FEDERAL AGENCY FOR SCIENTIFIC ORGANIZATIONS
RUSSIAN ACADEMY OF SCIENCES

FEDERAL STATE BUDGETARY INSTITUTION OF SCIENCE
INSTITUTE OF SOCIO-ECONOMIC DEVELOPMENT OF TERRITORIES
OF RUSSIAN ACADEMY OF SCIENCE

ECONOMIC AND SOCIAL CHANGES:

FACTS, TRENDS, FORECAST

5 (47) 2016

The Journal is published since 2008

According to the decision of Presidium of the Higher Attestation Commission of the Russian MES (No.6/6, dated 19.02.2010) the Journal is included in the list of leading scientific editions, recommended for publication of the main results of dissertations for the degree of Doctor and Candidate of Sciences.

The Journal is covered in Web of Science Emerging Sources Citation Index (ESCI).

The Journal is included into databases: VINITI RAS, Ulrich's Periodicals Directory, Index Copernicus International, EBSCOhost, Proquest, and also into the Russian Science Citation Index, and is presented in the open access on the platform of the Scientific e-Library (**http://www. elibrary.ru**).

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The Journal is also sent to the Library of Congress, the USA.

All research articles submitted to the Journal are subject to mandatory peer-review.
Opinions presented in the articles can differ from the editorial board's point of view.
Authors of the articles are responsible for the material selected and stated.

ISSN 2307-0331

Federal State Budgetary Institution of Science Institute of Socio-Economic Development of Territories of Russian Academy of Science (ISEDT RAS), which existed as Vologda Scientific Coordinating Center of Central Economic and Mathematical Institute of RAS until March 2009, is situated on the territory of the Vologda Oblast. V.A. Ilyin, Doctor of Economics, Professor, Honored Scientist of Russia, is the permanent director of the Institute. A lot of great scientists have played an important role in the formation and the development of ISEDT RAS as a scientific institution such as: academicians D.S. Lvov, V.L. Makarov, V.I. Mayevsky, A.D. Nekipelov, Y.S. Osipov. Everything that has been done before and is being done nowadays by the personnel of the Institute, it would be impossible without the constant support of the Vologda Oblast's Government and city leaders.

The formation of the scientific personnel with an active life position, a great demand for Institute's investigation, academic community's support of the new journal published by ISEDT RAS, which combined efforts of the economic institutes of RAS in the Northwestern Federal District, and furthermore development of international ties have become the main outcomes of the last years.

MAIN RESEARCH DIRECTIONS

Due to the Resolution № 96 by the Presidium of Russian Academy of Sciences dated from March 31, 2009 ISEDT RAS carries out investigations in the following fields:

- problems of economic growth, scientific basis of regional policy, sustainable development of territories and municipalities, and transformations of socio-economic space;
- regional integration into global economic and political processes, problems of economic security and competitiveness of territorial socio-economic systems;
- territorial characteristics of living standards and lifestyle, behavioral strategies and world view of different groups of the Russian society;
- development of regional socio-economic systems, implementation of new forms and methods concerning territorial organization of society and economy, development of territories' recreational area;
- socio-economic problems regarding scientific and innovative transformation activities of territories;
- elaboration of society's informatization problems, development of intellectual technologies in information territorial systems, science and education.

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In order to integrate scientific activities of the Institute's scholars into global research area, international scientific conferences are held on a regular basis; they result in cooperation agreements with different scientific establishments:

2007 – Cooperation agreement is signed with Institute of Sociology, of the National Academy of Sciences of Belarus , Center for Sociological and Marketing Investigations at the "International Institute of Humanities and Economics" (Belarus, 2008).

2008 – Protocol of intentions is signed with Alexander's Institute at the Helsinki University (Finland, 2008).

2009 – Cooperation agreement is signed with Center for System Analysis of Strategic Investigations of NAS (Belarus, 2009).

2010 – Cooperation agreement is signed with Institute of Economics of the National Academy of Sciences of Belarus (Minsk, 2010).

2011 – Cooperation agreements are signed with National Institute of Oriental Languages and Civilizations (Paris, 2011), Institute of Business Economy at Eszterhazy Karoly College (Hungary, 2011), Republican research and production unitary enterprise "Energy Institute of NAS" (Belarus, 2011). Protocol of intentions are signed with Jiangxi Academy of Social Sciences (China, 2011), Research and Development Center for Evaluation and Socio-Economic Development and the Science Foundation of Abruzzo region (Italy, 2011).

2012 – Cooperation agreement is signed with Center for Social Research at the Dortmund Technical University (Germany, 2012).

2013 – Cooperation agreement is signed with Jiangxi Academy of Social Sciences (China, 2013).

July 2013 – The application for research performance by international consortium involving ISEDT RAS within the 7th Framework Programme of European Community.

2014 – Cooperation agreement is signed with Jiangxi Academy of Social Sciences (China, 2014).

NEW PUBLICATIONS OF ISEDT RAS

Ilyin V.A., Povarova A.I. *Public Administration Efficiency. 2000–2015. Contradictory Outcomes – an Expected Result: Monograph*.

While Analyzing the Past, to Think about the Future. Under the scientific supervision of Doctor of Economics, Professor V.A. Ilyin.

Ilyin V.A. *Public Administration Efficiency: Chief Editor's Point of View.*

Strategy and Tactics of Implementation of Socio-Economic Reforms: Regional Aspect: Proceedings of the Seventh Research-to-Practice Conference, Vologda, Russia, December 17–19, 2015.

Shabunova A.A., Guzhavina T.A., Dement'eva I.N., Kozhina T.P., Lastovkina D.A., Afanas'ev D.A. *Regional Civil Society: Development Dynamics: Monograph*

Global Challenges and Regional Development in the Mirror of Sociological Measurement: Proceedings of the Online Research-to-Practice Conference. Vologda, March 14–18, 2016.

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FROM THE CHIEF EDITOR

DOI: 10.15838/esc.2016.5.47.1
UDC 338.2, LBC 65.050

Russian President Got a Constitutional Majority in the State Duma of the Seventh Convocation

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September 18, the election to the State Duma of the Russian Federation were held; it is the main political event of 2016 in Russia, which opens a new political cycle. According to the Central Election Commission, the current party of power, "United Russia", strengthened its positions in Parliament, having gained a constitutional majority.

Today many experts discuss the election results and how and why they were achieved. However, much less attention has been paid to the historical significance of the outcome of the election to the State Duma of the seventh convocation.

Meanwhile, historical parallels between modern Russia, the Soviet Union during its collapse and Tsarist Russia in the era of the revolutionary events of the early 20th century, in our opinion[1], convincingly show that the election held on September 18 may be another important step in Russia's transition to a new stage of development.

This transition began in 2000 when Vladimir Putin first took office as head of state and took decisive action that

[1] Ilyin V.A. Pravyashchie elity – problema natsional'noi bezopasnosti Rossii [The ruling elites: a problem for Russia's national security]. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz* [Economic and social changes: facts, trends, forecast], 2016, no. 4, pp. 9-34.

For citation: Ilyin V.A. Russian President got a constitutional majority in the State Duma of the Seventh Convocation. *Economic and Social Changes: Facts, Trends, Forecast,* 2016, no. 5, pp. 9-26. DOI: 10.15838/esc.2016.5.47.1

contributed to the country's recovery from the comprehensive socio-economic and cultural-moral crisis: efficient anti-terrorism campaign and resolving the conflict in Chechnya, introduction of mineral extraction tax that helped increase federal budget revenues in 3.6 times (from 615.5 billion rubles in 1999 to 2,204.7 billion rubles in 2002), etc.

In 2000–2007 the rise in oil prices favored a positive dynamics of the standard of living and quality of life. During this period of stabilization Russian society was able to understand and compare the historical experience of its existence, during the periods of the Soviet Union and the "turbulent 1990s".

In the 2007 Munich speech at the international conference on security policy Russian President Vladimir Putin spoke about the threats of a unipolar world, and also about the fact that Russia would continue pursuing independent foreign policy aimed to improve its sovereignty. It was a clear signal to foreign countries (especially the U.S.) about Russia's intentions to participate in global competition.

The end of Vladimir Putin's second presidential term and the beginning of Dmitri Medvedev's presidency accompanied by tough economic consequences of the global financial crisis (2008–2009) did not allow Russian society to realize and appreciate the conceptual nature of V. Putin's Munich speech.

A second (after the Munich speech) attempt to formulate basic provisions of a new state ideology was undertaken by V. Putin six years later (in September 2013) during his third presidential term, at the meeting of the Valdai International Discussion Club. In this speech, the leader of the country formulated an ideological paradigm of development, which the state plans to adhere to: "It is evident that it is impossible to move forward without spiritual, cultural and national self-determination. Without this we will not be able to withstand internal and external challenges, nor we will succeed in global competitions"[2].

The next step in the transition of Russia to a new stage of historical development is connected with the accession of Crimea and Sevastopol to the Russian Federation. This event (against the background of the "Ukrainian crisis" and strained relations with the United States) united all the layers of Russian society. During this period, leading Russian scientists spoke about the fact that "after almost 15 years of waiting, a "new and resurgent" Russia finally made the transition into a new bright and life-affirming age... If only we did not miss this chance!"[3]

[2] Putin V.V. *Vystuplenie na zasedanii mezhdunarodnogo diskussionnogo kluba "Valdai" 19 sentyabrya 2013 g.* [Speech at the meeting of the Valdai International Discussion Club]. Available at: http://www.kremlin.ru/events/president/news/19243

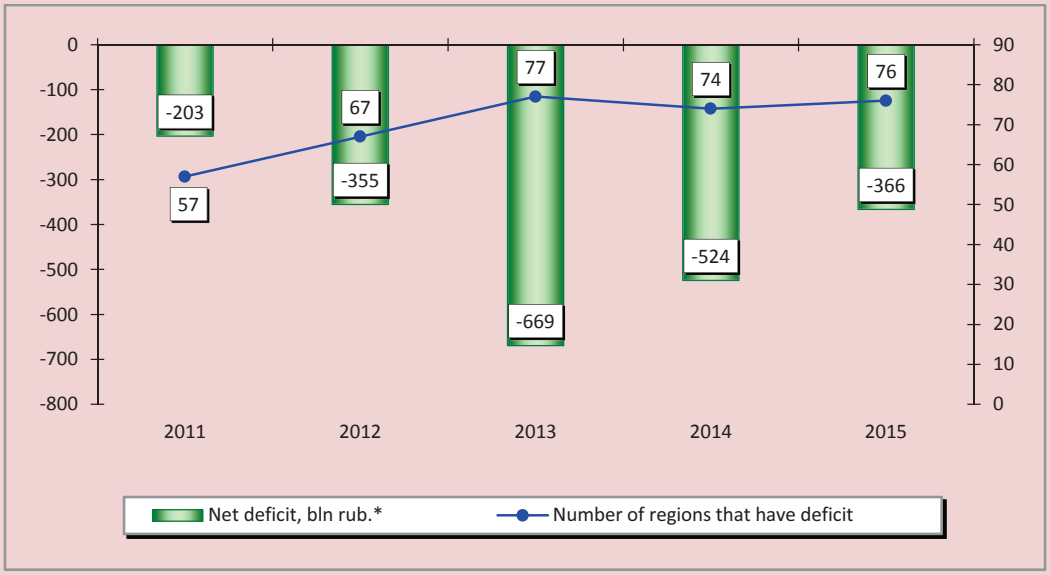
[3] Osipov G.V. Ne upustit' predstavivshiisya shans! [Do not miss this chance!]. *Sotsiologiya i ekonomika sovremennoi sotsial'noi real'nosti. Sotsial'naya i sotsial'no-politicheskaya situatsiya v Rossii v 2013 godu* [Sociology and economics of contemporary social reality. Social and socio-political situation in Russia in 2013]. Moscow: ISPI RAN, 2014. Pp. 6-18.

However, the achievements of the President's international policy aimed to strengthen Russia's sovereignty and promote its national interests were not supported by the course of domestic economic policies pursued by the Government of the Russian Federation. After the global financial crisis, the domestic economy has not achieved steady positive trend, and in 2011 a budget crisis started in Russia's regions, and it is still going on: for the period from 2011 to 2015, the number of subjects of the Russian Federation with the budget deficit increased from 57 to 76 *(Fig. 1)*.

Under the economic crisis that has been going on for quite a few yeas the following issues became more and more urgent: increasing the efficiency of state control, nationalization of the elites, staff reshuffle in the administration system aimed to meet the essential needs of the population more efficiently – to increase the standard of living and quality of life, to ensure stability, economic growth and social justice.

The election to the State Duma of the Russian Federation on September 18, 2016, in our view, should be considered from this historical viewpoint. Further development of the political system, staff changes, new people coming to power, and, most importantly, the fact whether **the President of the Russian Federation Vladimir Putin will be able to use the constitutional majority of the United Russia Party in the Parliament in order to implement the strategic objectives he set out in 1999 in the article "Russia at the turn of the millennium"** – all this will determine the life of the country in the coming years

Figure 1. Deficit of consolidated budgets of constituent entities of the Russian Federation, billion rubles



* Excluding surplus.

Source: Data of reports of the Federal Treasury of Russia. Available at: http://www.roskazna.ru/

and, in particular, the nature of public sentiment during the presidential elections of 2018.

In this major article, Vladimir Putin noted that the most important strategic tasks in Russia's development include the need to improve public administration efficiency, to strengthen state authority, and to overcome the split and internal division among major social groups and political elites. The importance of achieving these goals was emphasized by the President in his subsequent policy statements and strategic documents: the 2007 Munich speech, the 2013 speech at the meeting of the Valdai International Discussion Club, and the National Security Strategy 2015, etc.

> I am convinced that achieving the required growth dynamics is not only an economic task. This issue is also political in nature and, I dare say, in a certain sense, ideological. **More precisely, it is an ideological, spiritual and moral issue. Moreover, the latter aspect at the present stage seems to me especially significant from the point of view of consolidation of Russian society.**
>
> **Fruitful creative work, which our country needs so urgently, is impossible in a society that is split and internally divided.**
>
> The key to revival and the rise of Russia today lies in the public-political sphere. **Russia needs strong state power and must have it**[4]**.**

Today, the greatest positive trend is observed only in the solution of the first of these key objectives: in order to strengthen the statehood, the President actively implements personnel reshuffle at all the levels of the administration system[5].

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[4] Putin V.V. Rossiya na rubezhe tysyacheletii [Russia at the turn of the millennium]. *Rossiiskaya gazeta* [Russian Newspaper], 1999, December 30.

[5] For example:

March 3, 2016, Russian President signed the Decree "About the members of the Central Election Commission", according to which E.A. Pamfilova, former Chairman of the Council under RF President on the development of civil society and human rights was included in the CEC. March 28, 2016, she was elected Chairperson of the Central Election Commission.

July 28, 2016, Russian President Vladimir Putin united two federal districts, and replaced several governors and plenipotentiary representatives:

- the Crimean Federal District became part of the Southern Federal District (V. Ustinov was appointed its head);
- S. Melikov was appointed First Deputy Director of the Federal National Guard Troops Service and his post of Plenipotentiary Representative in the North Caucasian Federal district was given to O. Belaventsev;
- N. Rogozhkin was relieved from the post of Plenipotentiary Representative in the Siberian Federal District. His place was taken by S. Menyailo;
- D. Ovsyannikov was appointed Acting Governor of Sevastopol (instead of S. Menyailo);
- N. Tsukanov was appointed Plenipotentiary Representative in the Northwestern Federal District having replaced V. Bulavin on this post;
- D. Mironov was dismissed from the post of Deputy Minister for Internal Affairs and was appointed Acting Governor of the Yaroslavl Oblast;
- N. Belykh lost the trust of the President and was dismissed from the post of the Governor of the Kirov Oblast, he was replaced by I. Vasiliev, former auditor of the Accounts Chamber and head of the Federal Service for State Registration, Cadastre and Cartography (Rossreestr).
- October 5, 2016, Vladimir Putin signed a decree on appointing S.E. Naryshkin Director of the Foreign Intelligence Service of Russia (he replaced M.E. Fradkov).

On the same day, V.V. Volodin (former head of the Presidential Administration) was appointed Speaker of the State Duma. And his post was taken by S. Kiriyenko).

However, with regard to overcoming the split in Russian society and within the ruling elite, it is still premature to talk about obvious successes in this direction: in Russia, there remains an acute issue of social stratification and wealth inequality; and as for the public administration system, it seems that **"there exist two Russias: one is "deeply embedded in the Western world", the other is represented by "a new generation of Russian statesmen that inevitably accompany the sovereign growth"**[6].

In our opinion, special attention should be given to the features that the election to the State Duma of the seventh convocation will be remembered for:

1. On 18 September, Russian society demonstrated a very low turnout at the polling stations: 47.9% of voters (52.6 million people). For comparison, voter turnout for the Duma election in 2011 was 60.2% (65.7 million people), and in 2007 – 63.7% (69.5 million people).

2. United Russia, due primarily to the revival of a mixed electoral system (voting on party lists and single-mandate districts), received the constitutional majority in Parliament[7]**. This gives the President of the Russian Federation qualitatively new opportunities for the implementation of domestic and foreign policy (including the policy aimed to enhance public administration efficiency) and corresponds to the President's highest historical responsibility before his country, the responsibility he assumed when he secured his personal responsibility for the implementation of state policy in the sphere of national security (Decree No. 683 dated December 31, 2015 "On the national security strategy of the Russian Federation")**[8].

Assessing the final results of the vote, Vladimir Putin noted: "At a time of difficulties and many uncertainties and risks, people certainly choose stability and trust the country's leading political force... The election result was also an expression of people's reaction to attempts to exert foreign pressure on Russia, and to the threats, sanctions, and attempts to destabilize the situation in Russia from within"[9].

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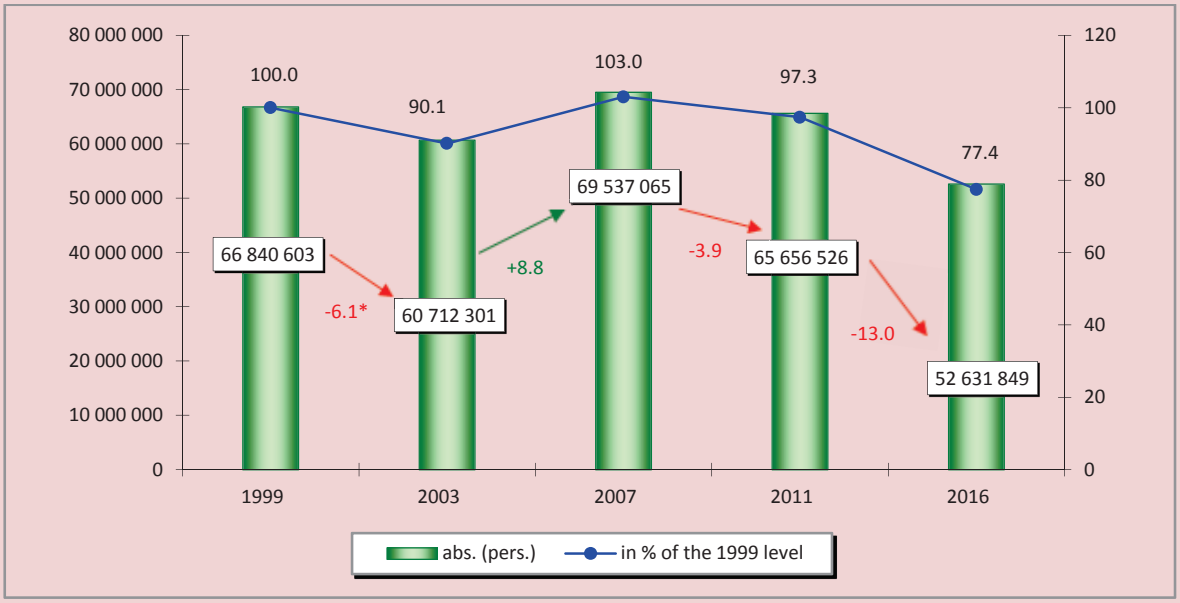
[6] Prokhanov A.A. "Gosudarstvo Polyarnoi zvezdy" ["The state of the Polar Star"]. *Gazeta "Zavtra"* [Newspaper "Tomorrow"], 2016, March 17.

