonprocess.com/siteadmincenter/PM%20Articles/refinery-operations_2-21_2011-11-02-Plant-Reliability-Through-Essential-Asset-Monitoring.pdf (Accessed on June 10, 2016).

[4] Bohnert, A., N. Gatzert, and P.L. Jørgensen. 2015. On the management of life insurance company risk by strategic choice of product mix, investment strategy and surplus appropriation schemes. *Insurance: Mathematics and Economics*, 60, 83-97. DOI: 10.1016/j.insmatheco.2014.11.003

[5] Burenok, V.M., G.A. Lavrinov, and A.G. Podolskii. 2012. *Cost estimation indexes of high-tech products*. Moscow: Granitsa. ISBN: 978-5-94691-492-5.

[6] Cao, L., W. Li, and L. Zhang. 2015. Audit mode change, corporate governance and audit effort. *China Journal of Accounting Research*, 8, Issue 4: 315-335. DOI: 10.1016/j.cjar.2015.05.002

[7] Caouette, J.B., Altman, E.I., Narayanan, P. and R. Nimmo. 2008. *Managing Credit Risk: the great challenge for global financial markets* (2nd Edition). John Wiley and Sons.

[8] Chou, D.C. 2015. Cloud computing risk and audit issues. *Computer Standards & Interfaces*, 42: 137-142. DOI: 10.1016/j.csi.2015.06.005

[9] Earnhart, D., and J.M. Leonard. 2016. Environmental audits and signaling: The role of firm organizational structure. *Resource and Energy Economics*, 44: 1-22. Available at: http://dx.doi.org/10.1016/j.reseneeco.2016.01.002 (Accessed on June 04, 2016).

[10] Gerasimov, V.V., N.V. Pyatyh, and E.S. Labutin. 2014. Economically viable forms of company reorganization. *Scientific works of Novosibirsk State University of Architecture and Construction*, 17(57): 69-76. [in Russian]

[11] Glazyrin, M.V. 2012 *Socio-industrial complex and system basis for modernization and self-development*. Moscow: Nauka. ISBN 978-5-02-037049-4. [in Russian]

[12] Ibadov, N. 2015. Contractor Selection for Construction Project with the Use of Fuzzy Preference Relation. *Procedia Engineering*, 111: 317-323. Available at: http://dx.doi.org/10.1016/j.proeng.07.095 (Accessed on June 04, 2016).

[13] Jespersen, A.H., P. Hohnen, and P. Hasle. 2016. Internal audits of psychosocial risks at workplaces with certified OHS management systems. *Safety Science*, 4: 201-209. DOI: 10.1016/j.ssci.2015.12.013

[14] Kachalov, R.M. 2012. *Management of economic risk: theoretical foundations and applications*. Moscow: Nestor-Istoriya. ISBN 978-5-90598-742-7. [in Russian]

[15] Kleiner, G.B. 2008. *Company Strategy*. Moscow, Delo.

[16] Liu A., and F. Wei. 2016. Research on Method of Dynamic Risk Evaluation of R&D Project Based on New Evaluation Scale of Linguistic Information. *JCIT*, 7(10): 34-40. Available at: http://dx.doi.org/10.4156/jcit.vol7.issue10.4 (Accessed on May 08, 2016).

[17] Liu, P, X. Zhang, and W. Liu. 2010. A risk evaluation method for the high-tech project investment based on uncertain linguistic variables. *Technological Forecasting and Social Change*, 78(1): 40-50. Available at http://dx.doi.org/10.1016/j.techfore. (2010).04.011 (Accessed on June 08, 2016).

[18] Marincev, D.A. 2012. Economic reliability of industrial enterprises (administrative aspect). *Personality. Culture. Society*, 14 (73-74): 238-241.

[19] Morris, A.S., and R. Langari. 2015. Measurement Reliability and Safety Systems. In: *Measurement and Instrumentation* (2nd Edition), 315-345. Academic Press.

[20] Movahedian, A., M. Khanzadi, S. Dabirian, and E. Kalhor. 2012. Forecasting contractor's deviation from the client objectives in prequalification model using support vector regression. *International Journal of Project Management*, 31(6): 924-936. Available at: http://dx.doi.org/10.1016/j.ijproman.(2012).11.002(Accessed on June 02, 2016).

[21] Peide, L., Z. Xin, and L. Weilong. 2010. A Risk Evaluation Method for the High-Technology Project Investment Based on ET-WA Operator with 2-Tuple Linguistic Information. *JCIT*, 5(10): 176-180. Available at: http://dx.doi.org/10.4156/jcit.vol5.issue10.22 (Accessed on June 12, 2016).

[22] Persakis, A., and Iatridis, G.E. 2016. Audit quality, investor protection and earnings management during the financial crisis of 2008: An international perspective. *Journal of International Financial Markets, Institutions and Money.* 41(C): 73-101. DOI: 10.1016/j.intfin.2015.12.006

[23] Platon, V., S. Frone, and A. Constantinescu. 2014. Financial and Economic Risks to Public Projects. *Procedia Economics and Finance*, 8: 204-210. DOI: 10.1016/S2212-5671(14)00082-3

[24] Putyatina, L.M., and A.E. Putyatin. 2013. Financial and economic reliability of the enterprises in the conditions of the Russian economy. *Scientific Papers (Bulletin of MATI*), 21: 311-314. [in Russian]

[25] Rashvand, P., Majid, M., Pinto, P. 2015. Contractor management performance evaluation model at prequalification stage. *Expert Systems with Applications*, 42(12): 5087-5101. Available at http://dx.doi.org/10.1016/j.eswa.(2015).02.043 (Accessed on June 10, 2016).

[26] Razova, E.O. 2013. Managing enterprise and its reliability. *Economics and management: analysis of tendencies and prospects of development*, 8: 257-260. [in Russian]

[27] Safa, M., A. Shahi, C. Haas, D. Fiander-McCann, K. Hipel, and S. MacGillivray. Competitive intelligence (CI) for evaluation of construction contractors. *Automation in Construction*, 59: 149-157. Available at: http://dx.doi.org/10.1016/j.autcon.(2015).02.009 (Accessed on May 13, 2016).

[28] Steven, B.M. 2014. *Financial Analysis*: Second Edition: A Business Decision Guide. Colorado: Accounting Tools Inc. ISBN: 978-1938910463.

[29] Trzcielinski, S. 2015. The Influence of Knowledge Based Economy on Agility of Enterprise. *Procedia Manufacturing*, 3: 6615-6623. DOI: 10.1016/j.promfg.2015.11.001

[30] Vilenskiy, P.L., V.N. Livshits, and S.A. Smolyak. 2015 *Assessment of investment projects efficiency. Theory and practice.* Moscow, Poli Print Service. ISBN: 978-5-7749-0518-8.

[31] Wang, J. 2016. Study of High-New Technology Innovation Project Performance Evaluation with Uncertain Linguistic Variables. *JDCTA*, 6(11): 321-327. Available at: http://dx.doi.org/10.4156/jdcta.vol6.issue11.40 (Accessed on April 10, 2016).

[32] Yanrong, W., L. Yu, and L. Kang. 2011. Evaluation of the Competitiveness of High-tech Entrepreneurial Enterprises. *Energy Procedia*, 5: 684-689. Available at: http://dx.doi.org/10.1016/j.egypro.2011.03.121.

[33] Yicen, D. 2016. Model for Evaluating the Technological Innovation Capability of the High-tech Enterprises with Uncertain Linguistic Variables. International *Journal on Advances in Information Sciences and Service Sciences*, 3(11): 421-427. Available at: http://dx.doi.org/10.4156/aiss.vol3.issue11.52

[34] Zheglova, N.V. 2015. Economic reliability of industrial enterprise: information support. *Topical Issues of Economic Sciences,* 47: 248-255. [in Russian]

Citizen Adoption of eGovernment in Slovakia

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Abstract:

The eGovernment represents the use of information and communication technologies to facilitate administration of government services. The eGovernment are developed for last two decades in worldwide. Public administration authorities in given countries are providing these services for its citizens with aim of faster and simpler use of government services. Many studies worldwide investigated the adoption of eGovernment or electronic services in general. Various variables and factors were investigated for possible effects on eGovernment adoption. This study uses Technology Acceptance Model adjusted for a purpose of investigation of the citizen adoption of eGovernment in Slovakia. The developed model was tested on data was gathered by questionnaire survey conducted among Slovak citizens potentially using eGovernment services. The hypotheses resulting from the proposed model were further tested on gathered data by the factor analysis. The analysis showed significant effects of perceived usefulness, perceived security, amount of information about eGovernment and perceived quality of services on citizen adoption of eGovernment. The factors of perceived ease of use and perceived enjoyment were not detected as statistically significant factors of eGovernment adoption.

Keywords: eGovernment, adoption, technology acceptance model, public services.

JEL Classification: G28, L86.

1. Introduction

The rapid development of information and communication technologies (ICT) brought innovations in many areas, including commerce, banking services and governance. New technologies allowed provision of governmental services in new form of electronic government in recent decades. Electronic government (or eGovernment, eGovernment) was defined by United Nations Division for Public Economics and Public Administration (2001) as utilizing the Internet and the World Wide Web for delivering government information and services to citizens. During following years, this definition had to be widen respecting development of new services and forms of eGovernment. Moon (2002) identified eGovernment as the use of all information and communication technologies to facilitate the daily administration of government. According to Hai (2007) eGovernment can be divided into three main categories: Government-to-Citizen (G2C), Government-to-Business (G2B) Government-to-Government (G2G). Al-adawi *et al.* (2005) stated that the primary goal of eGovernment is to facilitate citizen interaction with government. These G2C initiatives attempt to make transactions, such as renewing licenses, paying taxes, and applying for benefits, less time consuming and easier to carry out.

The eGovernment developed since its introduction into many forms using multiple information and communication technologies. Many governments around the world, has digitized a major portion of its public services and more frequently than before government communicates with the public through electronic channels of increasing complexity. With this development, electronic services of governments attained the transactional level. Horst *et al.* (2007) inducted that the increased level of electronic services might bring a simultaneous increase of risk. These risks are connected to the processes of sending information electronically and storing information electronically. This invokes possibility that third parties can intercept, read or even modify the information. In the case of electronic theft large quantities of delicate information can be fetched or destroyed quickly. The coupling of electronic data is simpler than with more traditional types of data storage. The information can be also passed on to other organizations quickly and easily without the public's consent. The risks of electronic services on the transactional level are more significant than at the informational level. The public needs to trust the integrity and information management capacities of the government or other involved organizations, as well as trust the infrastructure and those managing the infrastructure.

Colesca (2009) adduced that regardless of how advanced is a country in terms of ICT infrastructure and deployment, many technical and non-technical obstacles must be faced in the process of adoption of eGovernment. Eynon (2007) stated that concerns about inadequate security and privacy safeguards in electronic networks can lead to distrust in applications of eGovernment that might pose risks from unwarranted access to sensitive personal information to online fraud or identity theft. Such concerns can be a major hindrance to the citizen adoptions of eGovernment services. The process of eGovernment adoption might be affected by trust in government.

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Services of eGovernment in specifics of Slovak economy and public administration and their adoption by citizens of Slovakia will be the aim of this study.

2. Literature review

Electronic services in general are widespread in many areas of human activities thanks to the advances in information and communication technologies. Adoption of various technologies by its users is investigated using models based on theoretical frameworks of the theory of reasoned action (TRA) introduced by Fishbein & Ajzen, (1975) and theory of planned behaviour (TPB) further developed by Ajzen (1991). Research of technology adoption applies in many cases the technology acceptance model (TAM) developed by Davis (1989) on basic factors of perceived usefulness, perceived ease of use and awareness of given technology. The technology acceptance model allows to explain a substantial proportion of the variance in given technology usage intentions (Venkatesh and Davis, 2000) and has excellent measurement properties and empirical accuracy (Pavlou 2003).

In further studies investigating electronic services using TAM also other elements besides perceived usefulness, perceived ease of use and awareness of given technology were considered as factors influencing their acceptance by users. Substantial group of studies is dedicated to investigation of the customer acceptance of various forms of electronic banking. Cheng *et al.* (2006) detected that TAM reliably predicted consumers' acceptance of internet banking. Teo *et al.* (1999) extended technology acceptance model with perceived enjoyment as factor of motivation to use information system of electronic banking or any other general information system. Hawkins and Sato (2004) induced that both technical and non-technical aspects of trust in electronic banking must be addressed by banks to support their acceptance. The electronic identity as important prerequisite of electronic finance acceptance by consumers was identified by Bálint *et al.* (2011).

According to Claessens *et al.* (2002) all available information on electronic payments affects consumers' decisions about their adoption. The results of Suh and Han (2002) showed significant influence of security on acceptance of internet banking as very common electronic service. The promotion of trust in electronic services by creation and enforcement of reliable security policy was identified as crucial by Simpson (2002). Pikkarainen *et al.* (2004) found that information on electronic banking service present at websites of banks are another significant factor influencing its adoption. The results of Geetha and Malarvizhi (2011) showed that increasing level of security increases also acceptance of electronic banking services. However, the results of Widjana and Rachmat (2011) did not show significant effect of security on electronic banking acceptance. Alsajjan and Dennis (2010) detected a strong influence of trust on electronic payments adoption, together with perception of electronic payments as safe and easy. The influence of trust on electronic banking adoption was investigated also by Grabner-Kräuter and Faullant (2008) with detection of significant influence. Also, results of Qureshi *et al.* (2008) showed highly significant effects of perceived security of online banking on customers' transition from traditional banking to online banking.

Studies investigating acceptance of mobile payments also often use TAM modelling. Dahlberg *et al.* (2003) detected significance of perceived ease of use, perceived usefulness and trust in the case of mobile payments adoption. Schierz *et al.* (2010) ascertained perceived compatibility to be significant factor of mobile payments acceptance. The acceptance of contactless payments technology was also conducted (Vejačka 2015) with detection of perceived usefulness, perceived ease of use and perceived security as statistically significant factors.

Research conducted in the field of eGovernment aimed at various aspects. Moon (2002) adduced that web-based public services might help increasing trust in government by preventing corruption and inefficiency. The digital divide in meaning of inequality of access and usage of eGovernment is crucial issue that might influence adoption of electronic public service (Carter and Bèlanger 2005, John and Jin-Wan 2005, Carter and Weerakkody 2008). Reffat (2003) suggested for overcoming the digital divide provision of computer education to disadvantaged groups by governments. According to Macintosh and Whyte (2008), also a lack of participation in policy making processes may influence acceptance of eGovernment services.

Jorgenson and Cable (2002) compared e-commerce with eGovernment and detected major differences in access, structure and accountability. The eGovernment agencies are responsible for providing access to information and services to the entire eligible population, unlike in the case of e-commerce, where businesses can choose their customers. Authorities in eGovernment are often less centralized than in private businesses. This might delay implementation or introduction of government services. Furthermore, public sector agencies are obliged by the requirement to provide services in the best interest of the public, while e-commerce subjects might follow only their best interests. Warkentin *et al.* (2002) identified mandatory relationships and political nature of government authorities as the differences between eGovernment and e-Commerce.

In addition to mentioned technologies also eGovernment was investigated by various technology acceptance models. Gilbert *et al.* (2004) used combination of attitudinal technology adoption models and the service

quality concept detecting trust, financial security, information quality, time and money as predictors of potential usage of eGovernment services. Alaa-Aldin and Al Athmay (2013) suggested that demographic characteristics, such as gender, age, education, nationality, and employment, are important determinants of understanding the citizens' perceptions towards e-governance. Al-adawi *et al.* (2005) investigated the importance of trust and perceived risk in eGovernment and proposed its acceptance model based on TAM. Shin-Yuan *et al.* (2006) identified important determinants of user acceptance of the eGovernment service using theory of planned behavior. This study aimed at online tax filing and payment system in Taiwan and perceived usefulness, ease of use, perceived risk, trust, compatibility, external influences, interpersonal influence, self-efficacy, and facilitating condition were indicated as significant factors. Similarly, Ozkan and Kanat (2011) used theory of planned behavior and detected trust, perceived behavioral control and attitudes as explanatory constructs of intention to use eGovernment services.

Shareef *et al.* (2011) proposed own eGovernment adoption model indicating differences in adoption of services at various maturity levels. The study also adduced that there should be a definite tradeoff between the complexity of the security and the user-friendliness of the eGovernment service solution. Schwester (2009) recognized eGovernment adoption as a function of financial, technical, and human resources. Al-Shafi and Weerakkody (2010) using unified theory of acceptance and use of technology revealed that effort expectancy and social influences determine citizens' behavioral intention towards eGovernment. Rehman *et al.* (2012) developed own conceptual model based on TAM with findings that information quality is a significant variable when getting information from the government website. Furthermore, perceived ease of use, service quality and transaction security are significant variables which influence the citizens' intention to perform transactions with the government.

Lean *et al.* (2009) used Diffusion of Innovation model indicating trust, perceived usefulness, perceived relative advantage and perceived image to have direct positive significant relationship towards intention to use eGovernment service and perceived complexity has a significant negative relationship towards intention to use eGovernment service. While perceived strength of online privacy and perceived strength of non-repudiation had a positive impact on a citizen's trust to use eGovernment service. Horst *et al.* (2007) detected that risk perception, personal experience, perceived behavioral control and subjective norm significantly predict the perceived usefulness of electronic services in general, while trust in eGovernment was the main determinant of the perceived usefulness of eGovernment services. Bélanger and Carter (2008) created own adoption model and discovered that disposition to trust positively affects users trust of the internet and trust of the government, which in turn affect intentions to use an eGovernment service. Trust of the government also negatively affects perceived risk, which affects use intentions as well.

Researchers around the world use various models to investigate adoption of eGovernment service in given country. This type of research was not conducted in conditions of Slovakia to this date. In our previous research (Vejačka 2014), electronic banking as another form of electronic service was investigated by usage of technology acceptance model. Our aim in this paper will be to develop eGovernment adoption model based on TAM and to apply it in conditions of Slovak eGovernment.

3. Research methodology

In this study, Technology Acceptance Model will be used for modelling the factors of eGovernment services adoption by Slovak citizens. Many studies on acceptance of electronic services were conducted using well-established TAM, for example in fields of electronic finance (Black *et al.* 2002), internet banking (Howcroft *et al.* 2002; Grabner-Kräuter and Faullant 2008; Qureshi 2008) or eGovernment acceptance (Colesca 2009). Technology acceptance model developed by Davis *et al.* (1989) contained factors of perceived usefulness, perceived ease of use and perceived enjoyment and was often further extended and modified. Pikkarainen *et al.* (2004) extended TAM with factors of perceived security and the amount of information about investigated technology. Rehman *et al.* (2012) included into model also quality of eGovernmental service. Following model of citizen adoption of eGovernment services was created according to the results of literature review.

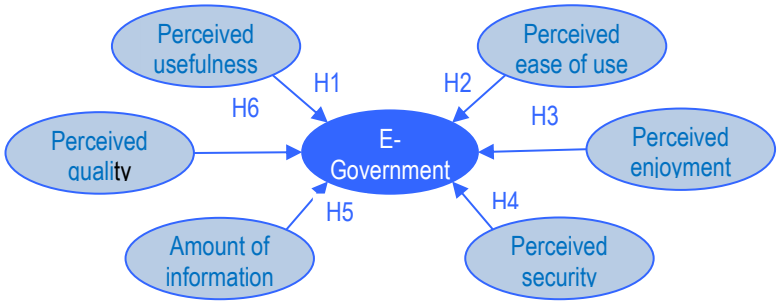

Figure 1 – The research model of eGovernment adoption

Our model adjusted classical TAM model with factors of perceived security, perceived quality of eGovernment services and amount of information about eGovernment. Some factors used in other studies (e.g. the quality of Internet connection) were not included according to results showing no significant impact on technology adoption (Qureshi 2008). Finally, research hypotheses were formulated, according to our proposed model of eGovernment adoption.

H1: Perceived usefulness has a positive influence on citizen adoption of eGovernment.

H2: Perceived ease of use has a positive influence on citizen adoption of eGovernment.

H3: Perceived enjoyment has a positive influence on citizen adoption of eGovernment.

H4: Perceived security has a positive influence on citizen adoption of eGovernment.

H5: The amount of information about eGovernment services has a positive influence on citizen adoption of eGovernment.

H6: Perceived quality of eGovernment services has a positive influence on citizen adoption of eGovernment.

Data for testing our constructed hypotheses about citizen adoption of eGovernment were gathered by questionnaire survey. The questionnaire survey was conducted during period from April 2016 to June 2016 among citizens of Slovakia. Questionnaires were distributed to potential users of eGovernment in form of electronic survey and also in printed form. In total 326 usable survey answers were gathered. The questionnaire gathered basic demographic information and data for testing hypotheses. The questions in survey were constructed to represent investigated factors influencing the adoption of eGovernment. For measuring answer option seven-point Likert scale was used. All usable gathered data was analyzed by correlation analysis, regression analysis and factor analysis.

4. Results

The demographic data were gathered to overview citizen groups attending our questionnaire survey. The frequency of eGovernment usage was also investigated. Over 54% of respondents were female (176 respondents) and almost 46% male (150 respondents). The most numerous age group of respondents was between 40 and 49 years old with 74 respondents and the least numerous group of younger than 20 years old with 29 respondents.

Over 69% of respondents (227 from the total of 326 respondents) indicated at least one use of eGovernment on informational level. The remaining 31% of respondents (99 respondents) did not use any eGovernment services yet. Approximately 27% (88 respondents) of respondents used Slovak eGovernment on transactional level. These results are slightly higher than in official report by European Commission (2016), what can be caused by composition of respondents' groups with probably higher digital literacy than Slovak average.

Following Table 1 provides basic overview of demographics information on respondents and the frequency of eGovernment services usage to the date.

Table 1 – Demographic data and eGovernment services usage results

Demographics and usage		Frequency	Percentage (%)
Sex	Male	150	46.01
	Female	176	53.99
	Total	326	100.00
Age groups	<20 years	29	8.90
	20-29 years	62	19.02
	30-39 years	56	17.18
	40-49 years	74	22.69
	50-59 years	63	19.33
	>60 years	42	12.88
Usage of eGovernment services	Do not use	99	30.37
	Obtaining information	227	69.63
	Sending filled forms	88	26.99
Frequency of usage to date	1-2 times	81	24.85
	3-5 times	55	16.87
	5-10 times	167	51.23
	More than 10 times	23	7.05

Source: own

Also, frequency of eGovernment services usage to the date of answering the survey was indicated by users. Over 30% of respondents did not ever use the eGovernment service not even for obtaining information from Slovak public authorities. Almost 25% of respondents used eGovernment services only once or twice before. Below 17% of respondents used eGovernment service for three up to five times to date. The most of respondents (167, 51.23%) indicated usage of eGovernment service for five up to maximum of 10 times before. The smallest group of respondents used eGovernment more than ten times. Results show that Slovak citizens do not use eGovernment service very often. This finding corresponds with recent report of European Commission (2016) about state of the eGovernment in Slovakia. Higher percentages were detected in our survey in both levels of usage of eGovernment services (informational and transactional).

The data for verification of our model of factors influencing adoption of eGovernment services by citizens were gathered in the second part of our survey. Respondents expressed level of acclaim with the statements on seven point Likert scale with levels from “strongly agree” to “strongly disagree”. The statements (included in Table 2) were grouped to six groups, each representing one of the factors intercepted in proposed research model, namely perceived usefulness (PU), perceived ease of use (PEOU), perceived enjoyment (PE), perceived security, amount of information about eGovernment service and perceived quality of service.

Gathered data were further analyzed in SPSS statistics software using confirmatory factor analysis with principal axis factoring. Furthermore, varimax rotation and Kaiser normalization were applied to process data in factor analysis. These methods are used as standard in studies using TAM based models (e.g. Gilbert *et al.* 2004, Colesca 2009, Geetha and Malarvizhi 2011). Only variables that fitted the model were included for further analysis.

Kaiser-Meyer-Olkin measure of sampling adequacy was expressed at 0.809 surpassing minimum level of 0.60 required for reliability. Bartlett’s test of sphericity was also conducted in SPSS and confirmed factorability at significant value below 0.001. So, confirmatory factor analysis was appropriate method. Further, Cronbach’s alpha test was performed to test the reliability of all constructs included in model and constructs surpassed minimum level for reliability at the value of 0.70 (Suh and Han 2002). The factor of perceived usefulness with four variables and Cronbach’s alpha at 0.871. The second factor of ease of use had three variables with Cronbach’s alpha at 0.769. The factor of perceived enjoyment of usage contained three variables and had Cronbach’s alpha value at 0.714. The fourth factor of perceived security with four variables had value of Cronbach’s alpha at level of 0.826. The amount of information about eGovernment services as fifth factor consisted of four variables and had value of Cronbach’s alpha at level of 0.783. The last factor was perceived quality of service contained three variables and had Cronbach’s alpha at the level of 0.840.

Table 2 – The factor analysis of eGovernment adoption

Variables of factor	Perceived usefulness	Perceived ease of use	Perceived enjoyment	Perceived security	Amount of information	Perceived quality
Using eGovernment services saves my time compared to the traditional government services	0.913					
Using eGovernment services is simpler	0.785					
Using eGovernment services brings me advantages	0.866					
Overall, I consider using eGovernment services to be advantageous	0.902					
Using eGovernment services is easy for me		0.687				
Using eGovernment services is clear and understandable for me		0.756				
It is easy for me to improve myself in using of eGovernment services		0.804				
Overall, I consider using eGovernment services to be easy		0.786				
Using eGovernment services is pleasant			0.687			
Using eGovernment services is positive experience			0.724			
Overall, using eGovernment services is a good idea			0.830			
I have enough information about secure use of eGovernment services				0.691		
I use eGovernment services securely				0.718		
My sensitive data are safe when using eGovernment services				0.729		
Overall, using eGovernment services is secure				0.735		
I have enough information about eGovernment services					0.705	
I have enough information about the benefits of eGovernment services					0.764	
Using eGovernment services improves service quality						0.831
eGovernment services are of good quality						0.672
Overall, I perceive eGovernment services as of a good quality						0.751
Percentage of variance explained	20.219	15.057	12.308	13.710	11.751	12.932

Source: Own survey data processed by SPSS Principal Axis Factoring with varimax rotation

All factors together represented 85.98% of variables' variance. The total reliability of the factor analysis conducted was 0.79. The dependent value in proposed and tested model was the use of eGovernment services. The factor of perceived usefulness explained the most of variance (20.22%) and respondents perceive usefulness of eGovernment services as very important when making decision if to use these services. Respondents, stated that using eGovernment services is a good idea, but they do not find it very pleasant. Also, some concerns about security of sensitive data were detected. Number of respondents also disputed about the quality of eGovernment

services in Slovakia, what might be caused by its slow development and multiple cases of delivering partially inoperative service to use in recent years. Furthermore, the regression analysis was performed with aim to investigate impact of identified factors on the use of eGovernment services by the consumers. Following Table 3 shows the results of the regression analysis of gathered data.

Table 3 – The regression analysis

Regression	Standardized coefficients: Beta	*T*	Significance
Perceived usefulness	0.231	3.372	0.011
Perceived ease of use	0.128	1.303	0.078
Perceived enjoyment	0.075	0.966	0.137
Perceived security	0.168	2.149	0.038
Amount of information	0.183	1.974	0.044
Perceived quality	0.214	2.861	0.023

Source: Own survey data processed

The statistical significance of identified factors was tested by regression analysis. Its results showed perceived usefulness (t=2.88, p<0.05), perceived security (t=2.15, p<0.05), amount of information about eGovernment services (t=1.97, p<0.05) and perceived quality (t=2.86, p<0.05), as statistically significant factors. The factor of perceived enjoyment (t=0.97, p=0.14) and perceived ease of use (t=1.30, p=0.08), were statistically insignificant.

In addition, our hypotheses were tested by correlation analysis of gathered data. The results of correlation analysis show that perceived usefulness, perceived security amount of information and perceived quality have positive influence on the use of eGovernment by citizens of Slovakia. The overall model was statistically significant (R^2=0.187, p<0.05). In following Table 4 are indicated correlations of all factors with the eGovernment use.

Table 4 – The correlation analysis

Factors	Use	Perceived usefulness	Perceived ease of use	Perceived enjoyment	Perceived security	Amount of information	Perceived quality
Pearson correlation	1	0.326	0.101	0.097	0.193	0.205	0.166
Significance		0.008	0.186	0.097	0.039	0.042	0.028

Source: Own survey data processed

Our results indicated that perceived usefulness, perceived security, amount of information and perceived quality have a positive effect on the use of eGovernment services in Slovakia. Data gathered supported our model hypotheses H1, H4, H5 and H6 were supported. Perceived ease of use and perceived enjoyment do not have statistically significant influence on the use of eGovernment services, so hypotheses H2 and H3 were not supported by the data.

Conclusion

The aim of study was to investigate citizen adoption of eGovernment in Slovakia. The Technology Acceptance Model (TAM) based model was developed and employed to model the adoption. The proposed model emanated from results of other studies investigating electronic services acceptance. Our model of eGovernment adoption contained TAM factors (perceived usefulness, perceived ease of use and perceived enjoyment) and additional factors of perceived security, amount of information on eGovernment and perceived quality. Subsequently, the model of eGovernment adoption was tested on data gathered via questionnaire survey. In total, 326 Slovak citizens responded in survey with usable answers to questionnaire. The gathered data served as background for factor analysis that detected proposed factors of eGovernment adoption. The factors of perceived usefulness, perceived ease of use, perceived enjoyment, perceived security, amount of information about eGovernment services and perceived quality of services were detected. Further the regression and correlation analyzes were performed to verify significance of factors.

Our results showed perceived usefulness, perceived security as factors with positive effect on acceptance of eGovernment services. The results correspond with other studies using TAM for electronic services acceptance investigation (Black *et al.* 2002, Horst *et al.* 2007). Other two factors of amount of information on eGovernment and perceived quality of services were also detected as significant corresponding to results of Colesca (2009) or Rehman (2012). Perceived enjoyment and perceived ease of use have not statistically significant effect on

eGovernment services acceptance according to our results. Perceived enjoyment as an insignificant influence is in contrast with some of the studies (Pikkarainen *et al.* 2004), but can be specific to the field of eGovernment services (Lean *et al.* 2009), while completion of some formalities is obligatory. Insignificance of perceived ease of use can be attributed to usage of eGovernment service in Slovakia even in conditions of imperfect electronic government services or systems.

This research contributes to the fields of adoption of eGovernment and technology acceptance in general. The study investigates preferences of Slovak citizens in using EGovernment with results indicating perceived usefulness, perceived security, amount of information about services and perceived quality of services as statistically significant factors of citizen adoption of eGovernment in Slovakia. The validity limitations of our study are in representativeness of sample gathered by survey. The research can be further extended on specific eGovernment services or model can be further adjusted to study other factors potentially influencing eGovernment adoption.

References

[1] Ajzen, I. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2): 179–211 Available at: http://dx.doi.org/10.1016/0749-5978(91)90020-T

[2] Alaa-Aldin, A., Al Athmay, R. A. 2013. Citizens' Perceptions towards e-Governance: Field Study. *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering,* World Academy of Science, Engineering and Technology, 7(9). Available at: http://waset.org/publications/16711/ citizens-perceptions -towards-e-governance-field-study

[3] Al-adawi, Z., Yousafzai, S. and Pallister, J. 2005. *Conceptual Model of Citizen Adoption of EGovernment,* Paper presented of the Second International Conference on Innovations in Information Technology, 2005. Available at: http://www.it-innovations.ae/iit005/proceedings/articles/g_6_iit05-al-adawi.pdf

[4] Alsajjan, B. and Dennis, C. 2010. Internet banking acceptance model: Cross-market examination. *Journal of Business Research*, *Advances in Internet Consumer Behavior& Marketing Strategy*, 63 (9–10): 957–963. Available at: http://dx.doi.org/10.1016/j.jbusres.2008.12.014

[5] Al-Shafi, S. and Weerakkody, V. 2009. *Factors Affecting EGovernment Adoption in the State of Qatar*. Paper presented at European and Mediterranean Conference on Information Systems, 2010: 1-23.

[6] Bálint, T., Bucko, J. and Esser, M. 2011. *Electronic identity, risks of its abuse and its importance for the development of e-commerce.* Paper presented at conference: 9th International Conference on Hradec Economic Days 2011 - Economic Development and Management of Regions Location: Univ Hradec Kralove, Czech Republic, February 1.-2. 2011, Conference proceedings Vol. 1 (24 – 27) Gaudeamus.

[7] Bélanger, F and Carter, L. 2008. Trust and risk in eGovernment adoption. *Journal of Strategic Information Systems*, 17: 165–176.

[8] Black, N. J., Lockett, A., Winklhofer, H. and McKechnie, S. 2002. Modelling consumer choice of distribution channels: an illustration from financial services. *International Journal of Bank Marketing,* 20 (4): 161-173. Available at: http://dx.doi.org/10.1108/02652320210432945 .

[9] Carter, L., and Bélanger, F. 2005. The utilization of eGovernment services: citizen trust, innovation and acceptance factors. *Information Systems Journal*, 15: 5-26.

[10] Carter, L., and Weerakkody, V. 2008. EGovernment Adoption: A Cultural Comparison. *Information Systems Frontiers*, Springer, 10 (4): 473-482. Available at: http://dx.doi.org/10.1007/s10796-008-9103-6.

[11] Cheng, E. T. C., Lam, D. Y. C., Yeung, A. C. L. 2006. Adoption of internet banking: An empirical study in Hong Kong. *Decision Support Systems*, 42(3): 1558–1572. Available at: http://dx.doi.org/10.1016/ j.dss.2006.01.002

[12] Claessens, S., Glaessner, T., Klingebiel, D. 2002. Electronic Finance: Reshaping the Financial Landscape Around the World. *Journal of Financial Services Research,* 22: 29 – 61. Available at: http://dx.doi.org/10.2139/ssrn.271935

[13] Colesca, S. E. 2009. Increasing e-Trust: A Solution to Minimize Risk in EGovernment Adoption. *Journal of Applied Quantitative Methods*, 4 (1): 31 - 44.

[14] Dahlberg, T., Mallat, N. and Öörni, A. 2003. *Consumer acceptance of mobile payment solutions*. G.M. Giaglis (ed.), mBusiness 2003. Paper presented at the Second International Conference on Mobile Business, Vienna, 2003: 211–218.

[15] Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13 (3): 319–336. Available at: http://dx.doi.org/10.2307/249008

[16] 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 (8): 982-1003. Available at: http://dx.doi.org/10.1287/mnsc.35.8.982

[17] Eynon, R. 2007. *Breaking Barriers to eGovernment: Overcoming Obstacles to Improving European Public Services*, European Commission, Brussels. Available at: https://www.oii.ox.ac.uk/archive/downloads/research/egovbarriers/Oct21Workshop/200710_breaking_barriers_to_egovernment.pdf

[18] Fishbein, M., and Ajzen, I. 1975. *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley: 578.

[19] Geetha, K. T. and Malarvizhi, V. 2011. Acceptance of E-Banking among Customers (An Empirical Investigation in India). *Journal of Management and Science*, Non Olympic Times, 2 (1): 1-9.

[20] Gilbert, D., Balestrini, P., Littleboy, D. 2004. Barriers and benefits in the adoption of egovernment. *International Journal of Public Sector Management*, 17 (4): 286 – 301. Available at: http://dx.doi.org/10.1108/09513550410539794

[21] Grabner-Kräuter, S., Faullant, R. 2008. Consumer acceptance of internet banking: The influence of Internet trust. *International Journal of Bank Marketing*, 26(7): 483 – 504. Available at: http://dx.doi.org/10.1108/02652320810913855

[22] Hai, J.C. Ibrahim 2007. *Fundamental of Development Administration*. Puchong, Selangor: Scholar Press.

[23] Hawkins, J. and Sato, S. 2004. Electronic Finance: an overview of the issues. *Communications of the ACM*, ACM.org, BIS workshop, Basel, Volume 49 (7). Available at: http://www.bis.org/publ/bppdf/bispap07a.pdf

[24] Horst, M., Kuttschreuter, M. and Gutteling, J.M. 2007. Perceived Usefulness, Personal Experiences, Risk Perception and Trust as Determinants of Adoption of EGovernment Services in the Netherlands. *Computers in Human Behavior*, 23: 1838-1852.

[25] Howcroft, B., Hamilton, R. and Hewer, P. 2002. Consumer attitude and the usage and adoption of home-based banking in the United Kingdom. *The International Journal of Bank Marketing,* 20 (3): 111- 121. Available at: http://dx.doi.org/10.1108/02652320210424205

[26] John, J., and Jin-Wan, S. 2005. EGovernment in South Korea: planning and implementation. *Electronic Government, an International Journal*, 2 (2): 188-204.

[27] Jorgenson, D and Cable, S. 2002. Facing the Challenges of EGovernment: A Case Study of the City of Corpus Christi, Texas. *SAM Advanced Management Journal*, 67 (3): 15-21.

[28] Lean, O. K., Zailani, S., Ramayah, T. and Fernando, Y. 2009. Factors influencing intention to use eGovernment services among citizens in Malaysia. *International Journal of Information Management*, 29 (6): 458–475.

[29] Macintosh, A. and Whyte, A. 2008. Towards an Evaluation Framework for eParticipation. *Transforming Government: People, Process and Policy*, 2 (1): 16-30 Available at: http://dx.doi.org/10.1108/17506160810862928

[30] Moon, M. 2002 The evolution of EGovernment among municipalities: Rhetoric or Reality. *Public Administration Review,* 62: 4.

[31] Ozkan, S. and Kanat, I. E. 2011. eGovernment adoption model based on theory of planned behavior: Empirical validation. *Government Information Quarterly*, 28: 503–513.

[32] Pavlou, P. A. 2003. Consumer acceptance of electronic commerce. Integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce*, 7 (3): 101–134.

[33] Pikkarainen, T., Pikkarainen, K., Karjaluoto, H. and Pahnila, S. 2004. Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet Research,* ABI/INFORM Global, 14 (3): 224-234. Available at: http://dx.doi.org/10.1108/10662240410542652

[34] Qureshi, T. M., Zafar, M. K. and Khan, M.B. 2008. Customer Acceptance of Online Banking in Developing Economies. *Journal of Internet Banking and Commerce*, 13 (1): 1-9.

[35] Rehman, M., Esichaikul, V. and Kamal, M. 2012. Factors influencing eGovernment adoption in Pakistan. *Transforming Government: People, Process and Policy*, 6 (3): 258 – 282. Available at: http://dx.doi.org/10.1108/17506161211251263

[36] Schierz, P. G., Schilke, O. and Wirtz, B.W. 2010. Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications*, 9: 209–216.

[37] Schwester, R. 2009. Examining the Barriers to eGovernment Adoption**.** *Electronic Journal of eGovernment,* 7(1): 113-122.

[38] Shareef, M. A., Kumar, V. Kumar, U. and Dwivedi, Y. K. 2011. eGovernment Adoption Model (GAM): differing service maturity levels. *Government Information Quarterly*, 28 (1)*:* 17–35.

[39] Shin-Yuan, H., Chia-Ming, Ch. and Ting-Jing Y. 2006. Determinants of user acceptance of the eGovernment services: The case of online tax filing and payment system. *Government Information Quarterly,* 23 (1): 97–122.

[40] Simpson, J. 2002. The impact of the Internet in banking: observations and from developed and emerging markets. *Telematics and Informatics*, New York: Pergamon, 19: 315–330. Available at: http://dx.doi.org/10.1016/S0736-5853(01)00019-3

[41] Suh, B. and Han, I. 2002. Effect of trust on customer acceptance of Internet banking. *Electronic Commerce Research and Applications*, 1: 247–263. Available at: http://dx.doi.org/10.1016/S1567-4223(02)00017-0

[42] Teo, T. S. H., Lim, V. K. G., Lai, R. Y. C. 1999. Intrinsic and extrinsic motivation in Internet usage. *Omega International Journal of Management Science,* 27: 25–37. Available at: http://dx.doi.org/10.1016/S0305-0483(98)00028-0

[43] Vejačka, M. 2014. Customer acceptance of electronic banking: Evidence from Slovakia. *Journal of Applied Economic Sciences*, Volume IX, 3: 514-522.

[44] Vejačka, M. 2015. Consumer Acceptance of Contactless Payments in Slovakia. *Journal of Applied Economic Sciences*, 10 (5): 760-767.

[45] Venkatesh, V. and Davis, F.D. 2000. Theoretical extension of the technology acceptance model: four longitudinal field studies. *Management Science,* 46 (2): 186 – 204. Available at: http://dx.doi.org/10.1287/mnsc.46.2.186.11926

[46] Warkentin, M., Gefen, D., Pavlou, P. and Rose, G. 2002. Encouraging Citizen Adoption of eGovernment by Building Trust. *Electronic Markets,* 12 (3): 157-162.

[47] Widjana, M. A. and Rachmat, B. 2011. Factors Determining Acceptance Level of Internet Banking Implementation. *Journal of Economics, Business and Accountancy*, 14 (2): 161–174.

*** European Commission 2016. eGovernment in Slovakia, February 2016, Edition 18, ISA: 1 – 45. Available at: https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/eGovernment%20in%20Slovakia%20-%20February2016_v1_00.pdf

*** United Nations DPEPA. 2001. *Benchmarking EGovernment: A Global Perspective.* United Nations Division for Public Economics and Public Administration, American Society for Public Administration: USA.

Mental Programs and Models of Economic Behavior in the Russian Society

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Abstract:

The relevance of the article has been determined by the impact on the economic behavior of the Russians at the turn of the century caused by a conservative turn in the mass consciousness. The authors used a multidisciplinary scientific approach, based on the methodology of social simulation. On the basis of cognitive design, the features of modal model and normative model of economic behavior in the Russian society were identified. The article reveals the contents of reflective and non-reflective structures of mental programs that determine the behavior of economic actors. The authors show that as a result of the conservative turn in the Russian mass consciousness, which occurred at the turn of the century on the wave of "disappointment" with liberal reforms, the Russian consciousness became dominated by "statist-liberal" trend with a predominance of conservative views, values and attitudes. The study of mental programs and economic behavior models allows us to understand why people behave differently in the same socio-economic situation

Keywords: economic behavior, mental program, property, labor.

JEL Classification: L10, O22, O29.

1. Introduction

In the modern Russian society, we can distinguish different models of economic behavior that have been formed in the context of modernization carried out by the State at the end of XX - beginning of XXI century. The economic behavior of Russians at the turn of the century had been greatly influenced by a conservative turn in the mass consciousness, associated with the increased discontent of a significant part of Russian society not only with the results of the reforms, but also with their objectives (Analytical Report 2011). As noted by the researchers, this turn has led to the evaporation in the Russian society of the ethics of free, but hard labor (Yanitskii 2012), which originated in the early 90s on a wave of euphoria from the objectives of liberalization of the Russian economy. Cognitive modeling of economic behavior makes it possible to better understand its specific characteristic peculiar to different social groups in Russia. This is the reason of the research interest for the mental programs and the models of economic behavior in the Russian society.

2. Literature review

The scientific literature is keenly focused on the rational nature of economic behavior, expressed in making decisions concerning the disposition of material goods and optimization of results under resource-limited conditions (Goodwin *et al.* 2013, Simon 1997). The study of the rational nature of economic behavior allows us to understand how the economic institutions operate successfully in society.

However, as noted by the researchers, the real economic behavior "systematically endures a shortage of the perfect rationality". Therefore, the scientists propose to study the models of economic behavior in terms of the violation of the principles of this "rationality". This kind of study makes it possible to distinguish the difference between the decisions that are made based on experience and those made on the basis of rational descriptions of the possible benefits and costs (Erev and Roth 2014). In this regard, the research practices actualized problems associated with the transition from the "hard" rationality models to the "soft" one at the macroeconomic level (Zafirovski 2003), and with the explanation of the relation of rational and irrational economic behavior of individuals (Gigerenzer and Selten 2002, Ariely 2008, Wakker 2010). In particular, some researchers studying the economic behavior of the Russian society from the standpoint of rational choice theory noted that the emergence of irrational elements in it has been caused by crisis conditions and economic and financial illiteracy of the population (Zinkovich 2015).

In research practice, there are different views about the role of objective and subjective factors determining the economic behavior. For example, some researchers say that the economic behavior depends on the institutional environment that provides opportunities for economic growth and fixes limits of the freedom of action of economic agents (Cebula *et al.* 2015). The others emphasize the importance of economic beliefs and values making it possible to construct the universal models of economic behavior of actors in different countries (Heaven 1990). There are researchers that pay special attention to the dependence of the economic behavior on the value preferences and identify two opposing value systems, one of which is focused on the economic independence of the actors, and the other one is focused on the economic paternalism. Such systems imply the opposite model of economic behavior: the economically progressive model that promotes the "long-term economic growth and welfare, as well as the implementation and support of innovation", and economically regressive model that determines the "long-term economic stagnation" (Lebedeva and Tatarko 2011). The other researchers studying the features of economic behavior in different countries note the powerful influence of national cultures on it (Ehmke *et al.* 2010). Some researchers, paying great attention to subjective factors, point out that cognitive abilities determine a significant part of the preferences of economic actors, which together with the personal traits explain their economic behavior. They also believe that the study of traits of economic entities can help to more accurately predict the results of their actions, rather than an analysis of their economic preferences (Rustichini *et al.* 2012).

In recent times, the researchers are applying more and more often a multivariate approach to the understanding of economic behavior, which is seen as a set of actions of economic actors in the synchronization of their material interests, resource capacities and value-regulatory potential (Radayev 2005). Under the frame of this approach, some researchers determine the relationship between values, beliefs and behavior of agents in the economic sphere, as well as study the impact on the economic behavior of the differences in levels of economic development of the territories (Graça *et al.* 2015). Other researchers believe that the economic behavior is based on the relationship between economic consciousness and the behavior itself, which does not always adequately reflect the content of consciousness. The economic behavior is also influenced by the conditions for the realization of economic consciousness and behavior, i.e. the social environment. In this regard, the researchers point out that there has been a paradoxical situation formed in Russia: "on the one hand, the confidence in some aspects of the economic development of the country has increased. On the other hand, many estimates regarding the macro-, meso- and microenvironment of socio-economic status of the people have worsened. According to researchers, all of this allows for the conclusion about a "sufficiently contradictory nature of the functioning of economic consciousness and behavior" in modern Russian society (Toshchenko 2014).

A review of scientific literature demonstrates the need for the conceptualization of ideas about economic behavior and reconstruction on that basis of it features in the Russian society. Identification of these features suggests the construction of different models of economic behavior caused by its mental programs.

2. Methodology

Economic behavior is a reaction of economic actors to the socio-economic situation in the form of certain rational and irrational actions aimed at the adaptation to the socio-economic environment. There are different opinions in modern literature about the factors of economic behavior determined by methodological preferences of a researcher. However, as shown by the research practice, these preferences are paradigmatically one-sided, so there has been a tendency in the modern study of economic behavior within which it is no longer considered only as actions arising from the socio-economic situation or individual personality traits, its beliefs and values. Economic behavior begins to be seen as the result of the actor's interpretation of the socio-economic situation and institutional and economic practices, attributing to them certain values and meanings in the socio-cultural context. As a result, the study of economic behavior starts to become increasingly contextual. Context principle in scientific research means that every economic phenomenon must be studied within the framework of the socio-cultural environment which gave rise to this phenomenon. Therefore, the previous search for universal scientific concepts and theoretical constructs useful in the study of any country regardless of its socio-cultural identity, in modern epistemology is considered methodologically invalid and is seen as an "alluring scientist utopia".

In addition, the context principle implies an understanding of the socio-economic reality how it "really" is and requires the study first of all of representations of people about the surrounding socio-economic world. It has been already noticed that people live in the socio-economic reality, which they picture to themselves, due to the ability to its designing based on knowledge obtained from the outside and from one's own socio-economic experience gleaned from informal practices of everyday life, and therefore as noted by Thomas (1928) "if the people define situations as real, they are real in terms of their consequences". Such an approach makes it possible to consider the economic behavior from the standpoint of social and cognitive aspect, under which the ways that shape people's

attitudes toward the situation is identified on the basis of its cognitive interpretation within a certain situation context (Crusius *et al*. 2012). In this regard, the researchers underlining the importance of such a context note that is not enough to learn a direct impact of the situation on human behavior, as a significant factor of his activity is his own life scenario interwoven in this context.

Interpretation of a socio-economic situation is made by the actors on the basis of mental programs that formed in the process of socialization and socio-cultural communication. In line with the idea about culture as a collective mind programming, rooted sometimes unconsciously in society in values, Hofstede considers mental programs as examples of "thinking, feeling and acting" (Hofstede 2001). Within the framework of a multi-dimensional methodological construct of an interdisciplinary scientific research in the mental program that determines the behavior of economic actors, we can distinguish cognitive, axiological and connotative structures both reflective (conscious) and non-reflexive (unconscious). Perceived structures of the mental program are unstable; being perceived by people, they are constantly diversified, and therefore become susceptible to internal and external influences. Unconscious mental program structures, on the contrary, are not very susceptible to internal and external influence, since they are not perceived by people as the basis of their economic behavior, and therefore they are stable.