[7] In the State Duma of the seventh convocation, the United Russia Party received 343 mandates out of 450: 140 seats (out of 225) on the federal list and 203 seats (out of 225) in single-member districts.

[8] The National Security Strategy–2015 stipulates that "the state policy of the Russian Federation in ensuring national security is carried out through the concerted action of all the elements of the system under the guidance of the President of the Russian Federation and with the coordinating role of the Security Council of the Russian Federation" (source: Ukaz Prezidenta Rossiiskoi Federatsii ot 31 dekabrya 2015 goda №683 "O Strategii natsional'noi bezopasnosti Rossiiskoi Federatsii" [Decree of the President of the Russian Federation of December, 31, 2015 No. 683 "On the National Security Strategy of the Russian Federation]. *Rossiiskaya gazeta* [Russian Newspaper], 2015, 31 December. Available at: http://www.rg.ru/2015/12/31/nac-bezopasnost-site-dok.html). Thus, the President takes up personal responsibility for ensuring the implementation of priority directions of state policy in the sphere of national security.

[9] Stenogramma soveshchaniya Prezidenta RF V.V. Putina s chlenami Pravitel'stva RF 19 sentyabrya 2016 g. [Transcript of the meeting of President of the Russian Federation Vladimir Putin with members of the Russian Government on September 19, 2016]. *Ofitsial'nyi sait Prezidenta RF* [Official website of Russian President]. Available at: http://www.kremlin.ru/events/president/news/52913

Figure 2. The dynamics of voter turnout for the election to the State Duma of the Russian Federation for the period from 1999 to 2016



* Increase/decrease in voter turnout for the RF State Duma election (million people).

However, the dynamics of indicator such as voter turnout clearly indicates that a significant number of Russians are not satisfied with the situation in the country. The turnout for the State Duma election has been declining since 2007; moreover if in 2011 compared to 2007, the turnout fell by only four million people, then in 2016 compared to 2011 – by 13 million that is three times more. In general, in 2007–2016, the turnout of Russians for parliamentary election decreased by 16.9 mln people *(Fig. 2)*.

Experts point out many reasons for a low turnout for the election to the State Duma of the seventh convocation: absence of political competition, people's distrust in the transparency of electoral procedures, the fact that the election was held in September and not in December (as usual), poorly organized information campaign, etc. However, it is important to note that despite all these nuances **the turnout was and still is a "litmus test" of public senti-ment and civic consciousness.** Experts from the Russian Academy of Sciences regard the voluntary refusal from participation in one of the fundamental democratic procedures as a latent form of protest: "***It is non-participation*** rather than protest vote that is becoming the most common means for citizens to express their political discontent"[10].

[10] *Dvadtsat' let reform glazami rossiyan (opyt mnogoletnikh sotsiologicheskikh zamerov): Analiticheskii doklad Instituta sotsiologii RAN v sotrudnichestve s Predstavitel'stvom Fonda imeni Fridrikha Eberta v Rossiiskoi Federatsii* [Twenty years of reforms in the eyes of Russians (an experience of sociological measurements): Analytical report of RAS Institute of Sociology in cooperation with the representative office of the Friedrich Ebert Foundation in the Russian Federation]. Available at: http://www.isras.ru/files/File/Doklad/20_years_reform.pdf

Insert 1.

In your opinion, how successful is the RF President in coping with the problem of economic recovery and increase in the citizens' welfare? (answer option: "successful and fairly successful")*

Socio-demographic categories	2000	2004	2005	2008	2009	2012	2013	2014	2015	Feb.– Oct. 2016	Dynamics + / –				
											2004 to 2000	2008 to 2004	2012 to 2008	Feb.– Oct. 2016 to 2012	Feb.– Oct. 2016 to 2015
Sex															
Men	26.9	35.3	37.3	36.0	33.7	27.5	31.3	33.6	34.0	27.3	+8	+1	-9	0	-7
Women	24.7	31.9	33.4	37.2	29.9	29.2	31.3	35.8	34.3	27.6	+7	+5	-8	-2	-7
Age															
Under 30	28.5	39.7	38.0	37.5	31.8	26.7	29.9	34.8	34.7	29.6	+11	-2	-11	+3	-5
30-55	24.8	32.7	34.8	36.2	30.8	28.1	31.6	33.4	34.6	26.4	+8	+4	-8	-2	-8
Over 55	24.2	28.7	33.3	36.7	32.7	30.5	32.1	36.8	33.1	27.1	+5	+8	-6	-3	-6
Education															
Secondary and incomplete secondary	27.5	32.5	35.5	32.8	31.3	26.2	30.0	32.6	31.9	24.4	+5	0	-7	-2	-8
Secondary vocational	26.2	32.8	34.5	37.7	30.9	28.6	31.0	36.1	34.3	26.4	+7	+5	-9	-2	-8
Higher and incomplete higher	22.1	35.0	35.6	39.9	32.5	30.1	33.1	36.0	36.3	31.6	+13	+5	-10	+2	-5
Income groups															
20% of the poorest people	21.4	28.0	40.6	35.0	31.0	20.6	24.2	24.6	20.4	18.3	+7	+7	-14	-2	-2
60% of the people with median income	25.7	33.3	35.7	36.5	31.6	30.5	31.8	35.7	36.1	26.8	+8	+3	-6	-4	-9
20% of the most prosperous people	30.7	42.5	36.3	37.7	32.9	34.6	37.1	43.6	41.8	36.3	+12	-5	-3	+2	-6
Territories															
Vologda	28.3	32.2	30.7	34.9	30.7	26.3	27.3	30.5	30.8	27.6	+4	+3	-9	+1	-3
Cherepovets	21.8	32.7	36.3	34.3	25.4	30.9	32.1	40.2	37.5	30.5	+11	+2	-3	0	-7
Districts	26.3	34.4	36.6	38.7	35.0	28.2	33.0	34.2	34.1	25.2	+8	+4	-11	-3	-9
Oblast	25.6	33.4	35.1	36.7	31.6	28.4	31.3	34.8	34.1	27.2	+8	+3	-8	-1	-7

January 2000 – May 2004 – V. Putin's first presidency; May 2004 – May 2008 – V. Putin's second presidency; May 2008 – May 2012 – D. Medvedev's presidency; May 2012 – present – V. Putin's third presidency.

* Excluding the share of those who found it difficult to answer.

In your opinion, how successful is the RF President in coping with the problem of economic recovery and increase in the citizens' welfare? (answer option: "without any considerable success and completely unsuccessful")*

Socio-demographic categories	2000	2004	2005	2008	2009	2012	2013	2014	2015	Feb.– Oct. 2016	Dynamics + / –				
											2004 to 2000	2008 to 2004	2012 to 2008	Feb.– Oct. 2016 to 2012	Feb.– Oct. 2016 to 2015
Sex															
Men	54.1	50.1	50.0	47.8	51.7	60.0	57.6	54.7	52.6	59.0	-4	-2	+12	-1	+6
Women	52.2	49.4	51.4	44.6	53.0	56.3	56.2	52.4	52.1	59.1	-3	-5	+12	+3	+7
Age															
Under 30	52.8	43.6	47.2	45.2	51.1	57.6	55.3	52.2	50.1	56.9	-9	+2	+12	-1	+7
30-55	55.0	51.2	51.3	47.1	53.7	59.0	57.5	54.8	52.9	60.6	-4	-4	+12	+2	+8
Over 55	48.7	52.7	52.7	44.9	51.5	56.5	56.9	52.3	52.9	58.2	+4	-8	+12	+2	+5
Education															
Secondary and incomplete secondary	49.1	48.5	49.8	43.6	48.7	57.4	57.0	54.6	52.8	59.3	-1	-5	+14	+2	+7
Secondary vocational	51.6	49.1	50.3	45.7	55.1	57.5	57.1	52.5	51.6	59.1	-3	-3	+12	+2	+8
Higher and incomplete higher	60.1	51.6	52.3	49.1	53.9	59.0	56.4	52.9	52.6	58.5	-9	-3	+10	-1	+6
Income groups															
20% of the poorest people	53.8	52.2	45.8	46.8	50.7	63.1	61.8	63.4	61.8	63.1	-2	-5	+16	0	+1
60% of the people with median income	53.6	51.7	50.9	45.8	53.0	57.6	56.7	52.6	51.4	60.1	-2	-6	+12	+3	+9
20% of the most prosperous people	52.6	43.4	52.7	50.4	56.4	53.6	53.8	47.4	47.3	55.4	-9	+7	+3	+2	+8
Territories															
Vologda	55.7	54.4	53.6	46.8	49.8	58.8	61.3	53.2	54.8	59.3	-1	-8	+12	+1	+5
Cherepovets	52.8	51.8	52.2	56.4	65.3	58.6	57.5	51.7	51.8	62.5	-1	+5	+2	+4	+11
Districts	51.7	46.4	48.8	40.5	47.2	57.2	54.2	54.4	51.3	56.9	-5	-6	+17	0	+6
Oblast	53.0	49.7	50.7	46.0	52.4	57.9	56.8	53.4	52.3	59.1	-3	-4	+12	+1	+7

January 2000 – May 2004 – V. Putin's first presidency; May 2004 – May 2008 – V. Putin's second presidency; May 2008 – May 2012 – D. Medvedev's presidency; May 2012 – present – V. Putin's third presidency.

* Excluding the share of those who found it difficult to answer.

In this sense, low voter turnout on September 18 clearly reflects the dissatisfaction of the population with the dynamics of the standard of living and quality of life, which is reflected in the sociological research data. So, in February – October 2016 compared to 2015 the share of positive ratings of the success with which the President promotes economic recovery and growth of citizens' welfare decreased in all major socio-demographic groups (by 2–9 p.p., *Insert 1*).

The proportion of people who negatively assess the work of the President in dealing with economic issues for the period from February 2015 – October 2016 also increased in all the main groups, this increase was the greatest (8–9 p.p.) among men 30–55 years of age who have secondary vocational education and, according to their own assessment of their income, are among the 60% of those having average income and 20% of the most wealthy citizens. Thus, today hidden protest potential is accumulated not only in socially vulnerable categories of society (persons of retirement age, the poorest segments), but among people with average and high levels of financial well-being.

Some Russian and foreign[11] experts note that **"the power in this election consciously used a tactic to reduce turnout: when the turnout is low, the proportion of manageable electorate voting for the "party of power" and its candidates is bigger...** The United Russia Party almost everywhere improved its relative results compared to the results of the voting on December 4, 2011. However, due to the low turnout in absolute numbers of votes, the overall result of United Russia is lower than on December 4, 2011"[12].

Communist party leader Gennady Zyuganov at a meeting with Russian President noted: "What we all have to analyze is the fact that **the party in power had 45 million votes in 2007**, this is very powerful support, and exceptionally crucial. In the crisis, critical moments the widespread support of the society

[11] Foreign media on the 2016 election to the State Duma of the Russian Federation (source: Newspaper "Kommersant" of September 19, 2016. Available at: http://www.kommersant.ru/doc/3093506):

"Before the election, the Kremlin has ensured that the election was held in a way that was convenient for it...the election was held against the background of such a political climate when the entire opposition is labeled as "traitors" that stab a "besieged" Russia and its President in the back" (source: the German edition of Frankfurter Allgemeine Zeitung (Schmidt F. Keine oppositionelle Partei schafft es in die Duma. *Frankfurter Allgemeine Zeitung*, 2016, September 18. Available at: http://www.faz.net/aktuell/politik/ausland/europa/in-russland-schafft-es-keine-oppositionelle-partei-ins-parlament-14442041.html).

"The results are not expected to lead to any dramatic changes; the established political parties are all broadly supportive of the country's president, Vladimir Putin, and the low turnout suggested more opposition-minded urban Russians simply stayed at home" (source: the English edition of The Guardian (Russian election unlikely to loosen Putin's grip on power. *The Guardian*, 2016, September 18. Available at: https://www.theguardian.com/world/2016/sep/18/russia-votes-in-election-unlikely-to-loosen-putins-grip-on-power).

"Turnout was the lowest since Russia became an independent country a quarter of a century ago – showing palpable voter apathy... The Kremlin also brought the vote forward from December, when urban residents more inclined to vote for opposition parties would more likely be at home and able to go to the polls instead of vacationing" (source: the U.S. edition of the Wall Street Journal (Ferris-Rotman M. Putin's Party Shores Up Power in Parliamentary Elections Amid Weak Turnout. *The Wall Street Journal*, 2016, September 18. Available at: http://www.wsj.com/articles/russians-head-to-polls-to-vote-for-new-parliament-1474184676).

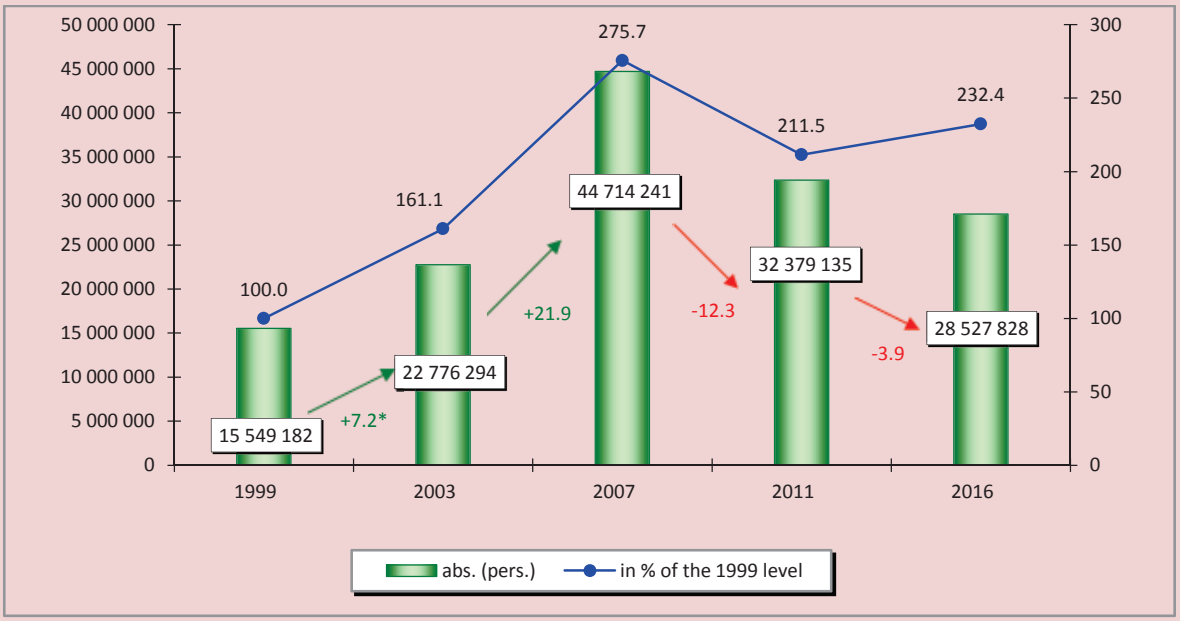
[12] Lyubarev A. Nizkaya yavka spasla "Edinuyu Rossiyu" [Low turnout saved the United Russia party]. *Informatsionnyi portal "Gazeta.ru" ot 16.10.2016* [Information portal "Gazeta.ru" of October 16, 2016]. Available at: https://www.gazeta.ru/comments/2012/10/16_x_4813741.shtml

is crucial. **This year the party in power received 28.7 million votes; they lost 17 million.** I understand that there are issues and reasons: if the GDP growth in 2012 was 3.4 percent, last year it was minus 3.7, and we are still in a recession. Losing 7 percent in five years means nearly 90 trillion rubles less in the budget. That amounts to two current budgets"[13].

According to the Central Election Commission, the percentage of support of United Russia in the 2016 election increased by 5% (from 49 to 54%), but in fact it lost almost four million votes (3.85 million people), and compared to the 2011 election – almost 16 million (16.19 million people; *Fig. 3*).

Only in 15 out of 83 Russian constituent entities there was an increase in the number of those who voted for the United Russia Party on September 18, 2016. In other regions, the support for the ruling party decreased in comparison with 2011. If we compare the voting results with those of the 2007 election, we will see that the increase in the number of votes in favor of United Russia is observed only in five out of 83 Russian regions *(Insert 2)*.

Figure 3. Dynamics of the share of those who voted for the United Russia Party (in 1999 the party was called the Unity Block) in the election to the State Duma of the Russian Federation for the period from 1999 to 2016



* Increase/decrease in the number of those who voted for the United Russia Party at the election to the State Duma of the Russian Federation (million people).

[13] Stenogramma vstrechi Prezidenta RF s liderami partii, proshedshikh po itogam vyborov v Gosdumu [Transcript of the meeting of Russian President with leaders of the parties, held after the State Duma election]. *Ofitsial'nyi sait Prezidenta RF* [Official website of Russian President]. Available at: http://kremlin.ru/events/president/news/52957

Insert 2

Dynamics of the votes for the United Russia party at the State Duma election in 2007, 2011 and 2016 (CEC data)*

Territory	%					People				
	2007	2011	2016 **	Dynamics (+/-) 2016 to 2011	Dynamics (+/-) 2016 to 2007	2007	2011	2016 **	Dynamics (+/-) 2016 to 2011	Dynamics (+/-) 2016 to 2007
Russian Federation	***64.30***	***49.32***	***55.22***	***5.90***	***-9.08***	***44714241***	***32371737***	***28527828***	***-3843909***	***-16186413***
Chechen Republic	99.36	99.48	96.33	-3.15	-3.03	574101	607909	635729	27820	61628
Republic of Buryatia	65.59	49.0	89.38	40.38	23.79	267776	186953	126461	-60492	-141315
Republic of Tatarstan	81.07	77.8	85.77	7.97	4.70	1950839	1777189	1941068	163879	-9771
Republic of Mordovia	93.41	91.6	84.78	-6.82	-8.63	580894	565597	440108	-125489	-140786
Republic of Tuva	89.21	85.3	83.52	-1.78	-5.69	118255	119705	116372	-3333	-1883
Karachay-Cherkess Republic	92.90	89.8	81.84	-7.96	-11.06	262308	267475	233498	-33977	-28810
Kabardino-Balkar Republic	96.12	81.3	77.72	-3.58	-18.40	481583	428171	375942	-52229	-105641
Kemerovo Oblast	76.82	64.6	77.69	13.09	0.87	1258100	931474	1363181	431707	105081
Republic of Ingushetia	98.72	91.0	72.65	-18.35	-26.07	159496	151257	129222	-22035	-30274
Republic of Kalmykia	72.43	66.1	71.67	5.57	-0.76	100170	90089	85923	-4166	-14247
Saratov Oblast	64.81	64.9	68.74	3.84	3.93	800272	863047	854702	-8345	54430
Yamalo-Nenets Autonomous Okrug	78.35	71.7	68.01	-3.69	-10.34	243337	209327	177428	-31899	-65909
Republic of North Ossetia – Alania	71.60	67.9	67.43	-0.47	-4.17	204132	297704	303794	6090	99662
Penza Oblast	70.31	56.3	65.19	8.89	-5.12	556210	410858	427283	16425	-128927
Bryansk Oblast	61.77	50.1	64.73	14.63	2.96	368750	312620	357780	45160	-10970
Tambov Oblast	59.79	66.7	64.60	-2.10	4.81	325732	399705	268116	-131589	-57616
Chukotka Autonomous Okrug	78.13	70.3	61.56	-8.74	-16.57	24206	19037	11266	-7771	-12940
Republic of Adygea	70.97	61.0	60.64	-0.36	-10.33	142627	136612	108778	-27834	-33849
Krasnodar Krai	62.06	56.3	60.14	3.84	-1.92	1522005	1527253	1211518	-315735	-310487
Rostov Oblast	71.89	50.2	59.75	9.55	-12.14	1604372	985470	924004	-61466	-680368
Voronezh Oblast	57.46	49.5	59.35	9.85	1.89	739269	614484	600109	-14375	-139160
Nizhny Novgorod Oblast	60.63	45.0	59.20	14.20	-1.43	964302	713289	694713	-18576	-269589
Tyumen Oblast	73.57	65.1	58.75	-6.35	-14.82	603230	494437	511529	17092	-91701
Lipetsk Oblast	62.30	40.3	56.99	16.69	-5.31	382341	218095	279969	61874	-102372
Republic of Bashkortostan	83.12	70.5	56.88	-13.62	-26.24	2170241	1684953	1195246	-489707	-974995
Stavropol Krai	62.20	49.2	55.87	6.67	-6.33	672070	495691	446630	-49061	-225440
Belgorod Oblast	65.39	51.2	55.59	4.39	-9.80	585723	465571	410373	-55198	-175350
Ryazan Oblast	57.10	39.8	55.33	15.53	-1.77	318581	202638	220944	18306	-97637
Tula Oblast	61.72	61.3	54.03	-7.27	-7.69	459366	562073	291219	-270854	-168147
Kursk Oblast	62.74	45.7	52.96	7.26	-9.78	387829	237415	229092	-8323	-158737
Chuvash Republic	62.27	43.4	52.70	9.30	-9.57	428160	262526	283568	21042	-144592
Samara Oblast	56.04	39.1	52.21	13.11	-3.83	736838	531254	653139	121885	-83699
Udmurt Republic	60.57	45.1	51.79	6.69	-8.78	453248	311721	268070	-43651	-185178
Volgograd Oblast	57.74	36.2	51.60	15.40	-6.14	647137	366888	410656	43768	-236481
Leningrad Oblast	59.23	33.7	51.54	17.84	-7.69	419701	224332	293758	69426	-125943
Altai Republic	69.46	53.3	49.80	-3.50	-19.66	68573	51342	35065	-16277	-33508
Khanty-Mansi Autonomous Okrug	65.96	41.0	49.45	8.45	-16.51	464999	243431	213426	-30005	-251573
Ulyanovsk Oblast	66.24	43.6	49.36	5.76	-16.88	455666	277048	256438	-20610	-199228
Oryol Oblast	59.85	38.9	49.15	10.25	-10.70	281992	166642	164864	-1778	-117128
Smolensk Oblast	53.92	36.2	48.53	12.33	-5.39	248128	147111	155001	7890	-93127
Kamchatka Krai	63.67	45.3	48.32	3.02	-15.35	98695	62240	44849	-17391	-53846

Territory	%					People				
	2007	2011	2016 **	Dynamics (+/-) 2016 to 2011	Dynamics (+/-) 2016 to 2007	2007	2011	2016 **	Dynamics (+/-) 2016 to 2011	Dynamics (+/-) 2016 to 2007
Republic of Mari El	67.54	52.2	47.46	-4.74	-20.08	287333	198570	134998	-63572	-152335
Moscow Oblast	60.26	32.5	47.29	14.79	-12.97	2047427	167251	989418	822167	-1058009
Republic of Sakha	63.99	49.2	47.27	-1.93	-16.72	275856	184552	141128	-43424	-134728
Jewish Autonomous Oblast	66.22	48.1	46.68	-1.42	-19.54	56871	33933	23819	-10114	-33052
Kaluga Oblast	61.65	40.5	46.60	6.10	-15.05	284219	185508	156802	-28706	-127417
Sakhalin Oblast	62.96	41.9	46.18	4.28	-16.78	139295	81419	66712	-14707	-72583
Vladimir Oblast	56.75	38.3	46.13	7.83	-10.62	416375	230059	200175	-29884	-216200
Pskov Oblast	56.73	36.7	46.05	9.35	-10.68	221253	112581	104976	-7605	-116277
Tver Oblast	59.71	38.4	45.99	7.59	-13.72	401115	234104	202855	-31249	-198260
Magadan Oblast	55.31	41.0	45.77	4.77	-9.54	42284	25895	19780	-6115	-22504
Arkhangelsk Oblast	56.72	31.9	45.21	13.31	-11.51	312249	157599	152836	-4763	-159413
Kaliningrad Oblast	57.38	37.1	44.78	7.68	-12.60	246120	156131	154668	-1463	-91452
Perm Krai	62.06	36.3	44.53	8.23	-17.53	721729	369944	311774	-58170	-409955
Republic of Dagestan	89.19	82.8	44.48	-38.32	-44.71	1163300	1368980	1294629	-74351	131329
Astrakhan Oblast	58.00	58.1	43.50	-14.60	-14.50	273921	256994	117631	-139363	-156290
Murmansk Oblast	55.11	32.0	43.26	11.26	-11.85	226582	111676	104181	-7495	-122401
Ivanovo Oblast	60.76	40.1	43.07	2.97	-17.69	298590	180730	136756	-43974	-161834
Kurgan Oblast	64.43	44.4	42.16	-2.24	-22.27	326566	190519	125058	-65461	-201508
Tomsk Oblast	58.41	37.5	42.11	4.61	-16.30	267289	148082	108028	-40054	-159261
Nenets Autonomous Okrug	48.78	36.0	41.89	5.89	-6.89	8315	7176	6993	-183	-1322
Orenburg Oblast	60.31	34.9	41.88	6.98	-18.43	563489	294249	270594	-23655	-292895
Sverdlovsk Oblast	62.04	32.7	41.81	9.11	-20.23	1327711	586298	574059	-12239	-753652
Krasnoyarsk Krai	60.68	36.7	41.64	4.94	-19.04	768099	397941	322136	-75805	-445963
Novgorod Oblast	63.13	35.3	40.98	5.68	-22.15	218812	103232	81216	-22016	-137596
Zabaikalsky Krai	n.a.	43.3	40.94	-2.36	n.a.	n.a.	190756	128964	-61792	н.д.
Saint Petersburg	50.33	35.4	40.66	5.26	-9.67	971272	703209	495230	-207979	-476042
Irkutsk Oblast	58.50	34.9	40.56	5.66	-17.94	620673	312709	262030	-50679	-358643
Primorsky Krai	54.87	33.3	40.35	7.05	-14.52	476318	246059	217859	-28200	-258459
Novosibirsk Oblast	59.07	33.8	39.32	5.52	-19.75	726328	408209	285700	-122509	-440628
Chelyabinsk Oblast	61.11	49.4	39.29	-10.11	-21.82	1128588	32371737	456485	-31915252	-672103
Yaroslavl Oblast	53.17	29.0	39.14	10.14	-14.03	352568	171326	149492	-21834	-203076
Komi Republic	62.06	58.8	39.06	-19.74	-23.00	305906	316916	106426	-210490	-199480
Republic of Khakassia	59.53	40.1	38.98	-1.12	-20.55	129321	84843	59357	-25486	-69964
Kirov Oblast	55.38	34.9	38.94	4.04	-16.44	451719	212389	171833	-40556	-279886
Amur Oblast	69.75	43.5	38.85	-4.65	-30.90	316190	154129	103010	-51119	-213180
Karelia Republic	57.28	32.3	38.50	6.20	-18.78	177322	90942	79446	-11496	-97876
Moscow	54.13	46.6	38.44	-8.16	-15.69	194027	2053156	991676	-1061480	797649
Khabarovsk Krai	60.68	38.1	38.33	0.23	-22.35	401043	213616	139494	-74122	-261549
Vologda Oblast	**60.47**	**33.4**	**38.03**	**4.63**	**-22.44**	**386002**	**184715**	**145404**	**-39311**	**-240598**
Omsk Oblast	60.14	39.6	37.48	-2.12	-22.66	608208	344713	218577	-126136	-389631
Kostroma Oblast	56.36	30.7	37.20	6.50	-19.16	200963	99283	78106	-21177	-122857
Altai Krai	54.69	37.2	35.95	-1.25	-18.74	666941	384429	273105	-111324	-393836

* Ranked according to the share of votes for the United Russia party in 2016.
** Data for 2016 are preliminary (as of October 15, 2016).

The constitutional majority of United Russia in the Parliament is due to several factors. The major ones are as follows:

✓ **return to a mixed election system**[16], which, and it was expected[17], has allowed the ruling party to gain an absolute majority of votes in single-seat districts *(Table)*;

✓ **creating conditions that contribute to the decline in voter turnout** (in particular, shifting the date of the single voting day from December to September);

✓ **amendments to the Federal Law "On political parties"**[18], leading to the emergence of "knowingly failing" political forces that took away some votes from the opposition parties;

✓ **smart PR campaign** calling voters' attention to the fact that United Russia is the party of the President (though, actually, "the party that calls itself the "President's

The transition to a mixed system of parliamentary election is more convenient for United Russia, because it is no longer able to win the election and get a majority by party lists. In total, all these parties can collect 10–12% that will go to United Russia. They can get the entire 100% by single-seat districts[14].

Under the Medvedev model, the party in power, having gaining 30%, could get a maximum of 150 deputies. Under the new model, even if they get 30% of 225 seats, it will comprise 70 deputies. But by single-seat districts, using the administrative resource, they will be able to put through the representatives of the ruling party and the All-Russia People's Front, taking the maximum number of districts. Under this scheme they will be able to gain not just a simple, but a constitutional, majority[15].

[14] Soloviev V. (Secretary of the Central Committee of the Communist Party, Deputy of the State Duma of the Russian Federation; source: Duma under the new rules. *Gazeta.ru* of March 01, 2013. Available at: https://www.gazeta.ru/politics/2013/03/01_a_4993629.shtml

[15] Nilov Ya. (Deputy Head of the LDPR faction in the State Duma; *ibidem*).

[16] Federal'nyi zakon ot 22 fevralya 2014 g. №20 "O vyborakh deputatov Gosudarstvennoi Dumy Federal'nogo Sobraniya Rossiiskoi Federatsii" [Federal Law of February 22, 2014 No. 20 "On the election of deputies of the State Duma of the Federal Assembly of the Russian Federation"]. *GARANT.RU* [Garant.ru]. Available at http://www.garant.ru/hotlaw/federal/526816/#ixzz4Lq0DppDP

[17] Expert opinion (Source: Duma under the new rules. *Gazeta.ru* of March 01, 2013. Available at; https://www.gazeta.ru/politics/2013/03/01_a_4993629.shtml):

1. Lyubarev A. (expert from the Committee for State Initiatives): "Given the current level of support, the United Russia can get much more seats in the parliament with the help of single-member districts, than it gets on party lists. The purpose of this bill was to ensure the composition of the State Duma remains the same and the majority of seats were left for the United Russia.

2. Golosov G. (Professor of the European University at Saint Petersburg): "Medvedev's bill has changed almost nothing in the existing system. And Mr. Putin apparently reasoned that it was high time to make a change, it is clear why he so judged: because the United Russia has ceased to win the election under the proportional system. The old electoral system returns in order to preserve the situation with the political monopoly of the United Russia at the level of the State Duma".

[18] *Federal'nyi zakon ot 2 aprelya 2012 g. № 28-FZ "O vnesenii izmenenii v Federal'nyi zakon "O politicheskikh partiyakh"* [Federal Law of April 2, 2012 No. 28-FZ "On amendments to Federal Law "On political parties"]. Available at: https://rg.ru/2012/04/04/partii-dok.html

Official results of the elections to the State Duma of the seventh convocation*

Party included in the State Duma according to the results of the voting on September 18, 2016	Number of seats obtained on the lists	The number of seats obtained in single-mandate constituencies	Total number of seats
United Russia	140	203	343
KPRF	35	7	42
LDPR	34	5	39
Just Russia	16	7	23
Total number of seats:	225	225	450

* Three seats in the State Duma of the seventh convocation were obtained by A. Zhuravlev, Chairman of the Rodina party, R. Shaikhutdinov, head of the federal political Committee "Civic platform" and B. Reznik, an independent candidate who was part of the United Russia faction in Duma of the sixth convocation.
Source: Central Election Committee announced final results of the State Duma election. *RBC* of September 23, 2016. Available at: http://www.rbc.ru/politics/23/09/2016/57e458999a7947b5f68a8268

party", has collected only one-quarter of those who respect Vladimir Putin, despite a huge propaganda campaign"[19]).

A key question that will determine the relationship between society and the government in the near future is whether the strengthening of positions of United Russia was a result of an increase in public trust in the ruling party and in the President personally or whether this strengthening proceeds from the reasons mentioned above. So far we can definitely say that the victory of the current government in the election on September 18, 2016 is the **"credit of trust" issued by the Russian society to the Russian President**. However, this "credit of trust" does not mean that people are satisfied with the status quo in the dynamics of the standard of living and quality of life, social inequality and social justice; this does not mean that people voted for the "stability" of the current situation.

On the contrary, the election results mean that the President is given carte blanche to prove himself in real action

> We all know it very well that success at the election always means a new challenge and a new frontier, because **people pin their hopes on the election, and these hopes need to be fulfilled**, because the Parliament is elected in order to solve country's problems, the problems that voters put before the authorities, including the supreme legislative authority of the country[20].

[19] N. Starikov: "84% of the population trust Putin. A little more than half of these 84% came to vote in September 2016 (turnout was 47.9%), and only half of those who came voted for the United Russia" (source: Starikov N. The results of the 2016 election campaign. *N. Starikov's blog* of September 19, 2016. Available at: https://nstarikov.ru/blog/70943

[20] Stenogramma vstrechi Prezidenta RF s liderami partii, proshedshikh po itogam vyborov v Gosdumu [Transcript of the meeting of Russian President with leaders of the parties, held after the State Duma election]. *Ofitsial'nyi sait Prezidenta RF* [Official website of Russian President]. Available at: http://kremlin.ru/events/president/news/52957

corresponding to national interests and strategic lines identified back in 1999[21] and continued in subsequent speeches – in the Munich speech (2007) and at the Valdai forum (2013), in the Address to the Federal Assembly (2014), and in the National Security Strategy (2015).

"In the government there are people who do not flatter themselves with the election performance of United Russia; they realize that the people who did not come to vote send out a very serious message. Because **passivity can easily change to another political sign. All the more so that the anger in society is growing. Therefore, there emerges an idea that it is necessary to change something"**[22]. In this regard, there are many new persons in the ruling party now; the President has implemented a number of personnel reshuffles and appointed new people to key positions in the system of administration; as many respected experts note, the situation is moving toward a comprehensive reset of the political system. We cannot rule out the option that Russian public administration is moving toward a two- or one-party system[23].

However, whatever the person-nel changes in the government may be, it is necessary to remember that they should not be an end in itself. If they are not accompanied by satisfying people's needs for social justice, then it becomes yet another manifestation of imitation, which scientists talked about many times and which Russian society has already faced in its recent history.

In addition, many experts have considerable doubts about the fact that the current government can change the present-day economic trend – whether

> Imitation becomes the fruit of activity (conscious or unconscious) when an artificial environment is created for processes and phenomena designed to achieve specific (selfish), putatively socially relevant, group and corporate goals... it thrives in those conditions when there is no steady feedback from the people, when their opinion is not taken into consideration, but they are proposed to follow the decision of the functionaries in power[24].

[21] Strategic goals and objectives of Russia's development for the next decade are given in more detail in V. Putin's program article "Russia at the turn of the millennium" published in *Rossiiskaya gazeta* of December 30, 1999.

[22] An interview with MGIMO Professor Vladimir Solovey on the radio "Komsomolskaya Pravda" on September 30, 2016. Available at: http://www.kp.ru/radio/guest/823390/

[23] "It is obvious that Russia now is forming a system with the so-called dominant party. It is the United Russia party, which will have not just a monopoly in politics, but it is ready to declare itself as the avant-garde of society. Just like the Communist party used to be the avant-garde of the Soviet Union..." (source: *ibidem*).

[24] Toshchenko Zh.T. Novye liki deyatel'nosti: imitatsiya [New faces of activity: imitation]. *Sotsiologicheskie issledovaniya* [Sociological Studies], 2012, no. 12, p. 23.

because of a basic misunderstanding of laws of modern economics, whether from the unwillingness to understand them due to a personal interest in the existing state of affairs[25].

Another important issue that the current government will have to deal with is as follows: the events of "Crimean spring" stirred in the Russian society a powerful layer of spiritual needs, which "are the basis of the Russian civilization project", though they were "dormant"[26]. Today this effect is fading away, it gives way to socio-economic problems; but it is clear that the **need for a new ideological paradigm of development will not be able to remain without response from the state.**

Russia's position in the international arena requires this as well, because none of the centers of a multipolar world cannot exist without ideological rod as strong as the American "consumer society". At the same time, neither socialism nor capitalism will dominate in Russian society, because the experience of both was lived through. "We have already lived under the socialist system and we remember its strengths and limitations well... Restoration of anything (especially in politics) rarely opens up new horizons"[27]. That is why it is necessary to adopt a completely new ideological content based on a deep, mental feeling uniting the majority of social strata of Russian society, the sense of social justice and high moral ethics.

Thus, "tactical achievement does not eliminate strategic uncertainty"[28]. The victory of the current government in the State Duma election confers on it the responsibility for solving the two most difficult issues – the withdrawal of the economy from a state of "sluggish depression" and the formation of a new ideological paradigm of spiritual and moral development. After United Russia got a constitutional majority in Parliament and in the entire power vertical (President, Government, State Duma, governors), the ruling elite has no more or less weighty opposition, which could become an obstacle to the making of administrative decisions that the elite considers necessary. The only obstacle is inside it – it is a confrontation between "the statists" and the liberals who defend

[25] **"The economic bloc of the government and the Bank of Russia will never admit to making an error.** After all, their price is huge – only in the past two years due to the fact that the Central Bank, after the withdrawal of external sources of credit due to the Western sanctions, reduced domestic credit as well, the underproduction of GDP amounted to about 10 trillion rubles, and the decline in investment was more than two trillion. The ruble incomes and savings of citizens and businesses devalued twice" (S.Yu. Glazyev's opinion on D.A. Medvedev's article "Social and economic development of Russia: Finding new dynamics" published in the journal *Voprosy Ekonomiki*, 2016, no. 10 (source: источник: Glazyev S.Yu. Chego ne khochet znat' prem'er? [What doesn't the Chairman of the Government want to know?]. *Gazeta "Zavtra"* [Newspaper "Tomorrow"], 2016, September 29. Available at: http://zavtra.ru/blogs/chego_ne_hochet_znat_prem_er)

[26] Gorshkov M.K. "Russkaya mechta": opyt sotsiologicheskogo izmereniya ["Russian dream": an experience of sociological assessment]. *Sotsiologicheskie issledovaniya* [Sociological Studies], 2012, no. 12, p. 10.