In the mental program, depending on the socio-economic situation, both conscious and unconscious structures can be activated, which affects the interpretation of the economic actors of this situation. Due to this, the actors, getting into the same socio-economic situation, design different patterns of socio-economic reality, determining the features of their economic behavior in society. The study of mental programs of economic behavior makes it possible to construct its various models in a particular society. Thus, the models of economic behavior can be regarded as analogues of short cognitive behavioral scenarios of typical life situations in which people interact with each other in a certain way (Shilkina 2012). Analysis of conscious mental program structures provides possibility to select the modal models of economic behavior as the most statistically common in a particular society. Analysis of the unconscious mental program structures makes it possible to select the normative model of economic behavior, typical for individuals who have undergone socialization within a particular culture. As modalities determining the models of economic behavior, it is possible to allocate the property and labor, which form the basis for behavioral scenarios of economic actors in society.

3. Results

Modal model of economic behavior of individuals constituting a particular social group in Russian society can be reconstructed on the basis of the results of sociological research of ideas, values and attitudes of the Russians (Levada Center 2016). Two of these social groups can be identified in the Russian society at the beginning of the XXI century: the representatives of one of them are guided by the liberal model of economic behavior; the representatives of the other are guided by the conservative one. Since the modal models of economic behavior are quite flexible, their boundaries are interpenetrating, which makes these models hybrid. So, in reality, economic behavior relating to the conservative model may contain elements of liberal model and vice versa.

Currently, only a small number of Russians adhere to the liberal model of economic behavior in pure form, in the mental program of which the base value is the private property and the market economy. Thus, only 3% of Russians believe that all large enterprises should be privatized, 17% believe that it is not necessary to raise the question of the return of the property privatized in the 90s to the government, 26% consider the market economy the most effective.

In practice, the liberal model of economic behavior in the Russian society is hybrid: "liberal-statist", because it includes elements of the conservative behavior model. In the mental program of the "liberal-statist" model of economic behavior the private property is associated not with large and medium capital, but with a small business. This is evidenced by the fact that 34% of Russians prefer to be self-employed, 24% opt of strengthening of the private ownership of land, 62% find the activity of subjects of small and medium businesses positive, and 47% believe that the activities of large Russian businessmen are beneficial to Russia.

Conservative model of economic behavior in pure form, the mental program which is dominated by the values of state property and state regulation of economic relations, is also held by a small number of Russians. For example, only 16% of Russians believe that only the state property should be in Russia, including the land property, 69% note the aggravation of income inequality between the rich people and poor people for the last 15 years.

In practice, the conservative model of economic behavior in the Russian society is also hybrid: "statist-liberal". This is evidenced by the fact that over the last 15 years in Russian society, on the one hand, the number of persons having inimical attitude to private property has been down by almost half, on the other hand, 52% of Russians consider an economic system based on state planning and distribution the most successful, 35% evaluate

negatively the activities of Russian businessmen and entrepreneurs, because they are disadvantageous for Russia. 45% of Russians believe that all large enterprises should belong to the state. 42% declare that the state ownership must be restored to all the property privatized in the 90s, 33% believe that it is necessary to restore the state ownership to the property that was illegally privatized, 57% agree with the land ownership being private, but controlled by the state. At the same time, 54% of Russians prefer to be salaried employee and receive a stable salary, 25% want to receive a salary and not to go to work, and 40% of Russians are not planning to start "their own business".

Under the economic crisis caused by the economic sanctions, the share of expenses of the Russians on food products exceeded 50%. Therefore, "the number of Russians, who believe the economic crisis is the main threat to the country, has grown from 29 to 49%. 53% of respondents are mostly threatened by rising prices and the impoverishment of the population, 35% fear the increase in unemployment. At the same time, almost half of the respondents said about the decrease in family consumption. "The index of consumer sentiment, which in 2008 was 100%, decreased to 60% in September, 2015 and 57% in January, 2016. However, in the middle of 2016, the majority of Russians say that their level of consumption remains the same (52% vs 36 %). According to the observations of experts, the Russians "are spending more than half of income on food, and are ready to continue to tighten their belts". This paradox is caused by the consumption peculiarities of the Russian people; most of them do not have experience in creating long-term investment and use the risky strategies of consumer behavior. In addition, experts say that the majority of Russians hold a course for a "decent" poverty, when people are not starving, but they are able to supply only their current needs, and in this context, they are fully dependent on the state. On this basis, the idea of paternalism is cultivated, and it "takes away the free choice in consumption from the people and constrains even more the free behavior of Russians, making people dependent and lacking initiative" (Novaya Gazeta 2016).

Along with the attitude toward the property, the "statist-liberal" model of economic behavior in the Russian society is also characterized by the attitude toward labor, which includes such components as motives of labor behavior, the actual work behavior characterizing labor activity, and the economic actors' evaluation of the labor situation. Motivational attitude toward work cannot be explained only through the identification of economic motivations of actors, therefore, as emphasized by the researchers, economic motivations, such as economic benefits, are secondary in comparison with the value motivation of employees related to their desire to be engaged in certain activities (Howley *et al.* 2015). The "statist-liberal" model of economic behavior of Russians is characterized by a terminal motivational attitude to work and instrumental one. Terminal attitude reflects the importance of labor as the life goal for people to whom the labor is the purpose of life and the means of self-fulfillment. With such an attitude toward labor, the level of material compensation is not important because people can work voluntarily, not under compulsion. An indicator of the terminal attitude to work is the focus of economic actors on the content of work and not on the earnings. The instrumental attitude toward work implies focusing on salary and not on the content of work. The work activity carried out in this case is a means of meeting the needs that are beyond of the labor itself. The instrumental attitude toward work is the focusing on high earnings, regardless of the content of work. At the beginning of liberal reforms in Russian society, the instrumental type of attitude to work dominated. However, as a result of the conservative turn in the mass consciousness of Russians, at the present time there is a steadily increasing importance of such terminal value, as "interesting work". In particular, 66% of Russians believe that the work is not only money, but also a means of self-fulfillment and communication with people.

Another component of the "statist-liberal" model of economic behavior in relation to labor is the actual labor behavior, showing labor activity of workers. At this moment, we can say that the level of labor activity of Russians is average. In particular, in 2015 there was a fairly high employment rate (65.3%) at the labor market. The growth in demand for labor was observed in the construction, transport and communications, public administration and social services, education and health care" (Forecast 2016). This kind of demand indicates that the actual work behavior, i.e. workers' activity depends on the type of work and salary. There is a growing activity of employees providing services and reduction in the level of workers employed in industry and agriculture. This makes it possible to draw the conclusion that within the framework of the actual work behavior, the Russian society is dominated by instrumental type of motivational attitude to work due to the contradiction between the type of work and salary.

The third component of attitude toward work is associated with the Russians' assessment of the labor situation in terms of satisfaction/dissatisfaction with their working activity. Statistical data show that, despite the work on weekends and holidays, 75% of Russians are quite satisfied with their work time-schedule. At the same time, 68% of respondents are satisfied with performing their duties, 64% are satisfied with working conditions, and

55% have the professional satisfaction. However, the level of wages is not satisfactory for one in four of working age, by contrast with the working retirees (29%) and young people (45%) (Rosstat study 2016).

Thus, in the mental program of "statist-liberal" model of behavior, the Russians' attitudes toward work, on the one hand, are most of all conservative focused on the content of work; the high earnings are of secondary importance. In the majority of Russians, conservative attitudes prevail in the area of satisfaction with the work situation, depending on the balance of the employee's skill level and the salary. But on the other hand, the activity of labor behavior of the Russians is dependent on correspondence of the type of work to the level of wages, so here the wage-oriented liberal labor attitude is determinative.

The standard model of economic behavior in Russian society is determined by unconscious structures of its mental program, which is dominated by statist-paternalist and egalitarian ideas, values and attitudes toward property and labor. There is the image of the supreme property in this program, the specificity of which is that the terms and restrictions relating to the use of property are imposed by the state "from the top-down". The conditional supreme property confirms also the priority right of the state to use the most important productive resources, and the absence of full rights of any individual or social group to any of its material object. Therefore, the mental program of the normative model of economic behavior in the Russian society does not contain the concept of the inviolability of private property and the need for its enforceability. In this program, the state keeps the right to expropriate property, especially the one received not as a result of the one's work, but as a result of rapid enrichment during repeated redistribution of property in the process of economic reforms and political regime change. In this regard, one of the features of the normative model of economic behavior is the weak legal protection of economic actors, a part of which is the weak protection of property rights.

The denial of absolute and unconditional nature of private property attributed to the consideration of the property in the Russian society the moral and ethical dimension. In this regard, there is an idea in the mental program that the activities of economic entities, including the state ones, should be determined not by the interests of owners but by those of the society. Therefore, it is the public interest that is considered as a priority in the formation of the type of interactions between producers and consumers in Russia. This feature of the mental program of the economic behavior is well expressed by one of Russian thinkers, who wrote that in Russia the private owner must realize that the enforcement of his rights is performed by the society, so he should also find himself as a "servant of the state, performer of the service function in the whole organism of national life". Therefore, the owner rights in the Russian culture are limited by "the interests of the social whole, the most fruitful cooperation objectives; the state has the right and duty to regulate it, the objective right sets norms for it, can put certain limits to it and impose certain obligations of the owner" (Frank 1993).

A particular attention in the mental program of economic behavior in the Russian society has been paid to natural resources, including the land ones, which are treated as a public domain. In this regard, the researchers note that "in the popular mind, there has always been an idea that the only valid source of acquisition of property rights can be the labor. Therefore, land, which is not the product of labor, should not be in private ownership, but only in temporary use, the right to which can be given only by the work" (Platonov 1993).

The mental program of economic behavior is also dominated by egalitarian values associated with a focus on collective forms of property and the maintenance of public tranquility when using its facilities. The basis of this tranquility consists in the egalitarian principle of public distribution of social wealth. This principle gives rise in the Russians of a "be like everyone else" attitude, freeing them from responsibility for their actions, which is transferred to the state as supreme arbiter.

In the mental program of the normative model of economic behavior, a special place is occupied by an attitude focused on justice as social equality. If the distribution according to labor is measured based on a correlation between the labor contribution of the worker and shares of the social product taken by him, the Russians consider fair the taking by each member of society of an equal share of the social wealth. Therefore, the Russian society is dominated by an idea, that the state is intended to directly meet the economic needs of all its members. The dominance of the idea of public appropriation in the mental program of the normative model of economic behavior makes the concept of the individualization of social labor impossible.

It is necessary to distinguish in the mental program of the normative model of economic behavior the concepts related to the attitude to labor and work, which are filled with social and ethical content: a person labors for himself, and works for someone else. If "labor for oneself" is perceived as an interesting meaningful activity that requires creative efforts, the "work for someone else" is a compulsory form of human existence, focused exclusively on the earnings. As a result, there has been a special work ethic formed in the mental program of the normative model of economic behavior, which under the domination of non-economic forms of economic activity contributes to the transition of working motivation to the sphere of the state, and in the everyday life it guides the economic

actor to a low level of material aspirations, forming a habit of poverty. In this regard, in the mental program of the normative model of economic behavior there is, on the one hand, the concept of working "carelessly", and on the other hand, the aspiration to work together, quickly and decisively, going out of way, however, in the prejudice of the consistency and accuracy. Therefore, the satisfaction of the Russians with the work depends on the degree of cooperation and mutual assistance in the process of joint work. At the same time, the Russians, not always realizing power-coercive nature of the employment relationship, give priority not to the interests of the individual, but to the results of collective actions, and therefore believe that "there are no irreplaceable people".

Conscious and unconscious structures of mental programs of different models of economic behavior in the Russian society are binary, which can be seen in the contradiction between these structures. Thus, conscious representations of Russians about the content of work and salary meet with the ethical images of the labor "for oneself" and work "for someone else". Conscious content of values of justice as a guarantee of legal support of private property and freedom of contract at the unconscious level is expulsed by preferences of equitable distribution according to work as the appropriation by each society member of an equal share of social wealth under conditions of state property.

Conclusion

The study of mental programs and models of economic behavior allows us to understand why people getting into the same socio-economic situation behave differently. Economic behavior is a reaction of economic actors on the socio-economic situation in the form of certain conscious and unconscious actions aimed at adaptation to the socio-economic environment. These actions are the result of economic actors' cognitive interpretations of a particular socio-economic situation based on mental programs containing the cognitive, axiological and connotative structures both reflexive and non-reflexive.

Unstable reflexive structures of mental programs determine the modal models of economic behavior as statistically the most common in the society at a given time. Non-reflexive structures of mental programs being their constants determine a normative model of behavior of economic actors as bearers of a particular culture.

Several modal models of economic behavior can be identified in the modern Russian society. First, there is a liberal model and a conservative one, in the mental programs of which the priority is given respectively to private property, market economy and labor as an instrumental value; to state property, planning and distribution economy and labor as terminal value. Secondly, there are hybrid models of economic behaviour: "liberal-statist" model and "statist-liberal" model, combining elements of both liberal and conservative models of behavior of economic actors.

In current times, the liberal and conservative models of economic behavior are adopted by a limited number of Russians: 9% and 16% respectively. At the beginning of liberal reforms in Russia, "liberal-statist" model of economic behavior was dominating with a predominance of liberal ideas, values and attitudes. As a result of the conservative turn in the Russian mass consciousness, which occurred at the turn of the century on the wave of "disappointment" with liberal reforms, the Russian consciousness became dominated by "statist-liberal" trend with a predominance of conservative views, values and attitudes. At the present time, approximately 50% and 25% of Russians adhere to the "statist-liberal" model and "liberal-statist" model of economic behavior respectively.

The normative model of economic behavior in the modern Russian society is conservative. In the mental program of that models, the absolute priority is given to statist-paternalistic and egalitarian ideas, values and attitudes, state property, state distribution of public goods, labor as a terminal value ("labor for oneself") and collective forms of labor activity.

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References

[1] Ariely, D. 2008. *Predictably Irrational*. New York: Harper Collins.

[2] Crusius, J., van Horen, F., Mussweiler, T. 2012. Why process matters: A social cognition perspective on economic behavior. *Journal of Economic Psychology*, 33 (3): 677–685.

[3] Ehmke M., Lusk J., Tyner W. 2010. Multidimensional tests for economic behavior differences across cultures. *Journal of Socio-Economics*, 39 (1), (January): 37–45.

[4] Erev, I., Roth, A.E. 2014. *Maximization, learning, and economic behavior*. Proc Natl Acad Sci US A. Jul 22, 111(3). [Electronic resource]. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4113920/ (accessed: 15.06.2016).

[5] Frank, S.L. 1993. *Ownership and Socialism. Russian philosophy of ownership* (18-20 centuries). St. Petersburg: "Ganza", JV: 327, 499.

[6] Gigerenzer, G, Selten, R. 2002. *Bounded Rationality: The Adaptive Toolbox*. Cambridge, MA: Mit Press.

[7] Goodwin, N., Harris, J., Nelson, J., Roach, B., Torras, M. 2013. *Macroeconomics in Context*. Armonk, New York: M.E. Sharpe.

[8] Graça, J.C., Lopes, J.C., Niza, C. 2015. *Economic values, beliefs and behaviors*: A regional approach. Análise Social, 214 (1).

[9] Grishina, N.V. 2010. Problems of the perception of situations. *Journal of Russian and East European Psychology*. 48(3): 16-26.

[10] Heaven, P.C.L. 1990. Economic beliefs and human values: Further evidence of the two-value model? *Journal of Social Psychology*. 130(5): 583-589. DOI: 10.1080/00224545.1990.9922949

[11] Hofstede, G. 2001. *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations across Nations.* Thousand Oaks CA: Sage.

[12] Howley, P., Buckley, C., Donoghue, C.O. and Ryan M. (2015). Explaining the economic "irrationality" of farmers' land use behaviour: The role of productivist attitudes and non-pecuniary benefits. *Ecological Economics*, 109 (January): 186–193.

[13] Platonov, O.A. 1993. *Russian way in the economy.* Russian way in the economic development. Moscow: AKIRN.

[14] Radayev, V.V. 2005. Economic Sociology: Textbook for Higher Educational Institutions. Moscow: State University, Higher School of Economics. 2005. *Economic Sociology*, 6(3): 107–115.

[15] Rustichini, A., DeYoung, C.G., Anderson, J., Burks, S.V. 2012. *Toward the Integration of Personality Theory and Decision Theory in the Explanation of Economic and Health Behavior*. [Electronic resource]. Available at: http://ftp.iza.org/dp6750.pdf (accessed: 15.06.2016)

[16] Shilkina, N.E. 2012. *Theoretical and method aspects of sociological modeling of social behavior of the individual and the group*. Recent Studies of Social Problems. 9.

[17] Simon, G. 1997. *An Empirically Based Microeconomics*. Cambridge: Cambridge University Press A compact and readable summary of his criticisms of conventional "axiomatic" microeconomics, based on a lecture series.

[18] Thomas, W.I., Thomas, D.S. 1928. *The child in America: Behavior problems and programs*. New York: Alfred A. Knopf. Available at: https://babel.hathitrust.org/cgi/pt?id=mdp.39015031951406;view=1up;seq=

[19] Toshchenko, Z.T. 2014. Economic consciousness and behavior: after a quarter century. *Sociological Studies, 7: 60-61.*

[20] Wakker, P.P. 2010. *Prospect Theory: For Risk and Ambiguity*. 44. Cambridge, UK: Cambridge Univ Press. DOI: 10.1017/CB09780511779329

[21] Yanitskii, O.N. 2012. *Social corridor of Russian modernization.* [Electronic resource]. Available at: URL: http://www.isras.ru/blog_modern_2.html (accessed: 15.06.2016).

[22] Zafirovski, M. 2003. Human Rational Behavior and Economic Rationality. *Electronic Journal of Sociology* [Electronic resource]. Available at: URL: http://www.sociology.org/content/vol7.2/02_zafirovski.html (accessed: 15.06.2016).

[23] Zinkovich, N.V. 2015. *Irrational models of economic behavior of the population during the period of structural crisis.* [Electronic resource]. Available at: URL: http://elar.urfu.ru/bitstream/10995/32434/1/klo_2015_278.pdf (accessed: 15.06.2016).

*** Cultural values and models of economic behavior: Scientific monograph. 2011. Ed. by Lebedeva N.M., Tatarko A.N. Moscow: "*Sputnik*" Publisher.

*** Economic Behavior, Economic Freedom, and Entrepreneurship. 2015. Ed. by Cebula R.J., Hall J.C., Mixon F.G., Payne J.E. *New York: Publisher*: Edward Elgar Pub.

*** Forecast of the labor resources balance in the 2016-2018 years. [Electronic resource]. Available at: http://www.rosmintrud.ru/docs/mintrud/migration/53(accessed: 15.06.2016).

*** The attitude of the Russians toward work. The results of the Rosstat study [Electronic resource] Available at : URL: http://rabotatam.ru/topic/6570-otnoshenie-rossijan-k-trudu-itogi-issledovanija-r/ (accessed: 15.06.2016).

*** The poor people make two-thirds of our country. 2016 *Novaya Gazeta*. No 42 (April 20) [Electronic resource]. Available at: URL: http://www.novayagazeta.ru/economy/72760.html (accessed: 15.06.2016).

*** The results of sociological research conducted in 2013-2016 by *"Levada Center*" (Economy. Levada Center [Electronic resource] Available at URL: http://www.levada.ru/tag/ekonomika/: (accesed: 15.06.2016)

*** Twenty years of reforms through the eyes of the Russians (the experience of years-long sociological surveying): *Analytical Report.* 2011. Moscow: Institute of Sociology of the Russian Academy of Sciences. 25-36.

Impact of Selected Determinants on Capital Structure Management in Areas of Manufacturing and Services in Companies of Visegrad Group Countries

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Abstract:

A selection of financing source is being influenced by many factors, which have impact on the entire economy of society. Attention is in article paid to the question how this selection is influenced by achieving profitability, liquidity and long-term assets. Those factors are chosen based on previously provided studies. The aim of the article is to evaluate the main aspects of theories of capital structure based on previous studies and elaborated analyses. Further aim is to find out by GMM method, to what rate the selected economic financial indicators (evaluating the main factors of business activity) influence a decision-making as it comes to the use of debt financing; those indicators are – profitability, liquidity and long-term assets the company disposes of in the V4 countries in manufacturing industry and services. Provided analysis indicated that there does not exist unified approach to the management of financial structure in particular countries and branches. Analyzed samples of companies not always created robust model, out of which conclusions could be made. The results also indicate that although in all analyzed countries debt finances primarily come from bank market, financial structure is not automatically managed based on dynamic trade off theories.

Keywords: theories of capital structure, debt/equity ratio, profitability, liquidity, long-term assets.

JEL Classification: G30, G32.

1. Introduction

Searching for suitable combination of own and debt finances led to the creation of many studies and later also theories dealing with an optimization of capital structure. The question of optimal capital structure is deals with by economists all over the world, however, the USA are considered a cradle of the theory of capital structure. Many areas exist being investigated in the frame of this topic. One of the basic areas such question is how the companies finance their activities, or what optimal combination of debt and equity is. Factors influencing the options of financing are the second very important issue. The last area is searching for the answer to the question how the selection of financing sources influences the rest of economy. The questions dealing with optimal division of financing sources do not have unequivocal answers and this fact is the reason for existence of many economic theories focused on capital structure.

2. Theoretical bases of capital structure theories

Within (1950), Weston (1955) already stated that many of those dealing with company finances based on theory, are skeptical as for existence and functionality of theories of capital structure. He sees the reason in the fact that there is wide scale of financial decisions, which have to be adjusted to external economic conditions and any of theories can capture it. In addition, psychological aspects play their role when it comes to decision on the use of financing sources and those could be elaborated into the models in very difficult way; the consequence of it is that decision-making on financing source can have more variants of solution depending on the angle of view.

Based on previous studies, capital structure theories can be divided to two basic groups. The first one, trade off theories are, the second, group is represented by pecking order theories. Basic studies of Miller and Modigliani had many limitations, therefore, at present time, only those two groups are considered. Both those groups are based on the original studies of Miller and Modigliani (1958).

The term trade off theory involves the group of theories, basis of which an evaluation of costs and yields resulting from leverage is. Those theories often assume that the selection of financing sources should at optimum balance marginal costs and marginal yields. For the first time, idea of those theories occurred in version III of M&M model (Miller and Modigliani 1963).

The core of trade off theories, a discussion of four basic topics is. First, final division of financing sources is not clearly determined. It means that there exist many variants how to achieve the optimum in different companies under different forms of the used financing sources. Secondly, impact of taxes is significantly problematic and is very depended on conditions resulting from tax legislation in particular country. For example, Graham (2003) dealt

[1] Univerzitní nám. 1934, Karviná, Czech Republic

with this issue in the most considerable way. Thirdly, costs of stringency are perceived rather as costs of dead weight than as transfers between individual forms of financing sources. In this context, many questions occur, e.g. are those costs fixed ones, do they increase with company size and with financial problems, are those costs one-time ones or they are connected with damage of company´s prestige etc. the first study connected with this issued, the study of Haugen and Senbet (1978) is. The last significant topic, transaction costs are. It is assumed here that adjustment of capital structure has to be gradual not sudden and marginal costs increase with increasing use of debt financing.

In the frame of trade off theories, two directions have developed – static and dynamic trade off theories. Static trade off theories are based on the fact that in the frame of economy, it is necessary to search for compromise between interest tax shield and stringency costs. Real profitability is thus depended on the level of debt regulating based on the used financing sources. The most significant study dealing with static trade off theory is that one of Bradley *et al.* (1984), which considers the role of interest tax shield. It assumes that investor is risky neutral and company faces progressive income tax always at the end of period. At the same time, it is expected that dividends and capital yields are taxed by one charge. Tax shields exist by them but they cannot be used in the same way across all companies and economy. If the company is not able to pay off its debts, costs of stringency occur and benefits of tax shield are lowered. Expected maximization of debts (the higher debt is the higher debt benefits are by those theories) and lack of evaluation of capital structure within time (lack of dynamics) are the main deficiencies of static trade off theories.

Dynamic trade off theories implement another aspect static trade off theories ignored. Expectations and costs for adjustment play very important role. In dynamic mode, proper decision on division of financing sources depends on expected profit within further period. It means that some companies expect profit within further period as it comes to financing of investments, another one use a debt financing and profit covers debts. By dynamic trade off theories, the selection of financing sources depends on what is expected from optimum. Dynamic theories do not work with only option of debt financing but they consider also option of using the own financing sources.

Pecking order theory is based on the study of Myers (1984). He states that retained profit is better than debt, debt is better than basic capital. Almost all theories belonging to this group deal with explanation of relative use of internal and external financing sources and preference of debt for the issue of equity securities. Most of studies state that if there is option to use the debt then issue of equity securities would not have to be realized. In the frame of pecking order theory, two basic group of approaches can be distinguished – by unfavourable selection and information asymmetry and by theories based on moral hazard and interest conflict.

In terms of unfavourable selection and information asymmetry, theories are based on the fact that only company manager can possess of all relevant information. Manager prefers such financing source, by the use of which he does not have to give any additional internal information or he can give it only in as small range. Those theories also prefer such source, which influences company´s activities as little as possible. Basic studies in this area, the studies of Myers and Majluf (1984) and Korajczyk *et al.* (1990) were.

When it comes to theories based on moral hazard and conflict of interests, manager deciding on the way of financing builds its decision on the idea that high value of debt financing can lead to the growth of profitability of own financing. He takes into account two basic conflicts – manager versus shareholder and creditor versus shareholder. In the conflict manager versus shareholder, costs can have two basic forms, which should guarantee the growth of economic results under different setting of financing sources. Those costs involve costs for monitoring the managers and implementation of controlling mechanisms to control managerial behaviour and costs for motivation system for managers. The main studies of this are the studies of Jensen and Meckling (1976), Jensen (1986), Harris and Raviv (1990) were. Both groups of costs should guarantee such managers´ behaviour, which would lead to maximization of shareholders´ wealth. The second type of conflict is based on different expectations because creditor prefers company´s stability because he collects interest payments out of sources he provided with and demands return of provided capital, which does not necessarily have to depend on creation of economic result. Contrary to it, the owner collects dividends or capital profit, which is lowered by debt costs, thus profit is conditioned by character and perspective of the projects. The most important study as for this conflict, the one of Diamond (1989) is.

3. Used methodology, data and aim

Most of studies assume that in the frame of financing sources debt financing would be used in some form. The studies can distinguish based on whether they primarily focus on maximization of accounting value or market value is of primary interest. They also differ by the fact whether they use all debt forms of financing or whether they

use only long-term debt forms of financing. Some authors of studies dealing with capital structure tend to exchange the indicator debt ratio or debt/equity ratio by financial costs/debt volume ratio thus interest rate.

In this study, in terms of used financing sources, debt/equity ratio (further DER) was used. Numerator involves bribable debts and denominator involves the value of equity. By bribable debts such finances are meant, which are connected with costs for provision with such sources. Factors influencing this indicator are based on theory of four dimensions. This theory of R. A. Brealey and S. C. Myers belonging to dynamic trade off theories says that finding the optimal capital structure is not easy because there is no universal and simple formula and it is necessary consider four dimensions – taxes, risk, assets type and financial freedom of company (Hrdý 2008). In terms of taxes, effectiveness of tax shield is given only in case the company achieves taxable incomes, otherwise it should not make debts. Risk has not small impact on optimal indebtedness; if the risk is big, company should keep the debts at lower level. Otherwise, it would influence negatively company profitability. In terms of assets type, companies, which in their assets structure show more less liquid or non-liquid assets, should have lower ratio of debts in liabilities than those having more tangible and liquid items. Financial freedom expresses company´s independence, ability to keep enough financial means for future investments, which can occur suddenly and guarantee thus higher profit for the company.

Based on this theory, to the model, return on equity (ROE), current liquidity (L3) and ratio long-term assets/total assets (SAA) were chosen to the factors influencing behaviour of companies. Solution of dimension of taxes was included to the main indicator debt/equity ratio because it includes only such capital forms, which demand particular costs, out of which interest costs of debts create item deductable from tax base. It also reflects company profitability. Selection of return on equity is based on the conclusions of dynamic trade off theories, which consider advantage of tax shields when suing debt financing, *e.g.* the studies of Fisher, Heinkel and Zechner (1989), Strebulaev (2007) or De Angelo *et al*. (2011). All studies deal with searching for optimal use of financing sources with profitability growth. For the purpose of analysis, return on equity is to be used as follows (3.1):

$$ROE = \frac{net\ profit}{equity} \tag{3.1}$$

Selection of current liquidity is based primarily on the studies of Williams (1988) and Shleifer and Vishna (2001), who state, that there exists positive relation between liquidity and debt use because lower value of liquid assets increases probability of not providing with financial means to creditor or increases probability of provision under less advantageous conditions. Current liquidity (L3) is important as for financial balance of the company because only sufficiently liquid company is able to meet its obligations. Contrary to it, too high liquidity is negative phenomenon for company owners because financial means are connected to assets, which do not work in favour of significant evaluation of financial means and shorten profitability. It is necessary to search for as balanced liquidity, which would guarantee both suitable evaluation of means and ability to meet obligations. Selection of indicator was limited by data accessibility because only value of current assets without partial structuring were accessible by many companies. To calculate indicator, the following formula was used (3.2)

$$L3 = \frac{current\ assets}{short{-}term\ debts} \tag{3.2}$$

The last monitored factor in terms of management of financial structure, volume of fixed assets (SAA) is. This idea is based on the fact that for horizontal evaluation of capital structure applies that long-term assets should be covered by equity or long-term bounded capital should be financed by long-term sources (3.3).

$$SAA = \frac{long{-}term\ assets}{assets\ in\ total} \tag{3.3}$$

Selection of ratio long-term assets/total assets is based on the study of Hart and Moor (1994) or the study of Antonion, Guney and Paudyala (2002). Those studies state that increase of long-term assets ratio is positive factor for bigger use of debt finances because those assets can be use as the guarantee. Above that, the study of Stulz and Johnson (1985) state that this relation can be seen more often in bank-oriented systems, which the countries of V4 meet. Selection of this indicator is at the same time motivated by the fact that long-term assets are perceived as the guarantee in terms of covering the debts. If the companies want to use debts, they should dispose of long-term assets, which would help to lower the risk of creditors and enable to gain financial means under more advantageous conditions.

As for the used analytical methods, panel regression by GMM was chosen. Panel regression can become fully-fledged tools to estimate functional dependence of big number of economic variables. Prucha (2014) states though that many panel data suffer from the problem of shorter time row and in terms of panel regression based on method of least squares on growth rate are totally unsuitable to be used. Therefore, GMM method is used in

programme Eviews. By Prucha (2014), Generalized Method of Moments (GMM) represents the way to investigate functional relations just among such panel data. Financial data based on annual frequency, gained from the basic accounting reports arranged in panels are suitable candidate to be researched by this regression method. Fact that among regressors, delayed endogenous explained dependent variable also occurs becomes big advantage of GMM method (Hall 2005). Impossibility of testing the heteroscedasticity and autocorrelation of parameters becomes disadvantage of this model. To perceive the testing result as relevant and to prove test results in particular models, all models will be tested as for statistical significance of individual items of model as well as for robustness of model by Sargan/Hansen test. Sargan/Hansen test shows to what rate this method is able to provide with practically same results even being burden by slight changes of parameters. Model is robust if results of Sargan/Hansen test are higher than 0,05.

Time row was selected from 2007 to 2014. The reason for choosing just this period is fact that the following analysis is the part of widely investigated issue on concrete companies, which could not provide with longer consistent time period than just since 2007. Such companies were chosen which are by database Amadeus considered very huge, huge and middle operating between 2007 – 2014. Such companies were selected, which fulfill at least one of the following conditions:

- yields of operation activities are min 1 mil. EUR;
- total assets of companies are min 2 mil. EUR;
- number of employees is min 15.

As above mentioned, companies of V4 are analyzed and attention is paid to two biggest branches in most countries (3 of 4) – manufacturing industry and services. Above said conditions of selection in the frame of database Amadeus generated the following sample of companies (see 0).

Table 1 - Number of analyzed companies in individual countries and individual branches

	Czech Republic	Poland	Slovakia	Hungary
Manufacturing industry	3 483	1 262	345	152
Services	2 707	2 842	660	194

Source: own elaboration

Out of Table 1 is clear that while in the Czech Republic were more companies of manufacturing industry, creating 56% of total number of companies, in Poland, Hungary and Slovakia companies dealing with services create bigger number.

The aim of this article is based on review of previous studies and elaborated analyses to evaluate the main aspects of theories of capital structure and find out to what rate selected economic financial indicators influence the decision-making on the use of debt finances: profitability, liquidity and long-term assets the company disposes of in the countries of V4 and selected branches.

4. Development of economic conditions in individual countries

Development of the Czech economy within monitored period is impacted by decrease of GDP growth rate – see Table 5. Up to 2008, Czech economy grew as it comes to GDP growth rate. In 2009, decrease of growth rate was reported connected to worldwide economic crisis. Within 2010 – 2011, slight recovery is seen connected to economic stabilization in Europe. By Czech Statistical Office, the years 2012 – 2014 went mainly through environment burden by low level of sentiment as for development of business and consuming environment; this level of sentiment was caused by both not solved debt crisis in Eurozone and the need of economies stabilization and internal reasons. Those were mainly based on unfavourable situation within previous years (marked by impacts of restrictive economic policy) and on uncertainty connected with further development.

Table 2 - Evaluation of development of Czech economy by selected indicators

	2007	2008	2009	2010	2011	2012	2013	2014
Growth rate of GDP	5,5%	2,7%	-4,8%	2,3%	2,0%	-0,9%	-0,5%	2,0%
Growth rate of industrial production	2,37%	0,72%	-10,37%	3,53%	2,76%	-2,23%	2,23%	-0,86%
Growth rate of turnover in services	9,60%	3,40%	-10,60%	3,20%	3,50%	0,60%	0,50%	4,10%

Source: own elaboration by OECD and EUROSTAT (2016)

Development of economy reflects growth rate of industrial production. Also in this area, decrease within 2007 – 2009 is reported. In 2010, industrial production increased being caused by recovery on European markets,

to which 84 % of production headed (by Ministry of Industry and Trade of the Czech Republic). Fact that domestic demand was not recovered can be considered negative. Concern about continuing and not solved economic crisis in Europe influenced homes consumption. Also because of that reason, in 2011, economy grew slower and 2012 was marked by decline. Table also shows that development of GDP growth rate copies also the field of services. It can be said though that both branches behaved within this period same as economic cycle.

Table 3 shows that compared to the Czech economy, Hungarian economy went through better development since 2012 when GDP growth rate increased, which did not happen in the Czech Republic.

Table 3 - Evaluation of Hungarian economy by selected indicators

	2007	2008	2009	2010	2011	2012	2013	2014
Growth rate of GDP	0,4%	0,8%	-6,6%	0,7%	1,8%	-1,7%	1,9%	3,7%
Growth rate of industrial production	0,82%	4,58%	-13,57%	14,29%	0,96%	-9,80%	6,55%	-1,09%
Growth rate of turnover in services	1,10%	3,50%	-5,90%	2,30%	-1,50%	1,60%	7,80%	8,80%

Source: own elaboration by OECD and EUROSTAT (2016)

Performance of Hungarian economy surpassed in 2014 expectations because economy by last data increase by 3,7%, which is the highest growth out of all member countries of European Union. Surprising result is given temporary favorable factors (last year favorable climatic conditions in agriculture (12 = of growth), improving sale situation on European market) and different regulations of government aiming to empower political power and take control over state sector and economy. Government becomes disputing strongly with its partners in EU and the USA as well with domestic or foreign subjects. Economic structure differs from that one in the Czech Republic. In Hungary, there is seen higher ratio of agriculture, which relies on fertile soil. Industry, significance of which is lower than in the CR is oriented to mining, metallurgy, construction materials or engineering. Inside the industrial sector, better results in 2014 were reported than in 2013 in 11 out of 13 subsectors of industrial production, out of which the best results were in car industry, however, in total it led to slowing down and decrease of growth rate of industrial production. The same positive development services show as it comes to turnover growth rate, where after crisis years 2009 and 2011 can be reported permanent growth since 2012 and in 2014, it has the second highest increase contrary to previous year. Development thus indicates that recovery of economy could bring bigger use of debt finances, improvement of return on equity and entire stabilization in all monitored indicators.

Poland is advantaged contrary to the Czech Republic, Hungary and Slovakia because it is the biggest country with the biggest number of inhabitants. It is advantaged mainly by the size of domestic market. While most of countries in European Union within 2008 – 2010 fought impacts of worldwide financial crisis, Poland was not influenced by that at all. Although within some years there can be seen slowing down of GDP growth rate, neither one year reports negative value. By polish analytics, it is consequence of bigger use of European funds as well as by significant growth of public investments connected with mainly European Championship in football in 2012. Since 2012, polish economy reported slowing down, see Table 4.

Table 4 - Evaluation of development of Polish economy by selected indicators

	2007	2008	2009	2010	2011	2012	2013	2014
Growth rate of GDP	7,2%	3,9%	2,6%	3,7%	5,0%	1,6%	1,3%	3,3%
Growth rate of industrial production	6,87%	-3,35%	-10,06%	5,14%	6,67%	1,35%	5,77%	0,48%
Growth rate of turnover in services	13,30%	9,50%	-1,30%	6,90%	10,30%	5,60%	4,00%	1,90%

Source: own elaboration by OECD and EUROSTAT (2016)

Development of Polish economy had unequivocally positive impact on services. Services showed decrease only in one year. Rest of periods is always increasing even intensity is different. Within 2010 – 2012, very significant growth is reported and since 2012 only decrease as for growth rate can be seen. There was always increase, decrease did not come within monitored period. As for industrial production, years 2008 and 2009 can be considered the worse. Within those years, very significant decrease came. Within further years, recovering is reported even increase shows fluctuating tendency.

Compared to the Czech Republic, Slovakia shows development that is more favorable although even here it cannot be marked as growth. Table 5 shows that within 2007 – 2009 is seen rapid decline of economic performance. In 2010, Slovakian economy was between recovery and threat of repeating recession. Recession came between 2012 and 2013. It was the period of significant weakening of economic growth (Morvay 2013). The year 2013 is by Morvay considered the period of the second wave of crisis of Slovakian economy.

Table 5 - Evaluation of development of Slovakian economy by selected indicators

	2007	2008	2009	2010	2011	2012	2013	2014
Growth rate of GDP	10,8%	5,7%	-5,5%	5,1%	2,8%	1,5%	1,4%	2,5%
Growth rate of industrial production	2,88%	3,09%	-14,28%	1,48%	2,87%	5,93%	-1,03%	3,84%
Growth rate of turnover in services	8,30%	8,70%	-18,00%	1,20%	3,50%	5,80%	5,70%	4,60%

Source: own elaboration by OECD and EUROSTAT (2016)

Slovakian economy though copied European development. By Morvay (2015), in 2014 Slovakian economy shows increase connected to the increase of European economy. He sees positively that the growth is connected with increasing demand mainly at domestic market. Car industry is considered the leader and generally such branches producing intermediate products and products with long-term use. Growth rate of industrial production and growth rate of turnover in services copy development trends of the values of GDP growth rate. In industrial production, recession returned in 2013 and recovery in 2014, which as for services is not so noticeable. The area of services reported quite favorable development because services reported only slowing of growth rate increase.

5. Analysis of impact of selected economic indicators on the use of debt finances by GMM method

When using GMM model among the companies' sample (as it was determined in the beginning of this article), attention was paid to how development of the use of debt finances (DER) is influenced by achieving effectiveness (ROE), liquidity (L3) and the volume of fixed assets to total value of assets (SAA) and the use of debt finance within previous period. Relations of individual variables in the selected branches are tested gradually in particular countries. Generally, relation can be expressed by the following formula (5.1):

$$\mathrm{DER_{it}} = \alpha_1 + \beta_1 * \mathrm{DER_{it-1}} + \beta_2 * \mathrm{X_{it}} + \varepsilon_{it} \quad (5.1)$$

where endogenous dependently variable $\mathrm{DER_{it}}$ represents development of debt/equity ratio i[th] variable within time *t* and evaluates the use of debt finances; exogenous independently variables are delayed value of debt/equity ratio of previous year $\mathrm{DER_{it-1}}$ and $\mathrm{X_{it}}$ represents all independently variables being the subject of investigation, thus development of return on equity, current liquidity and ratio long-term assets/total assets. Symbols α_1 and ε_{it} are the constants of model and residual item in model GMM.

Selection of above mentioned indicators is based on already realized studies, mainly on the studies of Nivorozhkin (2005), Hernardi and Ormos (2012), Crnigoj (2009), Růčková (2013), Růčková (2015), Růčková and Heryán (2015), which took into account the specifics of European environment mainly weaker accessibility of market data. Lack of accessibility of market data does not enable application of studies realized in the USA because most of their models use mainly market value of company as the dependently variable.

In terms of data credibility, all models were tested by Sargan/Hansen test. Final model is considered robust by all tests if the value of Sargan/Hansen test achieves the values higher than 0,05. At the same time, if model resulted as non-robust or the value of tested parameter in model with all independently variable resulted as statistically insignificant, individual testing was provided. The reason for individual testing of relations DER versus ROE, DER versus L3 and DER versus SAA is the fact that it can be admitted that when deciding on the way of financing, one of mentioned variables can be considered more significant as it comes to practical view. This idea can be supported by such situation that within the periods of economic decline or crisis, companies can consider preservation of payment ability the more important than achieving the profit. So, they can focus on management of liquidity and at the moment liquid position is stable, they solve profitability. The results of individual testing see in attachment.

At the same time, opposite relation of two monitored variables became the subject of investigation. This relation is expressed by the following formula (5.2):

$$\mathrm{ROE_{it}} = \alpha_1 + \beta_1 * \mathrm{ROE_{it-1}} + \beta_2 * \mathrm{DER_{it}} + \varepsilon_{it} \quad (5.2)$$

where endogenous dependently variable $\mathrm{ROE_{it}}$ represents return on equity i[th] variable within time *t*, exogenous independently variables are represented by delayed value of ROE of previous year $\mathrm{ROE_{it-1}}$ and development of debt/equity ratio. Symbols α_1 and ε_{it} are the constants of model and residual item in model GMM.

Situation is again modeled for the companies´ sample of all selected branches. Investigation of opposite relation is based on possible claim that achieving profitability influences the price of debt finances and in final consequences, it can influence also the volume of the used debt financing.

- The Czech Republic

The first analysis regarded the testing of connection of defined variable with debt/equity ratio in the Czech Republic. The results are summarized in the following Table 6.

Table 6 - Debt/equity ratio as dependently variable in connection with return on equity, current liquidity and long-term assets/total assets ratio in the Czech Republic

	Manufacturing industry	Services
DER $_{(t-1)}$	-0,0033**	0,0125**
ROE	32,8055***	19,6179***
L3	0,0002**	-0,0437
SAA	-14,8630	-11,5353
Sargan/Hansen test	0,5124	0,7968

Source: own elaboration in Eviews *9*

Note: *** item is statistically significant at the level of 1%, ** item is statistically significant at the level of 5%, * item is statistically significant at the level of 10%, items without marks are statistically not significant.

Table 6 shows that in both monitored branches, positive functional dependence exist in relation of profitability and the used debt finances because in all branches, together with return on equity increase a willingness to use debt finances increases. All values resulting from the model are statistically significant because the level of significance is at the level of 1%. Different situation is with impact of the use of debt finances in previous period on the use of debt finances in current period. At first sight, it can be seen that impact of this quantity is significantly weaker and above that, branches reacted in different ways. As for manufacturing industry, the use of debt finances in previous year led to their decrease in the following year. Situation in services is opposite; growth in the use of debt financing in previous year led to further growth in the following year. Rate of the use of debt financing is positively influenced by return on equity in both branches. The results were the same also within testing in model, in which DER was as dependently variable and only ROE as independently variable. Situation thus did not change when further variables were implemented.

Impact of current liquidity of companies on the use of debt financing was another analyzed relation. In terms of capital structure theories, this relation seemed to be logically defined but for the Czech Republic any conclusions could be made for services because the values became statistically insignificant. At the same time, this branch showed high error rate in model, thus liquidity could be evaluated only by individual companies not in this way set panel. In case relation with liquidity was analyzed, only relation of manufacturing industry was statistically significant; thus as for liquidity in manufacturing industry, it can be said that liquidity increases with amount of the used debt finances. When final coefficient is evaluated, it is clear that impact is very weak. When tested individually, items in models became statistically insignificant; so, as for services, it only supported the results of wider model and in manufacturing industry, they question possibility of impact.

Out of Table 6 also results that positive impact of long-term assets on the use of debts in the Czech Republic cannot be proved neither by one branch because not taking into account statistical significance, relation became negative. Above that, as it comes to statistical significance, item of long-term assets compared to total assets of companies of manufacturing industry and in services was marked as insignificant. Regarding the result, it was interesting to see the results of individual testing. In manufacturing industry, statistical insignificance of relation was proved. In services, individual testing led to different result. Model was for services robust and impact of the use of debt financing was statistically significant at the level of 1%. The result is positive, which would mean that increase of ratio long-term assets/total assets causes increase of the use of debt finances.

As said above, interest in terms of relation of the use debt finance and return on equity was investigated also in opposite dependence. It means that return on equity was dependently variable and variable, which influenced it, the use of debt finances was. The reason for investigation of opposite dependence is the fact that beside the use of debt financing should positively influence return on equity, at the same time, increasing return on equity positively influences accessibility of debt finances because when ROE increases, the price of debt finances can decrease. Table 7 proves the results of this relation.

Table 7 - ROE as dependently variable in relation to debt/equity ratio in the Czech Republic

	Manufacturing industry	Services
ROE $_{(t-1)}$	0,0006	0,0007*
D/E	0,0253***	0,0369***
Sargan/Hansen test	0,1506	0,2578

Source: own elaboration in Eviews 9

Note: *** item is statistically significant at the level of 1%, ** item is statistically significant at the level of 5%, * item is statistically significant at the level of 10%, items without marks are statistically not significant.

Out of Table 7, it is clear at first sight that relation is significantly weaker in both branches. Positive relation can be seen in both branches meaning that in monitored sample of companies, the use of debt financing has positive impact on the increase of profitability of own financing. Considering manufacturing industry, the values of return on equity within previous year became statistically insignificant because the level of significance is higher than 10% (17,2%). This value cannot be generalized. As for services, the level of significance is up to 10% (concretely 6,18%). In this case, it is question whether general conclusion can be made for the whole group of companies in services.

- Hungary

As for the number of represented companies, Hungary represented the smallest model. Even here, set models sustained the same. Testing of impact of individual independently variables on the use of debt financing did not bring unequivocal results, the same situation as in the Czech Republic. Contrary to the Czech Republic, all tested models were by Sargan/Hansen test robust meaning that all models provide with usable information even parameters were burden by slight changes.

Table 8 - Debt/equity ratio as dependently variable in relation to return on equity, current liquidity and long-term assets/total assets ratio in Hungary

	Manufacturing industry	Services
DER $_{(t-1)}$	-0,0541***	0,3452***
ROE	-0,6388**	0,6270
L3	-0,2899	-0,1078**
SAA	-3,9488*	-2,1860
Sargan/Hansen test	0,5956	0,4701

Source: own elaboration in Eviews 9

As for services, considering relation of ROE and DER, general conclusion cannot be made even the model based on Sargan test seemed to be robust. Manufacturing industry showed negative relation meaning that with the increase of return on equity the use of debt financing decreased. Statistical significance in this model was at the level of 5%. As for impact of the use of debt financing in previous period, in services we can find positive relation and manufacturing industry showed negative relation. For services though counts that after previous use of debt financing, within next period the use of debt finances increased; only in manufacturing industry, after previous use of debt finances, companies lowered the volume of debt finances. It can be caused by the growth of profitability and thus by preferring own capital to finance. Individual testing only proved the results of the whole modes because also here relation of ROE and DER was in services statistically insignificant.

Form the Table 8 it is clear that neither relation of DER and L3 has unequivocal result. Model was robust in both branches and both branches showed the same relation. Manufacturing industry showed negative relation but the value is statistically insignificant; therefore, conclusions in this way set model cannot be made. Servicers showed also negative relation, which is at the level of significance or is statistically significant at the level of 10%. Because of high level of significance, conclusion cannot be strictly unequivocal therefore, separated testing of dependence was provided. When testing, impact of L3 would be statistically significant at the level of 5% in services. Manufacturing industry showed the values statistically insignificant also in the frame of individual testing.