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their own interests and the interests of the "collective West". The first group accumulates "strong positions of pro-Western "agents of influence", those comprador forces, whose interests and assets are within the sphere of influence of the "collective West" and who at any cost, "dead or alive", need guarantees from the West that these interests and assets will be inviolable". The second group is "ready to get such guarantees "from a position of strength", using Russia's military-political potential"[29].

A crucial role in this confrontation will belong to the head of state, to his political will and the talent of strategic planning. Perhaps this will become a key factor that will affect the choice of Russians in March 2018 during the election of the President of the Russian Federation.

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Public Opinion Monitoring of the State of the Russian Society

As in the previous issues, we publish the results of the public opinion monitoring of the state of the Russian society conducted by ISEDT RAS in the Vologda Oblast[1].

The following tables show the dynamics of a number of parameters indicating the social feeling and socio-political sentiment of the Vologda Oblast population in August – October 2016, and also on average for the last six polls (October 2015 – August 2016). These data are compared with the data for 2007 (the last year of Vladimir Putin's second presidential term, when the assessment of the President's work was the highest) and for 2011 (the last year of Dmitri Medvedev's presidency). The yearly dynamics of the data is presented beginning from 2013.

Estimation of performance of the authorities

In August – October 2016, the assessment of work of the President of the Russian Federation did not change significantly and amounted to 68–69%. Approval of the President's work remains at the level of 2015 (69%), which is significantly higher that in 2011–2014 (55–64%). Approximately one in five residents of the Vologda Oblast (20%) gives negative assessments of the President's work, which is slightly higher than in 2015 (18%) and significantly exceeds the level of 2007 (12%).

The assessment of the work of the Chairman of the Government of the Russian Federation over the past two months became slightly worse: the percentage of positive judgments decreased from 53 to 49%; the share of negative judgements increased from 28 to 31%. The proportion of positive judgments about the work of the Prime Minister remains lower than in 2014–2015 (54–58%).

For reference: the nationwide level of approval of the RF President's performance remains stable. In August – October 2016 it was 79–81% according to VTsIOM (the share of negative assessments was 13–15%); and in August – September it was 82% according to Levada-Center (the share of negative judgements was 18%).

[1] The polls are held six times a year in Vologda, Cherepovets, and in eight districts of the oblast (Babayevsky District, Velikoustyugsky District, Vozhegodsky District, Gryazovetsky District, Kirillovsky District, Nikolsky District, Tarnogsky District and Sheksninsky District). The method of the survey is a questionnaire poll by place of residence of respondents. The volume of a sample population is 1500 people aged from 18 and older.

The sample is purposeful and quoted. The representativeness of the sample is ensured by the observance of the proportions between the urban and rural population, the proportions between the inhabitants of settlements of various types (rural communities, small and medium-sized cities), age and sex structure of the oblast's adult population. Sampling error does not exceed 3%.

More details on the results of ISEDT RAS polls are available at http://www.vscc.ac.ru/.

How do you assess the current performance of..? (as a percentage of the number of respondents)

Answer option	2007	2011	2013	2014	2015	Dec. 2015	Feb. 2016	Apr. 2016	June 2016	Anp. 2016	Oct. 2016	Average for the latest 6 surveys	Dynamics (+/-) the latest 6 surveys in comparison with…		
													2015	2011	2007
RF President															
I approve	75.3	58.7	55.3	64.1	69.1	69.7	68.1	66.9	67.4	68.7	68.4	68.2	-1	+10	-7
I don't approve	11.5	25.6	29.4	22.3	17.5	16.5	16.1	17.9	20.1	19.6	19.7	18.3	+1	-7	+7
Chairman of the RF Government*															
I approve	-*	59.3	48.9	54.2	58.1	57.9	54.9	53.5	52.8	52.7	49.4	53.5	-5	-6	-
I don't approve	-	24.7	32.8	27.6	21.7	21.7	22.6	25.7	28.6	27.7	30.6	26.2	+4	+1	-
Governor															
I approve	55.8	45.7	44.4	40.1	39.3	39.7	35.1	34.9	38.2	38.4	39.1	37.6	-2	-8	-18
I don't approve	22.2	30.5	33.2	38.9	36.2	35.3	38.2	39.6	40.3	40.0	39.3	38.8	+3	+8	+17

* Included into the survey since 2008.

In August – October 2016, the assessment of success of the President's actions in addressing the key problems of the country did not change significantly:

- the share of the Vologda Oblast residents who think that the President successfully copes with the task of strengthening international positions of Russia is 50–51%;
- the share of the Vologda Oblast residents who think that the President successfully copes with the task of restoring order in the country is 50%;
- the share of those who believe that the President is successful in protecting democracy and strengthening citizens' freedoms is 36–37%;
- the share of those who believe that the President successfully copes with the task of economic recovery and promotes the increase in the welfare of citizens is 26–27%.

It should be noted that in February – October 2016, the percentage of Vologda Oblast residents who think that Russian President's work on economic recovery and growth of welfare of citizens is unsuccessful increased from 57 to 61%.

Over the last 12 months on average the proportion of positive ratings (26%) remains lower than in 2011–2015 (31–35%).

In your opinion, how successful is the RF President in coping with challenging issues?*
(as a percentage of the number of respondents)

Answer option	2007	2011	2013	2014	2015	Dec. 2015	Feb. 2016	Apr. 2016	June 2016	Апр. 2016	Oct. 2016	Average for the latest 6 surveys	Dynamics (+/-) the latest 6 surveys in comparison with…		
													2015	2011	2007
Strengthening Russia's international standing															
Successful	58.4	46.2	45.7	50.4	51.7	53.2	50.9	50.7	52.2	50.1	51.4	51.4	0	+5	-7
Unsuccessful	24.9	33.7	36.2	32.4	31.3	31.5	29.1	30.9	29.0	30.3	28.8	29.9	-1	-4	+5
Index of success	*133.5*	*112.5*	*109.5*	*118.0*	*120.4*	*121.7*	*121.8*	*119.8*	*123.2*	*119.8*	*122.6*	*121.5*	*+1*	*+9*	*-12*
Imposing order in the country															
Successful	53.2	36.6	39.4	48.0	50.2	50.5	47.7	48.1	49.7	50.0	49.7	49.3	-1	+13	-4
Unsuccessful	34.0	50.0	47.5	39.1	37.9	38.0	37.2	38.2	37.5	35.1	35.6	36.9	-1	-13	+3
Index of success	*119.2*	*86.6*	*91.9*	*108.9*	*112.3*	*112.5*	*110.5*	*109.9*	*112.2*	*115.4*	*114.1*	*112.4*	*0*	*+26*	*-7*
Protecting democracy and strengthening the citizens' freedoms															
Successful	44.4	32.4	31.8	37.5	40.4	41.0	36.9	35.6	38.3	36.7	35.7	37.4	-3	+5	-7
Unsuccessful	37.0	48.3	51.0	45.4	41.5	43.7	44.3	45.3	42.2	45.0	44.7	44.2	+3	-4	+7
Index of success	*107.4*	*84.1*	*80.8*	*92.1*	*99.0*	*97.3*	*92.6*	*90.3*	*96.1*	*91.7*	*91.0*	*93.2*	*-6*	*+9*	*-14*
Economic recovery and increase in the citizens' welfare															
Successful	47.2	30.7	31.3	34.8	34.2	30.9	28.0	27.6	27.5	26.7	26.4	27.9	-6	-3	-19
Unsuccessful	39.1	56.1	56.8	53.4	52.3	55.7	57.0	57.9	59.1	60.4	60.9	58.5	+6	+2	+19
Index of success	*108.1*	*74.6*	*74.5*	*81.4*	*81.8*	*75.2*	*71.0*	*69.7*	*68.4*	*66.3*	*65.5*	*69.4*	*-12*	*-5*	*-39*

* Ranked according to the average value of the index of success for 2015.

Over the past two months, the structure of Russians' preferences concerning political parties did not change and it has remained stable since the beginning of 2016. The United Russia party is supported by 36–37%, LDPR – by 11–13%, KPRF – by 8–9%, the Just Russia party – by 5–6%.

According to the results of the 2016 State Duma election the ruling party received 38% of votes, LDPR – 22%, the Communist Party – 14%, the Just Russia party – 11%. As in 2011, supporters of the ruling party showed the almost complete coincidence of sociological measurement and results of the vote. A two-fold excess in the proportion of those who voted for United Russia over the proportion of those who shared the ideas of this party in 2007 may indicate that an administrative resource was involved. During the last two election campaigns, LDPR, KPRF and just Russia showed a significant gap between expected and real support, pulling part of the votes of the United Russia party.

C Since April 2016 there has been a decrease in the proportion of people who believe that no major political party expresses their interest (in April 2016 – 35%, in June – 30%, in August – 26%, in October – 24%). It is connected with the primaries held by United Russia in May 2016 and also with the election to the State Duma of the seventh convocation held on September 18, 2016.

Which party expresses your interests? (as a percentage of the number of respondents)*

Party	2007	Election to the RF State Duma 2007, fact	2011	Election to the RF State Duma 2011, fact	2013	2014	2015	Election to the RF State Duma 2016, fact	Dec. 2015	Feb. 2016	Apr. 2016	June 2016	Aug. 2016	Oct. 2016	Average for the latest 6 surveys	Dynamics (+/-) the latest 6 surveys in comparison with…		
																2015	2011	2007
United Russia	30.2	60.5	31.1	33.4	29.4	32.8	38.8	38.0	39.0	35.1	34.1	36.0	36.5	36.3	36.2	-3	+5	+6
LDPR	7.5	11.0	7.8	15.4	7.2	7.6	6.2	21.9	7.1	6.9	8.2	10.3	10.5	12.8	9.3	+3	+2	+2
KPRF	7.0	9.3	10.3	16.8	11.3	9.7	7.1	14.2	6.5	9.4	7.2	8.0	7.5	9.0	7.9	+1	-2	+1
Just Russia	7.8	8.8	5.6	27.2	4.6	3.5	3.6	10.8	3.7	2.7	2.7	4.0	4.7	6.1	4.0	0	-2	-4
Other	1.8	–	1.9	–	0.6	0.3	0.2	–	0.4	0.5	0.2	0.3	0.4	0.3	0.4	0	-2	-1
No party	17.8	–	29.4	–	34.9	34.4	31.8	–	30.5	31.7	34.9	29.7	26.1	23.7	29.4	-2	0	+12
It is difficult to answer	21.2	–	13.2	–	10.2	11.7	12.2	–	12.9	13.7	12.7	11.7	14.3	11.8	12.9	+1	0	-8

* Ranked according to the official results of the voting on the territory of the Vologda Oblast on September 18, 2016 (preliminary data of the CEC as of September 20, 2016).

Assessments of social feeling in August – October 2016 did not change significantly:

– the proportion of people who describe their mood as "normal, good" remains at the level of 69–70%;

– the proportion of those who say that "everything is not so bad; it's difficult to live, but it's possible to stand it" is 78–80%.

The proportion of the Vologda Oblast residents who consider themselves "rich" or "with average income" was 42–43% in October 206 (like in August), which is slightly higher than at the beginning of the year (40%). The proportion of people who consider themselves "poor and extremely poor" remains higher and amounts to 49–50%.

From April 2016, there has been a gradual increase in the consumer sentiment index (CSI), which indicates a growth in the positive expectations concerning the changes in the dynamics of people's financial situation and economic situation in the country: the index was 74 p. in April 2016, 77 p. in June, 79 p. in August, and 81 p. in October. Nonetheless, the consumer sentiment index still remains well below 100 points, which indicates the predominance of pessimistic forecasts in the evaluation of prospects for their personal financial well-being and the general state of the Russian economy.

Estimation of social condition (as a percentage of the number of respondents)

Answer option	2007	2011	2013	2014	2015	Dec. 2015	Feb. 2016	Apr. 2016	June 2016	Апр. 2016	Oct. 2016	Average for the latest 6 surveys	Dynamics (+/-) the latest 6 surveys in comparison with…		
													2015	2011	2007
Mood															
Usual condition, good mood	63.6	63.1	68.6	69.4	68.7	69.6	63.4	67.0	68.0	68.8	70.2	67.8	-1	+5	+4
I feel stress, anger, fear, depression	27.8	28.9	26.2	24.9	25.9	24.3	28.9	25.4	26.7	25.8	24.3	25.9	0	-3	-2
Stock of patience															
Everything is not so bad; it's difficult to live, but it's possible to stand it	74.1	74.8	79.3	80.8	78.4	78.0	73.1	77.5	78.2	78.3	79.5	77.4	-1	+3	+3
It's impossible to bear such plight	13.6	15.3	14.2	12.6	14.5	12.7	16.1	16.4	15.7	15.5	14.9	15.2	+1	0	+2
Social self-identification*															
The share of people who consider themselves to have average income	48.2	43.1	43.9	43.2	38.7	38.9	39.9	40.9	42.8	43.2	42.3	41.3	+3	-2	-7
The share of people who consider themselves to be poor and extremely poor	42.4	44.3	46.9	49.1	50.7	50.5	51.4	49.4	47.1	49.5	48.9	49.5	-1	+5	+7
Consumer sentiment index															
Index value, points	105.9	89.6	90.3	87.6	77.1	77.7	75.0	74.4	77.3	79.4	80.8	77.4	0	-12	-28

* Question: "Which category do you belong to, in your opinion?"

In general in the Vologda Oblast, in August – October 2016, the percentage of those who describe their social mood as being "good, normal, positive" has remained stable (70%). For the last two months, there have been no significant changes in the context of different socio-demographic groups.

In two out of 14 socio-demographic categories there was an increase in the percentage of people describing their mood as positive. Among them:

– men (by 5 p.p., from 67 to 72%);

– persons with secondary and incomplete secondary education (by 3 p.p., from 62 to 65%), and people with secondary vocational education (also by 3 p.p., from 69 to 72%).

Formally (within the sampling error), the decline in the assessments of social mood in August – October 2016 is registered in only one category – among people with higher and incomplete higher education (the percentage of positive judgments decreased by 2 p.p., from 77 to 75%)

Social mood in different socio-demographic groups (sum of answers "Good mood, normal condition", as a percentage of the number of respondents)

Population group	2007	2011	2013	2014	2015	Dec. 2015	Feb. 2016	Apr. 2016	June 2016	Апр. 2016	Oct. 2016	Average for the latest 6 surveys	Dynamics (+/-) the latest 6 surveys in comparison with…		
													2015	2011	2007
Sex															
Men	65.9	64.5	69.9	68.9	69.5	69.9	63.9	66.5	70.0	67.3	71.6	68.2	-1	+4	+2
Women	61.7	62.0	67.5	69.8	68.0	69.2	63.1	67.5	66.5	70.0	69.0	67.6	0	+6	+6
Age															
Under 30	71.3	70.0	75.5	75.1	77.1	76.9	69.9	75.4	81.2	74.5	76.3	75.7	-1	+6	+4
30-55	64.8	62.5	69.2	69.5	67.2	69.0	62.1	66.0	68.3	67.1	68.9	66.9	0	+4	+2
Over 55	54.8	58.3	62.4	65.4	65.5	65.9	61.5	63.7	59.8	67.7	68.3	64.5	-1	+6	+10
Education															
Secondary and incomplete secondary	58.4	57.4	60.6	62.5	63.6	64.6	57.8	62.4	62.9	61.7	64.7	62.4	-1	+5	+4
Secondary vocational	64.6	63.6	68.1	70.4	70.1	67.7	60.7	67.3	69.3	68.5	72.1	67.6	-2	+4	+3
Higher and incomplete higher	68.6	68.3	77.4	76.2	72.7	76.9	72.9	71.5	73.3	76.8	74.6	74.3	+2	+6	+6
Income groups															
20% of the poorest people	51.6	45.3	46.2	50.8	51.8	49.8	42.6	51.3	52.0	56.3	55.5	51.3	-1	+6	0
60% of the people with median income	62.9	65.3	71.9	72.3	71.0	72.2	66.3	67.6	69.3	70.4	71.8	69.6	-1	+4	+7
20% of the most prosperous people	74.9	75.3	83.3	84.8	82.0	78.8	77.9	81.0	85.2	78.5	79.3	80.1	-2	+5	+5
Territories															
Vologda	63.1	67.1	75.0	76.4	73.9	73.6	65.1	69.1	71.5	69.2	71.0	69.9	-4	+3	+7
Cherepovets	68.1	71.2	75.3	76.3	70.6	73.2	66.4	70.5	72.5	74.0	72.7	71.6	+1	0	+3
Districts	61.6	57.1	61.6	61.8	64.6	65.0	60.9	63.9	63.7	65.7	68.1	64.6	0	+7	+3
Oblast	63.6	63.1	68.6	69.4	68.7	69.5	63.5	67.1	68.1	68.8	70.1	67.9	-1	+5	+4

Conclusion

According to the results of the main political event of 2016 (election to the State Duma of the seventh convocation, which took place on September 18), the United Russia party got a constitutional majority in the Parliament, because it received 55% of votes nationwide (compared to 49% in 2011). In the Vologda Oblast, according to the preliminary data of the Central Election Commission, 38% voted for United Russia, which is 5 p.p. higher than in 2011 (33%).

However, in absolute terms, the number of votes for the ruling party at the 2016 election compared to 2011 decreased: nationwide – by 3.9 million people (from 32.4 to 28.5 million), in the Vologda Oblast – by 39.3 thousand people (from 184.7 to 145.4 thousand). It should also be noted that, in comparison with 2011, voter turnout in Russia as a whole decreased significantly – by 12 p.p. (from 60.2 to 47.8%), in the Vologda Oblast – by 15 p.p. (from 56.3 to 40.9%). In absolute terms, voter turnout in 2016, compared to 2011, decreased by 13.1 million people nationwide (from 65.7 to 52.6 million), in the Vologda Oblast – by 162.5 thousand (from 553.7 to 391.2 thousand).

The Central Election Commission's official data on the election to the State Duma of the seventh convocation fully reflect public opinion trends observed in sociological monitoring measurements. 38% of the Vologda Oblast residents note that the United Russia party expresses their interests, the party obtained the same percentage of votes on September 18.

It should also be noted that support for United Russia since February 2016 remains at the level of 35–36%. Its victory was largely achieved thanks to the low turnout and return to the mixed voting system. The proportion of positive assessments of the work of United Russia Chairman Dmitri Medvedev in the period from August to October 2016 declined by 4 p.p. (from 53 to 49%).

During 2016 (as well as in the past two months) there were no significant improvements in self-assessment of people's financial situation: the share of those who consider themselves "poor and extremely poor" is 50%. People's opinions about the success with which the President deals with economic recovery and increase in the welfare of citizens also remain negative (the share of negative assessments is 60–61%, positive – 26–27%).

The lack of positive change in people's perception of the dynamics of the standard of living and quality of life correlates with the data of official statistics. Thus, according to Vologdastat, in July 2016, real disposable income of the Vologda Oblast residents amounted to 88.6% compared to July 2015, and real wages – 98%.

Thus, the 2016 election campaign has not led to significant changes in public opinion about the state of the Russian society, the population shows neither excessive optimism nor pessimism. People are waiting for the development of events. We can only agree with the President that "this election result is, without question, an advance on the part of our people, and we now must live up to their expectations"[2], and hope that this advance will be justified.

[2] Stenogramma soveshchaniya Prezidenta RF V.V. Putina s chlenami Pravitel'stva RF 19 sentyabrya 2016 g. [Transcript of the meeting of President of the Russian Federation Vladimir Putin with members of the Russian Government on September 19, 2016]. *Ofitsial'nyi sait Prezidenta RF* [Official website of Russian President]. Available at: http://www.kremlin.ru/events/president/news/52913

SOCIO-ECONOMIC DEVELOPMENT STRATEGY

DOI: 10.15838/esc.2016.5.47.2
UDC 330.341, LBC 65.9(2Rus)-962

Institutions of Catching-up Development (On the Project of a New Model for Economic Development of Russia)*

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Abstract. The article shows that institutional trajectories of catching-up development in successful countries including similar interim institutions; this similarity is explained by common technological, institutional and cultural limitations which need to be taken into account and overcome. Corporatism, indicative planning, the availability of the "general" development agency with broad mandate, undervalued exchange rate – these and some other mechanisms provide the countries of the "economic miracle" with an opportunity to initiate and maintain rapid economic growth despite the low level of human capital, underdeveloped civic culture and market failures. Institutions of catching-up development contributed to the formation of collaborative relations between the government, business and society. They eased the limitations and were gradually modified, providing a transition to modern democracies with efficient market economy. The conducted analysis helps outline a plan for an institutional reform taking into account Russia's institutional features. The principles of administrative reform are considered. The author also sets the objective of forming a "hybrid" system of national planning which includes indicative planning

* The research is conducted with financial support of the Russian State Scientific Foundation (Project no. 14-02-00234a).

For citation: Polterovich V. M. Institutions of catching-up development (on the project of a new model for economic development of Russia). *Economic and Social Changes: Facts, Trends, Forecast*, 2016, no. 5, pp. 34-56. DOI: 10.15838/esc.2016.5.47.2

and program budgeting. A combination of public-private partnership and program financing is proposed for the financing of the planned projects. The author proposes to use Japanese experience of promoting temporary association of companies for the development of modernization projects. The principles of reforming the systems of state property and science management are discussed.

Key words: interim institution, social values, democratization, national planning, assimilation of technology, public-private partnership, project financing.

Introduction

In the last 70 years only a few countries managed to work an "economic miracle" and achieve rapid economic growth of over 7% per year – for 15–30 years. These countries include five Asian "tigers" and Malaysia, Western European countries that were previously lagging behind (Spain, Greece, Ireland), and war-ravaged European economies (France, Germany). Despite radical differences almost all these countries, aiming to build modern market mechanisms, carried out institutional reforms on the uniform principles. More precisely, they formed institutional pathways that contained several similar intermediate institutions[1]. The most important of them are indicative planning and the general (federal) agency for development (FAD), the national innovation system focused not so much on the creation of innovations as on borrowing more advanced technology and methods for economic management, and a system for funding large-scale projects. Financial systems in the countries with successful catch-up development had significant common features. In particular, they relied predominantly on the banking system rather than financial markets; banks had closer ties with the firms that borrowed loans from them, closer than in developed countries; the policy of central banks was synchronized with macroeconomic and industrial policy of the government and, as a rule, aimed to maintain an undervalued real exchange rate of the domestic currency.

This research relies on the hypothesis that the observed similarity of the institutional structure can be explained by the specifics of goals and technological, institutional and cultural barriers in the countries with catch-up growth. Improving the quality of life is a complex multi-criteria task for advanced countries, it requires costly search for innovation; opportunities for planning are very limited here. The quality of life for an economy whose lagging is very significant is closely related to GDP per capita, and the main way to raise it, according to Alexander Gerschenkron, is to borrow technology and practices of economic management. A relative simplicity with which the goal is formulated and the availability of information about major ways to achieve it are factors that predetermine a fundamental possibility of efficient planning and identify other

[1] About the concept of intermediate institution see: V.M. Polterovich (2007).

above-mentioned institutional features of countries that worked "economic miracle". Below, their experience is considered in light of the hypotheses formulated, and on this basis we outline the principles of institutional reform in Russia given the specifics of the Russian economy, current state of Russian institutions and civic culture.

Two concepts of catch-up growth

In order to understand the controversy about the ways to reform the Russian economy that has been going on for a quarter century, it is advisable to consider two types of institutions – competitive market institutions (CMI) and catch-up growth institutions (CUGI). Institutions of the first type, in my opinion, are those that ensure the high quality of competitive environment: protection of property rights, antitrust regulation, low barriers to entering the market, low levels of corruption, etc. Their effective operation requires the high level of civic culture. Institutions of the second type are intermediate. Their purpose is to provide rapid economic growth in conditions of cultural, institutional and technological limitations typical of developing countries. At the same time they mitigate these limitations, creating conditions for their own modification adapted to new conditions. Thus, CUGI are used as building blocks for constructing an institutional pathway that provides transition to a developed economy with high-quality institutions of the first type.

Among the restrictions that have to be considered and overcome in this process, features of civic culture are the most inertial ones. Paternalism, passivity, disrespect for the law, low level of generalized trust, short horizon for decision-making, fear of risk and uncertainty, and inability to cooperate – these traits are incompatible with competitive market institutions that ensure the efficiency of modern advanced systems. Experience shows that attempts to introduce radical improvements to CMI under these constraints are inefficient. However, this point of view still finds influential supporters in Russia (see, in particular, Akindinova et al., 2016)[2]. Their "recipes" are reduced to privatization of state property and alleviation of the "burden on business" by reducing social spending (establishment of "legitimate institutions for co-financing social benefits with citizens", p. 32). The authors pin special hopes on the introduction of a defined contribution pension system and on increasing the retirement age, since they consider these mechanisms to be "institutions of long-term money" (p. 24). Here they ignore the experience of dozens of countries that carried out similar reforms and failed. In particular, when a defined contribution system was adopted in Latin American countries, a significant proportion of workers moved to the informal sector (see discussion and references: Polterovich, 2012b).

[2] A.A. Kudrin supports similar concept (2016). We will return to the discussion of his program in Sections 8 and 14.

The concept of shock treatment for improving market institutions does not take into account the fact that some types of market failures play a particularly important role in developing economies. As a result of a low level of generalized trust, short-horizon decision-making, and fear of risk, firms are reluctant to undertake long-term investments. A short horizon leads to serious errors. Thus, the failed diversification of the Russian economy in the 2000s was largely caused by the fact that the market signals directed investment primarily to the mining sector.

In decision-making, "technological horizon" is of great importance along with time horizon. Sustainable catch-up growth is based on technological advancement. In the simplest cases, mastering new technology in one of the vertices of the production graph does not involve changing technology in adjacent vertices. However, these options seldom lead to a rapid growth in productivity. "Breakthrough" projects usually require simultaneous technological advance in the chain of related industries. In order to circumvent this difficulty, the formation of new or significantly updated sectors often relies on imported materials and equipment, as well as on external demand; import substitution and a shift to domestic supplies occur gradually and with a significant lag. It is possible to accelerate this process and overcome potential difficulties associated with import purchases and limited external demand only with the help of large-scale projects that are rare even in a developed market environment. Such projects require coordinated efforts of many actors, a high level of mutual trust, sufficiently long horizon for decision-making, and a reliable lending system. In order to implement such projects in developing economies where there are no such prerequisites, it is necessary to create special intermediate institutions that ensure coordination under the auspices of the state.

Forming intermediate institutions is akin to inventing, because it requires taking into account the specifics of a given country. However, when we analyze the experience of successful economies that achieved "economic miracle", we can see that a certain set of institutions and management methods was used by almost all of them to maintain rapid growth. It is natural to assume that this similarity is due to common technological, institutional and cultural constraints that had to be addressed and handled. One of the goals of the present study is to consider such institutions, this work complements a number of our previous works (see, in particular: Polterovich, 2016).

It is important to note that catch-up growth institutions mitigate cultural constraints in two ways. First, they form the framework for interaction contributing to the development of civic culture. Corresponding examples will be given below. Second, they initiate and support the growth that has a positive impact on civic culture.

Corporatism as an intermediate institution

Attempts to promote democracy in developing countries often cause a drop in production and the return to an authoritarian regime. It is outlined in Inglehart, (2000) that "mass values and attitudes have a decisive influence on the survival of democratic institutions in society" (p. 225). Objecting to an idea that the introduction of democratic institutions in itself leads to the development of democratic values, the author writes about Russians: "Having moved toward democracy in 1991, they did not... start to trust each other more, nor did they become more tolerant, or post-materialists to a greater degree. In general, they moved in an opposite direction" (p. 227).

A crucial question is how to avoid such consequences. In this regard, it is worth noting that modern economic growth under any political regime requires a high level of education and rationality; and raising the well-being inevitably leads to increasing the importance of post-materialistic values and, then, eventually, to the development of democracy (Inglehart, Welzel, 2010, p. 561).

Democratization was successful in the countries which from the very beginning formed a political system corresponding to paternalistic expectations. For instance, in East Asia, consolidating efforts during the process of reforms relied on a "merger" of the state apparatus and business in the framework of corporatist regimes that gradually transformed from state corporatism to societal corporatism (Unger and Chan, 2015). Corporatism is understood as a system of political and economic decision-making based on the interaction between state and organizations representing interest groups (primarily workers and employers). Comparative systems include a wide range of systems, from Francoist Spain to the Nordic countries and Austria in the post-war years. As a rule, within such regimes, the reforms were initiated by a strong leader (Park Chung-hee in South Korea, Lee Kuan Yew in Singapore, and so on), who managed to create a cohesive team of administrators focused on the tasks of promoting growth, in accordance with one of the principles of "developmental state" formulated by Chalmers Johnson (Johnson, 1999). Other principles of effective governance in catch-up countries noted by Johnson are also borrowed from the experience of successful corporatist regimes: sufficient decentralization, evaluation of performance of officials at all levels of the hierarchy for their achievements in promoting economic growth, and subordination of foreign policy to the tasks of economic development.

The role of the state in the framework of successful corporatist regimes declined gradually, simultaneously with changes in mass culture, so that these regimes transformed into modern democracies.

National planning system and the federal agency for development

In conditions of a poorly developed institutional environment the market itself cannot cope with the task of generating large-scale efficient projects. This is due primarily to a high uncertainty caused by considerable volatility of market situation – fluctuations of prices and exchange rates, lending terms, volatility of demand, and the unpredictable behavior of the state and partners. Distrust is combined with a low level of negotiability rooted not only in these objective circumstances, but also in the flaws of business culture. Another obstacle lies in the lack of information about cutting-edge technology due to the low level of human capital and objective difficulties in obtaining this information.

In the simplest situations the change in technology by one enterprise does not affect subcontractors. However, such development opportunities are quickly exhausted. Accelerated borrowing requires simultaneous change in complementary technology in different parts of production graph. At low levels of generalized trust and in the presence of paternalistic expectations, complementarity is an insurmountable obstacle for the market, but not for planning.

It is no coincidence that almost all the countries that achieved "economic miracle" used indicative planning in one form or another. Not only did it help overcome the above-mentioned market failures, but it also greatly influenced popular culture. Here is what Pierre Masse, a Frenchman who created indicative planning, wrote: "A plan is worked out through concerted efforts of the representatives of economic and social forces: civil servants, managers (agricultural, industrial, commercial), trade unions and employees. This collaboration provides more coherent forecasts and solutions and creates a sense of unity contributing to the implementation of the plan" (Masse, 1965).

Currently, several successful economies such as Ireland, China, India, Malaysia, and Saudi Arabia have indicative planning systems. Departments responsible for this process usually try to involve business associations and representatives of civil society in it; they initiate public discussions in order to raise the level of trust in the reforms planned, and hence to the respective power institutions. As shown in Horváth (2012), promoting trust speeds up economic growth.

Each of the national planning systems currently existing in various countries represents one or another version of a synthesis of two basic mechanisms: universal and program planning (Polterovich, 2015). The former, usually implemented in the form of indicative planning, aims to achieve accelerated and balanced development of sectors and regions through large-scale investment projects; it requires a hierarchy of specialized planning institutions to be formed. The latter, widely spread in the form of program budgeting, uses

a relatively small number of programs addressing key economic issues to promote development; the programs are designed and implemented by ministries and agencies that also carry out management. National planning in developing countries tends to be of the first type, and in the developed ones – the second type.

In Russia, both types of systems are formed simultaneously, these two processes being unrelated to one other. The elements of indicative planning are actually contained in several legislative acts, the most important of which are Federal Law 115-FZ of July 20, 1995 "On state forecasting and programs for socio-economic development of the Russian Federation" and Federal Law of the Russian Federation No. 172-FZ of June 28, 2014 "On strategic planning in the Russian Federation". The law introduces elements of rolling planning, points to the need for coordination of plans and forecasts at the federal and regional levels. It also provides for the involvement of citizens, economic entities, trade unions, employers, non-governmental and scientific organizations in the process of strategic planning[3]. In July 2016, an important amendment (Article 18.1) on the formation of a strategy for scientific and technological development of the Russian Federation was introduced in the law.

Simultaneously with the formation of a universal-type planning system in Russia, a system for program budgeting was designed. In 2007, budgeting horizon was increased from one to three years. Several documents regulating the elaboration and evaluation of state programs were adopted (Khrustalev et al., 2013, pp. 49-78).

The main objective of national planning is to initiate and select large-scale projects for production modernization with the subsequent control of their implementation. It requires coordinated work of many ministries and departments. Therefore, in almost all successful catch-up economies this work was led by the structure that reported directly to the head of the government: the General Planning Commissariat under the French Government, MITI in Japan, the Council for Planning in Ireland, etc. Ministries' interests do not coincide, and in the absence of such an agency it is difficult to consolidate efforts necessary to ensure rapid growth under tough administrative competition.

It is necessary for Russia to complete the formation of a mixed national planning system (NPS) that integrates planning and budgeting (and NIS – see below) and includes iterative formation of short-, medium- and long-term plans at the regional and federal levels. It is necessary to abolish excessive documentation, develop a uniform methodology for designing strategies and forecasts of funds distribution among budget items. It is necessary to create a special agency subordinate directly to the Chairman of

[3] Find a more detailed analysis in: Polterovich (2015).

the Government. Let us call it the Federal Agency for Development (FAD)[4]. It is possible to use the agencies for development that already exist in most of the regions (regional agencies for development, RAD) and make them regional offices of FAD by reorganizing them in a necessary way. RAD, therefore, will be simultaneously subordinate to FAD and to regional administrations. It is necessary to use a standard apparatus for making forecasts and evaluating plans, which would be based on modern methods of data presentation and calculations (social accounting matrix, computable general equilibrium models, and econometric models).

We emphasize again that our approach is based on a non-standard understanding of a "planning unit", which we consider to be not a company, but a major project. This will help overcome the "curse of dimensionality": in a market economy it seems unlikely that it would be possible to establish smooth communication between all, even relatively large, firms. We understand the planning task as a task of assembling a rational dynamic portfolio of projects, consistent with financial constraints and influencing production system parameters. Here one can use ideas developed in the management theory by many projects (see links in Sandru et al., 2015).

Various forms of state support of the planned projects (see below) should be provided for; as a rule, however, state participation should not be dominant. The percentage of budget funds spent on supporting the plans and designing the planned indicators, as well as the functions of FAD, should be reduced as Russia gets closer to advanced countries in terms of technology.

Apparently, the Russian government has become aware of the need to create a state authority that would engage in project selection and would be independent of the ministries. This is evidenced by the fact that on June 30, 2016 the Presidential Council for Strategic Development and Priority Projects was formed "to promote cooperation between the federal bodies of state power, bodies of state power of subjects of the Russian Federation, bodies of local self-government, non-governmental associations, scientific and other organizations in addressing issues related to strategic development of the Russian Federation and implementation of priority projects" (Decree..., 2016). However, so far, the Council can at best be seen as a first step toward the creation of FAD. The Council does not have its own financial resources to create an institution engaged in systematic work on the initiation, formation and selection of large-scale projects and development of plans on their basis. The majority of tasks that such a structure should deal with have not even been set out. Coordination

[4] It is worth noting that the Law of 2014 discussed above mentions "a federal executive authority responsible for drafting state policy and legal regulation in the sphere of analysis and forecast of socio-economic development".

issues have been submitted to the level of vice-premiers and key ministers, and there are serious doubts concerning the possibility of settling the disputes efficiently. It is suggested that the first "package" of projects should deal with health, education, housing construction and housing and utilities. As for industrial modernization tasks, they are mentioned only briefly.

The role of the state in the economy and management of state property

Corruption of government officials is one of the most popular arguments in favor of privatization. This argument, however, is untenable for several reasons. First, officials are representatives of the very culture that dominates the society and to which entrepreneurs and managers belong as well. Given the fact that they too can have disrespect for the law and a propensity to misappropriation of the rent, it is not clear why these traits should be less pronounced after privatization. Second, corruption and inefficiency of the government inevitably affect the process of privatization, which provides special opportunities for rent appropriation. Third, state-owned enterprises can serve as an important tool of industrial policy, ensuring the formation of new industries, mastering new technology and management methods. Experience of fast-growing countries confirms these considerations. Thus, high corruption was observed in Korea during the period of the country's rapid growth. At that, state investments, including the budget, state-owned enterprises and state-controlled enterprises, accounted for an average of slightly less than 38% of all investment in 1963–1979 (Kim, 1991, Table 3-1). Moreover, the government significantly limited the scope of decision-making for private enterprises. For example, in Korea in 1966, about 40% of all transactions were subject to state price control in one form or another (Kim, 1991, section 3B). Experience shows that the role of the state in the economy should be reduced gradually, in proportion to the accumulation of market competencies and improvement of mass culture. At that, each act of privatization or nationalization should be accompanied by detailed substantiation (Polterovich, 2012a, 2013, 2016).

National innovation systems: efficient borrowing

According to Alexander Gerschenkron, developing countries have a chance to catch up with developed ones with the help of "advantage of backwardness" – an opportunity to borrow technology and economic management methods developed and proved efficient in more advanced countries. However, this opportunity is not implemented automatically, its implementation requires a system of appropriate institutions and sound economic policies (Wong et al., 1999; Kayal, 2008). As already mentioned,

quick borrowing requires simultaneous changes at various points of the production graph. Market agents do not initiate such projects, especially in the context of a short planning horizon and mutual distrust. Their formation is the main task of the national planning system (NPS) and, in particular, of FAD. At this, NPS needs to work closely with NIS, the institutions of which – technology parks, free economic zones, etc. – should be formed to facilitate the borrowing of technology in the first place.

Speaking about the policy of borrowing, one should keep in mind the following processes and tools that help influence a country's absorptive capacity (Polterovich, 2009b):

• regulating the import of new equipment and technology, purchase of licenses and tariff policy;

• regulating foreign direct investment in domestic economy and abroad, and the rules of formation of joint ventures;

• promotion of outsourcing;

• mastering new methods of production organization as a result of competition on the world market;

• cooperation with foreign specialists: training and internships abroad, inviting foreign professors, joint research;

• prevention of brain drain, encouraging the return of compatriots who have been educated or obtained work experience in the West;

• participation of the state in the acquisition of patents;

• promoting research on identifying the most efficient ways of borrowing (see Section 7);

• promoting technology diffusion – transfer of technology between Russian companies.