In connection to negative relation DER with current liquidity in services it would be interesting to see whether bigger use of debt financing would be connected with guarantee by long-term assets. In manufacturing industry and in servicers, the values became statistically insignificant. Therefore, those values went under individual testing DER and SAA. However, also individual tests in manufacturing industry showed as statistically insignificant. Only

relation in services was statistically significant, where the value of coefficient is negative meaning that with increasing ratio long-term assets/total assets the use of debt financing decreased.

Regarding possible perception of opposite relation of variables, also in Hungary, relation will be tested with ROE as dependently variable. Again, it is investigated whether the relation sustains also, when a definition of dependently and independently variable would be changed. The results of analysis, which considered the relation of return on equity as dependently variable and debt/equity ratio as independently variable, Table 9 shows.

Table 9 - ROE as dependently variable in relation to debt/equity ratio in Hungary

	Manufacturing industry	Services
ROE $_{(t-1)}$	0,0271***	0,0474***
D/E	-0,0045***	0,0190***
Sargan/Hansen test	0,2913	0,3468

Source: own elaboration in Eviews 9

Note: *** item is statistically significant at the level of 1%, ** item is statistically significant at the level of 5%, * item is statistically significant at the level of 10%, items without marks are statistically not significant.

While in relation, in which DER was dependently variable, the values in services became statistically insignificant; in relation, where ROE was dependently variable, the values became in both branches not only statistically significant but models became robust as well. However, in this relation the final value is negative by manufacturing industry. It indicates that in this branch, with the growth of the use of debt financing equity profitability decreased. As for services, relation is positive thus with the growth of the use of debt financing also return on equity increased.

- Poland

Table 10 shows relation of the used debt finances and return on equity, liquidity and ratio long-term assets/total assets, from which positive relation is expected by dynamic trade off theories of capital structure.

Out of Table 10 is clear that in services the result is again lowered by statistically insignificance of variable in the model. As for manufacturing industry, results can be generalized; statistical significance is at the level of 1%. It can be said here that with the growth of profitability, rate of the use of debt fiancé increases, too. When DER and ROE were tested individually, the values were both robust and statistically significant but only in the area of manufacturing industry; as for services, the value of relation of ROE and DER shows statistic insignificance; thus, for this model the results cannot be generalized as for the results in tested sample.

Table 10 - Debt/equity ratio as dependently variable in relation to return on equity, current liquidity and long-term assets/total assets ratio in Poland

	Manufacturing industry	Services
DER $_{(t-1)}$	-0,1585***	0,0566***
ROE	4,8087***	0,5121
L3	-0,0307	-0,0021**
SAA	-1,3254	-5,7084**
Sargan/Hansen test	0,1186	0,4435

Source: own elaboration in Eviews 9

Note: *** item is statistically significant at the level of 1%, ** item is statistically significant at the level of 5%, * item is statistically significant at the level of 10%, items without marks are statistically not significant.

In the frame testing the relation between liquidity and the use of debt financing, one branch again shows statistically insignificant relation. It is manufacturing industry. As it comes to services, the values in model were statistically significant but at the same time, negative relation was proved meaning that companies in the sample of services used debt finances in lower rate under increasing profitability. In terms of individual testing of relation between L3 and DER, statistical insignificance of the value was proved for manufacturing industry. Relation of SAA and DER shows identical results as testing of relation between L3 and DER. The only difference is that impact of ratio long-term assets/total assets is more significant, final coefficient in formula is significantly higher than by impact of current liquidity.

Table 11 - ROE as dependently variable in relation to debt/equity ratio in Poland

	Manufacturing industry	Services
ROE_{t-1}	-0,2387***	0,0099***
D/E	0,2031***	0,0216***
Sargan/Hansen test	0,3469	0,3894

Source: own elaboration in Eviews 9

Note: *** item is statistically significant at the level of 1%, ** item is statistically significant at the level of 5%, * item is statistically significant at the level of 10%, items without marks are statistically not significant.

When testing opposite dependence, Table 11 shows that also in the frame of this way set model, positive relation between ROE and DER is proved in manufacturing industry and services but relation is less significant. Relation in services is interesting because in relation where DER was dependently variable, relation showed statistically insignificant in both the whole model and individual testing. In case, ROE is dependently variable, relation is statistically significant and positive. It could mean that in monitored sample of polish companies providing with services, return on equity would grow with the growth of debt finances use in case this relation would not be influenced by any further factor. In manufacturing industry, positive relation was only proved even opposite impact is less significant.

- Slovakia

Attention is primarily put on the services, in the frame of which the companies created 66% out of the total number of tested companies in both panels.

Table 12 - Debt/equity ratio as dependently variable in relation to return on equity, current liquidity and ratio long-term assets/total assets in Slovakia

	Manufacturing industry	Services
$DER_{(t-1)}$	-0,0015***	0,0443***
ROE	-17,4960***	-0,0007
L3	-0,0011*	-0,0801*
SAA	-17,1582***	-5,7084
Sargan/Hansen test	0,0141	0,4316

Source: own elaboration in Eviews 9

Note: *** item is statistically significant at the level of 1%, ** item is statistically significant at the level of 5%, * item is statistically significant at the level of 10%, items without marks are statistically not significant.

Although the model in this branch could be marked as robust (see Table 12), the value of independently variable of ROE and SAA are the values statistically insignificant and last monitored value L3 would be statistically significant at the level of 10%. Therefore, for the area of services, it cannot be said whether the core of dynamic trade off theories is fulfilled. Neither individual testing enables to made conclusion because also in the frame of this testing, all items became statistically insignificant.

The model set by companies of manufacturing industry was not robust, see Table 12, although all independently variables are statistically significant. Non-robustness of model indicates that oscillation in items was such significant that the model shows high error rate. Conclusions cannot be made neither for manufacturing industry. In partial test, model ROE to DER was robust and item was at the same time statistically significant at the level of 1%. However, relation was in mode negative, which means that if companies would be influenced by other variables when making decisions, then the use of debt financing would decrease with profitability increase. Another two individual testing proved that the model with L3 had the value statistically insignificant and the model with SAA was non-robust.

Table 13 - ROE as dependently variable in relation to debt/equity ratio in Slovakia

	Manufacturing industry	Services
ROE_{t-1}	0,0001**	0,0006***
D/E	-0,0560***	-0,0153***
Sargan/Hansen test	0,5615	0,4416

Source: own elaboration in Eviews 9

Note: *** item is statistically significant at the level of 1%, ** item is statistically significant at the level of 5%, * item is statistically significant at the level of 10%, items without marks are statistically not significant.

Testing of opposite dependence – return on equity as dependently variable – led to the results presented in Table 13. Out of this table results that in both branches the values became statistically significant at the level of 1% and at the same time, in both braches is proved negative relation. If impact of the used debt finances on return on equity would be taken into account, it would have to be said that in Slovakian companies in entire simple return on equity decreased with the growth of the used debt finances. Therefore, it can be said that as for the sample, debt finances were gained under unfavorable conditions because they influenced profitability in negative way.

Conclusion

The aim of this article was based on review of previous studies and elaborated analyses to evaluate the main aspects of theories of capital structure and find out to what rate selected economic financial indicators influence the decision-making on the use of debt finances: profitability, liquidity and long-term assets the company disposes of in the countries of V4 and selected branches.

Testing showed that in the countries of V4, situation is not unequivocal as it comes to manufacturing industry and services. It rather indicates that in the companies' sample being tested in individual models many general conclusions cannot be done. If conclusions of dynamic trade off theories would be considered, then expectations as for relations would indicate positive relation of DER and ROE, L2 as well as SAA. Those expectations were seen only in manufacturing industry with ROE and L3 and in service with ROE only in the Czech Republic and in Poland in manufacturing industry in relation of ROE and DER. The results are summarized in the following Table 14.

Table 14 - Summarization of the results of panel regression by GMM model

	Manufacturing industry			Services		
	ROE	L3	SAA	ROE	L3	SAA
Czech Republic	+	+	Not able	+	Not able	Not able
Hungary	-	Not able	-	Not able	-	Not able
Poland	+	Not able	Not able	Not able	-	-
Slovakia	-	-	-	Not able	Not able	Not able

Source: own elaboration

Although the models were in the Czech Republic, Hungary and Poland robust in both monitored branches, partial items showed statistical insignificance; this fact lead to the conclusions that the model as the whole neither in one tested country neither in one branch indicates unequivocal conclusions. As for Slovakia, in manufacturing industry, items were statistically significant though but the whole model was non-robust and oscillations could lead to wrong conclusions. In Slovakian services, the model was robust but all items were statistically insignificant. It cannot be said that companies of manufacturing industry and services in V4 countries would incline to the use of debt finances by dynamic trade off theories. It can be said though that if the selection of debt financing is influenced by achieving return on equity, current liquidity and ratio long-term assets/total assets, then it cannot be decided which theory is used. Considering the partial tests (see attachment) of impact of isolated quantities, positive relation was seen by relation of ROE and DER in the Czech Republic and in Poland in both branches. As it comes to other quantities, neither partial testing brought such results, based on which general conclusion could be made. Positive relation is seen by relation of SAA and DER by polish companies of manufacturing industry. It basically means that the growth of long-term assets is connected with the growth of debt finances. Companies got either long-term assets from bribable outside sources or long-term assets positively contributed to option to use those sources. Other individual tests either indicated statistical insignificance or relation became negative. The most significant result can be seen by Slovakian companies of manufacturing industry, where the use of debt financing decreased with the growth of return on equity. As for services, the most significant results are by Hungarian companies in relation of SAA and DER, which means that with the growth of share of long-term assets the use of debt financing decreased. Models based on relation of DER and L3 showed significant impact and at the same time with highest rate of unreliability.

Attention was also paid to testing of opposite relation, in which return on equity is dependently variable. Impact of the used debt finances was tested and achieving profitability within previous period. As for this testing, conclusions can be made because neither one of items became statistically insignificant as well as the models were robust. The results are summarized in the following Table 15.

Table 15 - Results of testing of relation with ROE as dependently variable in relation to debt/equity ratio

	Manufacturing industry	Services
Czech Republic	+	+
Hungary	-	+
Poland	+	+
Slovakia	-	-

Source: own elaboration

Table 15 shows that expected positive relation among use financing sources and return on equity is seen by manufacturing industry in the Czech Republic and in Poland. In services, positive relation is in all countries besides Slovakia. It means that in those cases, increase of debt finances led to the increase of return on equity. In manufacturing industry in Hungary and Slovakia and in services, the relation is opposite. It means that with the growth of share of debt finances, return on equity decreases. If conclusion would be made based on relation of those two factors, then Hungarian and Slovakian manufacturing companies and Slovakian companies providing services incline towards pecking order theories. Other models supported hypothesis about tendency to dynamic trade off theories.

References

[1] Antoniou, A., Guney, Y. and Paudya L, K. 2002. *The determinants of corporate capital structure: Evidence from European countries*. University of Durham, Department of Economics and Finance. Available at: http://s3.amazonaws.com/academia.edu.documents/30923060/determinanteurope.pdf?AWSAccessKeyId=AKIAJ56TQJRTWSMTNPEA&Expires=1479117058&Signature=9Hw3hADD%2BRk1rlhEw91D1ykR9OA%3D&response-content-disposition=inline%3B%20filename%3DDeterminants_of_corporate_capital_struct.pdf

[2] Bradley, M., JarrelL, G. A. and Kim, E. H. 1984. On the Existence of an Optimal Capital Structure: Theory and Evidence. *The Journal of Finance*, 39: 857–878. DOI 10.1111/j.1540-6261.1984.tb03680.x

[3] Bradley, R. and Myers, S. C. 2000. *Principles of Corporate Finance*. Sixth Edition. McGraw-Hill Education, 6th Pkg edition (December 2000). ISBN-10: 0072495847; ISBN-13: 978-0072495843

[4] Črnigoj, M., Mramor, D. 2009. Determinants of capital structure in emerging European economies: evidence from Slovenian firms. *Emerging Market Financial Trade,* 45(1): 72-89. DOI 10.2753/REE1540-496X450105

[5] DeAngelo, H., DeAngelo, L. and Whited, T. 2011. Capital structure dynamics and transitory debt. *Journal of Financial Economics,* 99(2): 235-261. Available at: http://dx.doi.org/10.1016/j.jfineco.2010.09.005

[6] Diamond, D. 1989. Reputation Acquisition in Debt Markets. *Journal of Political Economy*, 97(4): 828-862. DOI: 10.1086/261630

[7] Fisher, E. O., Heinkel, R. and Zechner, J. 1989. Dynamic Capital Structure Choice: Theory and Tests. *The Journal of Finance,* 44(1): 19-40. DOI 10.1111/j.1540-6261.1989.tb02402.x

[8] Graham, J. R. 2003. Taxes and corporate finance: A review. *Review of Financial Studies*, 16(4): 1075-1129.

[9] Hall, A. R. 2005. *Generalized Method of Moments*. Oxford University Press. Available at: https://books.google.ro/books?hl=en&lr=&id=8YkSDAAAQBAJ&oi=fnd&pg=PR9&dq=Generalized+Method+of+Moments+2005&ots=z4pho_LIP&sig=T4HfGKIZEj6sM8IVOzaQuyCiz5c&redir_esc=y#v=onepage&q=Generalized%20Method%20of%20Moments%202005&f=false

[10] Harris, M. and Raviv, A. 1991. The Theory of Capital Structure. *The Journal of Finance,* 46 (1): 297-355. DOI 10.1111/j.1540-6261.1991.tb03753.x

[11] Hart, O. and Moore, J. 1994. A Theory of Debt Based on the Inalienability of Human Capital. *Quarterly Journal of Economics*, 109: 841-880. DOI 10.2307/2118350

[12] Haugen, R. and Senbet, L. 1978. The insignificance of bankruptcy costs to the theory of optimal capital structure. *The Journal of Finance,* 33: 383-392. DOI 10.1111/j.1540-6261.1978.tb04855.x

[13] Hernadi, P. and Ormos, M. 2012. What managers think of capital structure and how they act: Evidence from Central and Eastern Europe. *Baltic Journal of Economics,* 12(2): 47-71. DOI dx.doi.org/10.1080/1406099X.2012.10840517

[14] Hrdý, M. 2008. Problems of Strategic Financial Management and Managerial Accounting of the Firms in the Czech Republic. *Global Conference on Business and Finance Research Proceedings,* 3(1): 52-63.

[15] Jensen, M. C. 1986. Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review*, 76(2): 323-329.

[16] Jensen, M. C. and Meckling, W. H. 1976. Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics,* 3: 305-360. DOI 10.1016/0304-405X(76)90026-X

[17] Korajczyk, R., Lucas, D. and McDonald, R. 1990. The Effects of Information Releases on the Pricing and Timing of Equity Issues. *Review of Financial Studies,* 4: 685-708. DOI 10.3386/w2727

[18] Modigliani, F. and Miller M. 1958. The Cost of Capital, Corporation Finance and the Theory of Investment. *American Economic Review,* 48(3): 261–297. DOI 10.1.1.686.498

[19] Modigliani, F. and Miller, M. 1963. Corporate income taxes and the cost of capital: a correction. *American Economic Review,* 53(3): 433–443.

[20] Morvay, K. *et al*. 2014. *Hospodársky vývoj Slovenska v roku 2012 a výhľad do roku 2014.* Bratislava: Ekonomický ústav Slovenskej akadémie vied. Available at: http://ekonom.sav.sk/sk/publikacie/-p222 (accessed September 7, 2016).

[21] Morvay, K. *et al*. 2015. *Hospodársky vývoj Slovenska v roku 2013 a výhľad do roku 2015.* Bratislava: Ekonomický ústav Slovenskej akadémie vied. Available at: http://ekonom.sav.sk/sk/publikacie/-p245 (accessed September 7, 2016).

[22] Myers, S. C. 1984. The capital structure puzzle. *Journal of Finance,* 39: 575-592. DOI 10.1111/j.1540-6261.1984.tb03646.x

[23] Myers, S. C. and Majluf, N. S. 1984. Corporate Financing and Investment Decisions when Firms Have Information That Investorst Do Not Have. *Journal of Financial Economics,* 13: 187-221. DOI 10.1016/0304-405X(84)90023-0

[24] Nivorozhkin, E. 2005. Firms' Financing Choices in EU Accession Countries. *Emerging Markets Review,* 6(2): 138-169. DOI 10.1016/j.ememar.2004.10.002

[25] Prucha, I. R. 2014. *Instrumental Variables/Method of Moments Estimation*. In: FISHER, M. M. a NIJKAMP, P. (ed.) Handbook of Regional Science. Springer Berlin Heidelberg. 1597-1617. DOI 10.1007/978/-3-642-23430-9_90. Available at: http://link.springer.com/referenceworkentry/10.1007%2F978-3-642-23430-9_90#page-1

[26] Růčková, P. 2015. Dependency of Return on Equity and Use of Finance Sources in Building Companies in V4. *E&M Ekonomie a Management*, 18(3): 73-83. DOI dx.doi.org/10.15240/tul/001/2015-3-007

[27] Růčková, P., Heryán, T. 2015. The capital structure management in selected business branches and companies from the building area in conditions of the Czech Republic. *Prague Economic Paper*, 24(6): 699-714. DOI 10.18267/j.pep.515 Available at: http://scholar.googleusercontent.com/scholar?q=cache:4ZxQOyJKP4gJ:scholar.google.com/&hl=en&as_sdt=0,5&as_vis=1

[28] Shleifer, A. and Vishny, R.W. 1992. Liquidation values and debt capacity: A market equilibrium approach. *The Journal of Finance,* 47(4): 1343-1366. DOI 10.1111/j.1540-6261.1992.tb04661.x

[29] Strebulaev, I. A. 2007. Do tests of capital structure theory mean what they say? *The Journal of Finance,* 62(4): 1747-1787. DOI 10.1111/j.1540-6261.2007.01256.x

[30] Stulz, R. and Johnson, H. 1985. An analysis of secured debt. *Journal of Financial Economics,* 14: 501-521. DOI 10.1016/0304-405X(85)90024-8

[31] Williamson, O. E. 1988. Corporate Finance and Corporate Governance. *Journal of Finance,* 43(3): 567-591. DOI 10.1111/j.1540-6261.1988.tb04592.x

*** Database AMADEUS

*** *EUROSTAT,* Available at: http:// http://ec.europa.eu/eurostat

*** Ministry of Industry and Trade of the Czech Republic Survey of the Czech Economy and MIT Sectors. Available at: http://www.mpo.cz/en/minister-and-ministry/analytical-materials/default.html

*** *OECD* Available at: http:// https://data.oecd.org/

*** Czech Statistical Office, Available at: http: https://czso.cz/csu/czso/statistiky

Appendix

Partial testing of determinants in relation to DER in manufacturing industry in individual countries

	Czech Republic	Hungary	Poland	Slovakia
ROE	33,0377***	-0,6158***	4,8075***	-17,5007***
Sargan/Hansen test	0,5968	0,6003	0,1335	0,7706
L3	-0,0001	-0,2639*	-0,0535	-0,0009***
Sargan/Hansen test	0,2578	0,4701	0,1294	0,4196
SAA	-6,5694	-1,8063	280,4653***	-37,5935***
Sargan/Hansen test	0,3559	0,5725	0,2981	0,0141

Source: own elaboration in Eviews 9

Note: *** item is statistically significant at the level of 1 %, ** item is statistically significant at the level of 5 %, * item is statistically significant at the level of 10 %, items without marks are statistically not significant.

Partial testing of determinants in relation to DER in services in individual countries

	Czech Republic	Hungary	Poland	Slovakia
ROE	19,8067***	0,5015	0,9154*	-0,0025
Sargan/Hansen test	0,6002	0,6082	0,3126	0,4797
L3	-0,0438	-0,1139**	-0,0009	-0,1082*
Sargan/Hansen test	0,8065	0,6397	0,3552	0,5698
SAA	0,1674***	-3,6385***	-4,4235	0,2324
Sargan/Hansen test	0,7603	0,6444	0,3729	0,4316

Source: own elaboration in Eviews 9

Note: *** item is statistically significant at the level of 1 %, ** item is statistically significant at the level of 5 %, * item is statistically significant at the level of 10 %, items without marks are statistically not significant.

Sustainable Development of Large Entrepreneurial Structures in Competitive Environment

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Abstract

In the modern world, large entrepreneurial structures determine economic and technical power of the country. Accumulating significant money capital, these structures influence internal market of the country and determine the vector of development of the global economy and influence the situation in competitive struggle on the international arena. Thus, it is very important to study peculiarities of sustainable development of large entrepreneurial structures in competitive environment.

Key words: large entrepreneurial structures, development, sustainability, competitive environment.

JEL Classification: O20, M21, F12.

1. Problem setting

As of now, scientists and practitioners do not have a common opinion regarding the role of large entrepreneurial structures in economy: some consider it to be a driving force of economy, others see it as a source of emergence of corruption and shade money flows and other negative aspects which hinder economic development. Despite that, none of the economists would deny that the level of influence of large entrepreneurial structures on market and competitive environment is very high.

At that, competitiveness of enterprises cannot form by itself. It is set by the measure of use of potential of enterprise in specific conditions and is determined by the level of development of attributes of organization and systems of its management. Thus, there's a necessity for study of peculiarities of sustainable development of large entrepreneurial structures in competitive environment.

With the global economic crisis, interest to this problem grows. The thing is that many economists think that one of the reason of its appearance it ineffective activities of large entrepreneurial structures which not only risked too much in main types of activities but hid unsuccessful results of the realized projects from the public.

The problem of sustainable development of large entrepreneurial structures in competitive environment has inter-disciplinary character, as its solution requires knowledge of sociology, economy, and the whole complex of special types of management (strategic, financial, innovational, investment, etc.). Special contribution into study of large integrated structures, theory of competition, competitiveness of enterprises, spheres, regions, and national economies was made by the works of the following scientists: Ansoff (1989), Ackoff (1985), Bandman, Ionova and Malov (1986), Vinslav (2003), Gvishiani (1998), Kleiner (1998), Lvov (2004), Minakir (2004), Nosov (2002), Sibirskaya (2003). At that, the issue of sustainability of development of enterprises and their competitiveness is viewed generally, without characterizing the specifics of development of large entrepreneurial structures.

2. Influence of sustainable development of large entrepreneurial structures on their positions in competitive environment

Competitiveness of entrepreneurial structures is a parameter which characterizes successfulness of actions of enterprise in the market, as compared to companies operating in the same sector of economy. Multiple theoretical

studies and research of practical experience allowed determining that competitiveness is a dynamic indicator that reacts to changes in the market. That's why enterprises that strive for preservation and improvement of their competitive position think about ways of sustainable development (Figure 1).

The term "sustainable development" is a many-sided notion. We consider that sustainable development of entrepreneurial structures is constant process of transition from the previous level of development to the following one that ensures realization of its capability to create and preserve its competitive advantages for a long time:

- despite changes in external environment;
- in view of growing problems with natural resources, necessity for protection of environment, quick scientific & technical and technological progress, etc.;
- for the purpose of increase of quality of satisfaction of clients' needs and improvement of value of indicators which evaluate the results of activities of enterprise in the market.

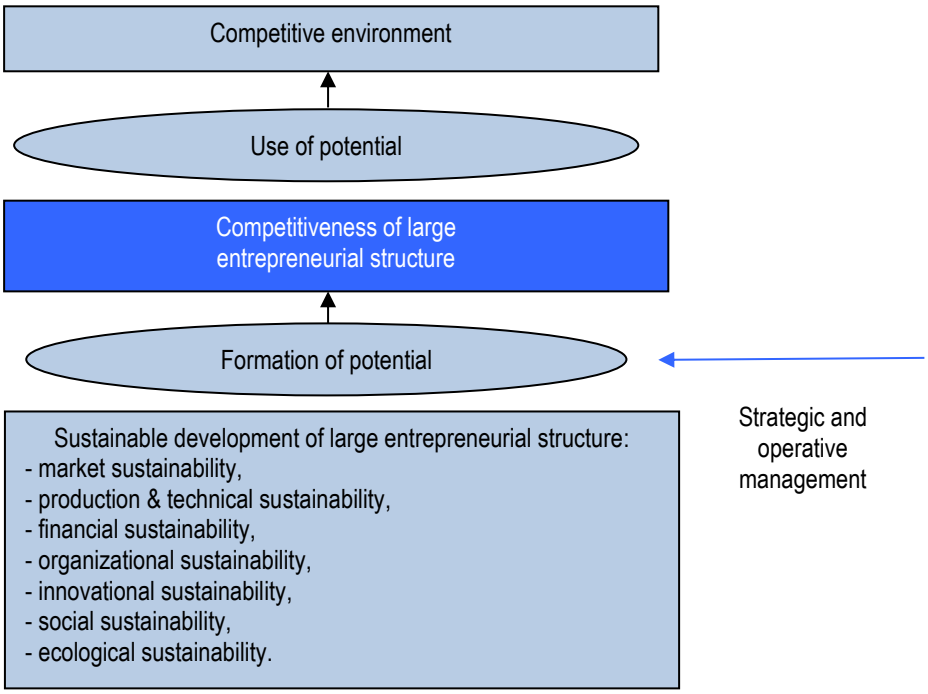

Figure 1 – Role of sustainable development of large entrepreneurial structure in formation of its competitiveness (compiled by the authors)

As is clear from the definition, managers of entrepreneurial structures – for the purpose of provision of sustainable development in competitive environment – have not only to strive for improvement of their financial results but for accounting of social, ecological, and institutional aspects of life, as well as influence on the society on the whole. Neglecting these principles, especially by management of large entrepreneurial structures, might lead to fatal consequences (irreversible processes in biosphere, appearance of conditions unfits for life, etc.)

As a result, development of entrepreneurial structure could be deemed sustainable if (Korchagina 2011):

- it is aimed at performance of strategic tasks of development of economy on the whole;
- its reproduction process corresponds to dynamics of needs of macro-system;
- it has a certain level of independence and autonomy and possesses adequate system of management;
- it possesses certain potential necessary for self-organization and self-development;
- satisfaction of needs of present time does not threaten entrepreneurial structures' capability to satisfy them in future.

3. Parameters determining sustainable development of large entrepreneurial structures

Sustainable development of large entrepreneurial structures is achieved in the process of strategic and operative management. Sustainability of large entrepreneurial structures, unlike medium and small ones, has its specifics:

- The feel the influence of short-term situational changes to a lesser degree and take cardinal long-term transformations in economy easier due to possession of large resources and, therefore, reserved for unpredictable situations. At the same time, they show less flexibility with necessity for change of strategic

course and are more difficult in management.

- Being noticeable members of market events – due to occupied share of the market – they can influence the market and change external environment of entrepreneurship.
- They are main members of evolutionary process in economy, as they have a possibility to develop and implement science-intensive and, therefore, capital-intensive technologies. This gives them a range of competitive advantages.
- Activities of these structures is under constant control of the state: on the one hand, they are under limiting measures for the purpose of preservation of competition in the market; on the other hand, they support and stimulate development of capital-intensive spheres.
- They have a possibility to accumulate experience and improve rules, methods, and procedures of rational entrepreneurship.

Sustainability of large entrepreneurial structures – under the conditions of generalization of results of research by Kostromin (2013), Korchagina (2011), Ryabov (2011), Ignatova and Rogova (2015) includes the following elements (Table 1).

Table 1 - Components of sustainability of large entrepreneurial structures (compiled by the authors)

Element of sustainability	Factors ensuring Sustainability	Basic indicators which characterize sustainability
Market sustainability	▪ Expansion of activities; ▪ Strengthening of competitive positions; ▪ Strengthening of business activity; ▪ Improvement of work with clients; ▪ Level of products' attractiveness.	▪ Sales volumes; ▪ Market share; ▪ Profit; ▪ Profitability of sales; ▪ Assets turnover.
Production and technical sustainability	▪ Increase of the level of technological correspondence to sectorial requirements; ▪ Increase of effectiveness of resources use; ▪ Increase of effectiveness of production and sales activities; ▪ Stability of production cycle; ▪ Level of resource provision.	▪ Coefficient of availability, renovation, and growth of main funds; ▪ Production sustainability; ▪ Profitability of production; ▪ Production potential.
Financial sustainability	▪ Sustainable structure of assets; ▪ Increase of profitability from financial and economic activities; ▪ Improvement of payment capacity.	▪ Coefficient of flexibility and autonomy; ▪ Coefficients of current payment capacity; ▪ Coefficients of financial dependence.
Organizational sustainability	▪ Stability of internal organizational structure; ▪ Development and speed of connections between various departments and services of enterprise; ▪ Increase of effectiveness of management. ▪ Growth of investment attractiveness.	▪ Indicators of organizational structure's efficiency; ▪ Net profit per 1 employee; ▪ Sum of investments into main capital; ▪ Term of profitability of investment projects; ▪ Profitability of investments.
Innovational sustainability	▪ Implementation of innovational technologies; ▪ Issue of new types of products; ▪ Implementation of new means of production organization.	▪ Sum of investments into R&D; ▪ Coefficient of renewal of active part of main funds; ▪ Coefficient of products renewal; ▪ Coefficient of labor efficiency growth.
Social sustainability	▪ The enterprise's personnel involvement into public processes; ▪ Support for growth of public well-being and level of social provision of employees; ▪ Creation of effective system of labor motivation.	▪ Wage arrears per 1 employee. Ratio of average wages at enterprise to average wages in the sphere; ▪ Coefficient of employee turnover.
Ecological sustainability	▪ Efficient use of resources; ▪ Reduction of negative influence on environment; ▪ Preservation and restoration of environment; ▪ Support for growth of public well-being.	▪ Level of waste; ▪ Coefficient of resource-saving technologies ▪ Level of secondary raw materials; ▪ Level of environment pollution.

Complex analysis of elements of sustainable development is a methodological basis for formation of the mechanism of sustainability of large entrepreneurial structure. The given indicators form the system of key parameters with the help of which it is possible to determine the level of sustainability of large entrepreneurial structure and its dynamics in time (Lutsenko 2011).

4. Peculiarities of sustainable development of large entrepreneurial structures in the Russian Federation

It was noted that sustainability of development of large entrepreneurial structures directly influences sustainability of national economy. Therefore:

- improvement of position of these organizations in the market is a stimulus for elimination of crisis phenomena in the economy of the Russian Federation;
- determination of reasons which hinder the sustainable development of large entrepreneurial structures will allow developing the system of measures which stimulate correction of current situation within these structures and in the national economy on the whole.

Unfortunately, long post-Soviet period was marked by unequal development of the spheres of national economy of the Russian Federation with a shift to raw-materials sphere. As a result, most of large entrepreneurial structures are concentrated in resource-extracting spheres. This is shown by ranking of the largest companies of Russia for 2015 (Ranking of largest Russian companies for 2015, 2016): 1st position – Gazprom, 2nd position – Lukoil, 3rd position – Rosneft. The authors' analysis of sustainability of development of leading oil extracting entrepreneurial structures (Table 2) allowed determining the following problems in their development:

Table 2 - Characteristics of sustainability of development of largest oil extracting companies (compiled by the authors)

Indicators of sustainable development	Normative	Year	Company's name				
			Gazprom	Lukoil	Rosneft	Surgutneftegaz	Transneft
Liquidity indicators							
Coefficient of total liquidity	2 and more	2013	2.41	2.31	0.74	7.63	0.94
		2014	2.28	1.51	1.26	7.45	0.63
		2015	2.35	2.09	2.08	6.50	1.28
Coefficient of quick liquidity	1 and more	2013	0.33	0.90	0.32	6.67	0.83
		2014	0.55	1.50	0.79	6.41	0.60
		2015	1.65	2.09	1.44	5.35	1.24
Coefficient of absolute liquidity	0.2 and more	2013	0.33	0.43	0.48	4.96	0.56
		2014	0.55	1.04	0.35	5.36	0.32
		2015	0.36	1.75	1.00	4.25	0.67
Indicators of financial sustainability							
Coefficient of ratio of borrowed and own assets	less than 0.7	2013	0.30	0.50	2.59	0.07	5.15
		2014	0.35	0.55	4.74	0.07	6.25
		2015	0.39	0.55	5.59	0.06	6.59
Coefficient of flexibility of capital	at least 0.05	2013	0.06	-0.13	-1.42	0.27	-3.58
		2014	0.02	-0.03	-2.68	0.27	-4.87
		2015	0.003	0.11	-2.63	0.18	-4.72
Coefficient of autonomy	at least 0.55	2013	0.77	0.67	0.28	0.93	0.16
		2014	0.74	0.65	0.17	0.94	0.14
		2015	0.72	0.64	0.15	0.95	0.13
Indicators of profitability							
Profitability of assets for net profit	At least 0.09	2013	0.10	0.18	0.03	0.12	0.01
		2014	0.02	0.12	0.06	0.30	0.01
		2015	0.03	0.15	0.03	0.20	0.01
Profitability of own capital	At least 0.14	2013	0.13	0.27	0.12	0.13	0.07
		2014	0.02	0.18	0.37	0.32	0.08
		2015	0.04	0.23	0.17	0.21	0.08
Profitability of goods, works, and services	At least 0.26	2013	0.22	1.00	0.63	0.32	0.02
		2014	0.05	0.84	0.12	1.03	0.02
		2015	0.09	1.17	0.03	0.77	0.02
Indicators of business activities							
Coefficient of working capital turnover	5.0 – 7.5	2013	1.76	0.29	0.16	1.21	2.97
		2014	1.20	0.41	1.53	0.90	3.33

Indicators of sustainable development	Normative	Year	Company's name				
			Gazprom	Lukoil	Rosneft	Surgutneftegaz	Transneft
		2015	1.17	0.30	0.90	1.16	2.42
Coefficient of own capital turnover	3.0 – 4.5	2013	0.63	0.27	0.18	0.41	4.66
		2014	0.44	0.21	3.17	0.31	4.61
		2015	0.46	0.20	2.67	0.28	4.58
Coefficient of accounts receivable turnover	The larger the better	2013	0.40	0.73	3.33	0.20	0.10
		2014	0.49	0.75	0.43	0.21	0.14
		2015	0.58	0.54	0.53	0.21	0.18
Coefficient of loan payable turnover	The lower the better	2013	0.11	0.62	2.64	0.09	0.26
		2014	0.16	0.82	0.28	0.14	0.20
		2015	0.16	0.60	0.37	0.12	0.20

Liquidity indicators. Sutgutneftegaz attracts very few assets from outside and prefers to use only own assets, which means underuse of cheaper – compared to own capital – source of financing. Transneft belongs to low liquid companies, i.e., there could be problems with paying current debts.

Indicators of financial sustainability. Rosneft and Transneft have low indicators of sustainability which show investments into slowly realized assets (main assets) and formation of turnover capital by means of borrowed assets.

Profitability indicators. They conform to the norm only with Surgutneftegaz and Lukoil – other companies' indicators are below the norm.

Business activity. Only one company (Transneft) has normal values of business activity – this means that other organizations work ineffectively. Most of large entrepreneurial structures of the Russian Federation face the described problems. The situation is aggravated by the global financial crisis and change of conditions of economic cooperation between Russian business and foreign partners due to economic sanctions. These phenomena significantly changed the environment in which large entrepreneurial structures conduct their activities. As a result, the factor which restrained development of large Russian companies in 2015 included (Byrkova 2016): ruble exchange rate, uncertainty of economic situation, high level of taxation, reducing demand in the internal market, quality of legal regulation of economy, complexity of bureaucratic procedures, high prices for energy resources, high interest of commercial loan, high expenses for labor payment, and lack of long-term investment assets. For different directions of economic activities, influence of some or other factors is different (Table 3).

As a result, index of entrepreneurial certainty of large entrepreneurial structures in the first quarter of 2015 reduced to - 6 positions.

The above problems in development of large entrepreneurial structures aggravate each year, and no one tries to solve them systemically. If this situation is preserved in perspective, economic crisis will be prolonged.

Table 3 - Ranking of factors which restrain development of large entrepreneurial structures for sectors of economy

Sector of economy	Top factors that hinder development of large entrepreneurial structures				
	RUB rate	Uncertainty of economic situation	High level of taxation	Reducing demand in the internal market	Quality of legal regulation of economy
Wholesale	1	2	3	4	5
Retail and public catering	1	2	4	3	5
Industry	1	2	3	5	4
Construction	2	1	3	4	5
Transport	1	2	4	3	5
Utility services and hotel business	2	1	4	3	5
Business services, consulting	2	1	5	3	4

Note: Compiled by the authors

Conclusions

Under the modern conditions, sustainable development of large entrepreneurial structures is capable to ensure growth of their competitiveness in the global market and stabilize development of national economy.

Sustainability of development of large entrepreneurial structures could be determined with the help of calculation and analysis of dynamics of the system of key parameters. These indicators are divided into seven main

groups, depending on the characterized structural element of sustainability.

Development of large entrepreneurial structures in the Russian Federation is hindered by a range of factors (main of them – ruble exchange rate, uncertainty of economic situation, high level of taxation, reducing demand in the internal market, and quality of legal regulation of economy).

Correction of situation and creation of preconditions for sustainable development of large entrepreneurial structures require solving the emerging problems by joint efforts (at the state level and at the level of large entrepreneurial structures). Thus, it is necessary to do to following:

- Activate internal potential of growth by means of increase of labor efficiency, liquidation of technical underrun of production, and increase of quality of management on the spots. According to the plans of the Ministry of Economic Development, labor efficiency is to grow by 50% by the end of 2018 (Ministry of Economic Development, 2016). Reserves of growth of this indicator within large entrepreneurial structures could be growth of capital-labor ratio by means of technical modernization of underdeveloped productions and increase of the quality of management at all levels of management (Lyapina, Konobeeva and Konobeeva 2015).
- Develop the programs of import substitution. These programs started to be implemented in life in recent years. For stimulation of import substitution by Russian goods, customs and tariff (taxes) and non-tariff (quotas, licensing of import) regulation, as well as subsidizing and other types of state support for production in Russia.
- Use non-renewable natural resources rationally. At the modern stage, the only way to enter the path of sustainable development is to refuse from intensive sales of resources, save them, and distribute resource rent fairly (Goals and tasks of sustainable development of Russia, 2016).
- Aim economic resources for development of human potential. For development of human potential, large entrepreneurial structures should use the policy of initiative (provide for employees the possibilities for purchase of new and improvement of existing skills, provide equal possibilities for career growth, create programs aimed for improvement of personnel well-being, etc.).
- Reduce administrative load on business. Administrative load on business grows annually (main causes: excessive requirements, which cannot be fulfilled; increase of the number of inspections from controlling bodies; stiffening of punishment). In order to change this tendency, Medvedev passed the plan regarding improvement of controlling activities in the country for 2016-2017. He set the task of implementation of risk-oriented approach during organization and conduct of control and inspection measures (Top Publications, 2016).

References

[1] Ackoff R., L., 1981. *Creating the corporate future*. Wiley (April 27, 1981). Hardcover: 312.

[2] Ansoff, I., 1989. *Strategic management*. Ansoff; ed. by L.I. Evenko. – M. Ekonomika: 519

[3] Bandman, M.K., Ionova, V.D., Malov, V.Y. 1986. *Territorial and production complexes: improvement of the formation process/* M.K. Bandman– Novosibirsk, Nauka: 94

[4] Byrkova, E. 2016. *What hinders the development of Russian business in 2015*? Available at: http://провэд.рф/analytics/research/26820-chto-meshaet-pazvivatysya-possiyskomu-biznesu-v-2015-godu.html (Accessed: 25.04.2016)

[5] Gvishiani, D.N., 1998. Organization and management [Text] / D.N. Gvishiani – M.: N.E. *Bauman MSTU Publ.,* – 3rd Ed: 332.

[6] Ignatova, T.V., Rogova, V.A. 2015. Management of sustainability of enterprises as a factor of economic security of production, *Science and education: household and economy; entrepreneurship; law and management.* August. Available at: http://www.journal-nio.com/index.php?option=com_content&view=article&id=3363%3 Apubl&catid=100%3Amart&Itemid=149

[7] Kleiner, G.B. 1998. Mechanisms of making strategic decisions and strategic planning at enterprises, *Issue of Economy,* 9: 4–25.

[8] Korchagina, E.V. 2011. Development of the model of analysis of sustainable development of the company, *Problems of Modern Economics.* No. 4.

[9] Kostromin, P.A. 2013. Sustainable development of enterprise under the conditions of modernization of

economy, *International scientific and practical conference "Economics and modern management: theory and practice"* (April 24, 2013, Novosibirsk, Russia) Available at: http://sibac.info/conf/econom/xxiv/32601(Accessed: 25.04.2016)

[10] Lutsenko, A.I. 2011. Indicators of sustainable development of large business and their connection to evaluations of GRI, *Young Scientist*, 5(1): 207-209

[11] Lvov, D. 2004. Management of scientific and technical development // *Problems of theory and practice of management,* 3: 63–67.

[12] Minakir, P.A. 2004. Economic integration: regional aspect // *Region: economics and sociology*. 1: 118–135.

[13] Nosov, S. 2002. Integration of investment resources in the structure of strategic alliance, *Issues of Economics,* 1: 140–151.

[14] Ryabov, V.M. 2011. Sustainable development of industrial enterprises under the modern conditions, *TSU Vector of Science,* 4(18): 271-273

[15] Sibirskaya, E.V. 2003. Integration structures as a foundation of region's development, *Region Science*. No. 1-2 (No. 42-43): 94-97.

[16] Stroeva, O., Lyapina, Innara, R., Konobeeva, Elena E., Konobeeva, Oksana, E. 2015. Effectiveness of Management of Innovative Activities in Regional Socio-Economic Systems, *European Research Studies,* Volume XVIII, Special Issue: 59-72,

[17] Vinslav, Y.B. 2003. Planning of development of integrated corporate structures, *Russian Economic Journal*, 8: 72–81.

*** Goals and tasks of sustainable development of Russia, 2016. Stages of transition. Available at: http://www.ecologyside.ru/ecosids-367-1.html (Accessed: 25.04.2016)

*** Ministry of economic development, 2016. Plan of measures for increase of labor efficiency, creation and modernization of jobs. Available at: http://ac.gov.ru/files/content/2416/plan-16-05-pdf.pdf (Accessed: 25.04.2016)

*** Ranking of largest Russian companies for 2015 for the volume of product sales, 2016. Available at: http://expert.ru/dossier/rating/expert-400/ (Accessed: 25.04.2016)

*** Top Publications, 2016. TopRe. Available at: http://topre.ru/2016/04/05/medvedev-utverdil-plan-po-umensheniyu-administrativnih.html (Accessed: 25.04.2016)

Peculiarities of Formation of Regional Finance in Russia

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Abstract:

The article discusses the theoretical aspects of the concept and peculiarities of formation of regional finance, approaches to learning and assessment; it reveals the importance of regional finances for the budgetary system of a federal type. Also, the peculiarities of formation of the finance of the second-tier in the Russian budget system and its differences from other countries with a similar budget arrangement have been studied. With the help of statistical and mathematical methods of analysis, the main factors affecting the finances of regions have been revealed. The influence of return of certain types of duties, macroeconomic indicators, peculiarities of debt and expenditure policies, and particular qualities of socio-economic development of returns from the federal budget have been evaluated. The conclusions about the state of regional finance in Russia have been made, and the methods of levelling the influence of factors adversely and significantly affecting finances of regions having the theoretical and practical significance have been proposed.

Keywords: budget, region, finance, tax revenue.

JEL Classification: H29, H50, H61, H63, H71, H72.

1. Introduction

The urgency of studying the peculiarities of formation of regional budgets is determined by difficult situation of regional budgets in slowing of the economy, an increase in the rate of inflation. There exists the need to reduce costs, an increase in budget deficit and the growth of expenditures of regional budgets on debt servicing. In this regard, the study of allowance of regional budgets permits assessing their condition, rightly justifying the specifics of the decision-making and identifying prospects for their development in the next year.

The budgets of the subjects of the regions belonging to the second level of the budget system are budgets of solely the subjects of the Russian Federation, excluding budgets of municipalities and territorial departments of the mandatory health insurance fund.

2. Concept headings

In practice, for the analysis of budgetary system, such concept as the consolidated budget of the Russian Federation subject is used, which is a collection of the regional budget and the budgets of all the municipalities in the territory of the subject (Figure 1.)

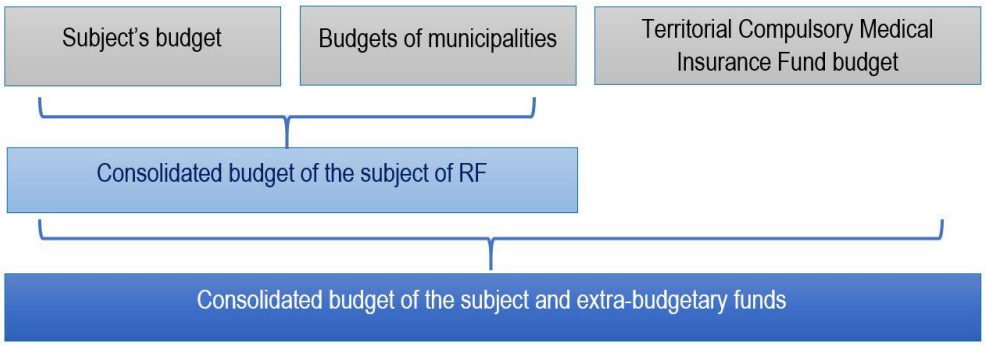

Figure 1 – Differences in budget concepts of the Russian Federation subject

Consolidated budget is a calculation index used by analysts to assess the status of regional finance. However, the consolidated budget and the budget of territorial extra-budgetary fund of the Russian Federation are the most extensive ones.

Data on the performance of the above-mentioned budgets are reflected in the official information published on the website of the Federal Treasury of the Russian Federation.

2.1. The role of the budget in the economic development of the region

Accumulated by budgets of regions funds are allocated within the region in various areas: for the implementation of social policy, education, development of culture and sport in the region, support of national

economy. The regional government almost fully finances socially significant spheres: education, culture, health and sports. Expenditures of the region in the sphere of payment of wages to workers of social sphere, construction of new schools, kindergartens, sports facilities, renovation of old objects improves the quality of life in the region of a large group of the population. Also, the regional authorities largely affect the degree of development of small and medium-sized businesses, business environment in general. In this regard, the regional finance functions include:

- Redistributive function

Redistributive function involves distribution of public funds, accruing from the return of taxes and fees from the population and the real economy, for various socially and economically important areas, maintenance and implementation of social policy in the region, investment and industrial programs (Figure 2). Redistribution carried out in those areas, in those sectors, which are due to the nature of the activity cannot or do not get a sufficient number of financial resources to ensure their way of life, continuity of the production process, etc.

Distribution and bringing produced goods to citizens is carried out through the budget system and has the most significant impact on the development of the region and, in our opinion, is the most basic function of the subject's budget.

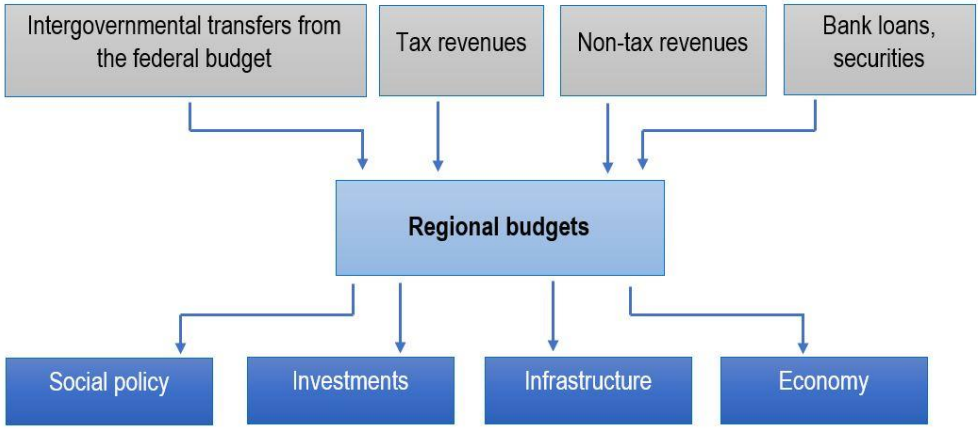

Figure 2 – Financial resources of regional budgets and their redistribution

- Motivation function

Motivation function is manifested in the independence of regional budgets on income adjustment from certain tax by changing the rate downward to reduce the tax burden and stimulate the growth of economic development. Also in conditions of relative autonomy regional authorities implement their own policy, creating conditions for investment and industrial development in the region (creation of Technopolis, an example of the Kaluga region (Vlasova and Abramova 2015), industrial zones with favorable conditions for business development in the field of rent and taxation), as well as ensuring alignment of business conditions. Actions of the regional authorities also aim at increasing the efficiency of regional authorities, to reduce unemployment, to make the quality of education and health better, to improve the quality of life of the population of the subject as a whole through the promotion of equitable distribution of income between different population groups. All this affects the degree of socio-economic development of the region.

- Control function

The control function is the responsibility of the regional authorities to carry out not only the distribution (budget costs), but also control over the use and distribution of funds received by the regional budget and from it, ensuring the flow of funds to the final destination. Carrying out the control over the companies in financial and economic spheres, operating on the territory of the subject, can improve the efficiency of their operations, increase the collection of taxes in the budget, to achieve a level playing field for all business entities.