The experience of the countries with the "economic miracle" confirms the critical role of borrowing (see, for example, Odagiri, Gotō, 1996). Their particular importance for developing countries is emphasized in a World Bank study (World Bank, 2008, p. 14). In this regard, the question of foreign direct investment deserves special attention. As shown by numerous studies, their impact on economic growth in a recipient country is ambiguous. This may explain the policy of Japan, which, having launched economic spurt in the mid-1950s, used strict state control of foreign direct investment up to the end of 1960-ies. Thus in 1956–1963, foreign investors pledged to invest in the Japanese economy the profit and revenue from the sale of property in Japan (Odagiri, Gotō, 1996, p. 40).

In order to intensify technological upgrade, the Japanese government supported the establishment of temporary research associations of firms belonging to any one or related industries; the firms teamed up to master new technology, creating common labs or executing different works within a joint project. A significant part of government grants and subsidies were allocated to support research associations (Odagiri, Gotō, 1996, pp. 52-56).

Thanks to this mechanism, borrowed or newly created technology was diffused without additional costs.

Of course, as they were approaching the cutting edge of technological border, all successful countries gradually shifted to an innovative path of development, which, however, does not rule out borrowing (see references: Polterovich, 2009 and contemporary literature review in Benhabib, Perla, Tonetti, 2014).

In the "economic miracle" countries, the strategy of borrowing at a certain point matched with export-promoting policy. This allowed exporters to master new technology without waiting for the emergence of internal demand for relevant products, and to expand domestic sales gradually. Unfortunately, today, due to political constraints this approach cannot be used in full. Therefore, special importance is attached to integrated projects that involve the development of domestic demand for new products and nationwide distribution of experience acquired by companies. Development institutions should be focused on the solution of this problem. High differentiation of Russian firms in terms of technology (Kuznetsov, 2014) provides an opportunity to implement this policy. Successful import substitution is unlikely to be established without integrated projects and active diffusion.

Such a system at the regional level could be based on efficient cooperation in the following chain:

regional authority – regional agencies for development – business associations – firms[5]**.**

Regional agencies for development are widely spread around the world. Nowadays, there are more than 60 of them in Russia, and they function in the majority of regions. About 40% of all industrial enterprises are included in at least one association (Kuznetsov, 2014, p. 77). Thus, there is reason to expect successful implementation of this idea.

Shaping a modern sector for science and enhancing human capital

In order to develop NIS and the planning system, it is necessary to establish a modern sector of science that contains all the necessary intermediate links between fundamental and applied research: academic institutions, research centers at universities, sectoral research institutes, and research departments in large firms. Furthermore, it is necessary to elaborate a large-scale program for enhancing human capital. Like many developing countries, Russia is experiencing an acute shortage of qualified personnel, exacerbated by the brain drain. Meanwhile, the ongoing reforms in education and science not only fail to solve the problem, but make the situation even worse. In its current form, it is yet another naive attempt to transplant American institutions, the attempt that is doomed to fail. In Russian conditions, there is no reason to expect that universities

[5] See: Polterovich (2011).

will become efficient centers for basic research, thereby replacing the Russian Academy of Sciences, and that at the same time they will become major carriers of research findings to production (one of the reasons is high teaching load). Continuing to pursue this policy will doom any long-term modernization program to failure.

The task for universities is to provide the economy with highly-qualified personnel. In order to design modernization projects it is necessary to establish a network of industry-specific research and design institutes. Such networks exist in Sweden, Norway, Denmark, Finland, and Germany, where "companies usually cooperate with institutes when they need directly applicable knowledge and with universities in order to obtain human resources" (Arnold et al., 2007).

The reform of academic science has come to a standstill. Instead of the promised liberation from economic concerns and bureaucratic work, academic institutions are piled with paperwork and reports. In addition, it turned out that the "two keys" policy could not be implemented because officials want to control science and the Presidium of the Russian Academy of Sciences remains passive. It is necessary to carry out a new reform of RAS which would focus on attracting young professionals, and subordinating the FANO to the new Presidium.

Education reform that has been carried out for more than fifteen years proves inefficient and costly. One of the most important reasons for its failure lies in the naive ideas about the possibilities of "free market". The reformers believed that the introduction of payment for education must improve its quality through competition between institutions and more careful selection of educational institutions by students. However, it has been was found that an important role in the market of educational services belongs to "conspicuous consumption": a significant share of high school graduates care more about getting the certificate of higher education from a prestigious university rather than the knowledge they obtain in the course of education. In the 1990s, the market responded to this demand through the emergence of many educational institutions that actually offer diplomas for sale. The ease with which they can be obtained attracted new consumers to this market[6]. A subsequent inefficient equilibrium – an institutional trap – is supported by the principle "money follows the student", according to which many universities are willing to lower their requirements: they admit weak students and do not expel underachievers. An additional factor in a "bad equilibrium" is an extremely low salary of teachers contributing to the aging of the teaching staff and a slow updating of training programs.

[6] In 1992 in Russia there were 2.7 million students, and in 2008 – 7.5 million (Klyachko, 2013, p. 34).

The processes described above were accompanied and supported by declining quality of school education due to low salaries of teachers and faulty reforms, primarily, an inept implementation of the unified state exam. The reformers ignored the extensive experience of other countries (see the analysis and references: Polterovich, 2012c), and now have to deal with "unexpected" negative effects for many years. Declining quality of school education clearly demonstrates by the data given by Klyachko (2013, p. 25). The proportions of students whose performance at the unified state exam in the Russian Language and in Mathematics was unsatisfactory increased, respectively, from 7.9 and 20% in 2006 to 11.2 and 23.5% in 2008. In 2009, the authorities had to reduce the pre-determined minimum acceptable performance levels for each mark (from "excellent" to "unsatisfactory") for both exams.

The education system in Russia needs to be reformed. Of course, it is necessary to continue raising teachers' salaries and to expand opportunities for pre-school and school education. In addition, it is advisable to include the following suggestions in the agenda.

A. Providing all universities with the right to determine the passing score as a weighted sum of their own exams and the unified state exam. In this case the weighting coefficients should be chosen independently within the restrictions established for each university.

B. Modernization of training programs.

C. Empowerment of teachers (advanced training courses, work trips to the best Russian and foreign educational institutions).

D. Shutting down educational institutions of extremely low quality on the basis of an anonymous examination of their programs and classes.

An important aspect in improving human capital is the adequate reaction of the educational system to changes in the structure of needs. In this regard, it is necessary to establish a system for lifelong learning and continuous monitoring of the labor market (Denisova, 2010).

Exchange rate as a tool of industrial policy and the problem of inflation

Policy of maintaining a low real exchange rate that promotes exports and import substitution was a common practice for successful East-Asian economies in 1960–1990 (Page, 1994, p. 239). Modern China tries to adhere to it as well. Despite its costs and high levels of corruption and lobbying unregulated at the legislative level, the policy proves more efficient than selective methods of industrial policy, such as tariff regulation. The paper (Polterovich, Popov, 2016) provides arguments in favor of this policy in modern Russia. This policy, generally speaking, is contrary to the goal of inflation targeting proclaimed by the Central Bank of Russia. The Central Bank and Alexei Kudrin set a goal of the price increase being not more than 4% per

year. However, this goal is not substantiated and in fact has no sufficient basis.

It is well known that inflation, either too low or very high, is unfavorable for growth. Thus, the relationship between inflation and growth has a threshold character. Numerous studies (see references: Polterovich, 2006; Polterovich, Popov, 2016) show that the threshold is higher for developing countries than for developed ones. The numerical estimates vary, but most authors get a value of about 10% per annum or higher. The majority of successful economies began their rapid growth with double-digit inflation; its subsequent decline was the result of economic growth.

If the task of reducing one-digit inflation is not set out, then the second task – reduction of the budget deficit to 1% – proclaimed by Alexei Kudrin to be the central one loses its meaning. There is no reason to believe that even a greater temporary deficit is incompatible with economic growth. But the reduction of budget expenditures, proposed as the base scenario, can permanently hamper economic growth.

Combining public-private partnerships and project financing

Thorough and comprehensive assessment of projects' efficiency is of particular importance in the planning process. For this purpose, in the framework of FAD it is necessary to assemble a group of professional consultants and develop a unified evaluation methodology, which ensures comparability of the effects for diverse projects (to the extent possible). It is necessary to establish the standards for independent examination. Using preferential interest rates in project financing is appropriate only provided that efficiency is high. On the other hand, restrictions on the growth of money supply should not be too severe, because one should not hamper the financing of the projects that are efficient a priori.

The financing of planned projects can be accomplished with the help of various schemes, and the role of the state can vary from a 100% coverage of costs to partial guarantees on loans. In our opinion, one of the most attractive schemes is public-private partnership combined with project financing. In the last fifteen years, this model became popular in Western countries, where it is used mostly for infrastructure projects (Yescombe, 2015; Delmon, 2015). However, essentially, nothing prevents its use for production modernization projects. Cooperation between the state and the bank in the assessment and monitoring of a project can significantly reduce the risks, and the basic principle that consists in repaying the loan at the expense of the project profit will make it possible to regulate money supply in the country.

Policy of low inequality

As noted in Page (1994, p. 222), rapidly growing countries of South-East Asia combined rapid sustainable growth with a very low level of inequality. Low inequality

creates conditions for rapid growth in the number of reasons. First, it contributes to social peace, providing ceteris paribus a relatively low share of the poor and creating a feeling of justice of the system, and "legitimacy of rules and institutions". Thus cooperation between the state, business and society is facilitated. Second, lower income differentiation ceteris paribus is associated with lower levels of corruption (You, Sanjeev, 2005), which is especially important when civic culture is underdeveloped. Third, low inequality increases the demand for domestic goods, since most affluent consumers are focused on imports. Of course, the inequality must not be too low so as not to inhibit incentives to work.

Role of cooperation and social capital enhancement

"As a concrete example of late development, the case of Japan differs from Western market economies, Communist dictatorships, or new states of the postwar world. The most significant difference is that the government in Japan pursued economic policy in cooperation with the private sector... This model turned out to be the most successful strategy for planned development in history. It is reproduced today in the industrializing countries of East Asia: in Taiwan and South Korea, and also in Singapore and other countries in South and Southeast Asia" (Johnson, 1982). We have noted above that this cooperation was the basis of the idea of "developmental state" and its institutions such as indicative planning. In different countries it was implemented in the framework of other structures, initially based on paternalism and trust of a small scope with its gradual increase. In this regard, it is necessary to mention institutions such as the system of lifetime employment and the main bank system in Japan and other East Asian countries (Wu , Yao, 2012), municipal enterprises in China, construction and savings banks in postwar Germany and Austria (Polterovich, Starkov, 2007).

An example of "economic miracle" achieved through liberal policy can be found in Ludwig Erhard's reforms in post-war West Germany. Indeed, Erhard did not use indicative planning; however, the role of the state in the process of transformations initiated by Erhard was not reduced to the formation of competitive market institutions. Suffice it to say that the liberalization of prices began in Germany only in 1948, and until 1952, the government controlled the prices of most important goods – essential commodities, steel, coal etc. In 1948–1960, the government had almost 44% of all net savings. Ion order to select the most important and effective projects, the Central Capital Market Committee was established, it worked closely with investors, providing loans at the rates twice below market rates for the implementation of selected projects (Stolper, Roskamp, 1979). The success of Erhard's reform was achieved through gradualist approach

and active redistributive social policy that ensured support of the population.

Major directions of the forthcoming institutional reform in Russia

The analysis carried out in the work leads to the hypothesis that the task of catch-up growth cannot be solved with the use of standard tools of economic regulation alone. It is necessary to restructure the entire system of institutions ensuring the formation and implementation of large-scale modernization projects. The experience of the "economic miracle" countries and the analysis of Russia's institutional specifics suggests the following main areas of such restructuring[7].

• Modernization of administrative management: formation of a team of fellow-thinkers in the upper echelons of power (instead of a structure based on the principle of "checks and balances"); inclusion of business and society in the system of management; evaluation of higher administrators' performance according to their contribution to growth (and not according to the degree of loyalty); regional decentralization.

• Formation of a national planning system based on the interaction between state, business and society, for the iterative development and coordination of targeted programs, short-, medium - and long-term plans[8].

• Improving absorptive capacity of the country and the formation of NIS to adopt technology with a gradual transition to innovation development.

• Development of the scientific sector and streamlining the interaction in the chain: basic science – applied science – development institution + R&D departments of large firms. Universities and the lifelong learning system are to provide this chain with highly qualified personnel. Updating and restoring the Russian Academy of Sciences.

• Education reform: granting the right to all universities to determine the passing score as a weighted sum of their own exams and the unified state exam; modernization of training programs; empowerment of teachers; shut down of educational institutions of extremely low quality on the basis of anonymous examination of their programs and classroom activities; development of the system for lifelong learning and continuous monitoring of the labor market.

• Creating a system that combines budget financing, public-private partnership and project financing of the scheduled projects. Formation of temporary unions (associations) of firms and providing them with funds on a competitive basis for the development of modernization projects.

• Establishment of a Federal Agency for Development subordinate directly to the Head of the Government, for the purpose of managing the system of national planning, NIS and institutional reforms.

[7] Due to the limited volume of the article not all of these areas have been discussed above.

[8] Of course, Russia should not copy the institutions that exist in the countries of the "economic miracle". Specifics of establishing a system for national planning in the Russian context is discussed in: Polterovich (2015).

• Modernization of state property management: formulating a mission for each state-owned enterprise, large-scale sale and purchase of shares only on the basis of appropriate project validation.

• Changing the policy of the Central Bank: focus on growth, rather than on lowering one-digit inflation. Maintaining a stable low real ruble exchange rate through the accumulation of reserves, and (or) reduction of the key interest rate.

• Reducing income inequality through progressive taxation and excise duties on luxury items.

• Establishing national construction savings banks, regional and corporate programs helping employees to purchase housing[9].

• Gradual improvement of market institutions along with the improvement of civic culture and welfare.

Of course, this list is not complete. In addition, each of these sections of the program needs detailed elaborating in accordance with the current state of Russian institutions and civic culture.

It is important to note that this project does not propose shock therapy. In its main points it requires the completion of the reforms that are already underway, which increases its chances of success.

About the program of the Stolypin club

The program described above develops a draft of the institutional reform proposed in the papers (Polterovich, 2009, a, b; 2010) and in the monograph Polterovich (exec. ed.; 2010). In these works and in some of our subsequent publications we spoke about the formation of a system for interactive growth management (SIGM); the previous section essentially elaborates the structure and functions of this system[10]. The program of the Stolypin club, "Economics of growth" (Stolypin club, 2015, 2016) contains a number of similar proposals. However, between the approach that we propose and the "Economics of growth" there are important differences that I would like to emphasize in a hope that the following comments will be further considered by the developers.

A. Indicative planning is not reduced to an "electronic system" whose main task is to forecast, as you can tell from the program text. This is the mechanism for initiation and selection of major projects, as well as a powerful tool to improve business environment – to strengthen trust, reduce uncertainty, increase the horizon of decision-making and reconciling interests.

B. The use of the growth rate of the number of productive jobs[11] that the program proposes as the primary criterion of effectiveness, in my opinion, is incorrect for three reasons. First, this index does not consider the costs of job creation. Second, it encourages "fragmentation" of the most effective jobs: it is more profitable to have two jobs than one job that produces greater

[9] See: Polterovich (executive editor; 2015).

[10] In particular, the work (Polterovich, 2010) emphasizes that in a period of stagnation of Western economies it is advisable to rely on import substitution (p. 15).

[11] For a considerable number of companies this indicator is equal to the number of new jobs that provide value-added per employee above a certain threshold.

value added. Third, this criterion gives an advantage to firms with a very low number of jobs.

C. There is no reason to believe that in the near future small and medium-sized enterprises can become the main drivers of growth. The experience of the countries of the "economic miracle" and the data of surveys of Russian enterprises show that large companies are better at borrowing, and cooperation with them is an important factor in the stable development of SMEs.

D. There exists an opinion that the "Economics of growth" offers to increase the money supply as an antidote. This understanding should be ruled out. Perhaps the reason lies not only in the speeches of some members of the Stolypin club, but also in the fact that the proposed funding scheme of projects has nothing to do with the process of their selection within the planning system; a link to project financing in our situation does not look like a reliable guarantee of projects' efficiency.

E. It is necessary to supplement the Program with sections on NIS, on science and education, and on the problems of privatization. In our current environment it is necessary to emphasize the relevance of borrowing and to consider the appropriate mechanisms; the policy of "stimulating" innovation leads to nowhere, given the fact that there is no demand for innovation; such a policy gives rise to manipulation and inefficiency.

F. Some of the program suggestions are not coordinated with each other. For example, rightly rejecting the reduction of inflation as a prime goal, the authors proclaim the need for market lending rates amounting to 4–5%, which does not make sense for non-priority projects with inflation of more than 4%; it is Alexei Kudrin's suggestion that such a rate be achieved.

It is not clear what the purpose of the proposed tax on foreign currency loans is: these loans make it possible to finance the purchase of foreign equipment without the risk of inflation.

On methodological errors in the development of reforms

It should be noted that the program put forward by Alexei Kudrin and the program of the Stolypin club contain some of the same methodological errors. One of them is pointed out by P.A. Minakir: both programs provide for the achievement of a balanced budget at the expense of the population, which will reduce demand for goods and thus cause the inhibition of growth (Minakir, 2016). Decline in welfare usually entails increasing social tensions, rising crime rate, expansion of the shadow economy and, therefore, deterioration of the institutional climate and decrease in tax collection. But it deprives Kudrin's program of the only tool it proposes to initiate growth and negates one of the main sources of growth specified in the program of the Stolypin club – a decline in the shadow production. Thus, both programs ignore the most important requirement for any reform: the need to form positive institutional expectations.

Both programs do not use the achievements of the economic science to justify their regulations, nor do they use the research on the strategies of catch-up growth in successful countries. Thus, their confrontation turns into a "struggle of opinions". This results in a negative consequence such as an incorrect comparison of Russia with developed countries[12]. Both programs rely on innovation development, ignoring the fact that the lack of "demand for innovation" in Russia is typical of the current stage of Russia's technological and institutional development. Accordingly, none of the programs attaches due importance to the crucial factor in overcoming stagnation – effective development of large-scale borrowing projects and diffusion of technology. At the current stage, this goal should underlie all institutional transformations. As experience shows, it is hardly achievable with the use of material incentives only. In order to overcome mistrust and start the process, the state should be initiator and participant of such projects.

Speaking about the general shortcomings, we cannot but underline a fundamental difference of the programs discussed. The reforms proposed by Kudrin focus solely on improving competitive market institutions. Experience suggests that such a strategy has little chance of success. The program of the Stolypin club, without denying the importance of competitive market institutions, is based on improving catch-up growth institutions and is, therefore, more promising.