The entire region's fiscal policy is focused on the improvement of socio-economic indicators, which are defined by the Budget Code and other legislative acts, including the orders of the President of the Russian Federation. Among other things, fiscal policy in the region should have a short and medium-term development programs, in the direction of social and economic development: provision of education, health, social workers' salary, support and modernization of permanently important companies, as well as the development of measures to attract investment to the subject. These programs (taking into account the characteristics of the economic

development of the country as a whole) allow adjusting and preparing a draft of the region's budget for three oncoming years, forecasting returns in the subject's budget and increasing the efficiency of their distribution. Thus, in general regional budget plays an important role in the development of the subject, performing an important economic and social function (Vlasova 2015).

2.2. Regional finance theory

Regional finance theory is represented in many works of Russian scientists. Under the authority of the "Finance" scientific school in Plekhanov Russian University of Economics the textbook "State and Municipal Finances" has been released, compiled by the University professors: Slepov, Chalova, Shuba (2011). A separate chapter of the textbook is devoted to regional finance and regional budgets, definitions, principles, functions and features of functioning are disclosed.

Shimshirt and Krashennikova (2014), the authors of the textbook "State and Municipal Finance Management" consider regional finance through the prism of inter-budgetary relations. Besides, the system of budgetary planning and control over the execution of the budget attracts attention.

Under the supervision of Valentey *et al.* (2014) the quarterly and annual analysis of trends in the fiscal sphere of Russia has been held. Special attention is paid to the consolidated budgets of the regions, both aggregate data for all subjects, and separate data on extended expenditure budget as regards the Smolensk region have been analyzed, where the budget was executed with a significant deficit.

In the article "Trends in the Development of Russian Regions" the authors (Valentey *et al.* 2014) analyzed the prospects of innovative development of the economies of the Russian Federation. Rating of regions has been drawn up on the basis of which they were combined into four groups. According to the survey, more than half of Russian regions had no clear trend towards an increase or a decrease, about a quarter of them had a tendency to growth.

The credit rating agencies are also engaged in the analysis of public finances, for example, Standard and Poor's. In February, 2016 preliminary results of the regional budgets were summed up, according to which the deficit of the consolidated budget of the Russian Federation subjects reduced, the pace of debt growth slowed and a share of commercial debt decreased. However, analysts have concluded that these positive effects are short-term and in 2016 deterioration in the socio-economic situation of the regions is expected (Varapetov 2016).

The author's team at the Institute of Economic Policy named after Gaidar (Gaidar Institute 2016) held monthly operational monitoring of the economic situation in Russia. The economic situation in the region as a whole has been analyzed, and an assessment regarding the recession, growth or stagnation in some sectors has been made.

Zubarevich, director of the regional policy at the Independent Institute for Social Policy provides a rapid assessment of the socio-economic situation in the regions of Russia. Zubarevich has analyzed a summary report on the implementation of the consolidated budgets of the RF subjects and has concluded as regards the factors having affected the economy of the regions to varying degree. In a recent article the results of 2015 in the context of the federal budget and the consolidated budget of the subjects were considered. Particular attention was paid to the reduction of costs as the main factor in reducing the deficit (Zubarevich 2016).

Mkhitaryan and Mikhaylova analyzed the differentiation of sources of budget revenues through appropriate regional economic indicators. The conclusion is that in Russia, depending on the territory there are different conditions of formation of a profitable part of the budget, and the main factor is the economic specialization of the region. The most successful and promising in the future are the regions whose economies have significant innovative component that provides a significant competitive advantage and a positive effect on the growth of budget revenues (Mkhitaryan and Mikhaylova 2015).

Bochko (2015) explicates the idea of the complication of the economic space and the human being as a single person. As for the factors accelerating the development of the regions, Bochko gives the following examples: technological progress, systemic innovative thinking of a person, rebalancing the economy (maintenance not all industries, but the most promising ones), raising the educational level of the population. Constraining factors include the uneven development of the territories, incorrect allocation of priority sectors, crisis of management, sanctions, inflation and reduced demand, standardization of educational programs, the weak development of studies on the regional economy.

In general, analyzing the works of the researchers on the issue of functioning of the regional finance the main topics that have been covered in the articles should be highlighted:

- budget balance problem: causes and main factors that can further affect the balance in a positive or negative way;

- socio-economic situation in the regions, the state of sectors of the economy and welfare of the population and the impact of these factors on regional finances;
- the ways to solve the problems of regional finance.

2.3. Methodology

We will use the methods of mathematical and statistical analysis of annual data, officially published accounts of the Federal Treasury of Russia and the Russian Ministry of Finance. To assess the current situation, we will use budgetary factors (Vlasova and Tolkacheva 2014, Vlasova and Vlasov 2015, Bochko 2015, Vlasov 2013).

Table 1 – Budgetary factors for the evaluation of subnational finances

No	Index	Design method
1	Budget coverage coefficient	Income / expenses
2	Coefficient of autonomy	Own revenues on income
3	Coefficient of fiscal sustainability	Total income less gratuitous receipts/gratuitous receipts
4	Coefficient of budgetary security of the population, rubles	Expenditure / population
5	Coefficient of security of expenditures by their own incomes	Own revenues to expenses
6	Debt load coefficient	Volume of debt to expenses * 100

Next, methods of statistical analysis have been used to evaluate the degree of impact of factors.

2.4. Analysis

The first part of the analysis involves calculation and assessing cost factors (Table 2), and allows highlighting the following features: increase in stability of regional budgets, reducing reliance on the federal budget (an increase in autonomy and dependency ratios), deterioration of the situation with debt load of regions.

Table 2 – Values of budget coefficients. Consolidated budget of the Russian Federation subjects without off-budget funds for the period from 2012 to 2015

No.	Index	2012	2013	2014	2015
1	Budget coverage coefficient	0.97	1.05	0.95	0.98
2	Coefficient of autonomy	79.20	71.80	80.60	81.90
3	Coefficient of fiscal sustainability	3.80	2.55	4.15	4.53
4	Dependency ratio	20.83	28.20	19.41	18.08
5	Coefficient of security of expenditures by their own incomes	0.77	0.75	0.77	0.80
6	Debt load coefficient	0.90	1.00	1.30	1.60

In the second part of the study we have intended to evaluate the effect of individual factors on sub-national finances. For this purpose, indicators (4) have been proposed and grouped in a system of equations. Next, we have calculated the dependence of the dynamics of the regions' income on the factors described above:

- High dependence of the consolidated budget revenues from income tax, which is determined by the legislation and public policy (Vlasova 2015).
- The high dependence of the considered incomes of the budget of the average wage and the GRP. This is due to the fact that a very high share of subjects' budget income is personal income tax (Valentey *et al*. 2014). The low level of correlation of the industrial production index with the income of the consolidated budget is associated, firstly, with the peculiarities of calculation and the comparability of data, as well as the fact that manufacturing industry is developed not in all regions. Therefore, the relationship of dynamics of income in general has not been proved, but with reference to specific regions, it can be confirmed (Gaidar Institute 2016).
- High dependence on oil prices, which is explained by the fact that the highest incomes are showed in regions associated with the extraction and processing of oil and oil products and because this group of regions exerts a significant impact on the volume total revenues of the consolidated budget. On the other hand, the decline in oil prices on the whole has a negative impact on economic activity in the country. The impact of the dollar rate in this situation is not so critical, and has no significant direct impact on the dynamics of the revenues of the consolidated budget of the Russian Federation.

3. Results and discussion

3.1. Peculiarities of formation of budgets of the Russian Federation

The budgets of the subjects of the Russian regions are formed from tax and non-tax revenues and gratuitous receipts. Tax revenues form the bulk of the revenues of regional budgets (more than 70%).

Figure 3 – Structure of revenues of the consolidated budget of subjects, %

Thus, the large number of different types of taxes and fees form revenues of the majority of regions.

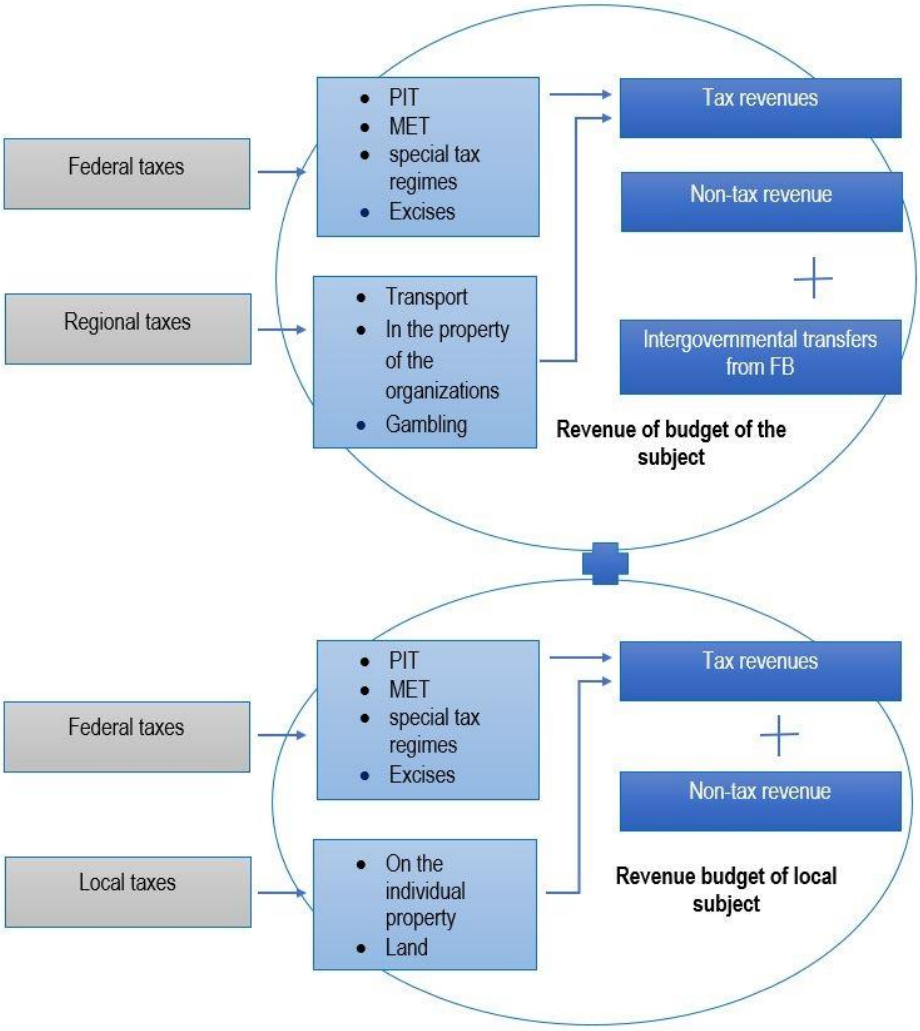

Figure 4 – Structure of revenues of the consolidated budget of subjects

Returns on the tax on personal income (40%), property tax, corporate profit tax are income producing directly to the budgets of the regions (Figure 5).

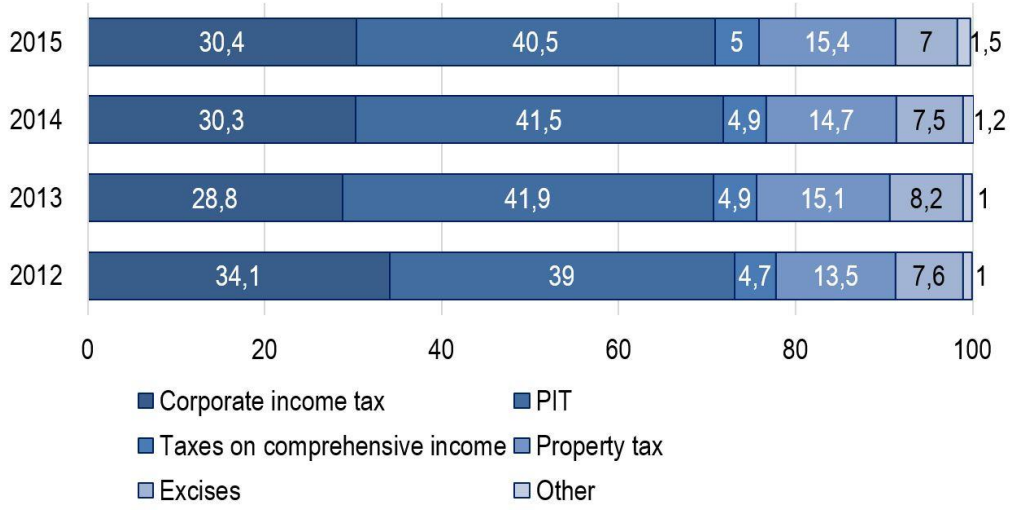

Figure 5 – Structure of tax revenues of the consolidated budget of the Russian Federation subjects

Regional finances in the Russian Federation are charged with the implementation of basic social functions such as education funding, social politics, culture, sports, etc. As a result, the regions are extremely difficultly reducing their costs, while the revenue part if grows, but not by a high rate. Therefore, it is important to assess the factors that affect the revenue part of the regional budget and develop measures to improve the efficiency of finance functioning on this level.

3.2. Evaluation of the effect of individual factors on regional finances

To assess the degree of influence of individual factors on the dynamics of regional finances, we used the published official statistics of the Federal Treasury of the Russian Federation.

In our opinion, the effectiveness of execution, as well as the regional finance structure may be influenced by the following factors:

- Peculiarities of the region in terms of climate, resource potential and producing units situated on its territory. These factors influence the structure of revenues of the regional budget. Thus, in areas with a highly developed industrial production or extraction of resources, the rate of revenues from income taxes is high. While in regions, where there are practically no profitable enterprises and extraction of resources is limited, the largest share of revenue accounted for PIT.

$$D = [t, nt, igt] \quad (1)$$

where: T – tax revenues, nt – non-tax revenues, igt – intergovernmental transfers.

- The regions characterized by a high degree of development, *i.e.,* in the context of our study these are the regions that receive consistently high own incomes, up to 80% of total revenues, have a different cost structure. Thus, such regions spend more than 8-10% of the total expenditure on the national economy. These factors include: the index of industrial production – Ip; average salary – S, GRP – GRP; The share of own revenues – OR. (2)

$$D = [IP, S, GRP, OR] \quad (2)$$

- The market factors: inflation – I, the price of oil – P, the US dollar rate DR, euro rate – ER.

$$D = [I, P, DR, ER] \quad (3)$$

Thus, we can obtain the system of equations by grouping factors:

$$\begin{cases} D = [t, nt, igt] \\ D = [IP, S, GRP, OR] \\ D = [I, P, DR, ER] \end{cases} \quad (4)$$

The solution to this system of equations allows revealing the degree of change in the income of the consolidated budget of subjects depending on changes in the individual factors within the system.

Conclusion

Thus, we identify some risks common to all regions as follows: the risk of growth of the budget deficit; a further reduction in income due to the decline in business activity of the population and businesses; possible increase in public debt and the debt of the subject of local budgets; increase in the share of unproductive expenditure as a consequence of the increase of the subject debt and its burden in connection with social obligations; the outflow of foreign investments due to inflation and the policy of import substitution.

To solve the current problems and to minimize risks, it is necessary to eliminate the possible causes and expeditiously deal with current tasks. The ways to solve existing problems related to regional finance are suggested below. In the course of study, the following issues of regional finances have been identified that are common to the majority of subjects of the Russian Federation:

- Lack of a profitable part of the budget and, as a consequence, the growth of budget deficits.
- The growth of the public debt of subjects and a significant proportion of expensive loans of credit institutions.
- Lack of efficiency of fiscal policy pursued by the regional authorities.
- Determination of the wrong priorities for funding and errors in budget planning related to the fact that the three-year budget plans are not linked with long-term strategies of socio-economic regions.

In this regard, the following basic recommendations have been made:

- Redistribution of the tax revenues that are now allocated to the federal budget, in favor of the regional one.
- Increasing liability of regions for the implementation of budget policy.
- Changes in the mechanism of granting of tax incentives on the basis of a direct positive impact on the economic development and welfare of the population.
- Changes in the structure of public debt, the replacement of expensive loans to credit institutions by more favorable cost loans and debt securities.
- SEZ development based on a single methodology, the introduction of certain criteria to support SEZ. Formation of the cluster structure of the economy.
- Evaluate the long-term strategy of socio-economic development on the adequacy of existing conditions and create a three-year budget in accordance with them. It is very important to correctly identify the top-priority funding directions.
- Development of public-private partnership as one of the ways of region's infrastructure development while reducing the burden on the budget by attracting private investors.
- Creation of a favorable investment climate by simplifying procedures for establishing and maintaining business data transparency needed for investors, as well as the provision of information in English, which will increase the capacity of regional budgets in the development of enterprises and reduce dependence on oil, i.e., structural changes in the economy.

Reasons for the shortcomings in the field of regional finance in the Russian Federation are the problems that have emerged many years ago and still have not been eliminated, and as a result, give rise to new problems. In particular, the volume of investments in fixed capital, which has been inadequate in the past and again reduced, which will result in the same problems, namely the lack of the necessary infrastructure and new taxpayers.

In general, a set of measures aimed at improving the sub-federal financial management, taking into account their particular organization in Russia, could contribute to positive development in this area.

References

[1] Bochko, V.S. 2015. Accelerating and constraining factors of a coordinated and balanced development of the regions. *The Region's Economy,* 1: 39-52.

[2] Mkhitaryan, V.S., Mikhaylova, S.S. 2015. Regional differentiation of conditions of formation of federal budget revenues. *Bulletin of Novosibirsk State University of Economics and Management*: 16-23.

[3] Shimshirt, D., Krashennikova, N.V. 2014. *State and municipal finance management*. Moscow: INFRA-M: ALFA-M. ISBN 978-5-98281-376- 3.

[4] Slepov, V.A., Chalova, A.Yu., Shuba, V.B. 2011. *State and municipal finances*. Textbook. Plekhanov Russian University of Economics Press.

[5] Valentey, S.D., Bakhtizin, A.R., Bukhvald, Ye. M., Lochugina, A.V. 2014. Trends in the development of Russian regions. *The Region's Economy*, 3: 9-22.

[6] Varapetov, K.S. 2016 Issues of inter-budgetary relations. *Vedomosti*, 4015 of 15.02.2016. Available at: https://www.vedomosti.ru/opinion/articles/2016/02/15/629407-mezhbyudzhetnih-otnoshenii

[7] Vlasov, S.A., Deryugina, Ye. B., Vlasova, Yu.A. 2013. Investigation of stability of Russian public finances in the short and long term. *Economics Issues*, 3: 33-49.

[8] Vlasova, Yu A. 2015. Budget Risks of Russian Federation Regions, the Determination and the Application in the Budget Process. *Mediterranean Journal of Social Sciences*, 6(4): 362-368.

[9] Vlasova, Yu. A, Vlasov, S. A. 2015. Evaluation of medium-term debt sustainability of Russian regions and the stability of the financial sector. *Economics and Entrepreneurship*, 11(1): 96-101.

[10] Vlasova, Yu. A. 2015. State and prospects of the debt instruments of the Russian Federation. In: *Problems of Social and Economic Development of Regions.* Proceedings of International Scientific and Practical Conference: 20-22.

[11] Vlasova, Yu. A., Abramova, A.I. 2015. The income potential of Russian regions as exemplified by the Kaluga region. *Creative Economy*, 10: 1255-1276.

[12] Vlasova, Yu. A., Tolkacheva K.S. 2014. The Collection of taxes in the formation of revenues of the budget system of Russia. In: *Problems and prospects of Economics and management.* Proceedings of the III[rd] International Scientific Conference. Saint Petersburg: 111-115.

[13] Zubarevich, N.V. 2016. Crisis: Lessons of budget savings. *Vedomosti*, 4052 of 11.04.2016. Available at: https://www.vedomosti.ru/opinion/articles/2016/04/11/637124-uroki-byudzhetnoi-ekonomii

*** Gaidar Institute. 2016. Official website of the Institute of Economic Policy named after Ye.T. Gaidar. Available at: http://www.iep.ru/ru.html

Oil as a Financial Asset

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Abstract:

The subject of this article is oil considered as an industrial raw material and a financial asset. The study of the development pathway of the global economy has shown that the global financial system is about to witness new virtual money and the financial instruments that may make oil non-demanded. The article analyzes the regularities reflected in oil price to understand the possibility of the crisis related to this situation. The article identifies the groups of factors directly or indirectly influencing oil and its price, which has enabled to establish their complicated correlation. Besides, it shows that the price of oil as a financial asset is greatly influenced today by the factors specific for the financial sphere.

Keywords: crisis, oil price, extraction, oil consumption, military conflict, petrodollar.

JEL Classification: G12, Q41, Q43.

1. Introduction

The problem of changes in oil prices has always remained paramount for academic economists, analysts, market participants, politicians, journalists, and other parties concerned. There are many scientific papers describing causes of change of high oil prices to their dramatic fall, and providing different predictions for the future.

Among the main factors of oil prices fall, there are usually the following ones:

- reduction in demand because of the state of economy in the main regions and countries of oil consumption;
- structure changes in demand caused by the increase in energy efficiency and occurrence of new kinds of fuel;
- technological innovations, such as the "shale revolution" in the USA;
- availability or lack of free capacities in the process of oil extraction and refining;
- military conflicts (or a threat of their occurrence) in petroliferous areas or in the areas of oil transportation;
- sanctions against oil producing countries (such as Venezuela, Iraq, Russia);
- the struggle among oil producers for maintaining their market shares, or their place on the market itself;
- processes related to the global redistribution of world property, etc.

Each of these causes requires a detailed analysis. However, it is most likely that the answer to the question, which is everyone is interested in, lies in an integrated approach to the investigation of the causes outlined above. At the same time, we can possibly reveal a lot of contradictions contained in them.

2. Influence of production and consumption of oil on its price

It is generally believed that the cause of the oil prices decrease in 2009 occurred because of the reduction in demand after the start of the crisis in 2008. However, we should note that this could have happened even earlier, it is evident from the comparison of oil prices dynamics in the last 21 year (Figure 1) and change in its production and consumption over the same period (Figure 2).

The data presented in Figure 1 show periods of significant increase in oil prices (for example, the years of 1997, 2001, 2003, 2007). According to the logic outlined above, we can assume that those were the years of a fall in supply or an increase in demand. In 1985, 1998, 2009, when the oil prices went down, a reduction in demand or an increase in production should have occurred.

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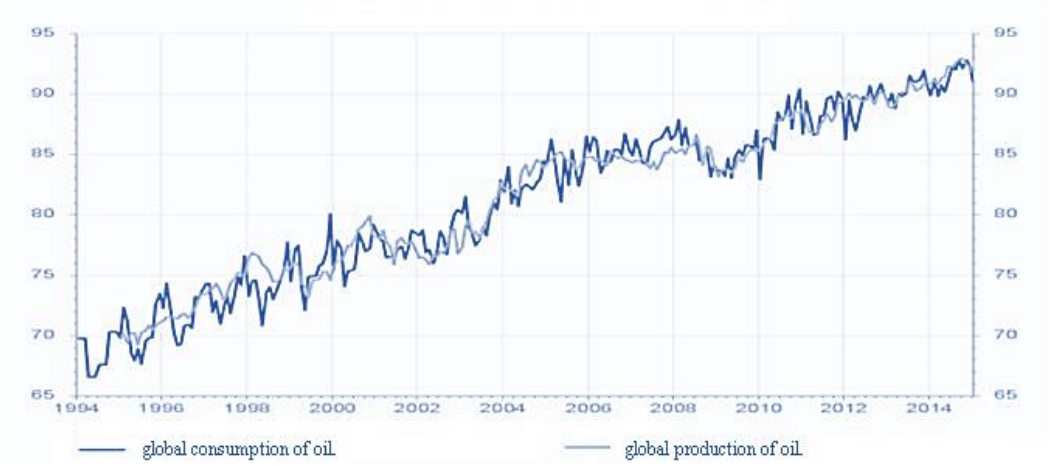
Source: www.tradingeconomics.com| NYMEX

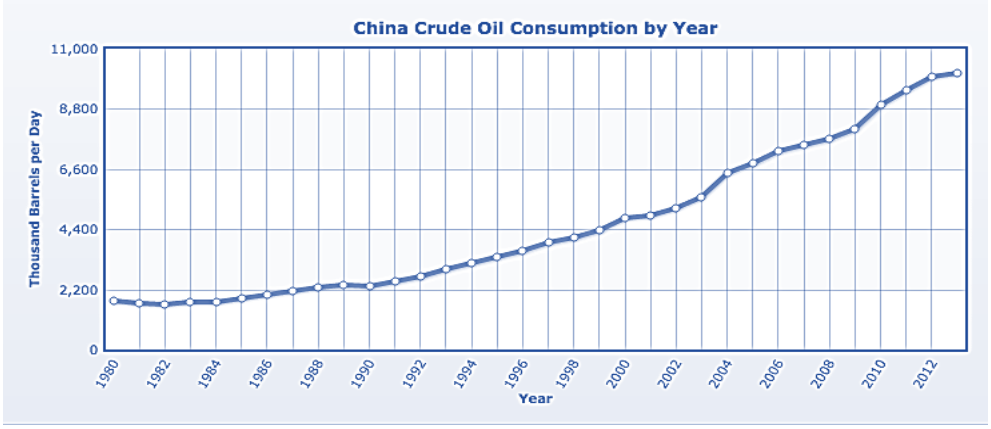
Figure 1 - Dynamics of crude oil prices, USD per barrel



Source: Thomson Reuters DataStream

Figure 2 - Production and consumption of oil in the world, million barrels per day

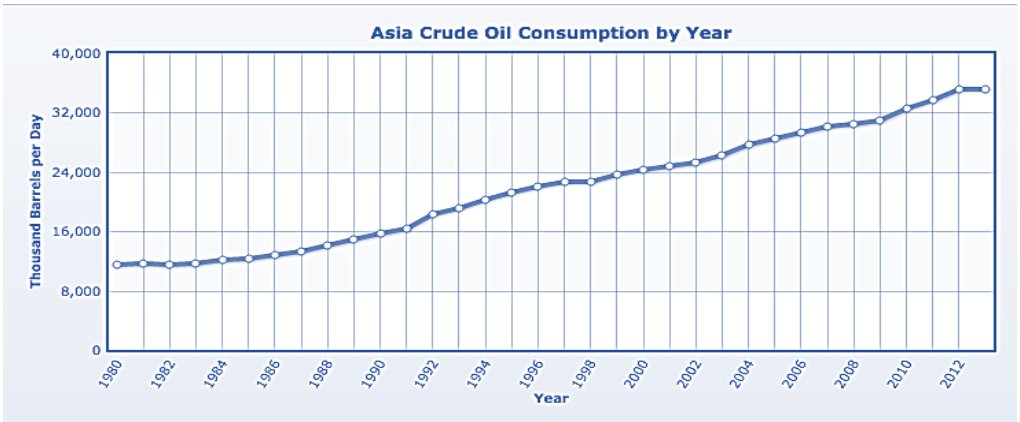
However, the data presented in Figure 2 demonstrate that the production has always followed the consumption. In any of the above points, no such patterns as large-scale overproduction, fall in the demand, increase or fall in production have been observed. In 2008-2009, when oil price fell more than by 3 times, there were no changes in the supply or demand balance. In developing the point of view concerning the impact of supply / demand balance on oil price, many analysts relate the almost double fall in oil price in 2013-2014 with an increase in its production in the USA that, as it is often said, violated the global balance. However, the USA increased its oil production by 15% in 2013, and by 17% - in 2014 (according to the data of U.S. Energy Information Administration). Thus, we need to analyze the growth of oil consumption in China (Figure 3).



Source: United States Energy Information Administration

Figure 3 - Dynamics of oil consumption in China, thousand barrels per day

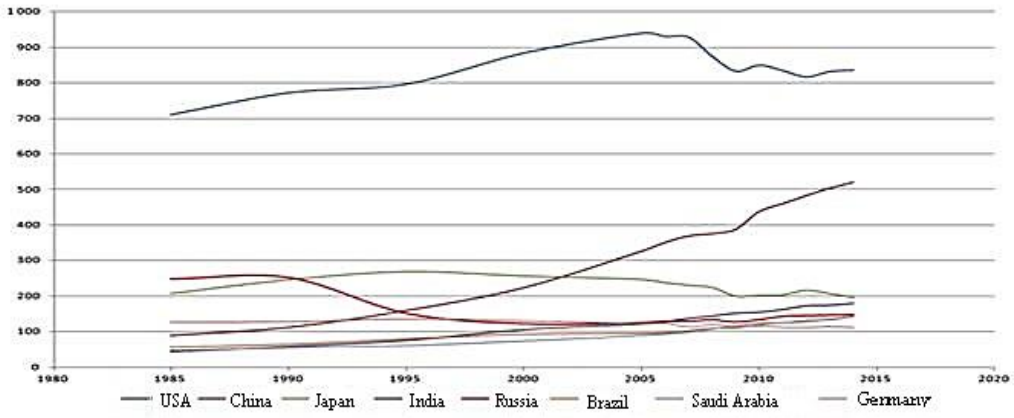
The figure shows that the growth of oil consumption in China exceeded the volume being additionally produced in the USA. There was a simultaneous growth in oil consumption in other Asian countries (Figure 4).



Source: United States Energy Information Administration

Figure 4 - Dynamics of oil consumption in Asian countries, thousand barrels per day

Figure 5 represents the dynamics of oil consumption for several countries for the period from 1985 and up to 2014.



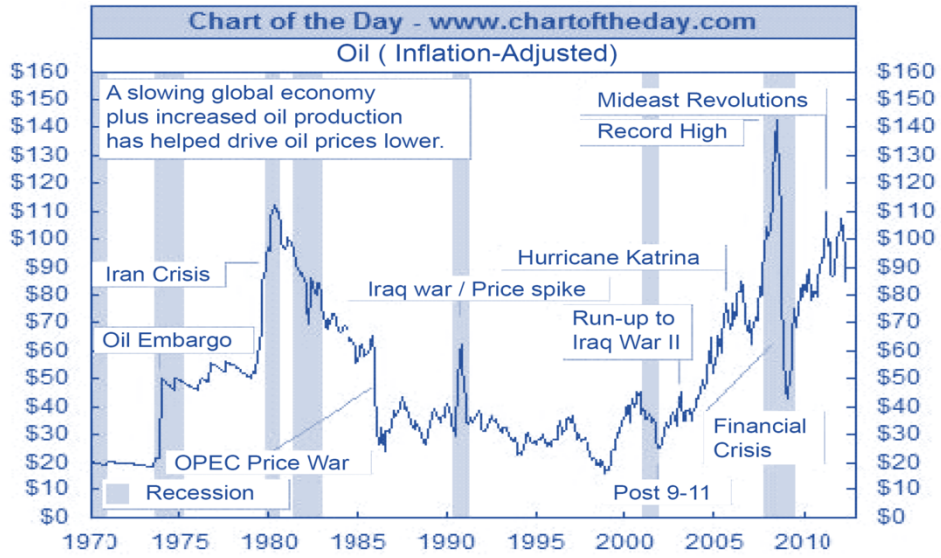
Source: British Petroleum

Figure 5 - Oil consumption of different countries, million tons per year

An analysis of data reveals an explicit connection between the decrease of the red line of oil consumption in Russia after 1991 and an initial upward growth of the curve of oil consumption in the US. The analysis also indicates a connection of the decrease in the curves of oil consumption in the US and Japan with the rapid growth of the corresponding curve of China. Basing on these figures, different conclusions can be made. However, we tend to infer that there exist periods in consumption growth for all the countries in the world, which results in the lack of physical oil. Moreover, prices generally do not react to such dynamics of consumption. Meanwhile, the USA already indicates the decrease in oil reserves.

According to a "short-term forecast" dated back to 7 July 2015, Energy Information Administration, which had claimed before that there would be no decline in oil production in the USA, reported that the volume of production dropped by 50 thousand of barrels per day in May 2015 and would continue to decline (Marketwatch 2015). However, even such level of production was kept only with extraordinary efforts. The statistics provided by the Government of North Dakota, where one of the largest deposits of Bakken shale oil is located, reports that the number of operating wells increased by 966 from January to June 2015, while in March there were only 253 of them. At the same time, production reached 1164 barrels per day in December 2014 and decreased by 12 thousand barrels per day in June 2015. It means that drilling volumes unprecedentedly increased, and production activity decreased. If we consider these factors together, we can easily recognize the first signs of exhaustion of the deposit. At the same time, oil prices keep falling, and most forecasts predict their further decline.

On the other hand, the website of Chart of the Day published a graph (Figure 6) representing WTI oil inflation-adjusted price for the period of 1970 - 2012.



Source: http://www.chartoftheday.com/

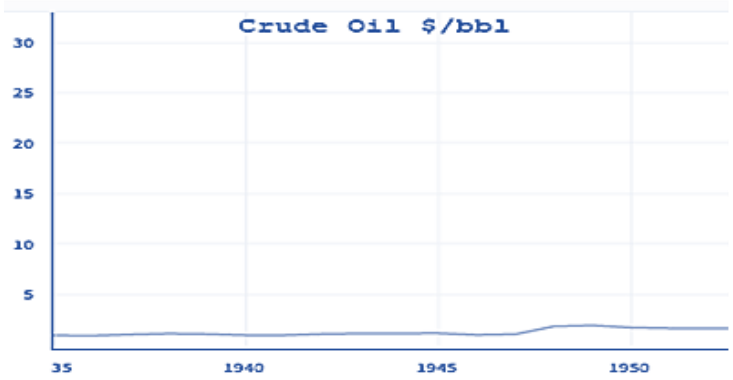
Figure 6 - Dynamics of WTI oil inflation-adjusted price for the period of 1970 – 2012, USD per barrel

Figure 6 shows that the authors relate the periods of a sharp rise of oil prices with the periods of aggravation of the Middle East situation. One might consider this standpoint to be quite justified. However, there was not any conflict in the Middle East in 1977 but oil prices grew. From 1980 to 1988, there was a war in Iraq and Iran; a military conflict between Israel and Lebanon occurred in 1982; in 1987, the Intifada began, and the price for oil kept falling all that time.

From March 2003 to December 2011, Iraq was at war. March 2011 was the start of a war in Libya. Military conflicts or revolutions appeared in the Middle East and North Africa all that time, and the price of oil was obviously demonstrating some completely independent dynamics: it was growing, or falling and vice versa - in 2004, 2009, 2011.

It is remarkable that the US and global markets did not even notice the dissolutions of the Council for Mutual Economic Assistance, or the Warsaw Pact, or the Soviet Union, which could have ended unpredictably, including military conflicts between former socialist countries, republics of the Soviet Union, or administrative regions of Russia (and there were some preconditions not only in Chechnya, but in other petroliferous regions of Russia as well – in Tatarstan and Bashkortostan). Approximately 30-40% of the world economy was shaken and rocked but oil price did not react at all although a downward trend was clear.

The oil market did not react to the Second World War as well. Oil prices remained almost constant at that period (Figure 7).



Source: British Petroleum

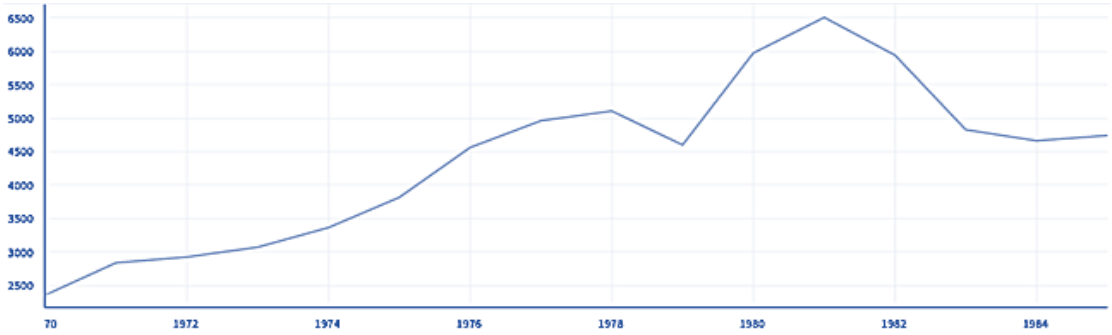
Figure 7 - Oil price in the middle of the 20th century, USD per barrel

Thus, following the aforesaid, it seems impossible to explain or predict a direction of the dynamics of oil prices by relating them only to the military conflicts. Of course, we cannot claim that such factors as demand in oil,

political and military situation in oil-producing countries, circumstances linked with production, refining and transportation of oil have no effect on its price. They, certainly, do influence, but there is probably a more complex, non-linear correlation than it is usually believed to be. Since an investigation of the degree and structure of this correlation may be a subject of an individual study, let us consider another group of factors that, to our mind, have a significant impact on oil price, and that are not often professionally discussed.

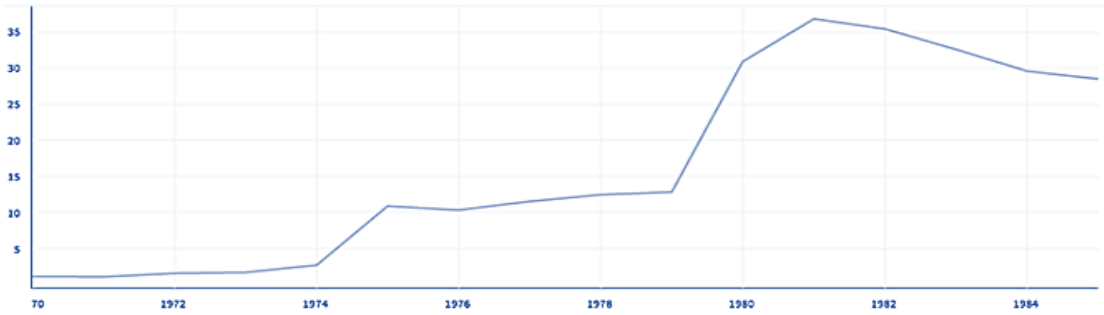
3. Comparative analysis of dynamics of prices for commodities

The dynamics of oil prices from 1970 to 1984, when the stock market trading of oil and its futures were not yet developed and oil was sold as a physically delivered commodity, can be compared with the price dynamics of other raw materials. The obtained results allow revealing existence of periods when significant rise in prices for commodities of completely different groups (Figures 8, 9, 10) and oil (Figure 11) coincide.



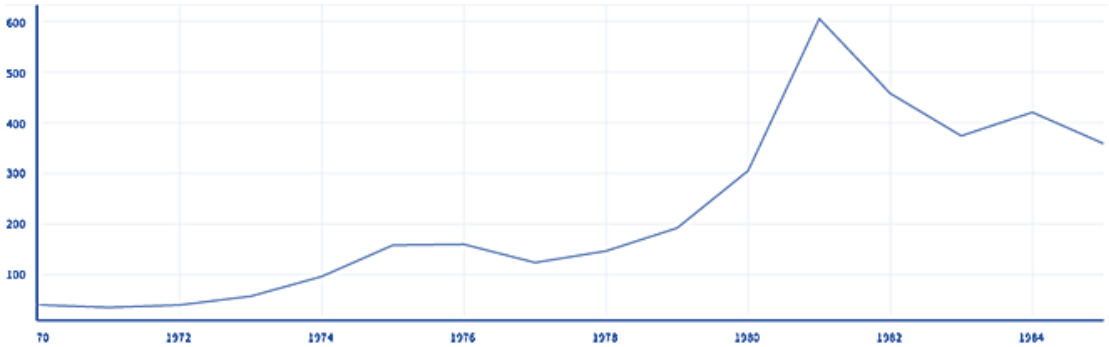
Source: World Bank Global Economic Monitor (GEM) Commodities

Figure 8 - Dynamics of prices for copper, USD/mt



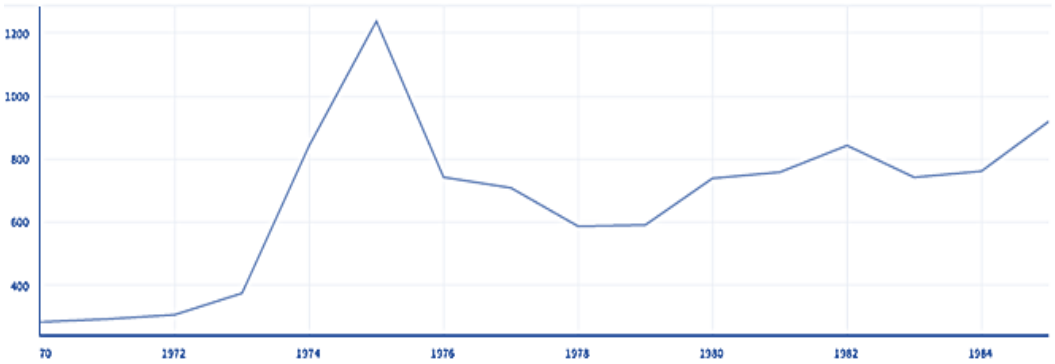
Source: World Bank Global Economic Monitor (GEM) Commodities

Figure 9 - Dynamics of prices for nickel, USD/mt



Source: World Bank Global Economic Monitor (GEM) Commodities

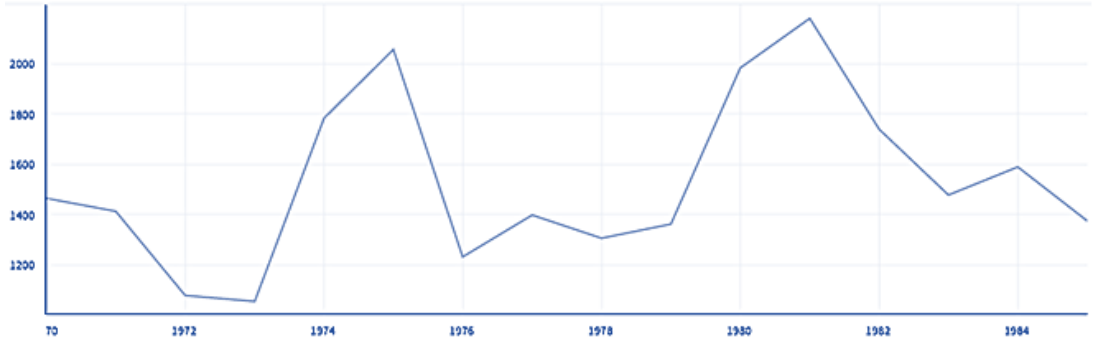
Figure 10 - Dynamics of prices for zinc, USD/kg



Source: World Bank Global Economic Monitor (GEM) Commodities

Figure 11 - Dynamics of prices for oil, USD/bbl

Analysis of these data allows us to recognize matching periods of rise in prices: 1974-75 and 1980-81. After 1981, the prices of the given commodities started to decrease. To specify the obtained result, we have conducted a comparative study on the dynamics of prices for oil and gold (Figure 12) for the same period of time.



Source: World Bank Global Economic Monitor (GEM) Commodities

Figure 12 - Dynamics of prices for gold, USD/toz

If we disregard differences in the levels and details of volatility, it becomes easy to notice that the main directions of the dynamics in gold and oil prices matched in the considered period of analysis: 1974 – growth, 1975 – for oil – stability in price and its high value, for gold – volatility around a high price; 1976 – growth of oil, price fall for gold; from 1977 – growth in price for oil and gold, and from 1979 – the graphs of price for oil and gold become similar without any conventions and reservations. Further, we have conducted an investigation on oil price dynamics (Figure 13) and gold (Figure 14) in the period from 2006.

Source: www.tradingeconomics.com| NYMEX

Figure 13 - Dynamics in price for oil from 2006

Source: www.tradingeconomics.com| COMEX

Figure 14 - Dynamics in price for gold from 2006

The conducted study reveals that price vectors are close or match each other in the direction and time: 2006-2008 – growth, 2009 – fall, 2009-2011 – growth, 2011-2013 - plateau at high prices and volatility, 2013 - gold falls in price and passes to a plane at high volatility level; one year later, oil demonstrates absolutely the same dynamics.

4. Influence of monetary and credit system on oil price

There comes a natural question: why different raw materials, products, so dissimilar in their properties, do exhibit matching dynamics of prices, given that the geography of their occurrence, their production technologies, their transportation, processing, and practical use do not have anything in common? Apparently, the reason lies in a factor, for which all these differences become insignificant. First of all, it seems that finance can be this particular factor.

In our point of view, it is particularly the monetary and credit system and the events taking place in it that did and do affect the price of petroleum (as well as prices of other tangible and intangible assets). There are researchers sharing this opinion, including Cifarelli (Cifarelli and Paladino 2009), Kolodziej and his colleagues (Kolodziej *et al* 2014), Morgan Stanley Global emerging markets equity team (*Morgan Stanley* 2015) and others. Their works present, in detail, the topic of increased impact of financial speculators on trade of oil futures from the 2000s till present.

However, we do not limit the understanding of oil as a financial asset neither by the problem of financial speculation, nor we refer it to the specified timeframe. There is enough evidence to suggest that already since the middle of the 70s, oil started to act in a dual way – 1) as a tangible asset, and 2) as a financial instrument. Here, when we speak about oil price, we mostly refer to commercial oil.

Let us consider a conceptual framework associated with this economic category. For example, an exchange price for oil remains at the level of 50 dollars per barrel for a long time, while the price at the real market, due to hedging contracts, is 90 dollars per barrel. There is also a black market of oil, where the price, according to available data, has not been exceeding 20-30 USD per barrel for a long time. However, there is a lack of statistical data concerning the actual volume of the market. Nobody knows what the volume of the oil barter market is, and how one should calculate prices there. What are the prices and volume of programs of the "oil for food" type, bulk purchase for defence purposes and so on?

Iran, being under sanctions for many years, has created a precedent for a broad oil trade, and not for dollars - for yuans, rupees, rubles, and other currencies of developing countries, for gold or by barter operations. Iran is not the only one making such type of activity, given that nobody estimated such a market and its prices.

It seems that not only prices but the very structure of the trade of real, physical oil has, for many researchers who study oil market, a high degree of uncertainty with many aspects being simply not considered. So now, when we talk about oil prices, we thus imply not prices for physical, commodity oil, but prices for stock exchange, contract, contingent, "paper" oil. To be more precise, oil prices has long been called the prices for financial derivatives - oil futures and so on. This has continued at least since 1990, when open positions on oil futures at the NYMEX constituted 1.5 of the world's oil production (and if we take into consideration the fact that a significant amount of oil produced in the USSR generally did not enter the world market, then the open positions are much more than the 1.5 of the world's oil production available on the global market). Moreover, there were also stock options with

oil base, and the Intercontinental Exchange (ICE) founded in London, and other exchanges, as well as off-exchange derivatives.

Therefore, there is a particular interest in the analysis of facts that are related to the influence of finance on the price of oil. In the middle of the 40s, international financiers won a brilliant victory by signing the Bretton Woods agreement that became the foundation of the post-war global monetary and credit system. At that point, not only an appearance of a new reserve currency was important, which itself was a great professional achievement. The Bretton Woods agreement, which gave a new degree of freedom concerning volume of money and credit, became the foundation for rebuilding the structure of the world economy from a mainly production economy to a mainly finance economy.

The no less brilliant system of "petrodollar", developing what the Bretton Wood had started, not only increased the demand in dollars and credits in many times, but also indissolubly connected a traditional commodity (oil) and a financial instrument (dollar). Dollar gained a new force as a “commodity currency”. At least in the processes connected with regulation of demand in dollar and dollar credits, its price and its stability or, vice versa, its volatility, the role of oil in regulation of inflation and many other financial processes sharply increased. Thus, oil has become one of the elements of the global financial system, and oil price has begun to obey the circumstances and rules of not only the commodity market, not only of processes going in the real economy, but also to the laws of the financial market, the financial sector. It seems right to consider oil as a financial asset in this particular aspect, not only in the exchange aspect.

These circumstances explain the matching in the dynamics of prices for oil and gold since 1979 because the matching results stem from coincidence in functions. One financial instrument was just added to another, *i.e.* to “black gold” was added to real gold. At the same time, we should not forget the fact that gold has been not only a raw material, but also money for an infinitely long period already, and its investment and reserve role is still maintained. Oil, of course, has not become money, but some functions of oil and gold have become almost identical.

To continue our study, we should consider a sharp increase in oil prices in 1974, the first one in many years. Many researchers explain this by the Arab-Israeli war, which, incidentally, lasted only 18 days. However, as it has been mentioned above, military conflicts cannot be considered to be the main reason of change in oil prices. For example, during the Yom Kippur War, the OPEC countries’ supplies fell by 5 million of barrels per day; that was only about 9% of world consumption, and that lasted only a few months. Meanwhile, the prices increased 4 times in that period, rising from 3$ to 12$ per barrel and remaining at this level for several years, and then increase continued.

The rise in oil prices in 1974 is often explained by "greedy" exporters that were trying to compensate for their losses caused by the dollar declining from 1971. In this context, it would be interesting to know in relation to what the "greedy" exporters were considering their losses, as dollar was the base of all oil prices and the tool of calculation; there was no other currency for that. If we imagine it in relation to gold, we should note that the dollar really became cheaper vs. gold, but not to the extent oil prices increased. Furthermore, in the period of 1974-75 it grew, but oil prices did not decline. Besides, gold still remained an international currency in that time; and oil rose vs. gold, although gold not only did not fall, but rather rose in price along with oil. Hence, all these references to the “greedy” exporters are not convincing. Moreover, neither before nor after 1974, changes in oil prices were explained by “greedy” or “generous” exporters.

From our point of view, the following happened: in 1973, Nixon (negotiations were led personally by Henry Kissinger) and Saudi Arabia managed to reach an agreement that the latter would sell its oil only for US dollars in exchange for the US military, political and diplomatic protection, armament supplies, and an opportunity to invest the money received from sale of oil to the US economy. During the next 2 years, all the OPEC and some other oil-producing countries signed more or less similar agreements with the United States. Thus, there emerged the system of “petrodollars”; at the same time, oil prices changed. Were its aim real, physical oil, such a significant increase in price should have been regarded as an unreasonably risky, dubious deal that lacked acceptable reasons and that occurred immediately after the agreement with the US. If dollar was the goal, then it would look quite transparent: it was not an oil price increase but dollar decrease vs. gold and oil. If the goal was to increase demand in dollars, then the “extended sale in the new season at special prices” would be a great start to “petrodollars”. Thus, along with gold, oil proved itself as a financial asset and tool.

As a result, oil quotes very soon acquired such features as high volatility, cycling, fractality, etc.; they are typical for stock markets. Price of oil began to correlate with many financial pointers - dollar rate, stock indices, earning power of the US exchequer bonds, etc.

Of course, in the future, the main demand in dollar had become provided not by oil, but rather by rapidly developing financial markets. However, in the context of this research, it can be concluded that the financial asset

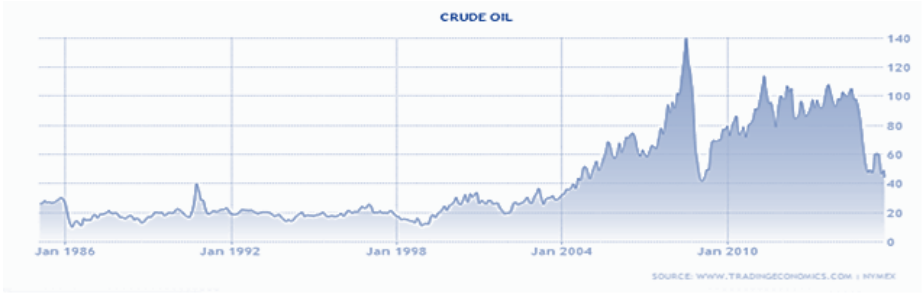
function of oil was increasing from year to year, and the price for oil were increasingly becoming dependent on events in the financial sector. For example, in the 80s, stock exchanges, just starting oil trading, quickly, almost instantaneously switched from trade on natural raw material to trade on "contingent" oil represented by futures and other instruments related to the oil.

It is believed, that futures were originally designed to soften financial and price risks of sellers and buyers of oil in the 80s. At that time, the number of participants in the oil market increased, as well as the number of operations in it, the value of regular trading reduced, the role of one-off transactions increased, where prices influenced by a set of unpredictable factors led to a sharp increase in risks of contracting parties.

However, one should compare the oil price before the 70s (Figure 15), when oil was not sold on stock exchanges and the dollar price was quoted in gold, with the price of oil after 1985 (Figure 16).

Source: www.tradingeconomics.com| NYMEX

Figure 15 - Dynamics of oil price before 1970, USD per barrel



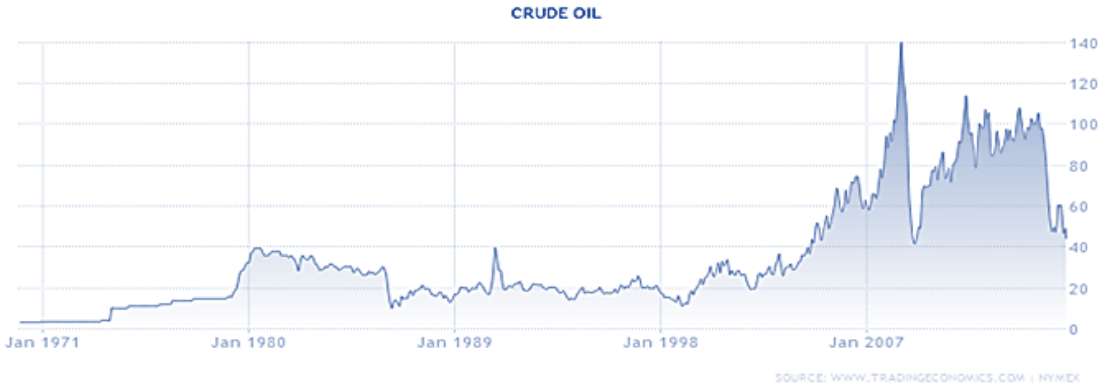
Source: www.tradingeconomics.com| NYMEX

Figure 16 - Dynamics of oil price after 1985, USD per barrel

An analysis allows us to conclude that we cannot speak of any reduced risks for the participants of transactions with oil through futures. All the stability and predictability of prices had remained in the 50s and 60s. Instead, you can clearly see the way of forming (at stock exchange) a new pattern of dependence of oil price on the price of another financial instrument - dollar, which now has become so familiar: dollar is up - oil gets down, dollar is down – oil is up (Figures 17-18).

Source: www.tradingeconomics.com| OTC INTERBANK

Figure 17 - Dynamics of the US dollar

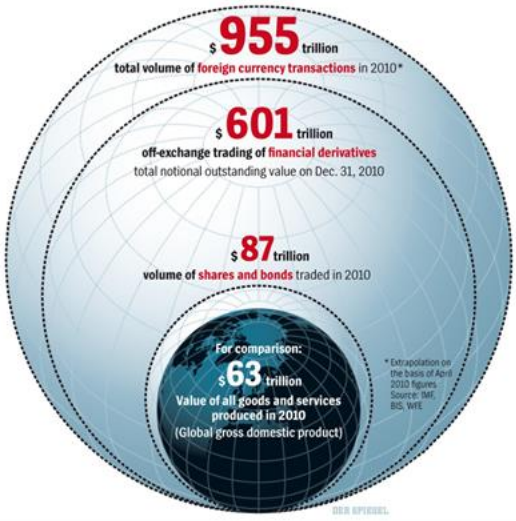


Source: www.tradingeconomics.com| NYMEX

Figure 18 - Dynamics of oil prices, USD per barrel

Analysis shows that if from 1974 to 1985 the matching of vectors of oil and dollar prices could still be treated as unstable and even random, then, somewhere in 1984-85, when the flourishing of oil markets and futures began, regularity began to emerge consistently: up to 1985, the dollar rises - oil falls; 1986 - oil is up, dollar points down; to 1987 - oil is down, dollar rises; and in 1989 - oil falls, dollar points up, etc.

Obviously, for a detailed study of the discovered regularities, we need to gain more information and knowledge. At the same time, if we consider that since the late 70s the central banks of the largest economies of the world (including the US and FRS) got the opportunity to change interest rates if state requires, and thus affect inflation, prices, and economic activity in various (and eventually in all) sectors of the economy, and as far as the zone of the dollar application and credit in it began to spread - in all economies of the world, then it is quite possible that the correlation we described between oil price and dollar after 1985 has more effect than just being a technical pattern, which is characteristic, however, for financial markets (Figure 19).



Source: Der Spiegel

Figure 19 - Size of the financial markets

Along with that, the share of financial sector has nowadays grown in several times (for example, the share of financial sector in the US profit has raised from a value less than 10% before the Second World War to more than 50% at present time), the structure of the world economy has changed so much that even “the flagships” of manufacturing and technological sector has begun to receive their main income not by products sale, but by stock markets (the original source of all the data is Thomson Reuters Datastream). The analysis conducted says that the capitalization increase of the leading markets comes to trillions of dollars given the absence of any macroeconomic or corporate improvements. Moreover, capitalization growth often overlaps with the most negative trends in business since 2008-2009.

5. Possibilities of artificial regulation over oil prices

Under these conditions, talking about oil, it can be stated that its function as a financial asset was only increasing over the years; on the other hand, it also should be noted that in condition of growth of finance economy, the significance of oil as a part of the monetary and credit system, the place of oil in it could and even had to be reduced and be reduced significantly.

In this regard, it becomes expedient to examine graphics of the US and European stock markets from 2008 to the middle of 2015 (Figures 20-21).

Source: S&P Dow Jones

Figure 20 - Dynamics of the European stock market

Source: S&P Dow Jones

Figure 21 - Dynamics of the US stock market

We can note that in the period of 2008-2009, these dynamics match almost perfectly. Since 2009, the dynamics of the US market is higher, but there begins their simultaneous and parallel increase, in which even corrections match. Moreover, this trend continues until the middle of 2015.

It is interesting to identify the reasons of the observed matching given the well-known differentiation in the US and European economy structures. Along with that, the situation in Europe gets worse by: England, threatening to withdraw from the EU, collapsed Greece, problematic Portugal, Spain, and Italy, unclear Hungary, the depopulated Baltic countries, poor Romania and Bulgaria, the losses from the sanctions against Russia, Ukraine, terrorist attacks, immigrants, refugees. There is nothing similar in the US, but the graphics look the same.

We can assume that the data concerning the fall or rise of percent fractions of GDP of the US or Europe play such an impressive role for investors that they not only prefer the stock markets of these particular countries but also act in them in the exactly the same way. However, capitalization data demonstrates that in 2015, companies in the Euro area, as compared to December 2014, recorded one of the largest growths in capitalization given the absolutely failed reporting results. Companies in Great Britain have even worse results. In the USA, the net profit has not increased in any way since 2011, but the rate of capitalization has increased by 60%. This situation allows us to conclude that the rapid growth of stock markets in Europe and the USA is based on a highly professional and highly successful work of financial institutions, as well as on their ability to regulate systems that are much more capital-intensive than the oil market.

Thus, it becomes interesting to analyze the dynamics of dollar and euro (Figures 22-23).

Source: www.tradingeconomics.com| OTC INTERBANK

Figure 22 - Dynamics of the US dollar

Source: www.tradingeconomics.com| OTC INTERBANK

Figure 23 - Dynamics of euro

One can see that the euro and dollar dynamics lie in opposition. When talking about money, it becomes pretty easy to imagine what a profit can be obtained by forcing investors to go in dollar and in euro. In this case, it would be appropriate to guess that the form of price correlation of oil and dollar, which had developed since the middle of 80s, had a similar goal. We should pay particular attention to the way the graphics end: dollar is rising up, thus following the stock market and demonstrating the stability and reliability of the US economy. And euro, while the European stock market is going up (as if being a strong economy), falls down (as if representing a weak economy).

In our opinion, this correlation may have a certain sense, because by the time dollar begins its sharp upward movement, there are already many things in the world economy that keep falling, or is already at the bottom: and the Asian markets, and the markets of developing countries, and their currencies, and commodities, and gold. There is a similar trend observed for euro.

Source: S&P Dow Jones

Figure 24 - Dynamics of the Asian stock exchange

Source: Bloomberg Finance L.P.

Figure 25 - Dynamics of currencies of the developing countries

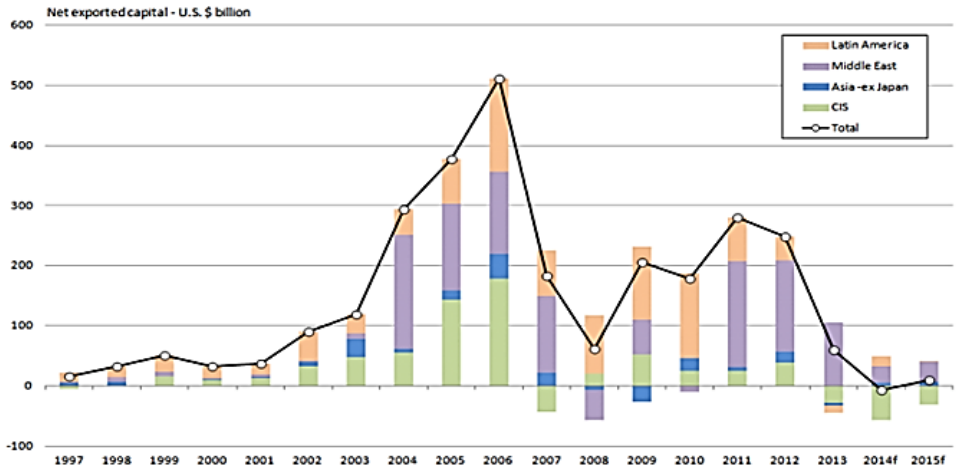
Let us return to the comparative analysis of the oil prices and dollar dynamics. From 2008 to 2012, there is the standard pattern: dollar is on top - oil is at the bottom, and vice versa. From 2012 to 2014, the dollar and oil stay in volatile flat, given their price vectors are not pointing in opposition, as usual, but point in the same direction. At this time, they begin to talk about oil breaking away from dollar, which is unlikely. And finally - 2014: dollar rises up sharply, oil drops down abruptly.

In order to understand this circumstance, it is necessary to unite all the assumptions given above. What is principal in the current study is that the priorities lie in dollar and the US stock market. Therefore, in late 2008, there becomes more money on the market and oil falls in a phenomenal way. At this point, the US government starts the first program of quantitative easing, QE 1: gold falls, the stock index S&P 500 falls, and dollar-grows. 2009 - a turning point comes: dollar, oil, gold, and S&P 500 rises, but at the end of this period, oil and gold falls slightly, and dollar falls sharply, and we see the S&P 500 growth against the background of a weak dollar. In August 2010, there begins the next stage of the quantitative easing program, the QE2: everything goes up - dollar, S&P 500, oil, gold, and at the end of the period, dollar reacts most dramatically: oil, gold, S&P 500 slightly reduce, while dollar sharply falls down. In this case, the main activities to support the growth of the US stock market should include activities on gold and oil to strengthen dollar and, accordingly, the US stock market. The next stage - QE 3 - begins in September 2012: dollar raises S&P 500 rises, oil falls, twitching up and down till 2014, gold rises a little bit but drops rapidly and does not reach its maxima any more.

Here, you can make an analogy with the long jump technique - with stones in ancient Greece, when a jumper run, pushed off the ground with stones in hands, and when he felt that the achieved inertia ends, he threw the stones away with the strength, thereby increasing length of the jump. Perhaps, something like this happens in the modern world. Despite the fact that the capitalization of the world stock market is variously estimated to be 70-90 trillion dollars, and many researchers, including Paul Krugman, constantly remind of redundancy of investment assets, thus the sources of money for the US stock market, and China's stock market (where it was directed approx. $ 15 trillion not very long before its fall) and for other markets, it seems, are sufficient.

However, you need to convincingly demonstrate money the right direction, so it is quite possible that first the precious metals market money, and then the oil money contributed to that. Anyway, after the end of the third phase, there came about 5 trillion dollars on the US stock market. You can estimate how much oil money could be there: the volume of legal purchases of commodity oil in the world in 2014 constituted more than 30 billion barrels, so that we can talk about 1 - 1.5 trillion dollars. This suggests conducting a new QE program, in which the main point is the volume of oil derivatives. Basing only on data from the end of May 2011, the New York Commodity Exchange open positions on oil futures were 365 billion of barrels of crude oil in a commodity equivalent, which is 12 times more than oil production in the world for the whole 2010. It is probable that someone might need money and from here. Anyway, it tells us once more about manifestation of oil as a financial instrument when the drop in oil price could contribute to keeping the global financial goals.

At the same time, a question remains: whether such a sharp decline in oil prices can be caused by almost exclusively financial motives, cause irreparable harm to the petrodollar system itself, which had worked so successfully since the middle of 70s? It is difficult to develop a common opinion on this subject, difficult to analyze causal relationships. However, the graph presented in Figure 26 allows us to understand that the moment for exactly price reduction of oil was chosen with a great success - when the need in dollar for the petrodollar system was minimal.



Source: BNP Paribas

Figure 26 - Dynamics of petrodollar exports per countries for 18 year

In case the statements given above are true, as long as dollar and the US stock market rise, the price for oil, as well as price for other physical assets, even in times of correction of the stock market and dollar, will keep falling. Only those assets will remain stable and show growth that will if not help, but at least not disturb the growth of the US stock market. Of course, the rise of dollar and the US stock market is not the only and ultimate goal of the global financial institutions. There are also problems of over-indebtedness, treasury bonds, the bond market, etc. However, the most important factor is the system stability, maintenance of the balance achieved.

Conclusion

To summarize, we can conclude that nowadays the finance economy develops along a trajectory that will lead us to virtual money and such instruments, for which oil can no longer be in demand. Perhaps, it would lead to another crisis, and to avoid it, we recommend comprehending all the patterns associated with oil price, the main of which were revealed in this study. In the modern economy oil has:

- two forms of existence - material, product, or contingent, contractual;
- two functions - industrial raw material, or a financial asset;
- two prices – a price for stock oil, and a price for contingent oil, oil as the financial asset.

There exist also different groups of factors that directly or indirectly affect either only one type of oil (either stock or contingent) or both types at once. All these factors are in complex correlation. Factors, which are specific to the field of finance, cause the predominant influence on the price of contingent oil that performs the function of a financial instrument in modern monetary and credit system. As during the last (or slightly more) 40 years, there has been a priority development of the financial sector, in comparison with the production one, the contingent oil price makes a greater impact on the price of the stock oil, rather than vice versa. This means that the factors affecting the price of the contingent oil are predominant in relation to the factors influencing the price of the stock oil.

References

[1] Cifarelli, G. and Paladino, G. 2009. Is Oil a Financial Asset? An Empirical Investigation Spanning the Last Fifteen Years (October 2009). *Università degli Studi di Firenze, Dipartimento di Scienze Economiche Working Paper*, No. 12 (October). Available at: http://dx.doi.org/10.2139/ssrn.1499099

[2] Kolodziej, M., Kaufmann, R.K., Kulatilaka, N., Bicchetti, D. and Maystre N. 2014. Crude oil: Commodity or financial asset? *Energy Economics*, 46: 216–223. Available at: http://dx.doi.org/10.1016/j.eneco.2014.09.006

*** Bloomberg Finance L.P. http://www.bloomberg.com/

*** Marketwatch. Oil output from major shale plays to fall 91,000 barrels a day in August. Available at: http://www.marketwatch.com/story/eia-oil-output-from-major-shale-plays-to-fall-91000-barrels-a-day-in-august-2015-07-13 (accessed August 8, 2015)

*** Morgan Stanley. The Straw That Broke Oil's Back. Available at: http://www.morganstanley.com/msamg/msimintl/docs/en_US/IN/Insights/tales_emerging_world/2015/tew_20150224_straw.pdf (accessed April 2, 2015)

*** S&P Dow Jones Indices. Available at: http://us.spindices.com/

*** Trading Economics. Available at: www.tradingeconomics.com

*** Thomson Reuters DataStream

*** United States Energy Information Administration. http://www.eia.gov

*** World DataBank. World Bank Global Economic Monitor (GEM) Commodities. Available at: http://databank.worldbank.org/data/reports.aspx?source=Global-Economic-Monitor-(GEM)-Commodities

The Emergence and Characteristics of Social Enterprise in Thailand

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Abstract

This paper aims to undertake a comparative analysis of the definition, the emergence, and characteristics of social enterprises in Thailand, Western Europe, the United Kingdom, the United States, Canada, and Latin America. The definition of social enterprise in Thailand is not clear. It addresses only three characteristics; the purposes of social enterprise, the types of business and the roles of social enterprise in society, economy and environment protection. However, it does not address policy or law supports, participation of various stakeholders, and the power of decision making and management. Unlike social enterprises in Western Europe, the United Kingdom, the United State, Canada and Latin America, most of social enterprises in Thailand were initiated by government policy since 2001 and become well-known since 2011. However, there is no law for social enterprise. Unlike social enterprises in Western Europe, the United Kingdom, Canada, and Latin America, but similar to social enterprise in the United States, it is found that social enterprises in Thailand do generate some profits. The private sector engages with social enterprises in the form of corporate social responsibility in order to get marketing and tax benefits. However, there is no linkage between Thailand's social enterprises and financial institutes. Social enterprises in Thailand operate in various forms of business; non-profit organizations, cooperatives, community enterprises, private organizations, and subsidiary companies. The policy and management of social enterprises in Thailand are influenced by many stakeholders, not only shareholders. Thailand's social enterprises have an important role in tackling poverty and improving quality of life. They create job and training. They employ disadvantaged people. They create income and distribute income to the community through the acquisition of wisdom, cultures and local inputs. Besides, they help to protect the environment. However, they do not have a role in technology transfer.

Keywords: social enterprise, community enterprise, social enterprise characteristic.

JEL Classification: O12, O29, O38.

1. Introduction

Although there is the Office of Social Affairs, and the Social Enterprise Promotion Act were established in 2015 (Thailand's National Reform Council 2015), the definition of social enterprise in Thailand is still not clear, and social enterprises do not have legal status. Today the government of Thailand pays more attention on the concept of sustainable development, and the concept of social enterprise is an alternative tool for sustainable development. If social enterprises are certified by law, they might be able to operate more smoothly and create much more benefits to the economy and society of Thailand. However, the unclear definition hampers social enterprises from being certified. Therefore, it is necessary to study the definition of social enterprise. This paper aims to undertake a comparative analysis of the definition of social enterprises in Thailand and foreign countries. Although the definition is being ambiguous, many organizations in Thailand call themselves social enterprises. Some of their characteristics, however, are different from social enterprises in foreign countries. This paper also analyzes characteristics of social enterprises in Thailand and the countries or regions of interest. In addition, this paper aims to analyze the emergence of these social enterprises and compare to the countries or regions of interest. The results will be used for suggestions to improve the definition of social enterprise, and formulate policy and law with regard to social enterprise in Thailand.

This paper is organized as follows. Section 2 describes the methodology and the conceptual frame work. Section 3 is literature review with regard to sustainable development and the definitions of social enterprise. Section 4 discusses Thailand's government policy regarding social enterprise. Section 5 explains the roles of public and private sectors in Thailand. Section 6 reports the result of a comparative study with regard to the emergence and

characteristics of social enterprise in Thailand and the countries or regions of interest, and section 7 concludes the results of the study.

2. Methodology and conceptual framework

2.1 Methodology

The analysis of this paper starts with literature review. Then, a comparative study regarding the definition, emergence, and characteristics of social enterprise in Thailand and the countries or regions of interest is conducted. This paper uses secondary data of social enterprise of Thailand, Western Europe, the United Kingdom, the United States, Canada, and Latin America. The data of Western Europe, the United Kingdom, the United States, Canada, and Latin America are used because they are social enterprise-leading countries. The concept of social enterprise is well-known in these countries. The data of Thailand are obtained from National Reform Steering Assembly (2015), Cooperative Promotion Department (2014), Ministry of Industry Thailand (2013), Office of the Secretary of the Community Enterprise (2012), and Thai Social Enterprise Office (2010). The data of Western Europe, the United Kingdom, the United States, Canada, and Latin America are obtained from Chhichhia (2015), Social Enterprise UK (2015), Enterprising Non-Profits (2014), Defourny and Nyssens (2012), and the United Nations Global Compact and the Rockefeller Foundation (2012).

2.2. Conceptual framework

In order to set up the concept of social enterprise in Thailand, this paper uses two approaches; domestic and international approaches. The conceptual research framework is shown in Figure 1. There are five steps in this study. The first is to review the concept of sustainable development. The second is to analyze the definitions of social enterprise. The third is to study Thailand's government policies with regard to cottage industry and community enterprise. The fourth is to consider the roles of public sector for social enterprise in Thailand, which includes non-profit-organization and non-government-organizations, groups of people, and private sector. And the final is to undertake a comparative study with regard to the emergence and characteristics of social enterprise in Thailand and the countries or regions of interest; the United Kingdom, the United States, Canada, Western Europe, and Latin America.

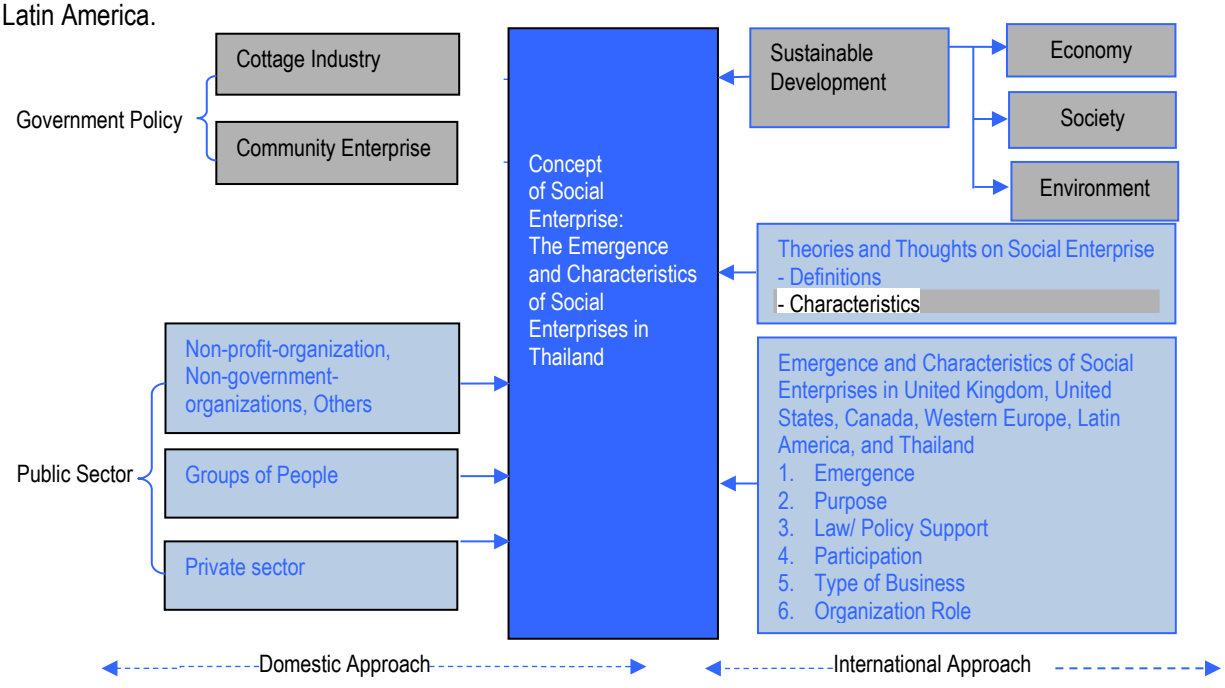


Figure 1- Conceptual research framework

3. Sustainable development and social enterprise

In the past, economic development had focused only on economic growth. However, it does not meet the needs of most people as well as social and environmental development. Therefore, government, public and private sectors, as well as civil society, attempt to find solutions and means to fill the gaps. Solving economic problems along with social and environmental problems is known as sustainable development (Office of the National Economic and Social Development Board 1996). The governments tend to pay more attention to community

economics to deal with distribution of income and social well-being. At the meantime, the private firms pay more attention on the concept of corporate social responsibility (CSR), although they operate with the hidden benefits such as tax deductions. Expenditures for society, such as donations to charities, can be used for income tax deduction (Toonsatitsak 2012). Civil societies establish foundations and charities to tackle social and environmental issues. Groups of people, such as women's groups, farmers' groups, cooperatives, and community enterprises, confederate to produce goods and services. As a consequence, the concept of "social enterprise" is adopted as a tool for sustainable development. *The term "social enterprise"* was discussed by several scholars.

The Department of Trade and Industry (United Kingdom) (2002) defines social enterprise as a business trading for a social purpose whose surpluses are principally reinvested for that purpose, or in the community, rather than established to maximize profits for shareholders and owners.

Defourny and Nyssens (2006) define that social enterprises are not-for-profit private organizations which provide goods or services with the explicit aim of benefiting the community. They rely on collective dynamics, involving various types of stakeholders in their governing bodies, placing a high value on autonomy and bearing economic risks linked to such activities. Furthermore, Defourny and Nyssens (2006) also use the term "community enterprise" as a subset of social enterprise. This is because community enterprises also run businesses for social benefit; most of which are referred to as cooperatives (Eversole cited in Ryan 2013). For Thailand, The Community Enterprise Promotion Act B.E. 2548 identifies community-owned businesses as community enterprise. The community enterprise is established to produces products or services. It is operated by a group of people living together in the same community or neighboring communities. It aims to generate income for its members, or create self-reliance of the community)Office of the Secretary of the Community Enterprise 2012(.

The United Nations Global Compact and the Rockefeller Foundation (2012) defines that social enterprises are micro, small, and medium-sized businesses, which aim for positive social or environmental outcomes while generating financial returns.

Social Enterprise UK (2015) identifies social enterprises as businesses which trade to tackle social problems, improve communities, people's life opportunities, or the environment. They earn their income by selling goods and services on the open market, but reinvest their profits back into the business or local community. So, when they profit, society profits.

For Thailand, Thai Social Enterprise Office (2010) *defined that social enterprises are those obtain income from producing and/or selling goods or services, with a clear objective* to solve the problems of society, or develop community, society and/or environment. These organizations do not maximize profit for the shareholders of the organization. Then, *Thailand's National Reform Council (2015) defines that social enterprises are organization that integrates its strength and efficient management strategies with the aim of benefiting the society. These organizations line between the traditional profit maximizing organization, and non-profit organization that obtain income from donations.*

From the presented definitions, we can categorize the characteristics of social enterprises into six categories: purposes of the organization; policy or law supports; participation of various stakeholders; types of business; roles in society, economy and environment; decision making and management. It is found that each definition identifies some similar characteristics of social enterprises.

Table 1 shows the conclusion for each definition.

Table 1 Adressing the characteristics of social enterprises by its definitions

Scholars/ Organizations	Characteristics of social enterprise					
	Purposes of the organization	Policy or law supports	Participation of various stakeholders	Types of busines s	Roles in society, economy and environment	Decision making and management
Department of Trade and Industry (United Kingdom)(2002)	✓			✓	✓	
Defourny and Nyssens (2006)	✓		✓	✓	✓	✓
Thai Social Enterprise Office (2010)	✓			✓	✓	
The United Nations Global Compact and the Rockefeller Foundation (2012)	✓	✓			✓	
Social Enterprise UK (2015)	✓				✓	
Thailand's National Reform Council (2015)	✓			✓	✓	

According to Table 1, all of the stated definitions emphasize the purposes of social enterprise. They indicate that social enterprises intend to benefit the community or society. For the perspective of policy or law supports, only the United Nations Global Compact and the Rockefeller Foundation (2012) focus on this characteristic. They define that social enterprises are micro, small, and medium-sized businesses. For the perspective of participation of various stakeholders, it is found that only Defourny and Nyssens (2006) address this characteristic.

They state that social enterprises involve various types of stakeholders in their governing bodies. For the perspective of form of business, only Deforny and Nyssens (2006), again, focus on this point. It is defined that social enterprises are not-for-profit private organizations which sell goods or services with the explicit aim of benefiting the community. With regard to the role in society, economic and environment, all definitions address the role of social enterprises in society and economy.

However, while the United Nations Global Compact and the Rockefeller Foundation (2012) and Social Enterprise UK (2015) identify that social enterprises aim to improve the environment, Defourny and Nyssens (2006), Thai Social Enterprise Office (2010) and *Thailand's National Reform Council (2015)* do not focus on the environment. For the perspective of decision making and management, only Defourny and Nyssens (2006) address this characteristic. It is defined that social enterprises involve various type of stakeholders in their governing bodies. This implies that the management policy is decided by stakeholders, not shareholders.

Suggestion with regard to the definition of social enterprise in Thailand. The definitions of social enterprise in Thailand which are defined by Thai Social Enterprise Office (2010) and *Thailand's National Reform Council (2015), addresses only three characteristics; the pur*poses of social enterprise, the types of business and the roles of social enterprise in society, economy and environment protection. It does not address about policy or law supports, participation of various stakeholders, and the power of decision making and management. The author therefore proposes the clearer definition as the following:

"Social enterprise is a juristic organization that is established by law, which earns income by selling goods and services on the open market, but reinvest their profits for positive social or environmental outcomes. Its governing body consists of both internal personal and representatives from various types of stakeholders".

4. Thailand's government policy

Up until the nineteenth century, Thailand's economy mainly relied on the agricultural production. Most of products were consumed, only a surplus was sold. From 1850 - 1868, Thailand began to trade with foreign countries. The emphasis moved towards economic trade and agriculturists were often exploited by merchants. The concept of cooperative was adopted to solve the problem. Additionally, at the end of World War II there was a lack of consumer products. To address the situation, the government issued policies to accelerate the development of industrial production to replace imports of foreign goods. Due to the Pacific War in 1941, consumer goods became deficient, Department of Industrial Promotion was established in 1942 to foster the cottage industries; the textile industry, the food preservation industry, the lacquer ware industry, and paper industry. Then, Thailand introduced

the first National Economic Development Plan (1961–1966). This plan involved promoting the cottage industry and community business to reduce dependence on the import of foreign goods.

In 1970, the government established the Small and Medium Enterprise Development Bank of Thailand for funding to small and medium-sized enterprises. After that, in 1972, which was at the time of the third National Development Plan 1972-1976 (Office of the National Economic and Social Development Board, 1972(, the government issued policies to promote industries in the region to solve the problem of migrants of labour coming to work in the city. Promoting rural industrialization was initiated to achieve employment and community business development. This policy had been undertaken since then until the end of the fourth National Development Plan 1977-1981 (Office of the National Economic and Social Development Board, 1977(.

Subsequently, the project of One Tambon One Product was created and has been undertaken since 2001. This project aims to strengthen the economy of community. Consequently, the economy was driven by the development of local products. In 2003, the government promoted the concept of community enterprise. Agriculturists were developed toward the producers of consumer products. After that, Thailand launched a policy to promote social enterprise by establishing the Office of Social Affairs and the Social Enterprise Promotion Act in 2011 and 2015, respectively (*Thailand's National Reform Council* 2015).

5. The roles of public and private sectors in Thailand

According to the current definitions of social enterprise in Thailand, public sector involves the concept of social enterprise. Preliminary social enterprises were founded by groups of people who had common problems. The groups have a variety of forms, such as cooperatives of farmers with the aim of resolving undersell agricultural products by middlemen, groups of housewives or community enterprises those were promoted by the government policies, non-profit organizations, and foundations. All of them aim to deal with social. Furthermore, lately non-government organizations and foundations need to adapt themselves for survival by earning income.

On the part of private sector, the concept of social enterprise is due to the implementation of CSR activities of private business organizations that have come up before. The Siam Cement Group Public Company Limited or SCG, for example, set up a fund for the benefit of society in 1963. Then, SCG foundation was established in 1992. SCG has allocated budget to SCG foundation (The Siam Cement Group Foundation 2013-2014). CSR activities benefit the society and solve social problems that the government is inaccessible. However, the main objective of private business organizations is seeking for profit. CSR activities contribute to public relations and corporate image. Apart of this, the private business organizations benefit from a reduction of corporate income tax. For instance, donors for education receive a reduction of corporate income tax for two times of donation value (Revenue Department 2013). Although CSR activities benefit the society, they lack of continuity.

In conclusion, the roles of public and private sectors on furtherance for the concept of social enterprise in Thailand are not distinct. This might be because the concept of social enterprise is new for Thailand. It is still lack of understanding for social enterprise, even the major concerned organizations. The concept of social enterprise has been just a stem of society that has been mainly driven by the government policy. Most people attend the concept of social enterprise because of the benefits they expect to receive, not mainly for the society.

6. A comparative analysis of the emergence and characteristics of social enterprise in Thailand and social enterprise-leading countries

This part presents the results of a comparative analysis. The emergence and characteristics of social enterprise in Thailand, Western Europe, the United Kingdom, the United States, Canada, and Latin America are analyzed and summarized in Table 2.

Table 2 - Summarized comparative analysis of the emergence and characteristics of social enterprise

Emergence and characteristics of social enterprise	Country/Region					
	Western Europe	United Kingdom	United States	Canada	Latin America	Thailand
Emergence (Initiated by)						
— Government	-	-	-	✓	✓	✓
— Public sector (groups of people)	✓	✓	✓	✓	✓	-
— Private sector (businesses)	✓	✓	✓	-	-	-
Purposes of the organization						
— Profit generation	-	-	✓	-	-	✓
— Social benefit or environmental	✓	✓	✓	✓	✓	✓
Policy or law supports						
— Policy support	✓	✓	✓	✓	✓	✓
— Law support	-	✓	✓	✓	-	-
Participation of various stakeholders						
— Government	✓	✓	✓	✓	✓	✓
— Public sector	✓	✓	✓	✓	✓	✓
— Private sector (businesses)	-	✓	✓	✓	-	✓
— Financial institutions	-	✓	✓	✓	-	-
Types of business						
— Non-profit organization (charity)	✓	✓	✓	✓	✓	✓
— Cooperative	✓	✓	-	-	✓	✓
— Community enterprise	✓	✓	-	-	✓	✓
— Private organization	✓	✓	✓	✓	✓	✓
— Subsidiary company[1]	-	-	✓	✓	✓	✓
Roles in society, economy and environment						
— Job creation and training	✓	✓	✓	✓	✓	✓
— *Employment of disadvantaged people*	✓	✓	✓	✓	✓	✓
— Income distribution	✓	✓	✓	✓	✓	✓
— Transfer of knowledge	✓	✓	✓	-	✓	-
— *Environment conservation*	✓	✓	✓	✓	✓	✓
Decision making and management						
— Decision making not depend on the ownership of capital	✓	✓	✓	✓	✓	✓
— Profits are mainly from economic activity	✓	✓	✓	✓	✓	✓
— Main production factors are within the community	✓	✓	✓	✓	✓	✓

Remark: [1]The main company is a traditional business but the associated company is a social enterprise.

6.1 Emergence of social enterprise

The idea of social enterprise has been widely acknowledged since the 1990s, originating in Western Europe, and then spreading across the world. Social enterprise involves groups of people or communities with the aim of making a profit to solve their difficulties. Moreover, social enterprises can be created by charity organizations to raise income but also willing to improve social and natural conditions. In conclusion, for Western Europe, social enterprise is influenced and structured by corporate, groups of people with financial aid from government, and other related entities (Defourny and Nyssens 2006).

In the United Kingdom, the government launched a nationwide Social Enterprise Strategy in 2002. It identified a range of policy initiatives aiming to increase the entrepreneurial potential of third sector organizations in the delivery of public services. Third sector organizations are the organizations that are separated from the public and private sectors (Pete and Jeremy 2010). Brandsen *et al*. (2005) explore the characterisation of third sector organizations and suggest that the traditional ideal-typical characterisation of third sector organizations is no longer applicable because these entities have developed hybrid organisational characteristics (*e.g.* adopting multiple goals - social, economic, environmental, resource mix, and governance systems) as a response to external environmental pressures from market and the state. Using social services provision as an example, Evers (2005) argues that voluntary and community social enterprises have emerged from the New Public Management era due to a process of hybridisation between third sector and public sector organizations as various types of public services, governance mechanisms, networks and markets overlap and intertwine.

This development is particularly evident in the United Kingdom since the early 2000s where central and local governments have been urging third sector organizations to adopt the social enterprise model to effect social change, to deliver services to the local community more effectively and as an alternative means to sustain their operations (DTI 2002; Cabinet Office 2006). The shift to the increasing emphasis of earned income and participation in market activities, can be referred to as social enterprise activity (Sepulveda 2009). More people than ever before are setting up social enterprises. (Cheriakova 2013)

In the United State, the idea of social enterprise also became well-known since the 1990s. Initially, social enterprise was development with aim of providing financial support to non-profit organizations experiencing a decline in both financial aid from government and donations (Defourny and Nyssens 2006). Nonetheless, there are two roots regarding the debate on social entrepreneurship and social enterprises.

The first root discusses the use of commercial activities by non-profit organizations in support of their mission (Kerlin 2006). The second root of this debate can be traced back to the organization of Drayton and Ashoka that was founded in 1980. The mission of Ashoka is to find and support outstanding individuals with pattern setting ideas for social change (Drayton and MacDonald 1993). Muhammad Yunus, founder of the Grameen Bank, a famous microfinance institution, targeted at poor rural women in Bangladesh, has been presented as an emblematic social entrepreneur. Ashoka focuses on the profiles of very specific individuals, first referred to as public entrepreneurs, able to bring about social innovation in various fields, rather than on the forms of organization they might set up. Various foundations involved in venture philanthropy, such as the Schwab Foundation and the Skoll Foundation have embraced the idea that social innovation is central to social entrepreneurship and have supported social entrepreneurs.

The debate has been strongly influenced by foundations that have provided financial support and visibility for outstanding social entrepreneurs as modern times' heroes and by consultancy firms that developed a whole industry focusing on business methods and earned income strategies to be adopted by nonprofits looking for alternative or more stable sources of funding (Defourny and Nyssens 2010).

In case of Canada, the past decade has seen an explosion of interest in the subject of social enterprise as well as dramatic growth in the number of entities and ventures. Canada absorbs the concept of social enterprise from the United Kingdom and the United States. However, the law in Canada is still catching up to the range of social enterprise models that have emerged. While the United Kingdom and the United States have developed, specialized corporate forms intended to accommodate this unique category of venture, Canadian law remains largely divided between traditional non-profit and for-profit models. Nonetheless, there are a variety of available options by which social enterprises in Canada can be structured.

Furthermore, most forms of social enterprise can be accommodated through one or more of these approaches. The optimal structure will vary from case to case and depends on the goals and priorities of the individual or organization engaging in the venture. It is vital that individuals and organizations engaging in social enterprise decide upon a structure based on these considerations, rather than allowing the structure to dictate the path that the enterprise takes (Manwaring, Valentine and Thomson 2011(

For Latin America, the emergence of social enterprises parallels to that found in Europe. The origins of the emergence of social enterprise in Latin America can be traced in large part to the influence of European traditions and practices brought along by immigrants from Western Europe. However, most of social enterprises in Latin America are cooperatives.

The acceleration of the growth of the sector was however hastened by global developments which led to political changes within the continent, as well as the economic dislocations caused by Washington Consensus measures imposed on these countries. According to Defourny (1992), political conditions beneficial to social enterprises emerged due to the failures of the welfare state system as well as the failures of centrally-planned

communism. This led to an opportunity for social enterprises to provide a viable alternative to intervention by the government in addressing socio-economic concerns. This was further reinforced by the results of measures implemented in response to the Washington Consensus, where the ultimate objective of all these changes was to reduce public spending and to provide new areas of activity for the private sector (Hintze 2003). The resulting economic crises further exacerbated the socio-economic problems. Against the backdrop of these conditions, social enterprise in the form of cooperatives emerged as a viable solution, as a private sector solution toward increasingly dire socioeconomic problems. Their activities highlight problems related to poverty income inequalities and production conditions that were no longer being addressed by the economic sphere and the public sector.")Poon 2011).

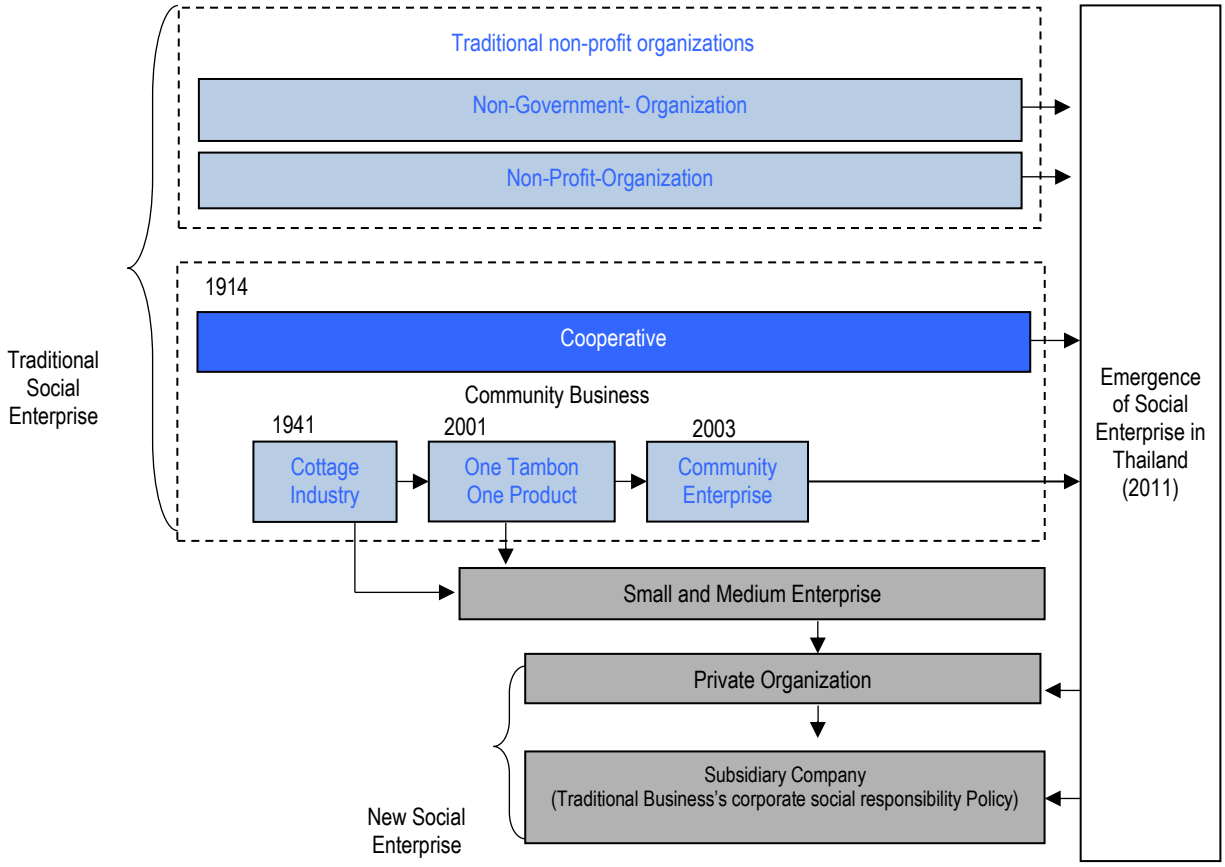
In Thailand, most of social enterprises were initiated by government policy, which aims to develop small-scale enterprises. Before the spread of the concept of social enterprise, the concept of cooperative has begun since 1914. The Department of Cooperatives Promotion has defined a cooperative as "an organization of people gathering together voluntarily to operate their enterprise as sharing owners and to control the operation by employing a democratic system to fulfill the necessary requirements and mutual prospects of economy, society, and culture." Cooperatives are private sector, non-government legal entities formed with the purpose of removing similar occupational obstacles which members are unable to deal with individually. They also create occupational benefits for all members and are more advantageous than operations run by individuals (Department of Cooperatives Promotion, 2014).

After that, the concept of cottage industry was promoted by the Department of Industry, Ministry of Economic, in 1941 (Ministry of Industry, 2013). Some of the cottage industries were developed to be small and medium enterprise. Furthermore, some of them became "One Tambon One Product" when Thailand's government launched the project with the objective of developing local production. And then, in 2003 the government promoted community enterprise. As a result, some local producers get together to establish a group of famers and some local producers were turning to community enterprises. Community enterprises disperse in different areas, both urban and rural.

Back to community enterprise in Thailand that was established under the Community Enterprise Act B.E. 2548, which intend to encourage local economies based on self-sufficiency. The main objectives of this Act are to promote local wisdom, create jobs, improve income, and support each other at the local level. It is expected that once community enterprise is strong enough, it will be developed toward small and medium enterprise. After that, the ideas of social enterprise become well-known since 2011. The Office of Social Affairs was found in 2011, and the Social Enterprise Promotion Act was established in 2015 (*Thailand's National Reform Council,* 2015).

Social enterprise in Thailand is different from other countries as it is a result of government policies. Nonetheless, some of them come from private sector. Private business organizations create subsidiary companies under the concept of CSR, and these companies operate as social enterprises. Furthermore, some social enterprises are created directly by private sector with the aim of benefiting the society. Moreover, there are some social enterprises which are in the forms of cooperative, non-government and non-profit organizations. In conclusion, the emergence of social enterprise in Thailand is initiated by the government, public sector, and private sector, as is presented in Table 2. We also present Figure 2 to display the diagram for the emergence of social enterprises in Thailand. Eventually, social enterprises in Thailand can be rearranged as shown in Figure 2.