Conclusion

As it is emphasized in the work (Polterovich, 2014), it is necessary to distinguish between investments in the level and investments in long-term growth rate. The increase in growth rate can be achieved by creating effective mechanisms for technological progress. Therefore, it is not just about regulatory measures, but primarily about the formation of institutions that contribute to technological evolution and rapid growth of physical and human capital. Countries that successfully implement catch-up growth were distinguished by the fact that they managed to build such institutions. This view is close to the idea of Chalmers Johnson concerning the feasibility to distinguish between regulatory state and developmental state.

The paper made an attempt to unite and develop the idea of institutional reforms in Russia, described in the work (Polterovich, ed.; 2010) and in several subsequent works based on analysis of institutions in the countries of the "economic miracle". We

[12] Thus, in the work "Economics of growth" (2015) on p. 34 we read that in Russia "in 2014 ...interest rates on loans were significantly higher than the rates in other developed countries". And here is an argument in favor of low inflation: "Neither the G7 members, nor China allow high inflation" (Kudrin, 2016, p. 12). Note that since the mid-1990s China has been accumulating gold and foreign currency reserves, and thus promoted economic growth and ran the risk of accelerating inflation. In February 2008, prices in China rose by nearly 9% compared to February 2007, but inflation in general remained low due to economic growth.

proposed the principles of administrative reform. The issue of formation of a national planning system was formulated as a task of creating a mixed system that includes indicative planning and program budgeting. The proposed system for financing planned projects was specified: here we speak about a combination of public-private partnership and project financing. It was proposed to use the Japanese experience of stimulating association of firms for the formation of modernization projects. The principles of reforming the system of state property management and the science sector were formulated.

Each of these ideas needs to be thoroughly elaborated. Their full implementation is likely to take 3–5 years. However, it is necessary to design the reform in such a way that positive changes could be observed during the very first year. Such effect is possible. It is well known, for example, that the process of drawing up plans, if it is not implemented by firms specifically hired for this purpose, but by the performers, forces them to take a new look at routine processes of production, stimulates the search for new solutions. It is necessary to improve the standard of living as soon as possible, even if this improvement is small. If after making such efforts the citizens believe in the reform, it will significantly increase the likelihood of its success.

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Received September 01, 2016

DOI: 10.15838/esc.2016.5.47.3
UDC 330.341.2; 334.025, LBC 65.01

Institutional Mechanism for Shaping Social Innovation*

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* This paper was executed with the support of the Russian Foundation for Basic Research, project No. 14-06-00024, and the Russian Foundation for the Humanities, project No. 16-32-00003.

For citation: Popov E.V., Veretennikova A.Yu., Omonov Zh.K. Institutional mechanism for shaping social innovation. *Economic and Social Changes: Facts, Trends, Forecast,* 2016, no. 5, pp. 57-75. DOI: 10.15838/esc.2016.5.47.3

Abstract. Institutional environment creates conditions for shaping social innovation projects. In this case, current rules and standards can both stimulate and inhibit the development of social innovation in a particular territory. The goal of the present study is to develop an institutional mechanism for the formation of social innovation. It is done with the help of multiparameter systematization method, graphic modeling and other general scientific methods. Theoretical principles of the research presented in the paper are based on the institutional theory, public sector theory, innovations theory, life cycle theory and others. The authors systematize the institutions that influence the formation and development of socio-economic environment; they also point out a list of barriers in the sphere of social project management and put forward possible solutions that help mitigate the impact of inefficient institutional structures. The paper proposes an institutional mechanism for shaping social innovation; this mechanism shows possible reasons for inefficiency of social innovation projects and explains how the institutional environment and internal rules and regulations affect the feasibility of project implementation and its effectiveness. The mechanism developed by the authors confirms a strong influence of institutional conditions on the process of creating and implementing social innovation projects. Results presented in the study can be used for shaping the institutional environment for socially oriented non-profit organizations and social entrepreneurs focused on the development and implementation of innovation projects.

Key words: institutions, social innovation, institutional mechanism, institutional environment.

Introduction

The level of people's welfare is a major indicator of socio-economic development in any country. Thus, decline in the standard of living in different categories of citizens aggravates social needs, which makes it necessary to find prompt solutions. However, it is not always possible to satisfy these needs at the state or municipal level in the short term; it is due to the following factors: limitations in the resources available, bureaucratic nature of the system and its many levels, inefficient institutions, and lack of social initiatives on the part of the citizens. In this regard, people's proposals and concrete actions that shape the conditions to meet social needs are becoming relevant. In this context, special importance is attached to social innovations are an effective tool to improve the quality of life of citizens.

It is no coincidence that in a period of crisis there is a surge of interest in social innovation. Working out the mechanisms for involving individuals in the development of the social sector is an effective way to increase people's social satisfaction, which is beneficial for their welfare and for socio-economic development in the territory under consideration. B.A. Erznkyan notes that "the social, by definition, cannot be imposed from above, it can emerge – under certain conditions, and sometimes

spontaneously, in spite of all the conditions – only from below, as an initiative, if not of the masses, then of individuals, of citizens". Thus, the author calls the very process of shaping the social sector "cultivation" [4, p. 29]. "Cultivation", in turn, involves shaping the institutional environment, institutional arrangements, socio-innovative activity of separate groups and specific individuals.

Modern socio-economic conditions also confirm the necessity of creating institutional mechanisms, stimulating social activity of the population and forming of the institutional conditions for the maintenance and development of the social innovation projects.

In this regard, the aim of this study is to develop an institutional mechanism for the formation of social innovation. To achieve this goal, the authors analyzed approaches to research on social innovation, revealed major characteristics of social innovation, defined the concept of institutional environment for social innovation, systematized exogenous and endogenous institutions, described institutional barriers of Russia's economy that impede the development of social innovation. In addition, the authors presented in graphic form and disclosed an institutional mechanism for shaping social innovation, the mechanism having been developed by the authors themselves.

The "social innovation" concept

The timeliness of the research on the topic designated above is confirmed by an increase in the number of forums and conferences devoted to social innovation: "Social Innovation Residency" in Canada, "Social Innovation Summit" in San Francisco, Forum for Social Innovation in Regions" (Omsk), and also by a growing number of organizations that promote social innovations: the Office of Social Innovation and Civic Participation at the White House in Washington, D.C.; the Ministry of Social Development and Social Innovation in British Columbia, the Centre for Social Entrepreneurship and Social Innovation under the National Research University "Higher School of Economics" in Russia and many others.

The surge of interest in this topic is due to a rapid transformation of modern socio-economic systems, which is associated with an increasing pace of technological change, globalization, intensity of information flows and development of network relations between economic agents.

At that, the theory of social innovation is at an early stage of its formation. Social innovation is an effective tool aimed to improve public welfare [19]. Most well-known examples of social innovation are Wikipedia, and Open University; projects of mass education such as Coursera, and Khan Academy; wind farms communities [15, 21] and others.

However, scientific literature provides no unified interpretation of social innovation, which caused a more detailed examination of this issue. International researchers engaged in studying the essence of this phenomenon are G. Mulgan, P. Koch, J. Hooknes, J. Fils, M. Moore, R. Nelson, L. Earl. As for domestic scientists, we should mention A. Golubeva, E. Sokolova, Kh.Z. Ksenofontova. Development specifics of social innovation and social infrastructure are also disclosed in the works of scientists of the Ural School of Economics [2, 24]. Evolution of social innovation in the public sector is highlighted in the works of I.S. Kats [5].

Having carried out our own analysis of scientific literature, we can therefore allocate the following approaches to the definition of social innovation. Representatives of the first approach [3, 21, 22, 23] treat social innovation as innovation designed to achieve social goals. In the framework of the second approach, R. Heiscala [17] and the Center for Social Innovation at Stanford University consider social innovations as something new that is happening in social space. This interpretation of the concept is close to the concept of "institution". Representatives of the third approach [18] consider that social innovation includes innovation in the social sector. In this case, social innovation is regarded as a public good. Based on the analysis of existing approaches, the present study provides its authors' definition of social innovation: *new ideas, opportunities and actions in social space, which increase the possibility of using resources to solve economic, social, cultural and environmental issues.* Social space is understood as a set of interrelated social processes, relationships, and social practices and attitudes that influence the creation of social innovation.

Institutional environment for social innovation

Institutional environment for social innovation is a set of institutions, institutional mechanisms and institutional agreements that dictate the terms of interaction between economic agents at all stages of socio-innovation process. Institutional environment can promote the development of social innovation projects or hamper their implementation; it can act as a catalyst for social innovation and as a barrier to the implementation of social innovation projects. In order to get a more detailed understanding of the content of institutional environment for social innovation, we have looked into several approaches to systematization of institutions, applicable to this type of activity.

Scientific literature contains considerable amount of research on the classification, systematization and typology of institutions. We provide the most common criteria for the systematization of institutions: the

level of implementation (formal and informal institutions) [8], the sphere of implementation (political, economic, social, environmental), the scale (macro-, micro-, mini- and nano-institutions), relation to state-and-territorial formations (municipal, regional, national, international), industry type (industrial, transport, agricultural, etc.), performance assessment (efficient, inefficient), management functions (institutions for planning, supervision, organization, and motivation), the place of origin (endogenous and exogenous), the degree of impact (direct, indirect), and the nature of impact (stimulating and constraining institutions).

The choice of a criterion for classifying the institutions in this work is due primarily to the goals that the author plans to achieve. In the framework of the study contained in this paper we focus on the following classification features: the place of origin, the level of formalization, the degree and nature of impact, and the scale.

The place of origin (exogeneity or endogeneity) of an institution shows, which institutions can be affected during the preparation of a socio-innovation project, and the impact of which institutions should be forecast. *The level of formalization* determines the nature of influence of an institution, and the stability of rules and regulations [1]. According to *the degree of impact,* there are institutions of direct impact that influence social innovation directly, and institutions of indirect impact that characterize the environment in which social innovation projects are implemented. Dividing institutions into stimulating and constraining ones helps identify the opportunities of institutional environment and the barriers it creates. The scale of an institution shows its importance and position in the hierarchy of institutions.

It is necessary to note the combination of different characteristics of institutions and their impact on social innovation projects. For example, the constraining informal institutions act as serious barriers to social innovation implementation, which is reflected, for example, in the conservatism of thinking inherent in some social groups. At the same time, the supporting (stimulating) institutions form favorable conditions for the implementation of social innovation. In order to study institutional environment for social innovation in more detail, we consider first the exogenous and then the endogenous institutions that form institutional environment for social innovation.

Exogenous institutional environment for social innovation

Exogenous institutional environment is a set of rules and norms that characterize the conditions of interaction of economic agents, the purpose of interaction is to create benefits, and the set of rules

and norms is described in the federal, regional or municipal legislation and national and territorial standards, and reflected in the habits of behavior and in the nature of interaction between partners and competitors in a specific territory or within a specific industry.

The base criterion to systematize exogenous institutions is the degree of formalization. The effectiveness of institutional environment is determined not only by the effectiveness of formal institutions, but also by the effect of informal institutions that serve as an essential condition for the formation of a complete picture of institutional environment for social innovation.

The next systematization criterion that we have chosen combines two classification features: the nature and degree of impact on social innovations. In other words, for the purpose of analyzing exogenous institutional environment for social innovation we highlight stimulating institutions, constraining institutions, and institutions that have an indirect effect. An example of stimulating institutions is presented by institutions for public financing of social innovation projects. Sanctions and embargoes that are typical features of constraining institutions prevent the expansion of social innovation. International, economic or social policy refers to indirect institutions and describes the environment in which it is planned to introduce social innovation.

The third systematization criterion is the degree of extent of an institution. The grouping of institutions according to the level of state-and-territorial formations helps build a hierarchy of institutions and shows the level that provided the resources allocated to specific rules and regulations. It is advisable to allocate the municipal, regional, national and international levels.

Figure 1 shows the structure of exogenous institutional environment for social innovation development as a cube, in which each plane reflects one of the above criteria.

In general, the cube contains 18 different combinations, that shows the presence of rules and regulations with the characteristics indicated, or, on the contrary, the presence of gaps in this type of activity.

For the purpose of a more detailed consideration of institutional environment for social innovation we have studied formal *(tab. 1)* and informal institutions separately.

Formal support institutions at the international level in this type of activity are presented as institutions for civic engagement, institutions for knowledge dissemination, and institutions for funding social innovation. At the national level this group includes various government programs, public-private partnerships, and preferential taxation. This group also includes legislative framework that

Figure 1. Structure of institutional environment for social innovation development

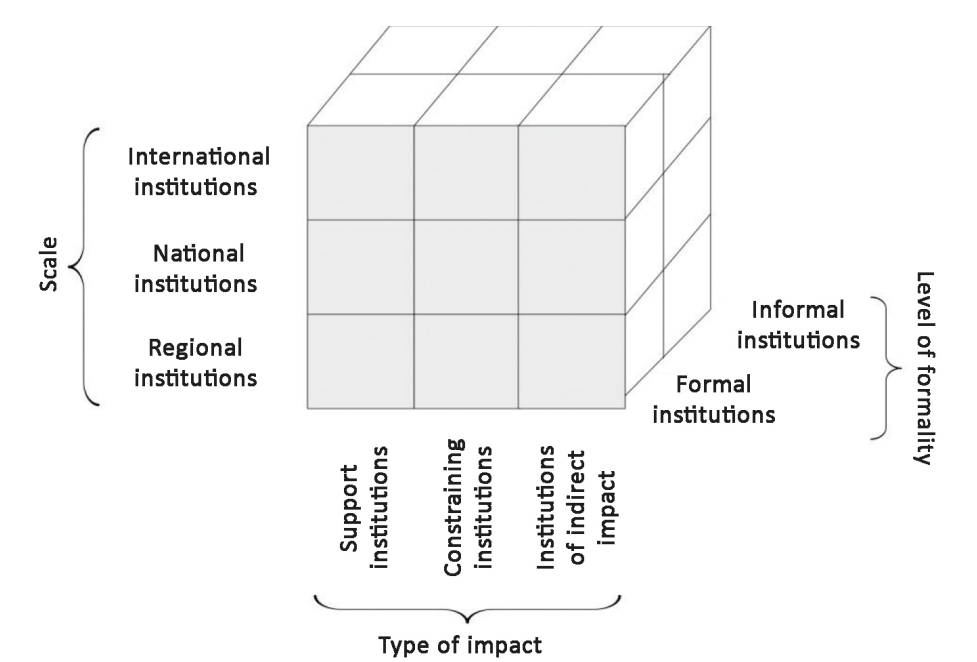


Table 1. Examples of formal institutions for social innovation

Level	Type of impact		
	Support	Restraint	Indirect impact
International	Institutions for civic engagement Institutions for knowledge dissemination Institutions for providing support to social innovation (for funding social innovation)	Sanctions, embargoes, visa regimes, etc.	International politics International law International movements, etc.
National	Governmental support programs Federal institutions for social development Public-private partnership Tenders Institutions for entrepreneurship regulation, non-profit organizations Preferential taxation for socially-oriented entrepreneurs Technology transfer institutions Federal law “On non-profit organizations”	Inefficient legal and regulatory framework at the national level	State social, economic, financial policy State statistics
Regional and municipal	Regional and municipal institutions promoting small and medium entrepreneurship	Inefficient legal and regulatory framework at the regional and municipal levels	Economic, social, financial policy of a region/city

governs the operation of technology transfer centers, social innovation centers, including those functioning under universities.

Support institutions at the regional level, as a rule, complement similar institutions at the national level. But their advantage lies in their more

concentrated focus. Formal restraint institutions hinder the harmonious development of economic processes and impede the implementation of social innovation. Constraining norms and rules at the international level are represented as sanctions, embargoes, and visa regimes. A common example of restraint institutions at the national and regional levels is also found in flawed institutions for legal support and inefficient legislative framework.

Indirect impact institutions represent institutions that exert an implicit effect. Such rules and regulations characterize the socio-economic system as a whole: political, legal, financial, environmental, economic, social and other factors that influence its development.

Informal institutions represent undocumented rules, regulations and mechanisms for their enforcement. They have a high degree of stability, which can either stimulate the development of social innovation or prevent its implementation. In domestic scientific literature, informal institutions represent a subject of a growing interest for researchers. So, for example, V.L. Tambovtsev published his monograph, in which he elaborates on the nature of informal institutions, principles of their functioning, and approaches to the study of informal institutions in the social sciences [14].

An example of informal support institutions at the global level can be found in religious foundations of Christianity, where it is considered a duty to do good to one's "neighbor" for the salvation of one's soul. Traditions of mutual aid and solidarity in dealing with social problems in different communities are related both to the national and regional level.

Informal restraint institutions will be religious norms that reject, for instance, scientific and technological progress, thus preventing the development of new activities, including social innovation. For example, members of the lower castes in India are forbidden to engage in entrepreneurial activities. Similar rules exist at both national and regional levels.

Endogenous institutional environment for social innovation

Endogenous institutional environment is a set of internal rules and regulations which the designers of social innovation projects follow when implementing these projects. Like in the analysis of the exogenous institutional environment, we allocated criteria for structuring endogenous institutions. Due to the fact that the main goal of social innovation is to solve social problems and meet social needs, it is advisable to group the institutions by types of activity: communication, production, and analytical [12, p. 126]. The second criterion for grouping the institutions was chosen to be the stages of the life cycle of social innovation, including its initiation, invention, imitation and adaptation [6].

At the stage of initiation a social problem is identified, and a process of generating new ideas is started. Production institutional environment at this stage includes various procedures and methods for generating ideas. The analytical component of institutional environment contains rules and regulations for carrying out a pre-project analysis, these rules are related to specifying the requirements, finding the resources, and planning future activities. Communication projection is reflected in building effective relationships with potential and current counterparties.

A social product or a service are developed directly at the invention stage. Here the ideas are implemented in a socially innovative project. It is necessary to allocate institutions for project design, funding, security (including information security), procurement, recruitment and staff development. Further detail is presented in *Table 2*.

At the stage of imitation we observe copying and diffusion of a social innovation solution, its projection to other areas or other activities. In this connection it is useful to mention the works of V.M. Polterovich [11], where the scientist reveals the essence of transplantation of institutions.

Adaptation is a stage in which current social decision undergoes transformation due to alterations in environmental conditions. The degree of innovation is virtually absent; however, the basis for the development of a new socially innovative project is formed.

Table 2. Examples of endogenous institutions for social innovation

Activity	Stages in innovation process			
	Initiation	Invention	Imitation	Adaptation
Production	Institutions for generation of ideas, institutions for strategic policy	Institutions for project design, institutions for attracting and developing resources, security institutions, institutions for tangible and intangible incentives	Institutions for diffusion of innovations and franchising, institutions for transplantation, institutions for the sale of the business	Institutions for organizational change and re-engineering processes
Analytical	Institutions for financial analysis and planning, fund-raising institutions, institutions for identification of needs, institution for the search for resources	Institutions for analysis and assessment of the organization's performance, institutions for financial and management accounting	Institute for analyzing the external environment, institutions for forecasting	Institutions for monitoring and analysis of changes institutions for identifying the needs
Communication	Institutions for interaction with contractors	Institutions for public relations	Institution for public relations (community involvement), institutions for dissemination and analysis of information institutions for communications with the external and internal environment	Institutions for interaction with clients and governmental agencies

It should be noted that the institutions presented in Table 2 are merely possible examples of this type of activity and may be supplemented by other rules and regulations.