There are three groups of social enterprises in Thailand. The first group consists of traditional non-profit organizations; non-government organizations and non-profit organization. The second group comes from cooperatives and community enterprises. The third group is traditional business's CSR comes from small and medium enterprises or private organizations that are precisely established with the aim of benefiting socie



Source: The author's initiation

Figure 2 - Diagram for the emergence of social enterprise in Thailand

6.2. Characteristics of social enterprise

We study the Characteristics of social enterprise for the six following aspects:

1. Purposes of the organization

Theoretically, the purpose of social enterprise is different from that of traditional business. While earning income from economic activities, social enterprise aims to solve social problems or transfer *benefit* to *society. Whereas,* traditional business aims to make profit for its shareholders. It is found that the social enterprises in Western Europe, the United Kingdom, Canada, and Latin America do not generate profits, while the social enterprises in the United States and Thailand do generate profits.

2. Policy or law supports

It is found that all countries or regions of interest have policies to support social enterprises. However, only social enterprises in the United Kingdom, the United States, and Canada are supported by law. In the United Kingdom, a community interest company is a form of company specifically created for the social enterprise sector. Community interest companies are required by law to have provisions in their articles of association to enshrine their social purpose, specifically an asset lock. The transfer of assets out of the community interest companies is restricted to ensure that they continue to be used for the benefit of the community. Furthermore, there is a restriction about a cap on the maximum dividend and interest payments it can make. A community interest company structure provides a clear signal to investors that the enterprise operates for the benefit of the community, and that this social purpose is protected by proportionate regulation. A community interest company may convert into a charity or into a Community Benefit Society or it may voluntarily dissolve. However, once established it may not convert into a standard limited company (Department for Business, Innovation and Skills 2011).

The social enterprises in these countries have legal status and certification as well as tax benefits. On the other hand, social enterprises in Western Europe, Latin America, and Thailand are not supported by law.

In case of Thailand, although the definition of social enterprise is not clear, there are government policies for encouraging and supporting social enterprise. There is the Social Enterprise Promotion Act, which was established in 2015. However, currently, some of social enterprises are under the Cooperatives Act B.E. 2471. Some of them are under the Community Enterprise Act B.E. 2548. And some of them are under the Civil and Commercial Code, which indicates the type of juristic organization. Nonetheless, there is no specific law covering all social enterprises. Now, the law for social enterprises is in the development process. The law imposes on many details such as company registration and cancellation, social venture fund, and the ways to promote social enterprise.

3. Participation of various stakeholders

Social enterprise involves several sectors. In all countries or regions of interest, social enterprises involve government and public sectors. However, private sector engages with social enterprises only in the United Kingdom, the United States, Canada, and Thailand. In these countries, private sector involves in the form of CSR for marketing and tax benefits. Furthermore, private sector links with social enterprise through the stock market. Since 2013, the stock markets in the United Kingdom and Canada have opened for investment in social affairs as well as trading stocks)Chhichhia 2015). In addition, it is found that social enterprises in United Kingdom and Canada involve financial institutes. This might be because the social enterprises need financial support for their operation, especially for running business.

4. Types of business

Social enterprise operates in various types of business. Social enterprises in the form of non-profit organizations exist in all countries or regions of interest. In Western Europe, the United Kingdom, Latin America, and Thailand, social enterprises are founded in the form of cooperatives and community enterprises. However, social enterprises in these forms of business are not found in the United States and Canada. Besides, social enterprises in the form of private organizations are also found in all countries or regions of interest. Furthermore, there are social enterprises in the form of subsidiary companies in the United States, Canada, Latin America, and Thailand. A subsidiary company is a part of a traditional company. While the main company operates traditional business, the subsidiary company operates social enterprise.

5. Roles in society, economy and environment

As previously stated, social enterprise is an alternative way of sustainable development. It has many roles. This paper considers the roles of social enterprise in social, economic and environmental development as follows:

- The role of social enterprises in society. Social enterprises in all countries or regions of interest play an important role in job creation and training, and the employment of disadvantaged people; including women, disabled people, homeless people, ex-convicts, and minority groups. For instance, in 2015, 16% of social enterprises in the United Kingdom employed disadvantaged workers more than half of their total workforce. In the same year, the social enterprises employed 59% of total disadvantaged people in the United Kingdom (Social Enterprise UK 2015). Employment of the disadvantaged people reduces social dependency and related problems.
- The role of social enterprise in the economy. Social enterprises in all countries or regions of interest create employment and income. For example, social enterprises in the United Kingdom contributed £24 billion to the economy and employed nearly a million people in 2015. Furthermore, social enterprises in the United Kingdom accounted for 41% of new employment, whereas the SMEs accounted for only 22%)Social Enterprise UK 2015). In addition, social enterprises help to distribute income to the community through the acquisition of local inputs. This is because social enterprises associate with the local communities. They utilize local wisdom and cultures)Enterprising Non-Profits 2014(. Some of them also purchase raw materials from the local communities. The economic activities of the social enterprises result in the benefits to the community. Unlike organizations which generate profits for their shareholders, social enterprises allocated their profits to the community or society. Therefore, social enterprises have an important role in tackling poverty and improving quality of life. For income distribution to the local community, social enterprises in the forms of cooperatives and community enterprises do this duty better than other forms of social enterprise. This is because they have a closer relationship with the community. Besides, they are established with the cooperation of three parties; the government, private business organizations, and the local community. With regard to transferring technology, it is found that only social enterprises in Western Europe, the United Kingdom, the United States and Latin America do technology transfer.
- The role of social enterprise in environmental protection. Social enterprises in all countries or regions of interest focus on environmental protection. Unlike the lots of traditional businesses, which maximize profit

regardless of the environmental impact, social enterprises play a role in preserving the environment. This might be because most of social enterprises associate closely with the community. Mostly, the operation of social enterprises relies on the local factors, which depend on the quality of the environment. Therefore, they help to protect the environment.

6. Decision making and management

Theoretically, the policy and management of social enterprises are influenced by many stakeholders, not only shareholders. The data from all countries or regions of interest support this theory. Furthermore, it is found that social enterprises in all countries or regions of interest earn income from economic activities. Moreover, the social enterprises employ the main raw materials and human resource from local community.

Conclusion

After undertaking a comparative analysis, the concept of social enterprise in Thailand is concluded as follows:

- Definition of social enterprise in Thailand

At present, *Thai Social Enterprise Office (2010) and* Thailand's National Reform Council (2015) define that social enterprises are business organizations which have a main aim of benefiting the society. They reinvest most of their profits to achieve social objectives rather than shareholders' wealth. Social enterprises are organizations which aim to tackle social problems. They are effective organizations because they use modern management systems and business models. It is believed that the modern management systems help social enterprises to become financial self-sufficiency and reduce dependence on government funding and donations, which are uncertain and discontinue. Uncertainties and discontinuities hinder social enterprises from achieving their social objectives.

It is found that this definition *addresses only three characteristics; the purposes* of social enterprise, the types of business and the roles of social enterprise in society, economy and environment protection. It does not address about policy or law supports, stakeholders' participation, types of business, and the power of decision making and management policy.

- Emergence of social enterprise

Unlike social enterprises in Western Europe, the United Kingdom, the United State, Canada and Latin America, most of social enterprises in Thailand were initiated by government policy. In addition to community enterprise, some social enterprises in Thailand come from private sector. Private business organizations create subsidiary companies under the concept of CSR, and these companies operate as social enterprises. Besides, some social enterprises are created directly by private sector with the aim of benefiting the society. Moreover, there are some social enterprises which are in the forms of cooperative, non-government and non-profit organizations. The ideas of social enterprise become well-known since 2011. The Office of Social Affairs was found in 2011, and the Social Enterprise Promotion Act was established in 2015. However, there is no law for social enterprise. The law is in the development process.

- Characteristics of social enterprise

Social enterprises in Thailand earn income from selling goods or services with the aims at solving social problems. Unlike social enterprises in Western Europe, the United Kingdom, Canada, and Latin America, but similar to social enterprise in the United States, it is found that social enterprises in Thailand do generate some profits.
Social enterprises in Thailand are supported by government policy. However, they are not supported by law. The law is still in the development process, whereas social enterprises in the United Kingdom, the United States, and Canada are supported by law. The social enterprises in these countries have legal status and certification as well as tax benefits.
Thailand's social enterprise involves both government public, and private sectors. The private sector engages with social enterprises in the form of CSR in order to get marketing and tax benefits. However, unlike social enterprises in Western Europe and the United Kingdom, there is no linkage between Thailand's social enterprises and financial institutes.
In Thailand, social enterprises operate in various forms of business; non-profit organizations, cooperatives, community enterprises, private organizations, and subsidiary companies.

Social enterprises in Thailand play a role in society, economy and environmental protection. They create job and training. They employ disadvantaged people, such as women, disabled persons, and minority groups.

Besides creating employment, they create income and distribute income to the community through the acquisition of wisdom, cultures and local inputs. As a result, they have an important role in tackling poverty and improving quality of life. They also help to protect the environment. However, they do not have a role in technology transfer.

The policy and management of social enterprises in Thailand are influenced by many stakeholders, not only shareholders. They earn income from economic activities, and employ the main raw materials, as well as human resource, from local community.

- Suggestions

Since the definition of social enterprise in Thailand is not clear. It should be redefined that social enterprise is a juristic organization that is established by law, which earns income by selling goods and services on the open market, but reinvest their profits for positive social or environmental outcomes. Its governing body consists of both internal personal and representatives from various types of stakeholders.

To benefit from the promotion of social enterprises in Thailand, it is necessary to choose the type of social enterprises that has a role in solving social or environmental literally. For example, community enterprises that employ local labour and production factors should be promoted. In addition, the government should support social enterprises that focus on the conservation of natural resources and other pressing issues in order to achieve the goal of sustainable development.

The law on the promotion and development of social enterprises, especially the law on accreditation of social enterprises, must be clear. Although social enterprises are founded by groups of people, they are organizations just like other business organizations. Therefore, they should be registered. Furthermore, because social enterprises serve society, they should be given privileges, such as tax incentives, more than general enterprises. This may encourage more social enterprises.

Due to social enterprises require funding for business expansion, financial institutions should be involved more in supporting the social enterprises. If social enterprises grow, there will be more positive impact on society or the environment as well.

Reference

1. Brandsen, T., van de Donk, W. and Putters, K. 2005. Griffins or Chameleons? Hybridity as a Permanent and Inevitable Characteristic of the Third Sector. *International Jurnal of Public Admintration*, 28: 749-765
2. Cheriakova, A. 2013. The Emerging Social Enterprise, Framing the concept of social entrepreneurship. *The Broker published by the Foundation for International Development Publications (IDP).* Amsterdam-The Netherlands. Available at: http://www.thebrokeronline.eu/About-The-Broker/(scrollto)/10737
3. Chhichhia, B. 2015. The Rise of Social Stock Exchanges. *Stanford Social Innovation Review Informing and Inspiring Leader of Social Change*. Stanford University. Available at: http://ssir.org/articles/entry/the_rise_of_social_stock_exchange
4. Defourny, J. 1992. The origins, forms and roles of a third major sector. *In Jacques Defourny & Jose L Monzon Campos (Eds), The third sector: cooperative, mutual and nonprofit organizations*. Belgium: De Boeck Universite
5. Defourny, J. and Nyssens, M. 2006. Social Enterprise in Europe: Introduction to an Update. *EMES European Research Network. Social enterprise in Europe: recent trends and developments.* No. 08. Available at: http://orbi.ulg.ac.be/bitstream/2268/11568/1/WP_08_01_SE_WEB. Pdf
6. Defourny, J. and Nyssens, M. 2010. Conceptions of Social Enterprise and Social Entrepreneurship in Europe and the United States: Convergences and Divergences. *Journal of Social Entrepreneurship* Vol. 1 (1): 32–53, Available at: http://ec.europa.eu/internal_market/social_business/docs/conference/defourny_en.pdf
7. Defourny, J. and Nyssens, M. 2012. The EMES approach of social enterprise in a comparative perspective. *EMES Working Papers Series. WP no. 12/03 EMES European Research Network asbl*.
8. Drayton, W. and MacDonald, S. 1993. *Leading public entrepreneurs*. Ashoka: Innovators for the Public (Arlington, Va.). Ashoka: 516. Available at: https://books.google.ro/books?id=3-LojwEACAAJ&dq=Leading+public+entrepreneurs&hl=en&sa=X&ved=0ahUKEwjkv9SG0KjQAhXKL8AKHX5QDYYQ6wEIIzAA

9. Evers, A. 2005. Mixed Welfare Systems and Hybrid Organizations: Changes in the Governance and Provision of Social Services. *International Journal of Public Administration*. 28: 737–748. Taylor & Francis Inc. Available at: http://dx.doi.org/10.1081/PAD-200067318

10. Hintze, S. 2003. *Estado y politicas publicas: Acerca de la especificidad de la gestion de politicas para la economia social y solidaria.* Presentation at the Segundo congreso Argentino de Administracion Publica. Sociedad, Estado y Administracion, Cordoba, Argentina. Available at: http://www.ag.org.ar/2congreso/Ponencias/Hintzes.pdf

11. Manwaring, S. M. and Valentine, A., Thomson, M. 2011. Social enterprise in Canada: Structural options. *MARS White Paper Series*. Available at: http://diversecityonboard.ca/wp-content/uploads/ 2015/11/MaRSReport-Social-Enterprise.pdf

12. Pete, A. and Jeremy, K. 2010. Constituting the third sector: processes of de contestation and contention under the UK Labour governments in England. *Third Sector Research Centre Working Paper* 42. Available at: http://dx.doi.org/10.1007/s11266-010-9178-9

13. Poon, D. 2011. The Emergence and Development of Social Enterprise Sectors. *Social Impact Research Experience Journal (SIRE).* University of Pennsylvania Scholarly Commons. Available at http://repository.upenn.edu/sire/8/

14. Robyn, E. 2015. Knowledge Partnering for Community Development. *Frist publish* 2015. Routledge Taylor and Francis Group London and New York: 117-118.

15. Ryan, R. 2013. *Social Enterprises and Local Government A Scoping Study*. Australian Centre for Excellence for Local Government (ACELG) and Institute for Regional Development, University of Tasmania.

16. Sepulveda, L. 2009. *Outsider, missing link or panacea? Some reflections about the place of social enterprise (with) in and in relation to the third sector*. Working Paper No. 15. The Third Sector Research Centre: Birgmingham

17. Toonsatitsak, M. 2012. The Revenue Department for Social: "give for happy society". *Journal of the Revenue Department*. No.59, Sep 2012. Bangkok, Thailand.

*** Cooperative Promotion Department. 2014. *General Knowledge* of *Cooperatives*. Available at: http://webhost.cpd.go.th/rlo/knowledge.html

*** Department for Business, Innovation and Skills. 2011. A Guide to Legal Forms for Social Enterprise. Department for Business, Innovation and Skills, London, United Kingdom

*** Department of Trade and Industry. 2002. Social Enterprise: A Strategy for Success, United Kingdom Department of Trade and Industry. Available at: http://www.dti.gov.uk/socialenterprise

*** Enterprising Non-Profits. 2014. Success Themes in Supportive Employment, How Social Enterprise Connects People with Jobs & Jobs with People. Available at: http://www.SocialEnterpriseCanada.ca

*** Ministry of industry Thailand. 2013. History of Ministry of industry Thailand. Available at: http://www.industry.go.th

*** National reform steering assembly. 2015. Special reform term 1: Social enterprise. The secretariat of the House of Representatives: 57. ISBN: 978-974-91=614-89-1

*** Office of the National Economic and Social Development Board. 1972. National Development Plan 1972-1976. Available at: http://www.nesdb.go.th/main.php?filename=develop_issue

*** Office of the National Economic and Social Development Board. 1977. National Development Plan 1977-1981. Available at: http://www.nesdb.go.th/main.php?filename=develop_issue

*** Office of the National Economic and Social Development Board. 1996. National Economic and Social Development Plan 1997-2001. Available at: http://www.nesdb.go.th/main.php? filename=develop_issue

*** Office of the secretary of the community enterprise. 2012.Community enterprise promotion act B.E.2548 (2005) Available at: http://www.sceb.doae.go.th

*** Revenue Department. 2013. Decree issued under the Revenue Code, regarding the Tax Exemption (No. 558) B.E. 2556**.** Available at: http://www.rd.go.th/publish/47537.0.html

*** Social Enterprise UK. 2015. Leading the World in Social Enterprise. State of social enterprise survey. Available at: http://www.socialenterprise.org.uk/about/about-social-enterprise

*** Social enterprise UK. 2015. What are social enterprise? Available at: http://www.socialenterprise.org.uk/about/about-social-enterprise

*** The Siam Cement Group Foundation. 2013-2014. Foundation background. Available at: http://www.scgfoundation.org/en/aboutUs-history.asp

*** Thai Social Enterprise Office. 2010. Thai Social Enterprise Promotion of the Prime Minister on Procurement act B.E.2554. (2011). Available at: http://www.scribd.com

*** Thailand's National Congress Reform. 2015. Special Reform Agenda1: Social enterprise. Secretariat of the House of Representatives. Bangkok: 14

*** The United Nations Global Compact and the Rockefeller Foundation. 2012. A Framework for action: Social Enterprise and Impact Investing. United States. Available at: http://www.unglobalcompact.org

Determinants of Bilateral Foreign Direct Investment Inflows in Pakistan from Major Investing Countries: A Dynamic Panel Approach

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Abstract:

As attracting inflow of Foreign Direct Investment (FDI) is a red-hot issue nowadays and it has become an ultimate goal of any developing country. This paper targets to inspect the effects of income, institutional quality (democracy) and trade openness on FDI inflows of Pakistan by applying dynamic PMG estimators. 24 FDI contributing countries are considered for a period of 1985-2014 for investigation. This paper finds the evidence for a positive contribution of income of both Pakistan and investing countries and trade openness in FDI inflows. Institutional quality can only attract FDI in short run.

Keywords: FDI inflows, income, democracy, trade openness.

JEL Classification: F21, O10, O17, F10.

1. Introduction

Developing countries are always facing lack of capital investment, trained skilful human capital, technological sufficient production processes and efficient markets. These absent factors of developing countries encourage them to compete among other developing countries to invite FDI for fostering their economic growth and to strength their national markets. For this purpose, economies encourage the inflow of FDI in order to excel their economic growth and development by providing conducive investing environment to the developed countries of the world.

FDI plays an extraordinary role and a direction in going global. FDI not only affects economy as an external resource inflow but also modernize industry and integrate the economy into international production. FDI is considered a way to attract investment from developed countries. The inflow of investment in any form from foreign countries facilitate the home country to avail the opportunities to fill the capital gap, improvement of human capital and managerial skills, technological up gradation, production processes, employment prospects and market structure. Financial investment can be attracted by essential and conducive economic environment.

Many studies, theories and researches have been conducted and tested for determining the driving forces of FDI and its flow for the last many decades. FDI means to invest in long term at some distant place e.g. country wise; where the FDI transaction may be occurred into different forms of Joint venture, transfer of technology, enterprise and management etc. FDI is an important factor in globalization. In 1970's international trade grew rapidly as compare to FDI but dramatically situation change in 1980's when investors motivated by technology transfer and establishment of marketing networks for perfect production and selling globally. Carbaugh (2000) states that flow of FDI usually occurs from the low-profit to high-profit sections, creating the future profit eagerness (profit seeking) which is one of the simple incentives to undertake investment activity. Nevertheless, it is apparent that high anticipated future returns play a substantial role in the movement of FDI inflows, until now there are numerous further aspects which should be measured carefully.

Every country engages its energies to be in marathon of economic growth and development but not all actually succeed in this milestone. A country's progress can be measured through a positive and healthy economic and political structure which can only be achieved by productive investment as it is considered essential for the long run existence and nourishment of an economy. FDI is one of the financial agents needed by any such developing country to progress as it can play distinctive and unique roles in the progress and development of an economy. It is not easy to deny the importance and significance role of FDI and to reject its influence on a developing country like Pakistan. There are some catalyst agents needed by any developing country to increase the FDI inflow in long run to bridge up the capital gap, improvement of production process, to equip with high quality and large scale economies, to incorporate modern and advance level technology and to improve the efficiency of human resources. The developing countries usually face short of financial resources for its onward investment in the country to improve the living standard of the society. The countries have become aware enough of this need and try to be benefited from developed countries by providing investment friendly policies. As Pakistan is having insufficient inflow of FDI, due to lacking of various factors which are needed to be addressed in order to understand the causes of inadequate inflow of FDI and to understand the importance of determinants that attract it. There have

been studies on the driving forces of FDI in Pakistan but none of these do the disaggregated analysis. To deal with the aggregate macroeconomic data can be source for misleading results due to aggregation biasness. Therefore, this paper is motivated to test the FDI inflows model by taking the data of 24 investing countries in a dynamic panel approach.

2. Literature review

The literature has discussed varied determinants to attract the inflow of FDI which are the actual potentials; a country should characterize to invite the foreign investment. At first, the studies are reviewed in the setting of bilateral FDI inflows with gravity model. For example, Frenkel *et al*. (2004) applies gravity model and OLS estimators for panel data are used by the authors regarding FDI flows from advanced economies to developing economies. They also employ dummy variables by using two-component model for capturing the home and investing countries effects along with the time effects. They conclude in their findings that distance and market size are influencing FDI flows; other economic features including economic growth and risk in recipient countries are also found critical for attractive transnational investment projects. Buch *et al*. (2003) explore FDI transmission by using gravity model. They applied two-step panel vector auto regression estimation. They used gravity model with specification of only two variables, size of two-sided trade and GDP per capita. The authors do not confirm the relationship of trade and FDI. Though using cross-section regressions over 5 years for the stock of German FDI abroad, it is concluded that distance and GDP are the key determinants of FDI. Ledyaeva and Linden (2008) explore the inward FDI Gravity model to explore the foundations of irregular spreading of FDI. That paper analyzes the factors having impact on six foreign firms of source countries in seventy-six Russian regions with cross-sectional data set during a period 1998-2002. That study concludes a positive impact of both countries' GDP on FDI. Contrary to this, the larger distance between the investing region and the home country led to low probability of FDI inflows. Bevan and Estrin (2004) analyze the gravity approach to Central & Eastern European from western countries. They also used panel data set of mutual flows and establish that the key aspects were market size, unit labor costs and distance.

In the relationship of FDI and democracy, de Mello (1997) states that remarkably, the country specific factors can be underlined from the prominent and significant institutional structures of the beneficiary country. These institutional structures may include deep-rooted democracy and social equity, political stability, legislation of corporations, the security of experienced property rights and degree of intervention into economy by the government. He also states that FDI provides control over the foreign entities as it is a form of international Inter-Firm Corporation.

For the growth of an economy, FDI is important. So, every country tries to attract more and more FDI to take greater advantages. Easterly (2001) states that it is a self-proclaimed fact that political stability is a significant issue in most of the developing countries because to implement and to achieve desirable outcomes from any policy, time is needed to build the trust of investors which is possible in long run through politically sound and stable situation. Policy weakness is also one of the issues. Many developing countries come across owing to many causes. Globerman and Shapiro (2003) inspect the importance of governance as a factor for US FDI and US promotes to invest in the countries which are having transparent governance and deep rooted social values. Transparence governance and effective legal system promotes the social values which lead to receive US FDI infrastructure and US FDI. Goyal (2007) observes that the countries with socially responsible corporate structure have seen the rise in the inflow of FDI. Countries have become keen to attract FDI inflow by revealing the type and social responsibilities of their particular firms. Inefficient governance of any country has significant impact on FDI.

The country with poor governance on property rights may not in a position to attract foreign investment. Doces (2010) in his empirical analysis of democracy on FDI of developing countries assesses that if there is an increase in the level of democracy, it offers the right combination of micro and macro environment to have high inflow of FDI. Ledyaeva *et al.* (2013) studies the variables corruption and democracy for inflow of FDI from foreign countries to Russian regions during 1996-2007. The authors in their panel study analysis assess that the foreign countries with less corruption and highly democratic level prefer to invest in regions of like characteristics with the attributes of less corruption and high democracy.

In the relationship of FDI and trade, Hsiao and Hsiao (2006) determine the relationship of volume of trade and FDI; they argued that exports lead to onward FDI inflow, which leading to economic growth in Eastern and Western countries. Liu *et al.* (2001) observe association between trade of China and FDI considering a panel data of China and 19 investing economies. They indicate that increase in China's imports expanded inward FDI from investing countries which in result increases exports from China. The growth of exports causes FDI inflow.

The following review of literature has also underlined the importance of FDI in a manner that everyone will accord on the need to explore the reasons for the loss of FDI and measures to improve the inflow of FDI to Pakistan.

Azam and Lukman (2008) investigate the influence of gross domestic product on FDI in Indonesia, Pakistan and India for period 1971-2005. They conclude that economic growth plays a vital role to attract the FDI and bi-directional relations also exist between them. They establish the findings that domestic investment, infrastructure, market size, return on investment and trade openness had positive and significant correlation with FDI inflows. Akhtar (2000) discusses that political instability is deteriorating the confidence of the investor and ultimately is disturbing the investment environment of Pakistan. The restless situation and extreme political instability in Pakistan has led to the hesitant behavior to local and international investors. Investors feel insecure about the return on investments due to unpredictable political situations which has made the investment environment very risky in Pakistan. Hashim *et al.* (2009) probe the influencing factors of FDI inflows in telecom sector. They observe that in Pervez Musharraf regime FDI in Pakistan as compared to the previous years started increasing year by year and has reached to its maximum peak in year 2008. However, it started to decline later after 2008. The decline has been observed due to political instability. The stable political conditions prevailing in a country has a significant relation with inflow of FDI.

The literature has established a view that inflow of FDI may be considered as lifeblood of developing economies in the modern era. Practical aspects of FDI along with future prospects have been the dream of many classical financials who are the advocators of robust financial system. The literature is verifying that the application of gravity model on FDI has become popular in recent years; earlier its application was common to Trade only. The gravity equation is used in the empirical finding of international trade and economics; bilateral trade, regress by GDP of two countries is directly proportional to their respective sizes while inversely proportional to their geographic distances. The substitution of FDI for Trade is of excessive attraction and latest approach. On the other hand, improper level of democracy is responsible for low of level of FDI inflows. Therefore, this present paper is motivated to collect the democracy, trade and GDP of FDI investing and recipient country in a gravity model to see role of mentioned factors on FDI inflows.

3. Data, model and estimation strategy

Data Sources

The data of FDI of Pakistan from major investing countries are taken from State Bank of Pakistan. GDP of Pakistan and investing countries, and imports and exports of Pakistan have been taken from WDI. All data is taken in million constant US dollars. Democracy index is taken from Freedom House.

Selection of the Sample

The sample of the data comprises of 24 major FDI contributing countries. The sample consists of Australia, Bahrain, Canada, China, France, Germany, Hong Kong, Italy, Japan, Korea (South), Kuwait, Luxembourg, Malaysia, Mauritius, Netherlands, Norway, Oman, Saudi Arabia, Singapore, Sweden, Switzerland, United Arab Emirates (U.A.E), United Kingdom (U.K) and United States of America (U.S.A). Annual time series of all selected countries are taken for a period 1985-2014. The sample is selected on the basis of maximum availability of data.

Model and Estimation Strategy

The concept of gravity model has earlier been used in International Trade but its implication on FDI is a recent concept. This study is applying the FDI Gravity Model particularly to the case of Pakistan and to dig out the causes for the loss of FDI in the recent time period. The history of gravitation model initiated in pure sciences by Newton in his second law of motion which was later applied in social sciences by Tinbergen. Tinbergen (1962) applied Newtonian approach to explain bilateral trade flows which is positively dependent on the GNPs of the trading partners or countries and negatively dependent on the air / shipping distance separating them. Here, this study is ignoring the distance as gravity model has also been used in the empirical estimation without distance. The purpose of dropping this variable is that it is constant over a single cross section and therefore, it disturbs the nature of dynamic model. Further, political condition is very important in attracting the FDI in any country suggested by de Mello (1997), Easterly (2001) and Doces (2010) and political condition can be accessed through the level of democracy. Therefore, democracy has included in the model. Furthermore, trade openness is also very important variable in attracting FDI as greater the trade openness is showing greater level of trade freedom. Foreign investor is more concerned with the openness of trade in a country due to their larger level of production, for a need of import of production inputs and exports of their product as suggested by Hsiao and Hsiao (2006) and Liu *et al.* (2001). Therefore, this paper is also considered the importance of trade openness for FDI inflows. To capture the impact of incomes, trade openness and democracy on FDI inflows in Pakistan, the study proposes the following model:

$FDI_{it} = f(GDPH_{it}, GDPF_{it}, OPH_{it}, DEMH_{it})$ (3.1)

where: FDI_{it} = FDI inflows in Pakistan, $GDPH_{it}$ = GDP per capita of Pakistan, $GDPF_{it}$ = GDP per capita of investing countries, OPH_{it} = Trade openness index of Pakistan, $DEMH_{it}$ = Democracy index of Pakistan, proxy for institutional quality in Pakistan.

The gravity model is non-linear in nature. Therefore, the study uses GDPs and trade openness in log form. Democracy is not taken in log due to an ordinal variable and it is also taking negative score as well. FDI inflows can also be negative and log is not possible.

After log, the model comprises of following equation:

$FDI_{it} = a_0 + a_1 LNGDPH_{it} + a_2 LNGDPF_{it} + a_3 LNOPH_{it} + a_4 DEMH_{it} + u_{it}$ (3.2)

where: LN is a natural log operator, *i* are 24 investing countries in Pakistan; *t* is time period of 1985-2014 in analysis.

The equation (2) will be tested by Pooled Mean Group (PMG) estimators. It is superior technique in testing the cointegration and short run relationships in the model as it is efficient in presence of mix order of integration and there is no need for pre-testing of unit root problem in variables. Further, it is dynamic and it also cares the heterogeneity in the cross sections. The test equation is as follows:

$$\begin{aligned} FDI_{it} &= \alpha_i + \varphi_1 FDI_{i,t-1} + \varphi_2 LNGDPH_{i,t-1} + \varphi_3 LNGDPF_{i,t-1} + \varphi_4 LNOPH_{i,t-1} \\ &+ \varphi_5 DEMH_{i,t-1} + \sum_{j=1}^{p-1} \phi_{1j} \Delta FDI_{i,t-j} + \sum_{j=0}^{q-1} \phi_{2j} \Delta LNGDPH_{i,t-j} + \sum_{j=0}^{q-1} \phi_{3j} \Delta LNGDPF_{i,t-j} \\ &+ \sum_{j=0}^{q-1} \phi_{4j} \Delta LNOPH_{i,t-j} + \sum_{j=0}^{q-1} \phi_{5j} \Delta DEMH_{i,t-j} + \xi_{it} \end{aligned} \quad (3.3)$$

Equation (3) is ARDL type equation for PMG estimators. It is used in finding the long run normalized coefficients and short run estimators can also be found from difference variable coefficients. The second to sixth terms on the right hand side can be called collectively as error correction term and can be used for the evidence of cointegration in the model.

Description of variables

GDP per capita is showing the average income level of a country. A higher income is Pakistan is a symbol for higher demand for product and local or foreigners' investors can have better returns of their investments. Further, income of investing is representing the supply condition of FDI from investing countries. Higher income is expected to have higher savings and investment capacities. The positive relationship of FDI inflows to both types of GDPH and GDPF is anticipated. Both led to economic stability which acts as a positive role to attract FDI.

Trade openness has been measured in terms of proportion of trade and calculated by dividing the sum of export and imports of Pakistan by her GDP. More trade is symbol of openness and foreign investors are interested in investment in higher open economies. Trade openness and FDI inflows are supposed to be positively related.

Democracy ensures the protection of the set of rights and freedoms of the citizens and protection of public interests. In democracy, political organizations and elected officials serve the public and protect the individual rights. In democratic government, all the eligible citizens having equal rights of casting votes in fair elections to elect a representative of government in executive and legislative offices. It has been used as a proxy of institutional quality. Polity IV has been implied as its proxy. This index's range is -10 to +10 and higher value shows higher level of democracy in a country. Democracy plays an important role for any country as it states about the political stability, law and order discipline, harmony among the institutes, appropriate governance on procedures of import and export with few restrictions and fair equality in social terms. A higher democracy or polity IV score means higher institutional quality as well. Therefore, a positive relationship between FDI and democracy is anticipated.

Data analysis and discussions

Table 1 shows the results based on PMG estimators and long run relation exists in the model as cointegrating coefficient is negative and significant. In long run, income of Pakistan (LNGDPH) is positively and significantly impacting the FDI inflows. It is evidence that Pakistani market size or demand for product is sufficient to attract the FDI inflows from investing countries. The income or GDP of investing countries (LNGDPF) has positive and significant, but at very low level *i.e.* 11% level of significance, impact of FDI inflows from investing countries. It is showing the supply condition of investing countries is also good enough. As increasing income, may result in

more savings that might be channelized towards the Pakistan in terms of FDI inflows. But, democracy has insignificant impact on FDI inflow in Pakistan. That is showing the insufficient institutional quality to attract FDI inflows in long run. However, trade openness has positive and significance influence on FDI inflows in long run.

Table 1 - PMG Estimators: Dependent Variable is FDI

Variables	Coefficients	S.E.	t-value	Prob.
Long Run Estimates				
LNGDPF	1.3916	0.8501	1.6369	0.1023
LNGDPH	2.5132	1.1268	2.2303	0.0262
DEMH	-0.4962	0.6948	-0.7141	0.4755
LNVOTH	1.7511	0.4961	3.5292	0.0005
				Short Run Estimates
Error Correction Term	-0.6275	0.0514	-12.2013	0.0000
ΔLNGDPF	2.7386	14.4831	0.1890	0.8501
ΔLNGDPH	3.5416	2.0200	1.7532	0.0802
ΔDEMH	0.8559	0.4358	1.9638	0.0501
ΔLNOPH	-0.5645	0.1998	-2.8257	0.0049
Intercept	-170.42	16.72394	-10.1902	0.0000

After a discussion on long run results, short run results are showing that income of Pakistan, as proxy for local demand for products and hence demand for FDI inflows has also positive and significance impact on FDI inflows like long run results. But, GDP of investing countries has insignificant impact on FDI inflows.

Further, democracy has positive influence at least in short run because its impact is absent in the long run. Therefore, institutional quality in Pakistan is at least remained helpful in inviting FDI in short run. Furthermore, trade openness is negatively influenced the FDI. It implies that more trade is becoming the substitute of FDI inflows. But this phenomenon is not hold in long run as positive and significant impact of trade openness has been observed. This also implies that foreign investors could be able to invest and produce the import-substitute by investing FDI in Pakistan in long run. Therefore, FDI is performing as complement of trade in long run and substitute in the short run.

Conclusions

In the literature, many of the studies have been accomplished to check the consequence of various determinants on inflow of FDI. This study has applied the FDI inflows' Gravity Model especially for the case of Pakistan taking into consideration Gross Domestic Product of Pakistan and investing country, Trade openness and democracy as independent variables along FDI as dependent variable. As the developing countries are striving for inflow of FDI irrespective of cultural, religion, infrastructural and social differences in order to fill capital gap, up-gradation of production processes, technology advancement and train human resources. The purpose of the research is to ascertain major drivers of FDI inflows in Pakistan. This study has engaged the testing of FDI inflows model on annual data of 24 countries for a period 1985-2014 by applying the dynamic PMG estimators. This research finds an evidence for long run relationship in the FDI inflows model. Income of Pakistan has found the positive contributor of FDI inflows both in short and long run. Income of investing country could only support the FDI inflows only in long run with very low level of significance. Democracy is showing positive influence only in short run but its long run impact is found insignificant. Trade openness has positive and significant influence on FDI inflows in long run but its impact is found negative in the short run.

References

[1] Akhtar, M.H. 2000. The Determinants of Foreign Direct Investment in Pakistan: An Econometric Analysis. *The Lahore Journal of Economics*, 5(1): 1-22.

[2] Azam, M. and Lukman, L. 2008. Determinants of Foreign Direct Investment in India, Indonesia and Pakistan: A Quantitative Approach. *Journal of International Business Management*, 4(1): 31-44.

[3] Bevan, A. and Estrin, S. 2004. The determinants of Foreign Direct Investment in to European Transition Economics. *Journal of Comparative Economics*, 32(4): 775-787.

[4] Buch, C.M., Kokta, R.M. and Piazolo, D. 2003. Foreign Direct Investment in Europe: Is there redirection from the South to the East? *Journal of Comparative Economics*, 31(1): 94-109.

[5] Carbaugh, R. 2014 *International Economics*, 15th Edition. Available at: https://books.google.ro/books?id=tjAeCgAAQBAJ&printsec=frontcover&dq=International+Economics+2000&hl=en&sa=X&ved=0ahUKEwjyodfw2ajQAhVnJcAKHS33B9AQ6AEIOjAF#v=onepage&q=International%20Economics%202000&f=false

[6] de Mello, L.R. 1997. Foreign Direct Investment in developing countries and growth: A selective survey. *Journal of Development Studies*, 34(1): 1-34.

[7] Doces, J.A. 2010. The Dynamics of Democracy and Direct Investment: An Empirical Analysis. *Palgrave Macmillan Journals*, 42(3): 329-351.

[8] Easterly, W. 2001. The lost decades: Developing countries stagnation in spite of policy reforms 1980-1998. *Journal of Economic Growth*, 6(2): 135-157.

[9] Frenkel, M., Funke, K. and Stadtmann, G. 2004. A panel analysis of bilateral Foreign Direct Investment flows to emerging economies. *Economic Systems*, 28(2): 281-300.

[10] Globerman. S. and Shapiro. D. 2003. Governance Infrastructure and US Foreign Direct Investment. *Journal of International Business Studies*, 34(1): 19-39.

[11] Goyal, A. 2007. Corporate Social Responsibility as a Signaling Device for Foreign Direct Investment. *International Journal of the Economics of Business*, 13(1): 145-163.

[12] Hsiao, F.S.T. and Hsiao, M.C.W. 2006. FDI, Export and Growth in East and Southeast Asia- Evidence from Time-Series and Panel Data Causality Analyses. *Journal of Asian Economics*, 17(6): 1082-1106.

[13] Ledyaeva, S. and Linden, M. 2008. Testing for Foreign Direct Investment Gravity Model for Russian Regions. *The European Journal of Comparative Economics*, 5(1): 87-105.

[14] Ledyaeva, S., Karhunen, P. and Kosonen, R. 2013. Birds of a Feather: Evidence on commonality of Corruption and Democracy in the origin and location of foreign investment in Russian regions. *European Journal of Political Economy*, 32(1): 1-25.

[15] Liu, X., Wang, C. and Wei, Y. 2001. Causal Links Between Foreign Direct Investment and Trade in China. *China Economic Review*, 12(2-3):190-202.

[16] Tinbergen, J. 1962. *Shaping the World Economy: Suggestions for an International Economic Policy.* The Twentieth Century Fund, New York.

Model of Formation of the Bank Deposit Base as an Active Method of Control Over the Bank Deposit Policy

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Abstract:

The bank deposit policy to raise funds in order to replenish the resource base must simultaneously deal with two problems in the current macroeconomic situation in Russia: the development of new opportunities to raise additional funds and cutting the costs of their raising and allocating. To confirm this hypothesis, the article examined retail deposits as the basis of borrowed resources of commercial banks during the crisis; offered classification of factors influencing the formation of the conditions of offering the line of deposits to individuals. The analysis of the conditions of the Russian and foreign markets for deposit sourcing from individuals in commercial banks was conducted, based on which conclusions were made about the state of the raised resources during the crisis period. The model of formation of the bank deposit base was offered as an active method of control over the bank deposit policy, and the algorithm of the application of this model in the allocation of the premium bonus fund of a commercial bank was developed.

Keywords: capital market, retail deposits, raised resources, interest rates, bank deposit policy, procedures of managing bank customer deposits.

JEL Classification: E50, E58, E59.

1. Introduction

The macroeconomic situation in Russia in general and in the financial sector in particular was quite difficult in 2014. The Russian economy has not yet had time to overcome the consequences of the global crisis of 2008-2009 by that moment; there was a landslide decline in oil prices, one of the main export commodities of the country; Western countries have introduced economic sanctions against the country. These events have had a major negative impact on the Russian economy: inflation increased, the ruble fell, the government, businesses and people revenues declined, private capital outflows increased. As a result of the sanctions, the markets of cheap western funding and the possibility of refinancing debt were actually closed for the banking sector; peaks of the payments on the external debt of Russian banks also fell for the 2014-2015 period. All these events led to a large-scale crisis in 2014.

However, the Russian banking sector managed to maintain stability in these difficult macroeconomic and external conditions. Despite the decline in demand for loans, the growth of troubled assets, liquidity shortages, mass review of banking licenses by the Central Bank of Russia (CBR), and an Increase in interest and credit risks have not resulted in systemic debt crisis. Moreover, this period saw an influx of savings of the population (in 2014, the share of bank deposits in the accumulated savings of the population amounted to 69%), which indicated, inter alia, maintaining confidence in the banks. In the conditions of limited sources of formation of the resource base of Russian banks, it seems appropriate in the current circumstances to identify additional opportunities to raise deposits for this purpose, available at: http://www.cbr.ru/publ/God/ar_2015.pdf.

The authors make a hypothesis: a challenging current macroeconomic situation in Russia requires a change in fund-raising activities of the banks in the framework of improving the deposit policy in terms of provisioning the

[1] 117997, Moscow, Stremyanny per., 36
[2] 125190, Moscow, Leningradsky pr., 80G

resource base of banks with extra funds and simultaneous reduction of costs of raising and allocating them. The hypothesis testing demanded answers to the questions:

- on which basis is it advisable for commercial banks to form borrowed resources?
- which factors have the greatest impact on the definition of the conditions of offering the line of deposits to individuals?
- which exact methods of managing the bank deposit policy can be used to model the formation of the bank deposit base during the crisis?

2. Method

Theoretical and methodological basis of the article. When writing this article, the authors relied on the scientific works and applied developments of Russian and foreign scientists and experts on the issues studied in the field of banking business and capital market. The work used the dialectical method of knowledge and a systematic approach to the study of the problem; general scientific and special methods were applied: analysis, in particular, comparative analysis, synthesis, analogy, classification, as well as historical and logical methods, tabular and graphic techniques.

The information base for the work includes laws and regulations of the Russian Federation that regulate the activities of commercial banks. Official Russian and foreign statistical information resources were used in writing the article, as well as the data from the official websites of research agencies, institutions and other organizations.

3. Results

3.1. Retail deposits as the basis of borrowed funds of commercial banks during the crisis

Commercial banks must have some resources at their disposal in order to carry out their activities. Commercial banks' resources are of paramount importance in a market economy, while borrowed funds occupy a major share of the total resources of commercial banks.

Borrowed funds of the banks cover about 90% of the total need in cash resources for the implementation of active operations, primarily lending. The bulk of the borrowed funds of the commercial banks are deposits, *i.e*. funds deposited by the customers in the bank on certain accounts and used by them in accordance with the account pattern and the banking legislation (Civil Code of the Russian Federation, Part 2, Chapter 44, Article 834).

Retail deposits take an important place among the sources of borrowed funds in the banking activities, but this source can only be used by commercial banks, which hold a special license from the Bank of Russia for deposit sourcing from individuals and are parties to the state system of individuals' deposit insurance. The right for deposit sourcing from individuals can be granted to banks, which have passed state registration at least two years ago, (Federal Law of the Russian Federation dated 02.12.1990 #395-1 "On Banks and Banking Activities" (as amended on 05.04.2016)).

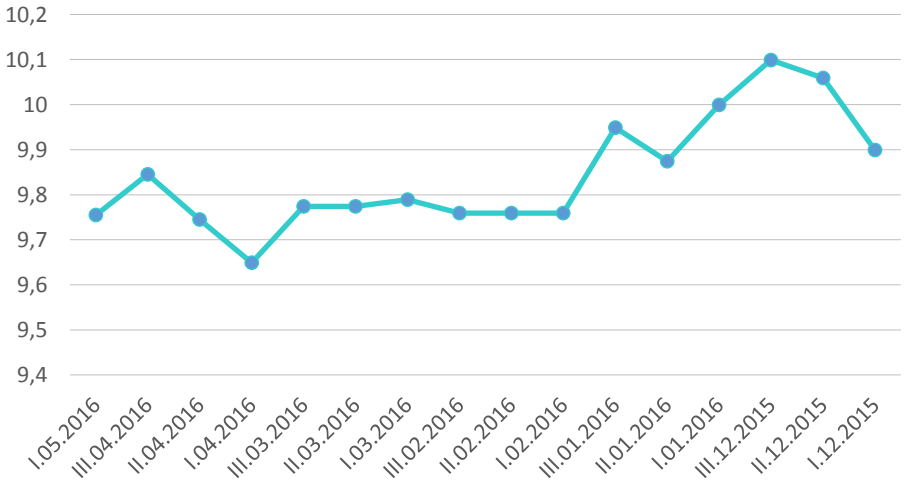
Currently, the market of deposit services is one of the most developed segments of the Russian retail banking market, although the crises of 1998, 2008 and 2014 significantly undermined public confidence in the banking system and led to a massive outflow of deposits for each of the periods under study in the short term. After the crises of reducing liquidity, the banking system regularly witnesses the subsequent increase in household deposits.

A significant number of attractive deposit products have recently appeared on the market, which perform cost savings function to customers and can be simultaneously used by them to carry out money transfers to other customers. Banks offer customers a variety of conditions to refill the account and withdraw money from it; the products are differentiated by customer type.

The existing differentiation of the interest rates is dictated by market conditions and macro-economic factors, as well as by the degree of reliability and reputation of the bank, and a customer mix. Banks, whose loan recipients include a significant number of lucrative enterprises engaged in trading, public catering and service, are able to offer investors more favorable lending terms than others.

In 2015, the largest banks showed the best results in comparison with 2013-2014. 86% of banks in the top 100 showed positive dynamics of retail deposits, and 26 leading banks in terms of deposits showed growth in deposits. For comparison, the growth in deposits among the ten largest banks amounted to 10.6% in 2014, and among the banks ranking from 11 to 100 it was almost twice as much – up to 20.6%, available at: http://www.cbr.ru/statistics/Default.aspx?Prtid=avgprocstav. Thus, the largest banks in 2015 were able to "win back" their 2014 "losses". This was the result of "leveling" interest rates on retail deposits in 2015, when due to regulatory innovations (higher contributions to the Deposit Insurance Agency when proposing higher rates to households), interest rates on deposits among big, medium and small banks largely leveled off. Meanwhile, on the

other hand, medium and small banks higher increased the rates on deposits against the backdrop of an economic "tsunami" in 2014, which allowed them to raise more funds from households (Figure 1). In addition, the Idea of sanctions against the largest state-owned banks, most likely, scared depositors very much in 2014 (Sberbank faced an unprecedented outflow of deposits in December 2014), while in 2015 this factor has ceased to influence the behavior of households when choosing a bank to generate savings, available at: http://www.cbr.ru/statistics/Default.aspx?Prtid=avgprocstav



Source: Compiled by the authors based on CBR data (http://www.cbr.ru/statistics/Default.aspx?Prtid=avgprocstav)

Figure 1 – Dynamics of the highest interest rate (for deposits in Russian rubles) of ten credit institutions raising the largest amount of deposits from individuals

Let's consider the terms for raising funds to deposits in the developed countries in dollars and euros (see Table 1).

Table 1 – Price terms (best offers) for deposits in the context of countries as of 01.04.2015

Country, bank name	Interest rate on US dollar deposits	Interest rate on euro deposits	Interest rate on deposits in other currency
Cyprus Bank of Cyprus, Cyprus Popular Bank Ltd, AlphBank.	up to 4.5 %		
Latvia, Citadele bank, BIGBANK	up to 3%	up to 2.65 %	
USA Edward Jones Vanguard Group	up to 2.96%		
Italy ING DirectItalia		1.4%	
Belgium ING Belgium		1.25%	
Germany ING DiBa		Up to 1%	
Netherlands ABN AMRO		up to 1% per annum.	
Great Britain Bank of London and the Middle East			up to 2.8% on pound sterling
Sweden Nordea			1% in Swedish kronor
Switzerland Postfinance bank Credit Suisse			0.15% in Swiss francs 0.72% in Swiss francs

Source: compiled by the authors based on Credit Banking data, available at: http://cbkg.ru/articles/vklady_v_inostrannykh_bankakh__top_10_samye_vygodnye_vklady_za_granicejj.htm

As can be seen from Table 1, the price terms of foreign banks in developed countries are quite low, interest rates for the best proposals are in the range of 1-3% due to a stable economy and a high level of development of the countries. In addition, it is necessary to note the presence of stringent terms of early termination of deposits in foreign banks, high thresholds of minimum amounts, as well as high taxes on the interest. The minimum amount of guarantee of the return of funds in case of bank bankruptcy under EU standards is at least 20,000 euros.

The situation with the CIS banks is directly opposite to the above examples. The yield on fixed-term deposits in national currency in Belarus and Moldova, whose level of inflation in the economy in 2015 was comparable with the Russian, accounted for about 45% and 11-12%, respectively. In general, investment in deposits with foreign banks is effective at a stable rate of the national currency against the dollar.

The most traditional form of savings for individuals is a bank deposit, of course, but in some countries with developed financial markets, particularly in the US, another financial instrument is widely used, which is a fusion of the legal nature of a bank deposit and securities – a Certificate of Deposit, available at: http://www.rusnauka.com/17_PN_2015/Economics/1_195236.doc.htm.

From the perspective of the commercial bank, the retail deposits are attractive due to the fact that they grant a lot of freedom in their use in profitable active operations compared with the sight deposits, contribute to solving the problem of bank liquidity, and reduce the requirements for the provisioning of the most liquid assets of the bank.

Table 2 shows data on the existing credit institutions, including those entitled to attract deposits from households.

Table 2 – Information on registration of credit institutions in 2016

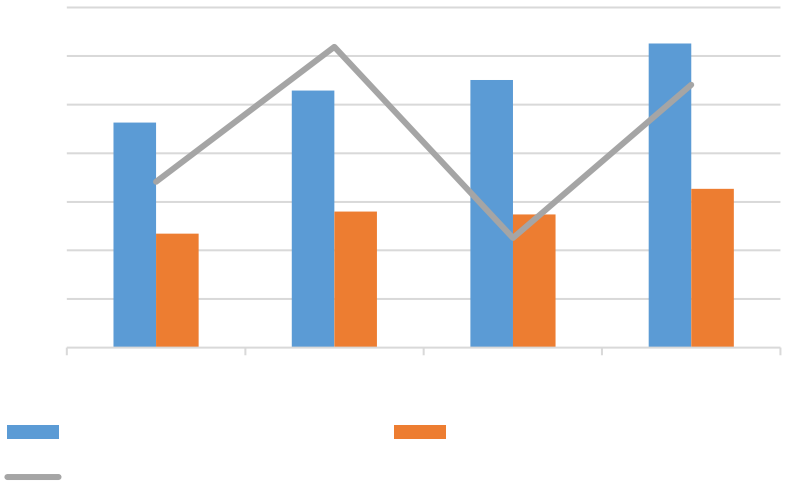
Operating credit institutions			
	01.01.16	01.02.16	01.03.16
CIs entitled to carry out banking operations, total	733	728	718
of which: - banks	681	676	665
- non-bank CIs	52	52	53
CIs with license (permit) granting them the right:			
- to take deposits of individuals	609	604	595
- to conduct operations in foreign currency	482	479	471
CIs with general license	232	231	229
- to conduct operations with precious metals	183	182	179

Source: compiled by the authors based on CBR data (http://cbr.ru/statistics/?PrtId=lic)

As can be seen from Table 2, there is a trend of decline in the number of credit institutions with the license granting the right to take deposits in 2016. This is due to the currently realized preventive policy of the Central Bank of Russia, aimed at reducing the level of risk in the banking business and the growth of confidence in commercial banks from customers.

The dependence of the level of interest rate on the deposit amount is common in banking practice, while the rate automatically rises during the term of the contract, if the deposit amount reaches the next threshold. For extra convenience of the depositors, both refill and partial withdrawal of money are allowed even for a fixed-term deposit, if the deposit amount does not cross the minimum amount established by the contract.

Figure 2 shows the share of retail deposits in the total structure of borrowed funds of banks. As of 01.01.2013, the share of household deposits in the structure of borrowed funds amounted to 50.7%, as of 01.01.2014 – 52.8%, as of 01.01.2015 – 49.7%, as of 01.01.2016 – 52.2%, available at: http://cbr.ru/statistics/UDStat.aspx?Month=03&Year=2016&TblID=302-22.

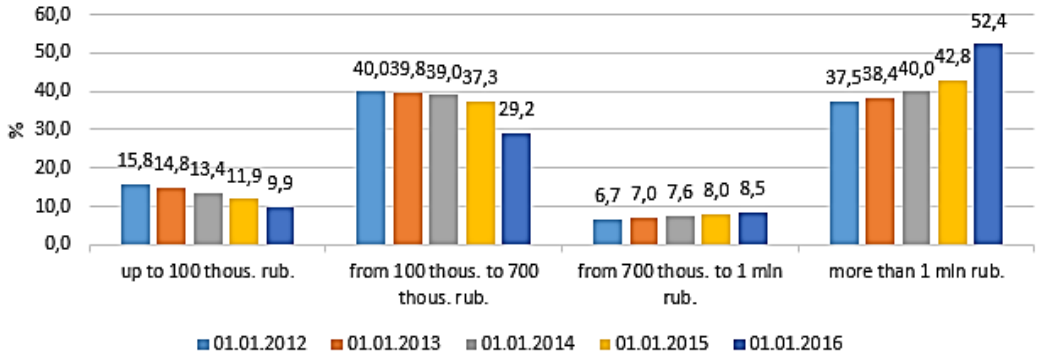


Source: compiled by the authors based on CBR data, available at: http://cbr.ru/statistics/UDStat.aspx?Month=03&Year=2016&TblID=302-22

Figure 2 – Share of retail deposits in the structure of customer funds, bln. rub

Figure 2 shows that an important source of funding of active operations of a commercial bank is borrowed funds, namely the funds of individuals, which requires commercial banks to conduct the active deposit policy and expand deposit operations. Deposit market is the main arena of competitive struggle for the money of the population.

Despite the crisis in the economy and falling incomes of the population, medium and large deposits grew the most actively in 2015. At year-end, the share of deposits from 100 thous. to 700 thous. rub. dropped from 37.4 to 29.2%; deposits from 700 thous. to 1 mln rub. increased their share from 8 to 8.5%; deposits of more than 1 mln rub. – from 42.8 to 52.4% of total deposits (Figure 3). As a result, deposits ranging from 700 thous. to 1 mln rub. and more than 1 mln rub. showed the largest increase over the year – 33.9 and 53.2% in terms of the amount and 29.6 and 78.6% in terms of the number of accounts, respectively, available at: http://www.asv.org.ru/agency/.



Source: compiled by the authors on the basis of the Deposit Insurance Agency data, available at: http://www.asv.org.ru/agency/

Figure 3 – Structure of deposits depending on their size, %

A similar trend (Figure 3) can be explained by the fact that bank deposits allow their holders to reduce losses from the effects of inflation and receive income in excess of the inflation rate component. On the one hand, investors receive a variety of banking products and the opportunity to place funds on terms that suit them the best in the current period. In turn, the diversity of existing types of deposits allows financial institutions to raise funds under the necessary and individual conditions for each bank.

3.2. Classification of factors influencing the formation of the conditions of offering the line of deposits to individuals

In our opinion, there are 3 groups of factors that influence the interest of individuals in opening deposits:

- functional, defined by the activities of the bank rendering services on placement of deposits;
- product, arising from the bank deposit policy;
- customer-related.

Let's consider each group in more detail. The totality of the factors of raising resources to the bank (Group 1) and their characteristics are reflected in Table 3.

Table 3 – Functional factors of the formation of borrowed funds of the bank

Factor	Characteristic
Interest rate policy of the Bank of Russia	The Bank of Russia may establish one or more interest rates for different types of operations or conduct interest rate policy without fixing the interest rate. The Bank of Russia uses interest rate policy to influence market interest rates. The key rate was introduced by the Bank of Russia as the main indicator of monetary policy on September 13, 2013.
Reserve requirements	The obligation to fulfill the required reserves occurs on the date when a credit institution obtains a license to conduct banking operations and is terminated with the withdrawal of the license to conduct banking operations from the credit institution.
Economic regulations of the bank activity	In order to regulate (limit) the risks taken by banks, the Bank of Russia uses numeric values and methodology for calculating the prudential supervision ratios (The Bank of Russia instruction dated 03.12.2012 #139-I "On prudential supervision ratios" (as amended on 07.04.2016)).
Deposit insurance system	Establishment of a system of compulsory deposit insurance (SDI) is a special state program implemented in accordance with the Federal Law "On insurance of individual deposits in the banks of the Russian Federation." Its main purpose is to protect households' savings placed in deposits and accounts in Russian banks in the Russian Federation. Protection of the financial interests of the citizens is one of the important social problems of the state. Deposit insurance systems are in place in more than 100 countries, including all member states of the European Community, the United States, Japan, Brazil, our closest neighbors – Azerbaijan, Armenia, Belarus, Kazakhstan, Ukraine. Currently, the SDI covers investors of 834 as of April 14, 2016, banks that are participants of the deposit insurance system, including: ▪ operating banks with a license to work with individuals – 578; ▪ operating credit institutions that used to take deposits but lost the right to raise individuals' funds – 6; ▪ banks in the process of liquidation – 250.
Banking competition	The market for deposit services provided to households is a segment of the retail banking market. The main buyers of resources are commercial banks. However, currently there is increased competition from credit consumer cooperatives and mutual funds that offer substitution products. The object of sale in the retail banking market is deposit services. Customer value (benefit) of a deposit service for the customer is saving and the accumulation of money. Deposit services are among the oldest and most traditional types of banking services. The unwillingness of the population to use the tools of the stock market (including due to the low level of economic knowledge) makes the bank deposits the main form of raising household savings.

Source: compiled by the authors

Let's consider the components of the 2nd group of factors – factors of the deposit product (product factors) resulting from the bank deposit policy. Banks are actively expanding the range of deposit products, increasing the number of outlets of retail sales of services, introducing new high-tech types of customer service. Deposit policy should be viewed as a set of its constituent elements (Table 4).

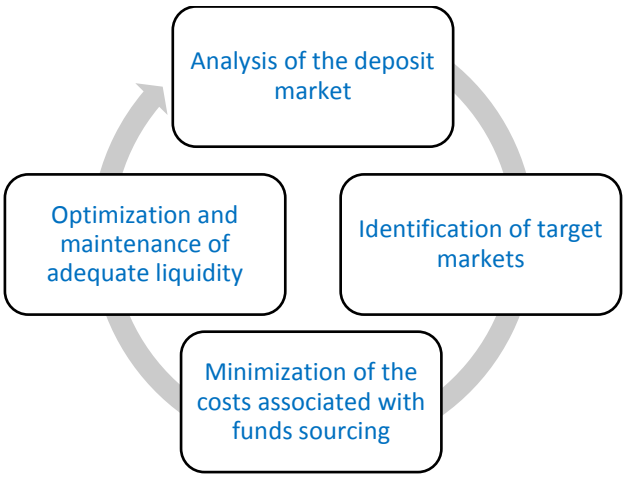
Table 4 – Constituent units of the deposit policy

Name of the unit	Constituent elements of the unit
Methodological	Principles of the deposit policy, objects of the deposit policy (borrowed funds of the bank and additional bank services (all-inclusive services); goals and objectives that contribute to the improvement of quantitative and qualitative indicators of commercial bank activities.
Functional	Elements of the deposit policy that describe its functions, order of their execution, bearing in mind that the bank deposits are managed, inter alia, to ensure an acceptable level of liquidity and profitability of the bank.

Name of the unit	Constituent elements of the unit
Instrumental	The set of methods, techniques, ways and means of achieving the objectives of the deposit policy, including the criteria for the quality of the deposit policy; types of deposit accounts of the bank's customers, etc.
Institutional	Subjects of the deposit policy: the bank's customers, commercial banks and public institutions.

Source: compiled by the authors using information Bukkhadurova M.N., 2012

For effective implementation of the deposit policy, each bank should conduct a set of necessary measures presented in Figure 4, taking into account its individual characteristics.



Source: compiled by the authors

Figure 4 – Program of the effective implementation of the bank deposit policy

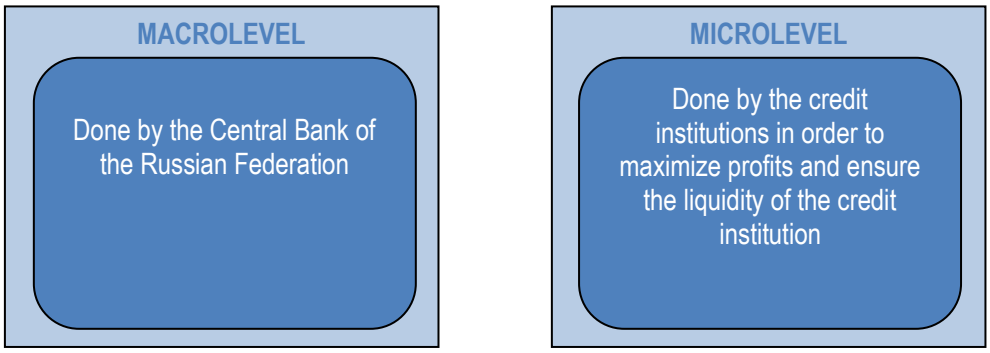
The third group of factors – client factors – are factors that influence individual behavior of an individual, which include the level of solvency of the population, the level of financial literacy, the needs of existing and potential customers in the deposit market; they especially clearly manifested themselves in Russia in a crisis. The dynamics of daily deposit growth shows that the savings activity of the population in 2015 was higher than the previous year. The growth of deposits in January-November 2015 was 8.8 bln rub. per day on average (in January-November 2014 it was 3.4 bln rub. per day).

According to the forecast of the Agency for Deposit Insurance, the total volume of deposits in 2016 will increase by 3.3-3.7 trillion rub. (14-16% in relative terms), reaching the range of 26.5-26.9 trillion rub. This forecast takes into account the possible slowdown in population income growth, the uncertainty of the exchange rate dynamics, and gradually decreasing (compared to 2015) level of interest rates on deposits. Another trend in 2015 is a gradual redistribution of deposits of individuals in favor of systemically important banks. The main beneficiaries were Sberbank and VTB structure. The share of the 30 largest banks by the volume of deposits increased from 79.2 to 81.7% in 2015, including the share of Sberbank of Russia increasing by 1 percentage point – from 44.9 to 45.9%.

3.3. Developing the model of formation of the bank deposit base as an active method of control over the bank deposit policy

Profitability is a key assessment of the results of any business, including banks. Since virtually the only objective constraint in profitability growth is the liquidity of the bank, this indicator actually measures the quality of bank management and its position in the competitive environment (Bondarenko, Isaeva 2014).

The most important performance indicators of bank management include management of the borrowed finances*, i.e.* efforts to establish and improve the structure of funds of credit institutions through sourcing from individuals and legal entities and/or other credit institutions. These efforts are aimed at maintaining the liquidity of both individual banks and the banking system as a whole. Bank deposits are managed on two levels (Figure 5):



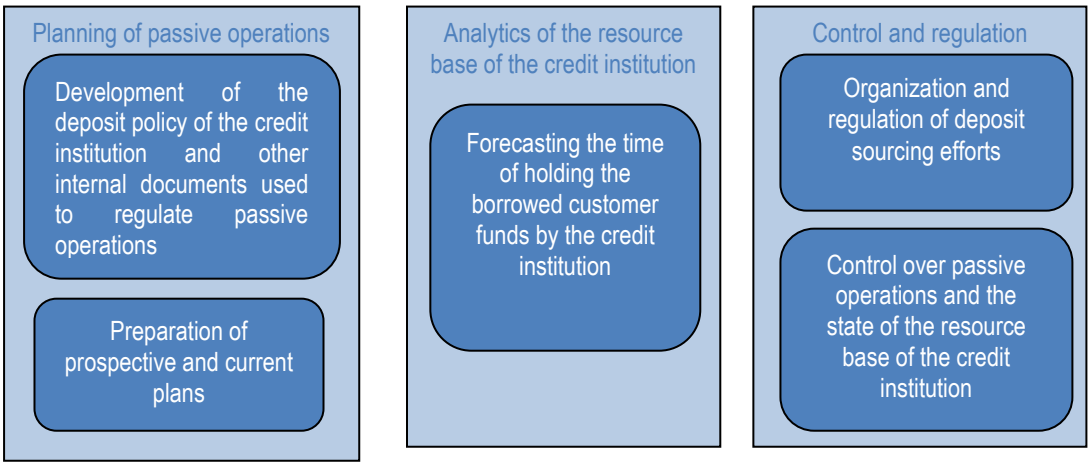
Source: compiled by the authors

Figure 5 – Levels of control over bank deposits

Measures for managing the customer bank deposits include the following operations (procedures) reflected in Figure 6, as follows (Markova, Sakhova, Sidorov 2013):

- planning of passive operations;
- analytics of the resource base of the credit institution;
- organization and regulation of deposit sourcing efforts and control over passive operations and the state of the resource base of the credit institution.

Conducting analytical work has the following purpose: to evaluate the credit institution as a whole and its individual departments and areas by comparing actual existing structure of deposits with the forecast data, the data for previous periods and with the results that have been achieved in other credit institutions. Materials and results obtained in course of analysis allow to identify positive and negative trends in the development of the credit institution, unused reserves, shortcomings in the planning and decision-making.



Source: compiled by the authors using data from Markova O.M., Sakhova L.S., Sidorov V.P., 2013

Figure 6 – Procedures of managing customer bank deposits

Economic methods of managing the borrowed resources of the bank are represented by three components, whose characteristics are given in Table 5.

Table 5. - Composition of economic methods of managing the borrowed resources of the bank

Name	Analytical methods	Marketing methods	Specific methods
Purpose	▪ assessment of the situation, identification of current issues and trends, determination of the need for adjustments to the bank's policy in the area of management of formation of borrowed resources	▪ study, diagnosis, stimulation of customers (actual and prospective)	▪ limitations, blockades
Feature of implementation in practice	▪ diversification of resources, funding, diversification of interest rates and other borrowing terms, tariffing, limitation, creation of "portfolios"	▪ creation of customer files, monitoring of the market for banking services, advertising, creation of the bank's image, ensuring accessibility and high quality of services, formation of integrated services	▪ limits on the account balance (size of the minimum balance), on the term of placement of funds, on the amount of payment, on the size of the initial and subsequent payments; ▪ introduction of blockades on debiting from the account

Source: compiled by the authors using data from Korobova G.G., 2014

The most important condition for economic and social development of any bank is a balanced system of active and passive operations both in the bank as a whole and in its branches and internal structural divisions. The current state of the resource base features numerous problems; these problems have extremely worsened in view of the global economic crisis in recent years.

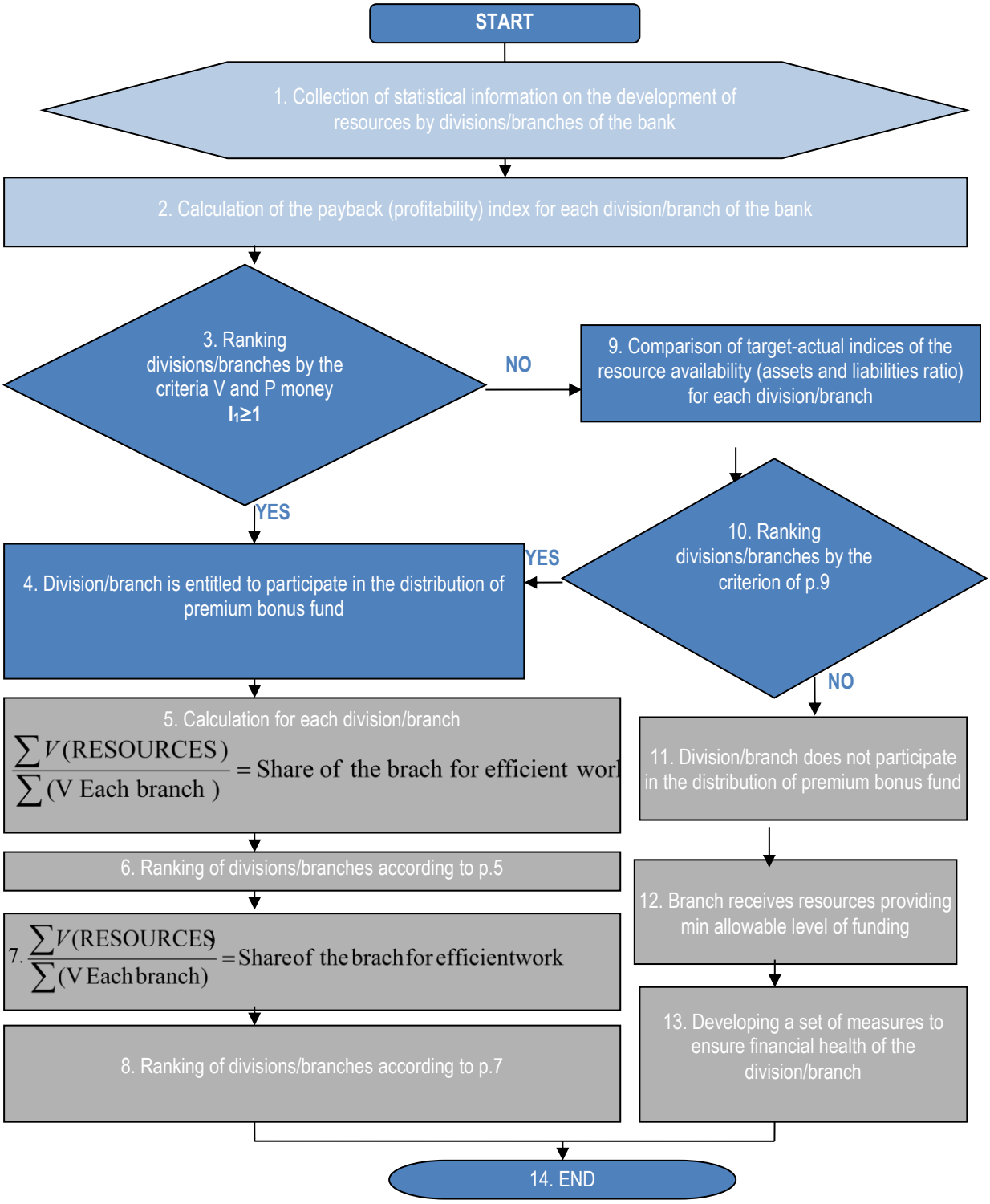
In a broad sense, the model of formation of the bank deposit base will be based on the principle of operation of credit institutions as the intermediaries in the money market. In this case, as shown in Figure 6, the banks will carry out a transit function in the movement of money from households and retail in payments for goods/services and raw materials to other market participants – legal entities and budget organizations, and in reverse order. It is important to emphasize that the payments and transfers enable the bank to operate with money free of charge within the settlement period. Level of the "settleability" of the money in this case is not predicted. However, the accounts of legal entities can be opened in the banks through which the transfers are made, and in this case the money can operate in the money multiplier for a significantly longer time, but on the basis of demand. However, the picture of "settleability" of resources significantly changes during the formation of the bank deposit base at the expense of funds of individuals, the value of money increases, the efficiency of the bank activity decreases.

Active methods should be used for motivation in terms of provisioning the resource base of banks with extra funds and simultaneous reduction of costs of raising and allocating them, that is, to ensure the growth of bank liquidity.

To do this, the authors developed and offered an algorithm of financial support for effective branches and internal structural divisions of the bank (in terms of raised volumes and value of resources on interbank interbranch market) during the formation of the transfer price relationships within one bank in the Russian Federation.

At the preparatory stage of the development of the algorithm of financial support of the efficient units (branches), it is advisable to take into account the pivotal regional issues, as currently there are serious imbalances and gaps in the financing of certain municipalities and regions of Russia.

Next, let's analyze in more detail the algorithm of distribution of premium/ bonus money from the central office of the Bank to its divisions and branches (Figure 7).



Source: compiled by the authors

Figure7 – Algorithm of application of the model for the formation of the bank resource base in the distribution of premium bonus fund

We collect statistical and financial information on the formation of resources by divisions/branches of the bank at the first step for further calculations. At this step, we need to prepare the following data: revenues of each division/branch of the bank (net of interbranch interbank transfers); expenses; population of the territory where the bank branch is located; average cost of living for the population.

At the second step, we make calculations for each division/branch of the bank involved in the formation of the resource base (an index of independence/payback/profitability).

The third step is the ranking of each division/branch, where the declared figures tend to a minimum by the price of resources and to the maximum by volume. In this case, these internal structural divisions (ISDs) are entitled to participate in the distribution of bonus fund – step 4. If the ISD has a negative comparison of target-actual indices of the resource availability (assets and liabilities ratio), it will lead to step 9 – with the identification of the causes of failure to achieve the targets.

If the ISD has not achieved the target, it does not participate in the distribution of bonus fund – step 11. These ISDs receive funds from the common fund of distribution of borrowed resources at step 12 to ensure the minimum allowable level of funding. At the same time, the financial departments (the head structure of the bank) participate in the development of measures for financial rehabilitation of these ISDs – step 13. If an error in the planning was found at step 10 for a group of ISDs, this group falls into the program of distribution of bonus funds and moves to step 4, where the division/branch is entitled to participate in the distribution of premium bonus fund. Step 5 involves calculating the share of the volume of borrowed funds for each division/branch, followed by the ranking at step 6. 7 and 8 steps duplicate steps 5 and 6, but the indices will be the prices of borrowed resources. The percentage of bonuses received at each reporting moment of time will depend on the achieved level of the branch and all branches in total.

This will allow to motivate employees of branches and internal structural divisions to work actively to search for and raise the cheapest resources for the necessary terms to the greatest possible extent.

4. Discussion

Despite the problems inherent to the banking sector in terms of formation (raising) and management of the funds raised from households, there are significantly more advantages of funds sourcing from these customers to commercial banks. Of course, some customers who are very disloyal to the banking business will not be satisfied with the lack of guaranteed income higher than the insured amounts of bank deposits, but nevertheless, it is the funds of individuals that have not only the right to exist in the funding market, but may also in the future take firmer positions on it due to the high settleability and predictability of the outflow on these resources. In Russia, the ongoing programs to increase the financial literacy of the population, including those conducted by the Central Bank of the Russian Federation, as well as geopolitical and economic stabilization, also contribute to this.

At present, almost any individual can choose the deposit product that will fit their goals in the best way, due to the variety of both price and non-price conditions of funds sourcing from households to deposits in the money market.

Along with the slowdown in inflation, acceleration of production growth, diminishing arrears of wages and pensions, the possibilities of commercial banks to raise resources from households will increase. At this moment of time, the deposit policy of any commercial bank in the field of sourcing will be aimed at maintaining/achieving a leading position in the market of retail deposits. In this case, savings of the population will remain the basis of the resource base. Banks should build up their resource base by offering new financial products for individuals developed on the basis of an assessment of macroeconomic parameters, regular monitoring of regional markets of deposits and services, level of demand for certain conditions on deposits.

The Russian banking business of the retail servicing of borrowed resources is in the dual state. On the one hand, the yield shown by some types of deposits is higher than the key rate without taking into account the rate of inflation, but on the other hand, indicators of the number of the commercial banks operating in the market are reduced, which may result in the fall of loyalty to the credit organizations and their products/services in the future, primarily from large investors.

Conclusion

The present study highlights the general trends of the formation, implementation and development of the bank deposit policies.

Currently, the market for deposit services is one of the most developed segments of the Russian retail banking market. Since the formation of this market in the Russian banking sector, it has been mainly focused on providing services to legal entities. The study of the authors suggests the possibility of consideration of public funds by commercial banks as the main source of the formation of stable resources. One such issue was considered by the authors in this article.

The most important condition for economic and social development of any bank is a balanced system of active and passive operations both in the bank as a whole and in its branches and internal structural divisions. The current state of the resource base of Russian banks features numerous problems; these problems have extremely worsened in view of the global economic crisis in recent years.

Three groups of factors have been identified and investigated in the process of research into the topic, which influenced the formation and implementation of the deposit policy of a commercial bank. The authors noted that the analysis of the factors influencing the bank deposit policy must be accompanied by an assessment of their effect on its operation, which involves the development (adjustment) of the economically reasonable pricing policy.

The authors analyzed and identified the main techniques and tools of managing bank deposits. The most important performance indicators of bank management include management of the borrowed finances, *i.e.* efforts to establish and improve the structure of funds of credit institutions through sourcing from individuals and legal entities and/or other credit institutions. These efforts are aimed at maintaining the liquidity of both individual banks and the banking system as a whole.

Methods of the bank deposit management, being the ways to influence the sources of raising the financial resources and relationships over the formation of the borrowed resource base, are used to implement strategic and tactical objectives of mobilizing financial resources.

Thus, when a bank chooses methods of managing borrowed funds, it must swiftly take into account the status of the overall economic situation in the country and the world situation in the planning of passive operations to be able to conduct the deposit expansion/restriction or placement of its excess reserves; develop effective territorial structure of the branches as channels for purchase/sale of resources; take the opportunity to provide additional (including non-banking) services into account in the pricing system to raise funds from customers. Properly selected methods of control over borrowed funds will enable the bank to maintain its stability with the use of the funds of CBR and other financial institutions in the domestic or international borrowed capital market.

Based on the research, the authors have identified the need to create a model of the formation of the bank deposit base, which would allow to take into account the contribution of each of its branches and internal structural divisions to increase motivation of raising cheaper and longer customer funds to deposits.

This study has developed an algorithm of financial support for effective branches or internal structural divisions of the bank (in terms of raised volumes and value of resources on interbank interbranch market) during the formation of the transfer price relationships within one bank in the Russian Federation.

To implement the steps of the algorithm of financial support for effective branches (divisions), it is advisable to take into account the pivotal regional issues, as currently there are serious imbalances and gaps in the financing of certain municipalities and regions of Russia. This will allow to motivate employees of branches and internal structural divisions to work actively to search for and raise the cheapest resources for the necessary terms to the greatest possible extent. In this case, savings of the population will remain the basis of the resource base. The developed model emphasizes that banks should build up their resource base by offering products for individuals with simultaneous calculation of the efficiency of their implementation, developed on the basis of an assessment of macroeconomic parameters, regular monitoring of regional markets of deposits and services, level of demand for certain conditions on deposits.

The hypothesis presented by the authors at the beginning of this work was confirmed. Of course, the methods and tools of deposit management described in this article are not exhaustive within the framework of the proposed model for the formation of the deposit base of commercial banks, while the presented list of indicator parameters of the algorithm of application of the model of formation of the bank resource base in the distribution of premium bonus fund is not ultimate. In the future, the authors are going to analyze other performance indicators of commercial banks operation and to examine the relationship of macroeconomic indicators and the capital market, confirming or refuting the hypothesis of their high correlation.

References

[1] Bondarenko, T.G. and Isaeva, E.A. 2014. Upravleniye rentabelnostyu raboty banka: kliyentooriyentirovannyy podkhod [Managing the Profitability of Bank Operations: Customer-oriented Approach]. *Bulletin of the Tver State University. Series: Economics and Management*, 4-2: 68-80.

[2] Bukkhadurova, M.N. 2012. *Depozitnaya politika kommercheskikh bankov vo vzaimootnosheniyakh s naseleniyem* [Deposit Policy of Commercial Banks in Their Relations with the Public], Ph.D. thesis, Financial University under the Government of the Russian Federation, Moscow, MI.

[3] Korobova G.G. 2014. *Bankovskoye delo [*Banking]. Moscow: Prospekt: 590.

[4] Markova, O.M., Sakhova, L.S., and Sidorov, V.P. 2013. *Kommercheskiye banki I ikh operatsii* [Commercial Banks and Their Operations]. Moscow: Dashkov and Co: 380.

*** Credit Banking Project. 2016. Available at: http:cbkg.ru/articles/vklady_v_inostrannykh_bankakh__top_10_samye_vygodnye_vklady_za_granicejj.html. (accessed 02.07.2016).

*** Federal Law of the Russian Federation "O bankakh I bankovskoy deyatelnosti" ["On Banks and Banking Activities"] of 02.12.1990 (as amended on 05.04.2016) #395-1.

*** Interest Rates and the Structure of Loans and Deposits by Maturity. 2016. Available at: http://www.cbr.ru/statistics/Default.aspx?Prtid=avgprocstav (accessed 02.07.2016).

*** Information about the Funds of Organizations, Bank Deposits and Other Borrowed Funds of Legal Entities and Individuals in Rubles, Foreign Currency and Precious Metals. 2016. Available at: http://cbr.ru/statistics/UDStat.aspx?Month=03&Year=2016&TblID=302-22 (accessed 02.07.2016).

*** Nekotoryye osobennosti razvitiya zarubezhnykh depozitnykh rynkov [Some Peculiarities of the Development of the Foreign Deposit Markets]. 2015. Available at: http://www.rusnauka.com/17_PN_2015/Economics/1_195236.doc.html (accessed 15.06.2016).

*** Registering and Licensing Credit Institutions. Available at: https://www.cbr.ru/analytics/bank_system/registr_licensing.pdf (accessed 02.07.2016).

*** The Bank of Russia Instruction "On prudential supervision ratios" of 03.12.2012 (as amended on 07.04.2016) #139-I.

*** Annual Report of the Bank of Russia for 2015. 2016. Available at: http://www.cbr.ru/publ/God/ar_2015.pdf (accessed 24.06.2016).

*** Annual reports of the state corporation "Deposit Insurance Agency". 2016. Available at: http://www.asv.org.ru/agency/ (accessed 02.07.2016).

*** Civil Code of the Russian Federation, Part 2, Chapter 44, Article 834 of 30.06.2016. Moscow: YUNITI.

Pricing and Estimation Aspects in the Construction Industry of Russia

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Abstract

Over the last century, the Russian system of pricing and estimation in the construction industry has become the most detailed regulatory system of tariffs and costs; today the system of estimation norms combines prices for technological blocks of construction works that involve both the manual labour and the most leading technologies. However, the bulk of the regulatory system requires intensive work to make tariffs closer to the current market price taking into account price changes in the labour market and in the cost of materials. The system has a number of problems, for example, regulatory norms of estimated costs in Russia do not correlate with the European system much, and the rapid growth of technologies does not allow to change technology maps into estimated prices. The creation of the information database of aggregated indicators of various levels and specification that is primarily based on the real performance indicator of work amount, labor intensity, materials and machines consumption requires tremendous effort. The continuity of cost calculations at various stages of the investment and construction process (investment stage, engineering, etc.), requires the development of mechanisms to level differences between estimate calculations carried out in different types of estimates, as well as the documentation on mutual settlement for the work performed in order to ensure the validity of the regulation and establishment of reasonable price limits for construction products. This article is devoted to the study of the problem of improving the system of pricing and estimation in Russia at the present stage of its development.

Keywords: investment-building complex, estimated pricing, value engineering, costing standards database.

JEL Classification: D40, L74.

1. Introduction

The construction industry is one of the well-financed industries in the economy. According to statistics, the annual expenditure of the federal budget on the capital construction is accounted for more than one trillion rubles; the industry employs over 218 thousand specialists.

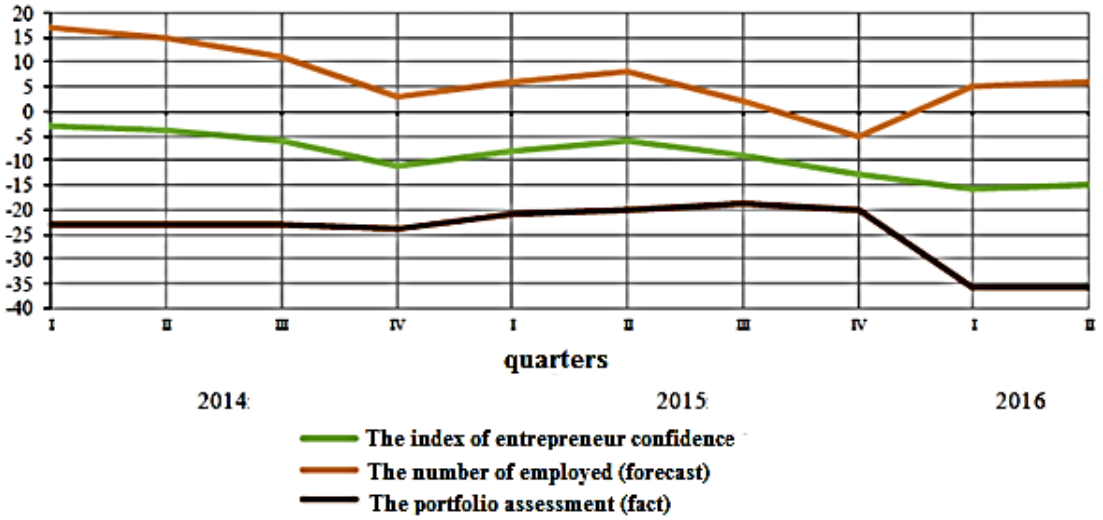

Figure 1 - The index dynamics of entrepreneur confidence in construction

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The business activity of construction organizations can be measured by the index of entrepreneur confidence in the construction industry. The index dynamics of entrepreneur confidence in construction are shown in Figure 1.

Construction volumes in 2016 are lower than in the previous year. Large organizations get more orders. This situation shows the decline in business activity in the construction industry. The employment in the construction industry in 2016 is lower than in 2015. This may indicate that small construction companies do not withstand competitive struggle and leave the market. The indicator "order portfolio" decreased by 16% in 2015.

The current economic crisis has led to a large-scale reduction in incomes of budgets at all levels. In this regard, the problem of pricing in construction has become one of the urgent tasks that needs to be solved because the rational use of budgetary funds used in the construction industry and the competitiveness of the national economy depend on the quality of its solution and as a result, how quick it will be possible to recover from the crisis.

The existing pricing system in the construction industry is practically not adapted to market conditions of the building complex operation and does not meet the principles of controlled autonomy of participants in investment and construction activities:

- there is inadequate accounting in the current cost standards database of numerous modern and foreign production technologies of construction works, new means of mechanization and transport, materials and equipment and the norms of necessary production and other kinds of costs;
- in conditions of market relations in Russian economy, there is no systematization of the methods and forms of pricing of construction products; assessment of work value that is based on the basic index method in the preparation of estimate calculations often leads to a distortion of the real costs of capital construction of objects;
- a modern monitoring system over a quarter of a century deals with very specific tasks of controlling only prices of material resources, which nomenclature does not always reflect the need for the construction industry.
- from the sphere of law and normative-methodical regulation the procedure "falls out" that deals with the formation of other types of construction costs, in addition to the estimated pricing, which will be determined by the customers (primarily by public ones) in the planning of capital investment, funding for the capital construction of objects, in payment procedures and reciprocal payment for work performed, etc.;
- moreover, with the transition to market relations in the construction industry, there are new kinds of costs that should be considered when working on the estimate documentation. They include, in particular, the cost of obtaining the source data, technical conditions, development and expertise costs of the tender documentation, as well as organizing and managing some competitions (Sayfullina 2011)

2. Methods

In conditions of the current economic system of Russia, the pricing in construction should be focused on market conditions and contractual relationships between the participants of investment and construction activity (Shindina 2007; Shindina 2006). Let us analyze the scheme of the relationship of participants in construction, where the investor becomes a customer – Figure 2.

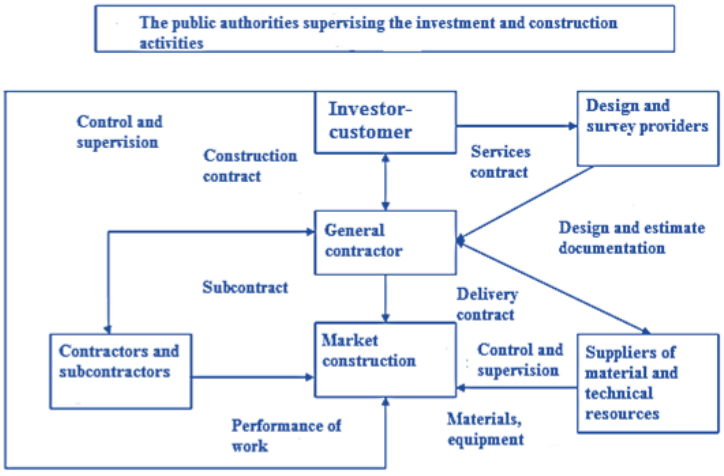

Figure 2 – The scheme of relationship of the subjects of investment and construction activity

Currently, in the Russian Federation the basis of pricing in construction is the estimated-normative base, which includes state estimated norms and other regulatory documents. None of the branches of material production have such system. Its development started in Soviet times, and it was based on a system of resources rationing in construction. This system has been developed for a centrally planned economy, therefore, at the present stage of the development of the construction industry in Russia it does not allow to form the basis for the formation of the contractual prices.

In accordance with the basic methodological document in pricing in construction MDS 81-35.2004 in Russia all estimated standards are classified according to the level of application and degree of consolidation (Ardziov 2003). According to the level of application, they are divided into State (Federal), territorial (TER), industry and individual. The choice of estimated standards depends on the location of the object and funding sources of its construction. Depending on the degree of consolidation estimated standards may be elemental and enlarged. Existing in Russia federal and territorial estimated standards are focused on element-by-element calculations, *i.e.* forming costs for certain types of construction and mounting, construction and repair and commissioning works (Agapiou *et al*. 1995, Bakhareva *et al.* 2015, Buzyrev *et al*. 2006, Fedorova and Shindina 2016, Popova 2003).

It is not quite possible to quickly identify the preliminary costs of the building or construction structure because today in Russia there is no system of aggregated indicators that are bound to construction projects or works.

Thus, one of the priority directions of the development of the system of estimate calculation and preparation techniques of estimate calculations is an adequate information base of aggregated indicators at various levels.

In Germany and the United States the system of estimated standards, which consists of general and elemental indicators of cost, is used at different stages of project management. For example, in order to define the upcoming costs of construction or renovation of an object the cost indicators that are bound to the type of building are applied. When working on the estimate documentation and determination of the estimated cost of construction and mounting works there are indicators that are bound to the constructive part. The cost indicators of individual works are used in payment for the work performed, although they can also be used in the formation of local estimates. These indicators are developed annually and they give information about the average cost of construction or reconstruction of an object in the country. {Foreign experience of determining estimated construction cost by Karakozova}

The unit costs are presented by costs of previously concluded contract, official statistics and data of annual guides (of the firms "Means", "Marshal & Swift" in the USA).

For example, the guide of the firm "Means" examines in detail all types of construction work and presents 50-60 thousand of unit costs on them, taking into account the cost of materials, labor, machinery, overheads costs and profit of the contractor (profit and overhead costs of the general contractor are counted separately). The expenditures on salaries of workers in the estimates are placed in the same standards according to which the administration of construction firms makes payment with workers. The aggregate costs of construction works contain approximately three thousand costs on buildings and structures.

3. Discussion and results

3.1. Resource method

Nowadays in the construction industry in the Russian Federation the estimating cost of works is based mostly on the basic-index method in the preparation of estimate calculations, which often leads to a distortion of the real costs of the capital construction of objects.

The basic-index method is based on the application of federal unit costs and territorial unit costs using conversion indices in current prices. The indexes are used to determine construction costs in current or forecasted prices. The main purpose of the index is to take into account the factors that lead to an increase in construction costs in relation to the baseline. The index is applied to the basic value of 2000 that is defined by unit costs *(*Ardziov 2003, Baloi *et al.* 2003, Buzyrev *et al*. 2006 - Methodology of the construction output valuation in the Russian Federation).

The analysis of indexes reported by the Ministry of Construction shows that they do not fully take into account the changes in the present value of resources. Moreover, a list of resources, costs of which are reported by the authority of the Russian Federation (organization), seems to be insufficient and their cost is incorrect, because at the federal level there are no methods for the estimated cost of construction resources calculation according to the current price level and each subject of the Russian Federation establishes this order independently.

In terms of market functioning of the construction complex the resource prices (material, labour, technical), equipment prices form and manage the market, rather than a system of ratios and indexes.

3. 2. Monitoring

The building complex needs to be provided with the information concerning the actual cost of works and it should be realized through the creation of a unified open information system (national system of price information/regulatory and price information portal). It will contain the actual information about the prices of building materials, the cost of technical and human resources throughout the country taking into account the territorial specific features. In Figure 3 there are basic price norms, so one can calculate the indicators of estimated construction cost.

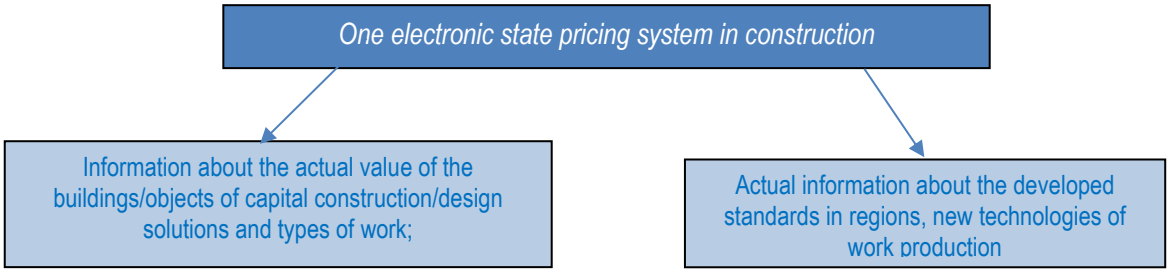

Figure 3 - The composition of information of one electronic state pricing system in construction

The establishment of a national system of price information will allow us to solve the problems (Gumba *et al.* 2014, Golubova 2010):

- to achieve "transparency" of price market of construction works, including material resources;
- to ensure the real open pricing mechanism – from the price of materials, products and structures through the cost of works to the actual cost of capital construction of objects;
- to make it possible for contractors to make decisions together with the customer at the stage of contract negotiations and performance of construction works;
- to provide fiscal authorities with a good basis for monitoring.

The formation of the information base must be done according to the principle of globalization along with regional pricing authorities, self-regulatory organizations and others.

3. 3. Engineering

The development of pricing system should cover the entire investment and construction process and be based on the establishment of one normative and methodical approach towards the cost formation of construction at various stages, including:

- capital investment planning aimed at the capital construction of objects;
- preparation of project documentation and its expertise in the capital construction of objects;
- state procurement of construction works and certain types of work;
- capital construction of objects;
- operation of objects of capital construction;
- maintenance of capital construction.

The system of cost formation in the investment and construction process is presented in Table 1.

Table 1 - Cost formation

Stages of investment and construction project	Types of cost	
Investment planning	Preliminary assessment of viability/feasibility of the project	Investor
Business – planning	Integrated calculation of cost/preliminary estimates	Investor. Customer
Engineering Design, technical and economic feasibility Project approval by state authorities	Estimated cost of construction	Investor. Customer
Resource planning	Initial price of the contract Price of the contract	Customer. Contractor
Performance and approval of construction and mounting works by state authorities	Actual construction price Forecasted cost of construction	Contractor
Management and operation of real estate objects Object commissioning	Cost of capital and current repair	Users

The development of modern pricing system extends the "usual" borders of estimated pricing, extending its effect not only on the development of the estimates at the design phase but also on the determination of the value of construction materials at other stages of the investment and construction process (Methodology of the construction output valuation in the Russian Federation, Mochtar and Arditi 2001, Popova 2003).

Due to this, it is necessary to develop a system of a new level – the system of construction cost engineering, which combines the preliminary assessment of investment costs, estimated pricing, contract pricing, and system of actual construction costs which allows connecting these processes when managing them.

A set of methods and tools for managing the cost of the investment project at all stages of its viability, the procedure of transition from one kind of value to another, expertise processes and cost control are the essence of the system of value engineering (Value/Cost Engineering): the development of construction pricing must be carried out through a transition to a system of construction cost engineering as an independent type of the professional activity. The value engineering system includes the following processes: development of project budget (budget planning), efficiency assessment of capital investment (investment assessment), estimated pricing, examination (validation) of the estimated cost of construction, construction cost, rationing, cost control of the operation of the project, analysis of actual costs (construction costs).

Conclusion

The main suggestions for the improvement of the national methods of construction cost calculation taking into account the advanced foreign experience are the following:

- to conduct a general comparison of all national collections with foreign ones according to all standards. Thus, according to the results of the comparison, it is necessary to get rid of outdated standards;
- to continuously improve the element, estimate normative base, which takes into account a variety of construction technologies, regional peculiarities, new construction machinery, means of mechanization, materials, designs and equipment; to form their nomenclature only according to those standards that are actually used and correspond to the technological equipment of construction companies;
- to ensure the continuity in the calculation of the cost at various stages of the investment and construction process (investment stage detailed design, etc.), so that the differences between the estimates carried out in different types of estimate documentation, as well as documentation for reciprocal payment for the work performed and services do not exceed reasonable limits;
- to establish the information database of aggregated indicators at various levels that are based primarily on the real indicators of physical volumes of work, labour intensity, material consumption per unit of power of building production among objects, representatives, and regions.

References

[1] Agapiou, A., Price, A. D. F. and Mccaffer, R. 1995. Planning future construction skill requirements: understanding labour resource issues. *Construction Management and Economics*, 13(2): 149-161.

[2] Ardziov, V.D. 2003. Pricing and estimation in construction. St Petersburg: Piter.

[3] Bakhareva, O. V. *et al.* 2015. Infrastructure in the Region: Long-Term Investments of Institutional Investors in Russia. *Journal of Advanced Research in Law and Economics*, 3(13): 488.

[4] Baloi, D. and Price, A. D. F. 2003. Modelling global risk factors affecting construction cost performance. *International Journal of Project Management,* 21(4): 261-269.

[5] Buzyrev, V. V., Suvorova, A. P. and Ammosova, N. M. 2006. The basics of pricing nd estimation norms in construction. Rostov-on-Don: Feniks.

[6] Fedorova, S.F. and Shindina, T.A. 2016. On the Building Information Modeling of Capital Construction Projects Market Development. *Journal of Internet Banking and Commerce*, 21(S3): 1-29.

[7] Golubova, O.S. 2010. Pricing and estimation in construction. Minsk: Registr.

[8] Gumba H.M., Ermolaev E.E., Uvarova S.S. 2014. Pricing and estimation in construction. Tutorial and Workshop. Yurayt.

[9] Mochtar, K. and Arditi, D. 2001. Pricing strategy in the US construction industry. *Construction Management & Economics*, 19(4): 405-415.

[10] Popova, E.N. 2003. Project design and estimation. Rostov-on-Don: Feniks.

[11] Sayfullina, F.M. 2011. The optimization of the pricing mechanism in the system of investment development of the innovation and construction complex. *Contemporary Problems of Economics and Law*, 9: 12-16.

[12] Shindina, T.A. 2006. The aspects of treaty relations in the construction industry. Bulletin of SUSU. Series *Market: Theory and Practice*, 15(70): 138-143.

[13] Shindina, T.A. 2007. The organization of relationship in the construction sector: cluster management system. Chelyabinsk: Publishing house of SUSU.

[14] Usmanova, N.V., Shindina, T.A. and Basharina A.V. 2015. Development and Assessment of Interactive Teaching Approach Impact on Communicative Competence of Bachelors of Economic Universities. *Procedia-Social and Behavioral Sciences,* 214: 729-738.

*** Methodology of the construction output valuation in the Russian Federation (Approved by the Russian Construction Committee resolution MDS 81-35/2004 # 15/1 05.03.2004).

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The Role of Human Capital in the Creative Economy in the Košice Region

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Abstract

The concept of the creative economy has adopted a main role in society. If the Slovak Republic wants to remain competitive in this changing global society, it needs to prepare programs or initiatives for creativity, innovation and attracting quality human capital. The aim of this paper is to analyse the issue of human capital in a selected creative industry (in this case the design industry) in the Košice region. The research focuses on the evolution of the design industry in the region as well as on the determination of localization factors. This article relies on qualitative and quantitative research to explore the complex relationships, mechanisms and movements about human capital in the creative industry in this region. The research questions focus on what localisation factors explain the existing design industry in Košice and what the main requirements and opportunities are for the development of human capital in this industry. The research mainly focuses on the educational factor. This is found to be the most important factor given that it forms and shapes the creative class.

Keywords: human capital, creativity, creative economy, creative class, creative industry, regional resilience.

JEL Classification: R58, I21, Z18.

1. Introduction

Human capital has been an issue in a number of studies in all countries (Schultz 1961, Becker 1997, Edvinsson and Malone 1997, Sveiby 1997). The claim that the growth of cities is related to human capital can be dated back to Jacobs (1961). Schultz (1961) has also shown that human capital is the accumulation of labour, knowledge and skills applied to productive activities. It is the key element of intellectual assets and one of the most important sources of a firm´s sustainable competitive advantage (Cabrita and Bontis 2008, Edvinsson and Malone 1997). The importance of human capital has also been presented by other authors in their studies (Chang and Lai 2008, Ondrejkovič 2011, Murgaš 2008). According to Dakhli and De Clercq (2004), human capital is embodied in people´s skills, knowledge, and expertise which can be improved primarily through education and work experience. This paper is divided into several parts. The first part contains a summary of the theoretical background about human capital in the creative industry. The second part focuses on the research methodology while the third part presents the results of the research in the Košice region. The final part provides a conclusion as well as some recommendations for the future.

2. Theoretical Backgrounds to the human capital in the creativity industry

The concept of human capital is strictly connected with the educational attainment of people (Becker 1964; Cabrita and Bontis 2008). On the contrary, the concept of the creative class relates to a person´s occupation. Faggian *et al.* (2014) describe human capital as normally being measured by years of schooling, embedded in each individual and can be seen as more of a "stock". On the other hand, the creative class is more of a "fluid" concept. People can enter or exit a creative occupation at any point in time. Therefore, the creative class resembles a flow rather than a stock. Human capital theorists (Becker 1964, Glaeser 2005, Mincer 1974) argue that concentrations of educated individuals, along with training, will produce high levels of long-term economic growth. Early proponents of human capital research argued that if individuals acquired more education, they would receive a higher rate of return via their wages (Becker 1964). They argue for the importance of human capital in public policy by writing that "education is widely viewed as a public good, which increases the efficiency of economic and political factors while hastening the pace of scientific advancement". The conclusion of these models is that the key to regional growth lies not in reducing the costs of doing business, but rather in concentrating a critical core of highly educated and productive people (Yigitcanlar *et al.* 2008, 45) On the other hand, Davidsson and Honig (2003) have argued that formal education does not seem to be the determining factor of success throughout the business process or in terms of the gestation of activities.

According to Madsen *et al.* (2003), human capital can be divided into general human capital and specific human capital. General human capital refers to a general capability derived from formal education while specific human capital refers to a specific capability derived from industry knowledge, experience, training and skills. With

regard to general human capital, the absorption and transfer of knowledge are influenced by the general knowledge of the individual learner (Wang *et al.* 2009). A formal education provides a foundation of general knowledge to absorb new tacit marking knowledge. Entrepreneurs with greater general human capital are usually in a better position to recognize and value new external knowledge (Carter 1989).

Table 4 - Human capital definitions

DEFINITION	RESEARCHERS
Combined knowledge, skills, innovativeness and ability of company´s individual employees to meet the task at hand	Edvinsson and Malone (1997), Johnson (1996) Subramanian and Youndt (2005), Ondrejkovič (2011)
The capacity to act in a wide variety of situations to create both tangible and intangible assets	Sveiby (1997)
Comprises the individual´s education, skills, values and experiences	Becker (1975), Mincer (1970), Cabrita and Bontis (2008), Writh *et al.* (1995), Becker (1975), Mincer (1970)
Denotes the tacit knowledge embedded in the minds of the employees. Employees generate IC through their competence, attitude, motivation and intellectual agility.	Chang and Lai (2008)
The knowledge, skills, competences and other attributes embodied in individuals that are relevant to economic activity.	OECD (1998)
Human capital = school education	Gould, Ruffin (1995); Benhabib, Spiegel (1994)

Source: Mehralian *et al.* (2013)

Florida (2002) has advanced the idea by replacing the concept of human capital, as the source of economic growth, with the construct of creative capital. Creative capital differs from human capital in a few respects. Firstly, it specifies more closely the quality of better labour essential for higher productivity and growth. The second distinctive dimension for creative capital is quality of place (Florida 2002, in Yigitcanlar 2008). Batabyal and Nijkamp (2010) have argued that it is important to see the differences between the concepts of human capital and the creative class. Glaeser (2005; in Batabyal and Nijkamp 2010, 242), has suggested that there is little or no difference between these concepts. In his words, "creative capital equals human capital, as most, if not all, members of the creative class are skilled and highly educated individuals". On the other hand, Marlet and Van Woerkens (2007; in Batabyal and Nijkamp 2010) have argued that the notion of creative capital is a broader concept than the notion of human capital. Florida (2003) has noted that creative capital begins most fundamentally with the people that he calls the "creative class". The creative class is identified as the group of individuals who are either highly educated or engaged in creative, *i.e*. scientific, artistic or technological types of activities (Florida 2002, 2005) and translate their creativity into economic returns (Florida 2005). The process of value creation in the creative industries consists of these main steps: idea creation, research and development, production, and distributions that are facilitated by the creative workers. Townley *et al*. (2009) has suggested that research in the creative industries may be considered in relation to the capital that informs its domain; human capital (creative ideas), social capital (networks), and organizational capital (recognized authority or expertise) which all explore the role of organizations in producing, processing, and managing creativity. Townley *et al.* (2009) has pointed out that human capital refers to employees´ knowledge, skills and experience. On the other hand, social capital contains the knowledge embedded in interactions among individuals and their network of inter-relationships, including internal relationships with employees and external relationships with customers, suppliers, and so on.

Therefore, it seems that the mapping of the creative industries and the main role of human or creative capital faces many difficulties in terms of definitions, methods of collecting data and how to implement the results of any subsequent research.

3. Research methodology

The creative industries have become the subject of an increasing amount of research and theoretical development (Landry and Bianchini 1995, O´Connor and Wynne 1996, Robinson 2001, Matheson 2006). Many researchers have theorized about the importance of the creative industries and also on its definition. The term creative industries have been described differently by Florida (2002), UNCTAD (2010), DCMS (1998) in addition to

a number of other researchers (Garhnam 2005, Wiesand and Söndermann 2005, KEA 2006, 2009, UNESCO 2006). For UNCTAD (2008), creative industries are "centered but not restricted to arts and culture. They can be tangible products or intangible services with creative content, economic value, and market objectives. It can be defined as the "cycle of creation, production, and distribution of marketable products or services using creativity as primary input"." The classification of creative industries can be divided into four broad categories; cultural heritage, arts, media and functional creations (UNCTAD 2008). UNESCO (2013) has applied the term creative industries to a much wider productive set, including goods and services produced by the cultural industries and those that depend on innovation, including many types of research and software development. The definition of the creative industries by DCMS (1998) is "industries which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property". In this study, the "Creative Industries" approach with the definition of creative industries by UNCTAD (2008) will be followed. Table 2 shows the different classification systems and their implications between the broad categories in the cultural and creative industries (UNESCO 2013).

Table 2 - Cultural and Creative Industries

DCMS Model	Symbolic Texts Model	Concentric Circles Model
Advertising Architecture Arts and antiques market Crafts Design Fashion Film and video Music Performing arts Publishing Software Television and radio Video and computer games	*Core cultural industries* Advertising Film Internet Music Publishing Television and radio Video and computer games *Peripheral cultural industries* Creative arts *Borderline cultural industries* Consumer electronics Fashion Software Sport	*Core creative arts* Literature Music Performing arts Visual arts *Wider cultural industries* Heritage services Publishing Sound recording Television and radio Video and computer games *Related industries* Advertising Architecture Design Fashion *Other core cultural industries* Film Museums and libraries
WIPO Copyright Model	**UNESCO Institute for Statistics Model**	**Americans for the Arts Model**
Core copyright industries Advertising Collecting societies Film and video Music Performing arts Publishing Software Television and radio Visual and graphic art Interdependent copyright industries Blank recording material Consumer electronics Musical instruments Paper	Industries in core cultural domains Museums, galleries, libraries Performing arts Festivals Visual arts, crafts Design Publishing Television, radio Film and video Photography Interactive media Industries in expanded cultural domains Musical instruments Sound equipment	Advertising Architecture Arts schools and services Design Film Museums, zoos Music Performing arts Publishing Television and radio Visual arts

DCMS Model	Symbolic Texts Model	Concentric Circles Model
Photocopiers, photographic, equipment Partial copyright industries Architecture Clothing, footwear Design Fashion Household goods Toys	Architecture Advertising Printing equipment Software Audiovisual hardware	

Source: United Nations/UNDP/UNESCO (2013)

All of these classifications describe similar subcategories such as advertising, film and video, music, publishing, arts, software, TV and radio, architecture, design. Design will be the object of interest in the current study.

4. Previous research

The importance of human capital for economic growth and development has long been recognized. The link between human capital and growth was formalised by Lucas (1988 in Faggian, Comunian, Cher Li 2014, Glaeser 2000) in what became a very well-known model of endogenous growth. Barro (1991) and Simon (1998) (in Florida, Mellander, Stolarick 2007) have all confirmed the relationship between human capital and growth at a national level). An earlier empirical study by Bantel and Jackson (1989; in Mehralian *et al.* 2013) confirmed that more innovative firms are managed by well-educated people who are diverse according to their professional tasks. Marvel and Lumpkin (2007; in Mehralian *et al.* 2013) have concluded that there is a positive association between radical innovations and their level of human capital measured in the form of formal education and knowledge of technology. A study by Felício, Couto and Caiado (2014) focused on small and medium-sized (SME) Portugese firms across various business sectors with the exception of the financial sector. The selected firms employed between 10 and 250 persons and data was collected by questionnaires. The results of this research argued that human capital in all its complexity determines organizational performance. Manzoni and Volker (2013) adopted an inductive qualitative research approach, based on the roadmap proposed by Eisehardt (1989). It consisted of doing case studies with professional service firms in architecture. The research involved 38 semi-structured interviews with 15 Italian architects, 16 British architects and 7 Dutch managing partners and architects. In another study, Kembaren, Simatupang, Larso and Wiyancoko (2014) focused on how design drive innovation from the management perspective is implemented in the Indonesian creative industry. In order to identify the critical variables, an exploratory case study was used (Yin 2003; in Kembaren, Simatupang, Larso and Wiyancoko 2014). Hoyman and Faricy (2008) indicate that human capital is also correlated with job growth and the influx of young educated workers. They have found that communities with high intellectual capital – as measured by the density of research universities – along with human capital were significantly related to both average wage growth and average wages in an MSA. For them, human capital is more of a long-term strategy than the creative class strategies. Florida (2002) also used qualitative research and focus groups to improve understanding of the structure and mechanism of the relationship of concentrations of bohemians to concentrations of human capital and to clusters of high-technology industries.

The research on the creative industries in the Slovak Republic is in progress. So far, the empirical evidence has primarily focused on measuring the region's creativity using the Creativity Index (CI). The most convincing work with regard to this is by Kloudová (2008). She has modified the creativity index of Florida (Florida and Gates 2001) for the social and economic conditions of the Czech Republic. The creativity index consists of the 3T – tolerance, technology and talent for each region. The Creativity Index was simplified by the author because of the unavailability of some statistical data. A similar method was used by Petrikova, Vaňová and Borseková (2015) in their article "The role of the creative economy in the Slovak Republic". The data used in their research were provided by the Slovak Statistical Office and Eurostat in 2009 at the regional level. Their research confirmed that there are crucial disparities among the Slovak regions according to the creativity index and that creative people are concentrated in the more developed regions of the Slovak Republic. The Bratislava region was identified as the most developed region with the greatest creative potential and highest concentration of creative people. The rest of Slovakia is characterised by the immigration of the work force to these regions.

Murgaš and Ševčíková (2011) used the methodology of Hui *et al*. (2005) and Florida (2002) for the calculation and comparison of the creativity potential in the Slovak regions. Hui *et al*. (2005) prepared a creativity index which consists of 88 indicators grouped into 5 sub-indexes. The hypothesis about the different results of two different indexes was only partially confirmed.

The original Florida 3 T model was modified for the European environment as the Euro-Creativity Index (Florida, Tinagli 2004). This model was mostly focused on technology, patents and so on. In addition, KEA European Affairs established a novel, reputable statistical framework for measuring the interaction of diverse factors that contribute to the growth of creativity in the European Union. They prepared a European Creativity Index (ECI) which was applied to the Slovak environment by Hudec and Klasová (2016) in the "Slovak Creativity Index – A PCA Based Approach". The results of their research confirmed the hypothesis about the impact of urbanisation on providing attractive conditions for the creative class, talent and creative industries. The Human Capital sub-index shows the highest level of creative talent in the Banská Bystrica region in terms of the variables regarding students in arts and culture and number of cultural employees.

A report by Šipikal and Szitásiová (2014) presented the results of the project "Creative economy – national and regional conditions and stimulus" in the Slovak Republic. They analyzed the existing need for support and existing support for creative industries in the field of education and labor force development in Slovakia in general.

5. Results and discussion

The current research is divided into three parts. The first part focuses on the identification of the districts, where the design industry is concentrated in the Košice region. For this empirical analysis, 2013 - 2014 regional level data from the Slovak Statistical and Financial Administration Bureau of the Slovak Republic was used. For the second part, data was collected from entrepreneurs with the aim of analysing the creative industries in the selected region from their point of view. All of the research was done through sectorial and regional case studies of different creative sectors (advertising, architecture, fashion, design, performing arts and information technology) in the Žilina region, Košice region and Nitra region under the project "Creative economy – national and regional conditions and stimuli". The whole project team conducted more than 100 interviews with the owners of creative companies. However, this article will only concentrate on the design industry in Košice.

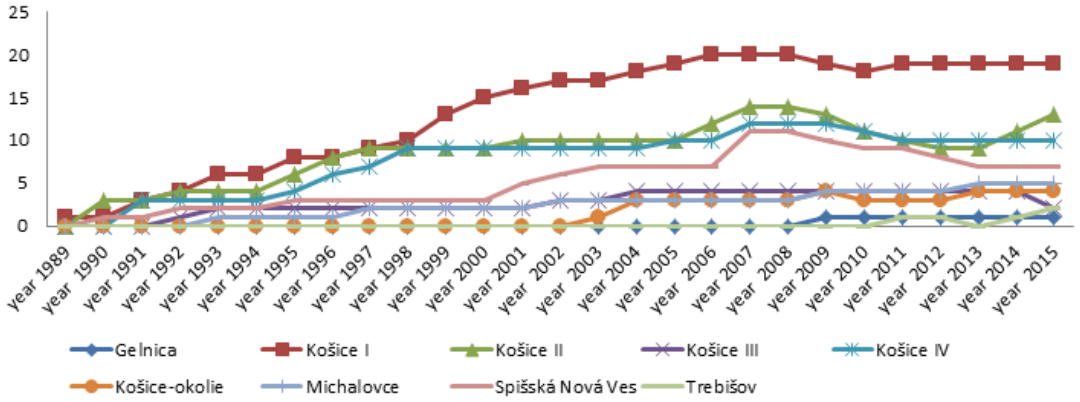
The third part of the research focuses on human capital and their needs as future potential creative workers. The aim of this part is to analyse and understand the process of human capital creation during their time studying at university.

The key limitations in this article are the use of a survey tool to generate a sufficiently adequate volume of data that can be utilised in qualitative and quantitative research and sample size of the respondents.

5.1 Empirical Analysis of the design industry in the Košice region

The situation in the design industry has been analysed by a few researchers. Balog *et al.* (2014) analysed the situation of the creative and culture industries in Slovakia from 1990 to 2010. Their research was conducted on the basis of 12,936 firms´ legal persons of the 39 industries, which have been grouped into 11 categories According to their research, it seems that the highest share of companies in the cultural and creative industries (out of the total number of companies) is in the Bratislava region (7.8%) Trnava region (3.3%) and Košice region (3.3%). On the other hand, the lowest share of these companies is in the Prešov region (2.2%) and Žilina region (2.3%). Their study focused on the theoretical and practical background of the creative and cultural industries in the Slovak Republic. They analysed industries such as architecture, design, advertising, film and video, software, publishing, music and visual arts.

A team of researchers at the Technical University in Kosice analysed the situation of selected creative industries, especially architecture, advertising and digital media in the Košice region for a project proposal (Buček *et al.* 2015). Following this project, the situation in other creative industries was analysed. In particular, the design industry was examined in greater depth. Balog *et al.* (2014) has noted that the development of the design industry in the Slovak Republic was significantly lower in the early 1990s. However, the situation became much more dynamic after 2001 peaking in 2007 and 2008, when 20% of all firms in this industry started up. The establishment of companies rapidly decreased after 2008 which shows the sensitivity of the industry to negative economic developments or a crisis. A similar situation was found in the Košice region. The design industry increased until 2007/2008, but subsequently dropped in all districts as shown in Figure 1.



Source: Compiled by author based on data taken from Slovak Statistical and Financial Administration Bureau of the Slovakia

Figure 1 - Development of the design industry in Košice region (absolute values)

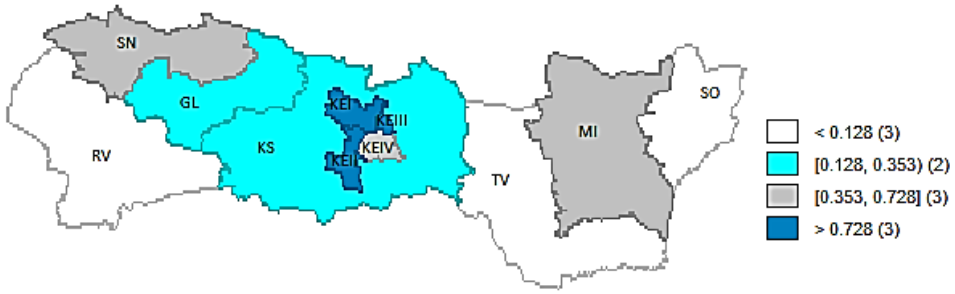
Creative industries have a tendency to cluster and to exploit agglomeration and urbanisation economies (De Propris *et al.* 2009). Creative firm agglomeration at the Local Administrative Units- LAU4 was analysed especially in the Košice region. Standard location quotients (LQ) were used as an indicator of industrial agglomeration in the given geographical unit of analysis (De Propris *et al.* 2009; Hudec, Klasová 2016) It is defined mathematically as

$$LQ = \frac{\frac{FCS}{FREG}}{\frac{FCSSR}{FSR}} \quad (1)$$

where: FCS stands for the number of creative firms in a given region (region consists of districts); FREG stands for the total number of firms for all sector in that region; FCSSR stands for the total number of creative firms in Slovak Republic; FSR stands for the total number of firms in Slovakia.

The LQ measures, for a given unit of geographical analysis, whether there is an agglomeration of creative firms which is larger than the national average. The relative highest value of LQ indicates relative specialisation in that sector for that unit of geographical analysis.

For the purpose of this article, the specialisation was indicated when the LQ was in the 0.728 – 1.15[1] scale. The "number of firms" was used as the measure of specialisation because it was necessary to establish the presence of creative clusters in a geographical area. It is aligned with the focus of established cluster definitions as the presence of groups of firms in a place as evidence of potential clustering (De Propris *et al.* 2009). To use of LQ as indicators of creative cluster presence does, however, present its own limitations. There are limitations such as the relevance of a geographical level of analysis and the limited database of the firms (there are more self-employees and small firms in this kind of creative industry). Data from the Financial Administration Bureau of the Slovak Republic was used and GeoDA was used for the data processing.



Source: Compiled by author based on data taken from Financial Administration Bureau of the Slovak Republic

[1] A lot of authors indicated different scale of localisation quocient, *e.g.* De Propris *et al.* (2009) was written that if the LQ is greater than 1, this means that the agglomeration is greater than the national average, which indicates relative specialisation in that sector for that unit of geographical analysis. Pavelková *et al.* (2009), Štofková and Štofko (2007) indicated specialisation if the LQ is higher than 1, 2; Skokan (2012) was written that the LQ in scale 0,85 – 1,15 is usefull for the practice. We modified for the purpose of this article with the limitation of the usefull data.

Map 1: LQ in Košice region for the design industry for year 2014

The dark blue represents a high level of concentration in Košice I (LQ was 0.95), Košice III (LQ was 0.85) and Košice II (LQ was 0.74). The LQ with a lower value is indicated in the district Košice IV (0.69), Spišská Nová Ves (0.49) and Michalovce (0.35). In other districts the value of the LQ was very low: Košice okolie – 0.29; Gelnica – 0.27.

The results of this method show that the design industry as a creative industry is located in the "heart/centre" of the Košice region. This is determined by the localisation factors which should be highlighted by the respondents during the qualitative and quantitative research.

5.2. Qualitative research

The study identified 62 companies through the classification SK NACE in the group 74.10 Design in the Košice region from the ELIS database. The qualitative research was carried out in the Košice region. The main barriers of this research were the limited information about the companies and missing contacts. There were 12 companies contacted although 4 companies refused to participate in the survey. The structure of the interview was divided into several themes. The first part of the interview was focused on the main characteristics of the company's activities. Only three of companies employ more than 2 persons. These entrepreneurs mainly have customers from the Košice region and Eastern Slovakia (75%). Around 37.5% of the respondents export their products to foreign countries. One of the most interesting aspects explored in this research focused on the participant´s perception of whether they used to improve their qualifications. The second theme of the interview was focused on their individual motivation and also on their education. All of them had a university degree in the field "design". Five of them had attended the Technical University in Košice and three respondents had graduated from the Academy of Fine Arts and Design in Bratislava. Only one participant studied in a foreign country through the programme Erasmus+. Half of the respondent didn´t have the opportunity to study abroad. The main reason was the political and social situation in the Slovak Republic before 1989. The majority of respondents expressed their opinion regarding the quality of the education system in Slovakia. In their opinion, the education at university has some strengths and weaknesses. One strength is the theoretical background in the Bachelor study programme as support for the next level. In the Master's programme, respondents expected more practical experience and participation in enterprising projects. There was a very interesting expression from the designers: "*For our future career we needed more subjects such as accounting, marketing, business administration and others. When we started our businesses, we didn´t know how to prepare a pricing list, how to analyze the situation in the market or which strategy would be best in comparison with our competitors*." For their career, they need more practice and experience such as cooperation with entrepreneurs. The manager or owner of a design company is required to have expertise knowledge, to know how to communicate with clients and other project members, to be precise with their projects and be creative.

The last theme of the interview was designed to identify localisation factors ("soft" and "hard") which influenced the decision-making process and the barriers that may affect their business. This was carried out by previous researches (Hudec 2007). The participants divided "hard" factors into two main groups with the highest/sufficient quality or insufficient quality:

- sufficient: the qualification of a local labour force in the Košice region, competition in the industry and availability of suppliers are sufficient (87,5%); retail stores and possibilities to study (75%).
- insufficient: market size and public support (87,5%), the organisation of festivals and fairs, dynamics of the local market.

The respondents detected the main "soft" localisation factors for their business such as the countryside, parks, people with similar interests, city equipment. The respondents were also asked to describe the reasons why they started their business in Košice. Interestingly, several respondents indicated that the main reason why they started their activity in Košice was their long-term background in Košice, where they had studied, had a family, friends and relatives. When they started their businesses, there was a "hole" in the local market and there were favorable conditions for the design industry. The last reason was producing an object from which they as the creative person received great personal satisfaction.

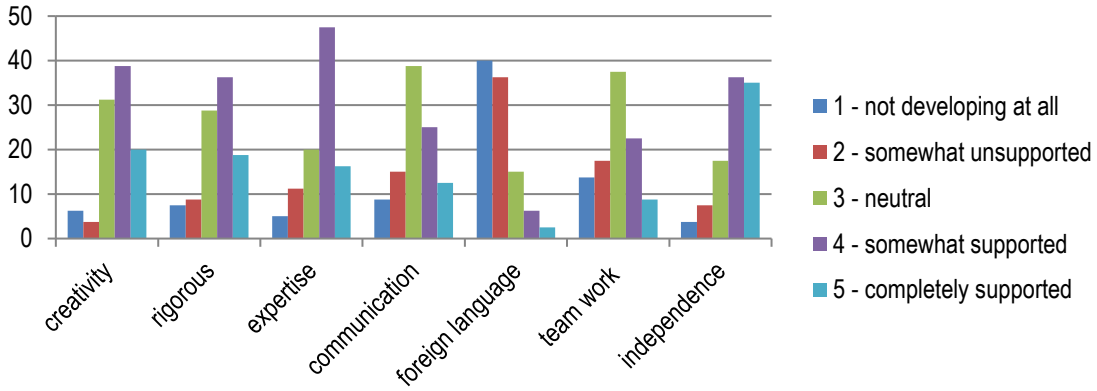
5.3. Results of the questionnaires

During the research, questionnaires were distributed at the Faculty of Arts. The process of collecting questionnaires was very long and depended on the teachers´ goodwill. Finally, 80 questionnaires were collected from the students of The Faculty of Arts. 81% of respondents were from Urbanism and Architecture, 11%

respondents were from Design and 8% of respondents studied Fine Art. Around 31% of respondents were students of bachelor degree programme (in their third year).

Around 55% of the respondents started their artistic activities at primary school. 35% of them started their artistic education at an artistic primary school and continued it at secondary school. For the purpose of this article, the most important part was the quality of education from the point of view of the students. 63.8% of the respondents were satisfied with the quality of the education at the Faculty. Only 36.3% students saw some shortcomings such as equipment in the classrooms and studios not being sufficient. In addition, the building of the Faculty needs reconstruction. Students also identified the lack of practice including specialist entrepreneurship education, cooperation with entrepreneurs in real projects and so on.

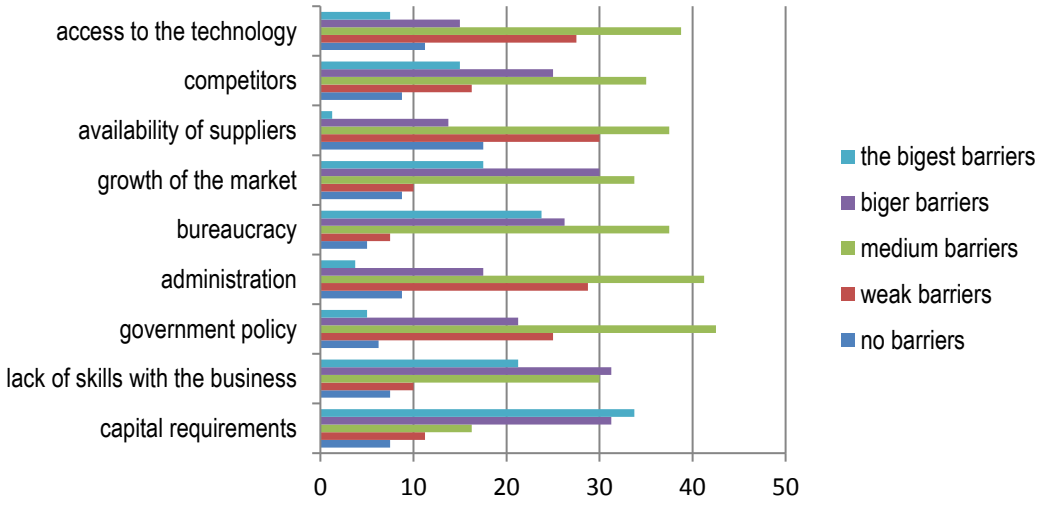
The main objective of the Faculty is to prepare graduates for being engaged, apart from improving their professional artistic activities, as the initiators of cultural and artistic life in society and become creative impulses for others. The students assessed how the Faculty supports the relevant skills for their future careers and professional lives. In their opinion, the Faculty mainly supported their professionalism/expertise (47.5%), creativity (38.75%), rigor (36.25%) and independence (36.25%) with learned subjects. On the other hand, 40% of respondents thought that the Faculty completely unsupported foreign languages (Figure 2).



Source: Compiled by author based on data taken from questionnaires

Figure 2 - How faculty supported students' skills by the study programme (in %)

Many students (56.25%) try to find grants for their projects and cooperate with enterprises. The Faculty of Arts offers the mobility program ERASMUS+ to study one semester or a full academic year abroad, *e.g.* Germany, Italy, the Czech Republic, Portugal, Poland, Hungary, Austria. For 67% of the respondents the mobility programme is necessary for their job. Some students (around 36%) would work in a foreign country after finishing their Master's degree, but this would be the second choice for them. The first choice would be a job opportunity in Košice or Eastern Slovakia (82.5%). In the following part of the questionnaire, students indicated the significance of major barriers for the establishment of business.



Source: Compiled by author based on data taken from questionnaires

Figure 3 - Major barriers for the establishment of business

Figure 3 shows that the biggest barriers to starting a business are capital requirements, bureaucracy with the start-up of the business, lack of entrepreneur´s skills and also the growth of the market. Around 57.5% of students regularly monitored the market situation and legislation related to the creative industry. According to the results of the questionnaires, the creativity of students is influenced by their life, environment and also university education.

Conclusion

This paper has analyzed the role of human capital in the creative industry of design in the Košice region. A survey of students at the Faculty of Arts was conducted as a potential "creative" class e.g. in the design industry, arts, architecture and so on. The situation between the entrepreneurs and designer in the Košice region was also analyzed. The objective was to understand what respondents made of their knowledge and experience regarding the creative industries while studying at university.

Based on this aim, the first research question was to identify the district with the highest localization quotient in the Košice region and also to explain the reason for starting business there.

From the empirical studies, it is evident that designers are mainly concentrated in the "heart" of the Košice region: Košice I and Košice II. The development and concentration of design companies was influenced by hard and soft localization factors. The number of designers increased after 2001 mainly in Košice I and Košice II. The situation changed after 2008 when the number of design companies decreased. This was the reaction of the region to the recession. The period of 2008 -2009 was identified as the "Great Recession". The reaction of the region´s economy to the shock of the recession can be different; it depends on many factors. A region´s economic structure, the competitiveness and innovative propensity of its firms, the skills of its workforce, its entrepreneurial culture, its institutional forms and its economic governance arrangements, will all shape the resistance and response of its economy to, and its recovery from, a shock. Economic structure is often thought to play a particularly key role in shaping a region´s sensitivity or resistance to shocks (Martin 2011). As suggested by Sonnino and Griggs-Trevarthen (2013; in Dinh, Pearson 2015, 284), successful adaption is possible when the community economy has flexibility, innovation and creativity to change in ways that are compatible with changed availability and structures of community resources. Community Economy Resilient can be conceptualised as the capacity of a community economy as a whole to counteract the negative economic impacts of disturbances and to adapt to changed economic conditions due to disturbances, in order to maintain non-declining economic standards of living. In this concept, five kinds of capital are important: financial capital, natural capital, physical or built capital, social capital and human capital (Ellis 1998; Goodwin 2003; in Dinh, Pearson 2015). Human capital plays a key role in advancing recovery efforts as this kind of capital is used to access and develop other types of capital. Human capital refers to the productive capacities of an individual, both inherited and acquired through education, training and experience (Goodwin 2003; in Dinh, Pearson, 2015). Following this, educational institutions are able to support the development of the creativity economy by offering a variety of academic programs that cater to the need of the

growing industries (Rustiadi 2014). This was confirmed by the current research in the second and third parts with some recommendations. At first, it can be stated that:

- there is a sufficient qualified workforce (human capital) in the region;
- higher education provides a more theoretical background although for future careers a more interdisciplinary approach is necessary;
- the presence and quality of soft localization factors are very important in this kind of creative industry.

The resulting recommendations are grouped under two headings:

- re-evaluate higher education: The Bachelor degree should provide a theoretical background for students, while the Master's degree should be more focused on practical and relevant subjects such as marketing, business administration, accounting, management.
- facilitate the project "university incubator" to ensure cooperation between faculties and the business sector in "real" projects.

Therefore, educational institutions, especially universities are able to support the development of the creative economy, but need to offer a variety of programs that reflect the requirements of the market.

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References

[1] Balog, M. *et al*. 2014. *Možnosti rozvoja kreatívneho priemyslu na Slovensku*. Bratislava: Slovenská inovačná a energetická agentúra. 1. Vydanie.

[2] Bantel, K. A., Jackson, S. E. 1989. Top management and innovations in banking: does the composition of the top team make a difference? *Strategic Management Journal*, 10(1): 107-124. In Mehralian *et al*., 2013.

[3] Barro, R. J. 1991. Economic Growth in a Cross Section of Countries. *Quarterly Journal of Economics*. 106(2): 407-443.

[4] Batabyal, A., Nijkamp, P. 2010. Richard Florida´s creative capital in a trading regional economy: a theoretical investigation. *Ann Reg Sci*, 44: 241 – 250. DOI 10.1007/s00168-008-0262-7

[5] Becker, G. S. 1964. *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education.* New York: Columbia University Press.

[6] Benhabib, J., and Spiegel, M.M. 1994. The role of human capital in economic development: Evidence from aggregate cross-country data. *Journal of Monetary Economics,* 34: 143-173.

[7] Cabrita, M. R., Bontis, N. 2008. Intellectual capital and business performance in the Portuguese banking industry. *International Journal of Technology Management.* Vol. 43. Nos 1-3. In Mehralian, G. *et al.* (2013). A framework for human capital indicators in knowledge-based industries: evidence from pharmaceutical industry. *Measuring Business Excellence*. 17(4): 88-101. Emerald Group Publishing Limited.

[8] Carter, A. P. 1989. Know-how Trading as Economic Exchange. Research Policy, 18: 155-63

[9] Chang, S. S. Lai, J. 2008. The effect of alliance experience and intellectual capital on the value creation of international strategic alliances. *Omega.* Vol. 36. In: Mehralian, G. *et al*. 2013. A framework for human capital indicators in knowledge-based industries: evidence from pharmaceutical industry. *Measuring Business Excellence*. 17(4): 88-101. Emerald Group Publishing Limited. DOI 10.1108/MBE-10-2012-0053

[10] Dakhli, M., De Clercq, D. 2004. Human capital, social capital, and innovation: a multi-country study. *Entrepreneurship & Regional Development.* 16(2): 107-128.

[11] Davidsson, P., Honig, B. 2003. The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing* 18 (3). Available at: http://eprints.qut.edu.au/5832/1/5832.pdf

[12] De Propriset, L.*et al.* 2009. The geography of creativity. *Interim report, NESTA. Making Innovation Flourish*. Available at: http://www.nesta.org.uk/sites/default/files/the_geography_of_creativity.pdf.

[13] Dinh, H., Pearson, L. 2015. Specifying community economic resilience – a framework for measurement. *Australasian Journal of Regional Studies*: Volume 21(3). Available at: http://anzrsai.org/assets/Uploads/PublicationChapter/Dinh-et-al-Final.pdf

[14] Edvinsson, L., Malone, M. 1997. Intellectual Capital: Realising your Company´s True Value by Finding its Hidden Brainpower. Harpercollins, New York. In: Mehralian, G. *et al.* 2013. A framework for human capital indicators in knowledge-based industries: evidence from pharmaceutical industry. *Measuring Business Excellence*. 17(4): 88-101. *Emerald Group Publishing Limited*. DOI 10.1108/MBE-10-2012-0053

[15] Eisenhardt, K.M. 1989. Building Theories from Case Study Research, *Academy of Management Review*, 14(4): 532-550.

[16] Faggian, A., Comunian, R., Qian Cher Li. 2014. I*nterregional migration of human creative capital:* The case of "Bohemian graduates". Geoforum, 55: 33-42.

[17] Felício, J. A., Couto, E. 2014. Human capital, social capital and organizational performance*. Management Decision*, 52 (2). DOI: 10.1108/MD-04-2013-0260

[18] Florida, R. 2002. *The Rise of the Creative Class:* And How It's Transforming Work, Leisure, Community and Everyday Life. Hardcover – International Edition, April 30, 2002, 416 pp. Basic Books; First Printing edition (May 1, 2002).

[19] Florida, R. 2003. *Cities and creative class*. City Commun. 2(1): 3-19.

[20] Florida, R. 2005. *Cities and the Creative Class*. New York: Routledge. Psychology Press. Available at: https://www.uzh.ch/cmsssl/suz/dam/jcr:00000000-68cb-72db-0000-00006cf4d6f7/03.19_florida_05.pdf

[1] Florida, R., Gates, G., Knudsen, B., Stolarick, K. 2006. *The University and the Creative Economy*. Available at: http://www.creativeclass.org/rfcgdb/articles/University%20For%20City%20and%20Community%204.pdf

[2] Florida, R., Mellander, C., Stolarick; K. 2008. Inside the black box of regional development – human capital, the creative class and tolerance. *Econ. Geogr.* 8 (51): 615-649.

[3] Florida, R., Tinagli, I. 2004. *Europe in the creative age*. 1st Ed. New York & London: Alfred P. Sloan Foundation & Demos, 48 p.

[4] Garhnam, N. 2005. From cultural to creative industries. *International Journal of Cultural Policy,* 11(1): 15-29

[5] Glaeser, E. L. 2000. The new economics of urban and regional growth. In *The Oxford Handbook of Economic Geography*, Ed. Gordon, C., Meric, G., Feldman, M. 83-98, Oxford: Oxford University Press.

[6] Glaeser, E.L. 2004. *Book Review of Richard Florida. "The Rise of the Creative Class"*. Available at: http://post.economics.harvard.edu/faculty/glaeser/papers/Review_Florida.pdf

[7] Goodwin, N. R. 2003. Five Kinds of Capital: Useful concepts for Sustainable Development, *GDAE Working Paper.* Tufts University. In Dinh, H., Pearson, L. 2015. Specifying Community Economic Resilience – A Framework for Measurement. *Australasian Journal of Regional Studies*, 21 (3).

[8] Gould, D., Ruffin, R. J. 1995. *Human capital, trade, and economic growth.* Weltwirtschaftliches Archiv 131: 425–445.

[9] Hudec, O. 2007. *Regionálne inovačné systémy: Strategické plánovanie a prognózovanie*. Košice: Ekf TU, 198 s. ISBN 978-80-8073-964-5.

[10] Hudec, O., Klasová, s. 2016 in the "Slovak Creativity Index – A PCA Based Approach. In *European Spatial Research and Policy*. Volume 23 (1). DOI: 10.1515/esrp-2016-0003.

[11] Hui, D. *et al*. 2005. *A Study on Creativity index*. 1st Ed. Hong Kong: Home Affairs Bureau, The Hong Kong Special Administrative Region Government, 100pp. Available at: http://www.uis.unesco.org/culture/Documents/Hui.pdf

[12] Jacobs, J. 1961. *The economy of cities*. Vintage Books. A division of Random House, New York. Available at: https://books.google.co.in/books?id=OaydDAAAQBAJ&printsec=frontcover&dq=The+economy+of+cities&hl=en&sa=X&ved=0ahUKEwj5vbHLwqnQAhWsDMAKHQJWDz4Q6AEIIzAA#v=onepage&q=The%20economy%20of%20cities&f=false

[13] Kembaren, P., Simatupang, T. M., Larso, D., Wiyancoko, D. 2014. Design Driven Innovation Practices in Desing-preneur led Creative Industry. *Journal of Technology Management & Innovation*. Volume 9 (3).

[14] Kloudová, J. 2008. *Kreatívni ekonomika*. Praha: Grada Publishing. ISBN 978-80-247-3608-2.

[15] Landry, Ch., Bianchini, F. 1995. *The Creative City*. 1st edition. London: DEMOS. 227p.

[16] Lucas, R. E. 1988. The mechanics of economic development. *Journal of Monetary Economics*, 22. 3-42. In Faggian, Comunian, Cher Li, 2014

[17] Madsen, H., Neergard, H., Ulhoi J. 2003. Knowledge-intensive entrepreneurship and human capital. *Journal of Small Business and Enterprise Development 10* (4): 426-434.

[18] Manzoni, B., Volker, L. 2013. *Working through paradoxes in professional creative service firms: lessons learned from design competitions.* EGOS Colloqium Montreal 2013.

[19] Marlet, G., Van Woerkens, C. 2007 The Dutch creative class and how it fosters urban employment growth. *Urban Stud,* 44: 2605-2626. In Batabyal, A., Nijkamp, P. 2010. Richard Florida´s creative capital in a trading regional economy: a theoretical investigation. *Ann Reg Sci* 2010 44: 241 – 250. DOI 10.1007/s00168-008-0262-7

[20] Martin, R. 2011. Regional Economic Resilience, Hysteresis and Recessionary Shocks. *Plenary Paper Presented at the Annual International Conference of the Regional Studies Association*, Newcastle.

[21] Matheson, B. 2006. A culture of creativity: design education and the creative industries. *The Journal of Management Development;* 25(1): 55 - 64.

[22] Mehralian, G. *et al*. 2013. A framework for human capital indicators in knowledge-based industries: Evidence from pharmaceutical industry. *Measuring Business Excellence*, 17(4): 88-101. DOI 10.1108/MBE-10-2012-0053

[23] Mincer, J. 1970. The distribution of labor incomes. *Journal of Economy Literature*, 8: 1-26.

[24] Murgaš, F. 2008. *Ľudský kapitál ako súčasť agregovaného humánneho kapitálu a jeho priestorová diferenciácia na Slovensku.* Available at: http://kdem.borec.cz/P_PDF/Murgas.pdf

[25] Murgaš, F., Ševčíková, M. 2011. Geografický prístup kmeraniu kreatívneho kapitálu. Prípadová štúdia: Index kreatívneho kapitálu Slovenska. *Creative and Knowledge Society/ International Scientific Journal*, roč.1, č. 2.

[26] O´Connor, J., Wynne, D. 1996. *From the Margins to the Centre: Cultural Production and Consumption in the Post-industrial City*. Aldershot, Ashgate O'Shea

[27] ONDREJKOVIČ, P. 2011. *Sociálny a kultúrny kapitál ako sociálne hodnoty, normy a ciele vo výchove avzdelávaní*. Katedra sociológie FF UKF v Nitre, Nitra.

[28] Petrikova, K., Vaňová, A., Borseková, K. 2015. The role of creative economy in Slovak Republic. *AI & Soc*, 30: 271-281. DOI: 10.1007/s00146-013-0508-5

[29] Robinson, K. 2001. *Out of Our Minds: Learning to be Creative*. Published June 15th by John Wiley & Sons (first published January 1st 2001), London.

[30] Rustiadi, S. 2014. *Creating Better Education System, building Stronger Human Capital: A Creative Industries Perspective.* The 6th Indonesia International Conference on Innovation, Entrepreneurship and Small Business. Procedia – Social and Behavioral Sciences 169: 378-386.

[31] Schultz, T. W. 1961. Investment in Human Capital. *American Economic Review*. 51(1): 1-17. Available at: http://www.jstor.org/stable/1818907

[32] Simon. C. 1998. Human capital and metropolitan employment growth. *Journal of Urban Economics*. 43: 223-43

[33] Šipikal, M., Szitásiová, V. 2014. *Education as Tool for the Development of Creative Industries in Slovakia*. *Košice:* 5th Central European Conference in Regional Science – CERS. Available at: http://www3.ekf.tuke.sk/cers/files/zbornik2014/proceedings2014/Proceedings2.htm

[34] Subramanian, M., Youndt, M. A. 2005. The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal*, Vol. 48. In: Mehralian, G. *et al.* 2013. A framework for human capital indicators in knowledge-based industries: evidence from pharmaceutical industry. *Measuring Business Excellence,*17 (4): 88-101. DOI 10.1108/MBE-10-2012-0053

[35] Sveiby, K. E. 1997. *The New Organizational Wealth: Managing and Measuring Knowledge-based Assets, Barrett-Kohler*, San Francisco, CA. In: Mehralian, G. *et al.* 2013. A framework for human capital indicators in knowledge-based industries: evidence from pharmaceutical industry. *Measuring Business Excellence*. 17(4): 88-101. DOI 10.1108/MBE-10-2012-0053

[36] Townley, B. *et al.* 2009. Managing in the creative industries: managing the motley crew. *Human Relations*. 62: 939-62. In Chen, M. Y-Ching, Wang, Y. S., Sun, V. 2012. Intellectual capital and organizational commitment. Evidence from cultural creative industries in Taiwan. *Personnel Review*, 41(3): 321-339. DOI 10.1108/00483481211212968

[37] Wang, H. C. *et al*. 2009. Firm-specific knowledge resources and competitive advantage: The roles of economic- and relationship-based employee governance mechanisms. *Strategic Management Journal*, 30: 1265–1285. DOI:10.1002/smj.787

[38] Wiesand A., Söndermann M. 2005. *The Creative Sector – An engine for diversity, growth and jobs in Europe.* European Cultural Foundation, Amsterdam. Available at: https://static1.squarespace.com/static/526e5978e4b0b83086a1fede/t/531760a8e4b02dddf7554ee3/1394041000285/The+Creative+Sector+Engine+of+Diversity.pdf

[39] Wright, P. M. *et al*. 1995. Matches between human resource and strategy among NCAA basketball teams. *Academy of Management Journal*, 38(4): 1052-1074. DOI: 10.2307/256620ACAD

[40] Yigitcanlar, T., Velibeyoglu, K., Baum, S. 2008: *Creative urban regions: Harnessing urban Technologies to support knowledge city iniciatives*. New York: Information science reference, 337 s. ISBN 978-1-59904-720-1

[41] Yin, R. K. 2003. Case Study Research and Methods. 3rd Ed., Sage, New York. In Kembaren, P., Simatupang, T. M., Larso, D., Wiyancoko, D. 2014. Design Driven Innovation Practices in Desing-preneur led Creative Industry. *Journal of Technology Management & Innovation*. Volume 9 (3).

*** DCMS 1998. *Creative Industries Mapping Document*. Department for Culture, Media and Sport, London.

*** KEA European Affairs 2009. *The impact of culture on creativity*. A study prepared for the European Commission. June. Available at: http://www.acpcultures.eu/_upload/ocr_document/CE-KEA_CultureCreativity_CreativityIndex_2009.pdf

*** OECD 2001. The Well-Being of Nations. The Role of Human and Social Capital. Center for Educational Research and Innovation. *OECD Publications*, France. ISBN 92-64-18589-5 – No. 51647

*** UNESCO 2006. *Understanding creative industries: Cultural statistics for public-policy making*. UNESCO, Global Alliance for Cultural Diversity.

*** United Nations/UNDP/UNESCO 2013. *Creative Economy Report 2013 Special Edition*. Widening Local Development Pathways. Available at: http://www.unesco.org/culture/pdf/creative-economy-report-2013.pdf

*** UNCTAD 2008, 2010 *The Creative Economy report* 2008. The Challenge of Assesing the Creative Economy: towards Informed Policy-making. Available at: http://www.unctad.org/en/docs/ditc20082cer_en.pdf

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