Institutional issues in the development of social innovation

The above systematization of institutions that describes the institutional space in the development and implementation of social innovation is a theoretical platform for further analysis of institutional conditions in a particular territory. At that, initiators and developers of socially-innovative projects face some challenges, which lead to the fact that social projects become inefficient. For example, national social innovations such as the "Electronic Russia" project, and the introduction of technical regulations have failed.

Implementing social innovation is a complicated matter due to quite a few factors.

First, the effect of introducing a socially innovative project is often deferred and implicit. In order to trace it, one needs to use a previously elaborated mechanism to assess the effectiveness of the solution proposed.

Second, social innovation needs to be embedded in the current socio-economic space. In other words, institutions functioning in this territory should be focused on the development of social innovation environment.

Third, social innovation needs to meet the needs of society and its particular members and to ensure the willingness of potential consumers to pay for this social innovation.

Currently, institutional environment oriented toward the direct support of social innovation is being formed. Here social entrepreneurs face a number of barriers to socio-innovative development. The barriers can be manifested as institutional traps [10], dysfunction of institutions [13], and as an absence of necessary rules and regulations governing this type of activity.

When identifying institutional issues in the development of social innovation, we relied on practical information about social innovation gathered from the Forum for Social Innovation in Regions, which took place in November 2015 in Omsk [9]; we also used the works of scientists dedicated to the systematization of institutional traps [7, 10]. All this helped identify institutional barriers that hinder the development of social innovation and find possible ways of reducing their negative impact *(Tab. 3)*.

First and foremost, the table shows issues that directly characterize informal institutional environment: low level of trust and people's resistance to innovation. In order to handle these issues, it is necessary to have strong and transparent public institutions, the credibility of which should increase.

Table 3. Institutional barriers to social innovation

Factors restraining social innovation	Restraining institutional environment		Ways to reduce negative impact
	Institutional traps	Dysfunctions of institutions or absence of institutions	
Low level of trust	Opportunistic behavior of participants and partners of the project	Dysfunction of trust institution in terms of interaction between the innovator and partners	Designing efficient formal institutions
People's resistance to innovations	Conservative thinking	Dysfunction of development institutions in connection with risky nature of activity	Continuous support to socially innovative projects Development of a mechanism to engage citizens in the process of social entrepreneurship
Chaotic and weak dissemination of information about social innovation	Expensive marketing services	Dysfunction of information-searching institutions concerning the uneven distribution of information	Informing entrepreneurs about the ways to distribute information Development of a platform for social entrepreneurs
Flaws in financial support mechanisms	Lack of economic competitiveness of socio-innovative projects	Underdeveloped institutions for public-private and municipal-private partnership	Introducing amendments to the law on concession agreements Development of PPP programs directly for social entrepreneurs
Inefficient measures of state support for social innovation	Absence of comprehensive action on the part of the government to support social innovation, lack of support of investment projects in the social sphere	Absence of institutions for social innovations development	Providing support to investment projects in the social sphere (low-interest loans, reimbursement, etc.)
Absence of private investors in the social sphere	Reluctance of entrepreneurs to invest in social projects	Dysfunction of institutions for implementation of social projects consisting in the absence of mentoring	Providing state support to social investors
Lack of the necessary knowledge and skills in social design and entrepreneurship	Low attractiveness of this type of activity for qualified personnel	Dysfunction of education institutions consisting in limited successful experience	Formation of knowledge and skills in organizing socially-innovative projects
Absence of a road map	Lack of experience in implementing social innovation	Dysfunction of support of social innovation at the municipal and state level	Introducing a road map for social innovators
High risks	Poor institutional environment for promoting potential social innovators	Absence of institutional mechanisms for social innovators insurance	Introducing the best insurance programs for social innovators

The second group of issues (chaotic and weak dissemination of information on social innovation, inefficient financial support mechanisms, poor governmental support, absence of private investors in the social sphere, lack of necessary knowledge and skills in this area, high risk, absence of a roadmap) can be resolved through the development of various social programs, projects, legislative amendments, etc. Decisions for this group are of a more formal character. The table contains more detailed information about the improvement of institutional environment for social innovation. Removing barriers to socio-economic development will lead

to a surge in social development and it will also have a positive impact on economic performance in the territory.

Institutional mechanism for shaping social innovation

Efficient implementation of socio-innovative projects requires appropriate institutional conditions. In this connection it is necessary to consider what economic agents are involved in creating social innovation, what institutions the developer has to deal with in the course of project implementation, and in what form the project itself is presented.

Social innovation space comprises subjects engaged in introduction and implementation of social innovation, including social innovation developers, public entities, non-governmental funds providing support to such projects, and people as the end user of the result. Social innovation as a result of the project activities is the object. Institutional environment contains *ex ante* institutions and *ex post* institutions. *Ex ante* institutions serve as a kind of filter of efficiency and viability of an innovation in the current institutional framework, while *ex post* institutions show people's willingness to consume the social innovation.

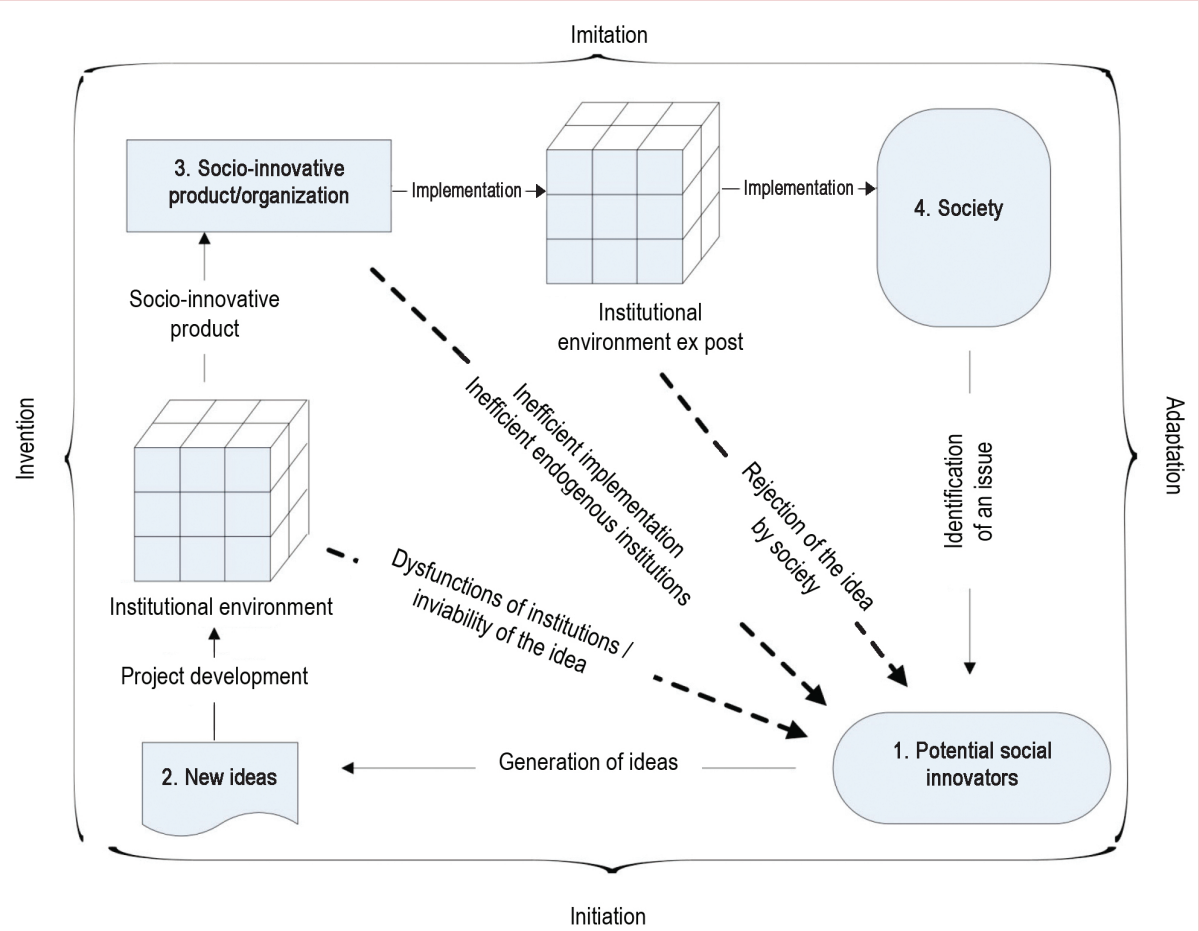
In the course of its development, social innovation changes from one form to another. A problem identified in a social environment becomes the driving force for generating ideas, which, if properly supported, will be presented as a socially innovative project and then transformed directly into the very social service or product that society consumes.

Having analyzed the interactions regarding the development and implementation of social innovation, we developed an institutional mechanism for the formation of social innovation, it is presented in *Figure 2*. In order to substantiate the above mechanism, it is necessary to show its connection with the life cycle of social innovation. Therefore, we considered the specifics of each stage in relation to social innovation.

Crisis phenomena in economic processes, unfavorable economic and political situation on the world stage, various failures both in government and in the private sector serve as a driving force for socio-innovation development. These phenomena trigger the initiation of social innovation. Governmental structures, social entrepreneurs, socially oriented non-commercial organizations, and ordinary citizens faced with a specific problem – all these categories can act as potential social innovators.

At the stage of invention the developer shapes his idea in a concrete form: prepares the project, basic documentation, project team, etc. After that, the idea, having been put in one form or another, goes through

Figure 2. Institutional mechanism for shaping social innovation



the institutional filter. Getting in the institutional environment *ex ante*, the project faces many formal institutions, most of which are formal. At the same time these institutions either slow the process of turning this idea into social innovation, or, conversely, stimulate it. Here there are two possible scenarios for the development of social innovation, they are defined by the quality and relevance of this innovation and by specifics of institutional environment in the territory. The first scenario is realized in the case of thoroughly elaborated social-innovation project, its relevance in the territory, and supporting institutional environment. In this case, the project receives necessary support, including financial aid, and the developer moves on directly to its implementation.

The second scenario that involves the project's failure is possible if the project was not prepared thoroughly

or if institutional environment is restraining it. If the former reason lies in inefficient endogenous institutions, then the latter happens when exogenous institutions are weak.

If the project has been elaborated thoroughly, recognized as relevant and supported by investors, then the initiative group embarks on the stage of its implementation. The relations arising between the participants of the project group can be based either on an employment contract, or on trust (not formalized). For large social projects, it is advisable to formalize the relationships legally. The process of regulating the activity, developing organizational structure, formalization of relations between participants of the process will be called the process of endogenous institutional design.

Once the project is ready, it is advisable to move to bringing this innovation to the consumer. Imitation stage includes the spread of the innovation among consumers, and also copying the proposed solutions in other territories or by other economic actors. It happens that consumers are not ready to use the given social decision, or they do not understand the essence of the issue that this innovation aims to handle – all this can become an obstacle to the efficient implementation of a socially innovative project. At this stage, there are two possible development scenarios. Efficient institutional environment *ex post* will contribute to the diffusion of the innovation; inefficient institutions, in turn, will cause the failure of the project at this stage. If a social innovation does not correspond to informal institutions, there is a probability that the project implementation will fail.

In the absence of such a contradiction the project is further developed and disseminated. Its scale is gradually expanding. This stage involves the existence of institutions that ensure lawful transfer of social technology, including that through licensing or franchising. Examples of successful dissemination of social innovation through strong informal institutions can be found in the model of Grameen Bank, participatory budgeting, public movement for protecting order and environment, and others.

An important role at this stage belongs to the diffusion and reproduction of innovation [20]. Here social innovation can cause change in socio-economic systems that will influence social movements, business models, laws and regulations, infrastructure; it can also change the way people think and act. For example, vigorous work of "Greenpeace" movement has contributed to system-wide changes in many countries: they adopted environmental protection regulations, changed people's thinking

concerning environmental protection; the amount of emissions into the atmosphere; enterprises began to use ISO 14000 international environmental management standard.

The needs of society and specifics of socio-economic systems are constantly changing. In this regard, social innovation has to adapt to these changes. Such "revival" is part of adaptation process, and the life cycle starts again. For example, the non-governmental organization "Greenpeace" identifies environmental protection issues and successfully develops projects to address them.

Let us present a more detailed demonstration of the proposed institutional mechanism on the example of the social and innovative project "Grameen Bank". The project was founded and developed by Muhammad Yunus who was awarded the Nobel Peace Prize 2006 for it. He developed a unique micro-credit program that in its essence represents the so-called solidarity lending that involves assessing human resources of the group to which the money is lend rather than checking the borrower's creditworthiness. An important feature of the project that enhances its social orientation is the fact that the profit derived is allocated to support social infrastructure and other social projects. The above description characterizes the initiation stage of a social innovation.

At the stage of invention M. Yunus took initial steps to implement this idea: 42 farmers received small loans of 27 US dollars. The success of this project depended on the efficiency of informal institutions, in particular, the institutions of trust. Minimizing formal procedures for the issuance of micro-loans helped reduce the project's self-cost and establish low interest rate. Informal institutions represented as trust institutions along with local traditions and customs essentially replaced formal procedures. Besides, the project demonstrated the impact of formal institutions on inefficient informal institutions. Women were main borrowers of the Grameen Bank (97%). This fact is contrary to religious norms that forbid women to engage in entrepreneurial activities. However, the existing formal institutions have helped eliminate this problem [26].

At the stage of imitation of the project there was an increase in its scope, and the transplantation of microcredit principles in other countries. At the stage adaptation Grameen Bank began to offer new types of loans: five-percent "student" loans, loans for "construction of latrines and wells", loans for the "purchase of a cell phone", etc.

As we have noted above, in the Russian economy, interest in social innovation is increasing rapidly. However, examples of major public

projects like "Electronic Russia", introduction of technical regulations and development of a Unified State Automated System show negative impact of current institutions on the implementation of socio-innovative projects' results. Let us consider these examples in more detail.

The federal target program "Electronic Russia (2002–2010)" proved inefficient. The misconduct of the project executors led to the embezzlement of funds and therefore to high transaction costs. That was why the goals could not be achieved in the scheduled time period due to the presence of institutional traps and dysfunctions of the institutional environment.

Another practical example of institutional traps can be found in inefficient formal rules of the institutional environment that developers have to deal with at the stage of imitation. In practice, this is due to the inefficiency of bureaucracy and decision-making methods. The problem quite clearly manifested itself at the stage of implementation of technical regulations. It was implied that the regulations would be introduced by directly applicable law that would help eliminate additional administrative barriers and the possibility of deviant behavior. As a result, instead of 700 technical regulations planned to be adopted before 2011 only eleven were actually adopted. However, currently, it is planned to introduce new technical regulations that will be effective on the whole territory of the Eurasian Economic Union.

An example of poor institutional design, which occurs at the stage of invention, is EGAIS (unified state automated system) designed for state control of production and turnover of ethyl alcohol. The cost of its implementation is estimated at 7–12 billion rubles. Irrational design of this system had a negative impact on producers in the form of losses that accounted to 1 billion U.S. dollars in 2006; total losses amounted to 60 billion rubles.

A successful example of social innovation is the project "Green Corridor", it helped reduce in dozens of times administrative barriers, corruption, time and material costs of obtaining municipal services. The project was created in the city of Shakhty, Rostov Oblast, for the purpose of accelerating the movement of documents in providing municipal services to people. In the phase of initiation, the idea of the project "Green Corridor" was due to the following reasons: increase in the number of citizens, lack of officially set deadlines and duration of registration of documents, etc. At this stage, we observed the quality institutional design of the project, which optimized

the time of registration of documents, the process of interaction of applicants with public officials, it also distributed the responsibility between officials and solved the problem of territorial fragmentation of the documents involved in the procedure. As a result, the duration of land registration process was reduced from 12 months to 18 days.

In general, these examples demonstrate quite clearly the impact of the institutional environment on the efficiency of socio-innovative projects. In addition, the institutional mechanism proposed for the formation of social innovation enabled us to present the specifics of interaction of elements in socio-economic space. The mechanism demonstrates the importance of both exogenous and endogenous institutions in the development and implementation of social innovation projects, which confirms its theoretical and practical importance.

Conclusion

The study conducted with the aim of creating an institutional mechanism for the formation of social innovation, has given the following results.

First, it helped systematize social innovation institutions based on criteria such as their place of origin, scale, level of formalization, degree and nature of impact.

Second, a practical analysis of social innovation was carried out, which helped identify main barriers of a modern institutional environment for socio-innovation development. A classification of these barriers was made and efforts to eliminate them were proposed.

Third, an institutional mechanism for shaping social innovation at each stage of the life cycle was presented. The institutional mechanism demonstrates possible variants of innovation development depending on individual characteristics of institutional environment in a particular territory.

Theoretical importance of this study lies in the extension of the theory of institutional analysis and theories of innovation as applied to social processes, and also in the formation of a theoretical platform for further in-depth analysis. Practical value of the findings consists in a possibility of their usage by public administration authorities to implement effective policy to remove barriers and create an enabling institutional environment for social innovation. In addition, these developments are of great importance for social entrepreneurs, non-profit organizations, and government agencies that initiate socially-innovative projects and implement them directly in socio-economic space.

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Received May 18, 2016

DOI: 10.15838/esc.2016.5.47.4
UDC 314.117:316.346.32-053.9(470.12), LBC 60.542.18(2Rus-4Vol)

Determinants of Active Longevity: Results of a Survey of Vologda Long-Livers*

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* The study is conducted with support of the Russian Humanitarian Scientific Foundation, project no. 16-02-00301/16 "Secondary socialization of elderly people as a determinant of the quality of life: trends, problems, mechanisms".

For citation: Kalachikova O.N., Barsukov V.N., Korolenko A.V., Shulepov E.B. Determinants of active longevity: results of a survey of Vologda long-livers. *Economic and Social Changes: Facts, Trends, Forecast,* 2016, no. 5, pp. 76-94. DOI: 10.15838/esc.2016.5.47.4

Abstract. Population ageing is a major demographic challenge for the majority of developed and developing countries. The implications of population ageing are not reduced to purely economic aspects (increasing the burden on the working population, growing deficit of pension funds) and they lead to a change in people's attitude toward the elderly as a social group, the resource potential of which should be disclosed, the task being of major importance for any "ageing" country. At the same time, a priority of population policy in any country is to increase life expectancy of its citizens. Thus, given the forecast reduction in demand on the labor market and possible raise of the retirement age in Russia, authorities at all levels focus not just on the increase in life expectancy, but on active longevity of its citizens, which is reflected in the maintenance of physical and moral health of man for as long as possible. The paper investigates determinants of active longevity. The first part of the paper provides statistical analysis of prevalence of this phenomenon in various regions of the world and Russia. The authors draw a conclusion that here the role of geographical and climatic conditions on a global scale is insignificant. However, it is revealed that the number of long-livers in the vast majority of cases is directly proportional to the level of socio-economic development of the territory. The second part of the paper presents the results of sociological research on the determinants of active longevity based on interviews with long-livers in Vologda. The data obtained show that among the factors under consideration it is not the biological (genetic) or geographic factors that are of the greatest importance to the increase in life expectancy, rather it is the behavioral factors such as physical activity, balanced nutrition and a correct day regimen, absence of bad habits, involvement in social activities and extensive social environment, high labor activity. The revealed "secrets" of longevity are not specific recommendations, they rather represent the elements of the style and lifestyle of an individual on the whole, the compliance with which may significantly increase the chances of survival to older ages and help retain physical and mental activity.

Key words: active longevity, long-livers, population ageing.

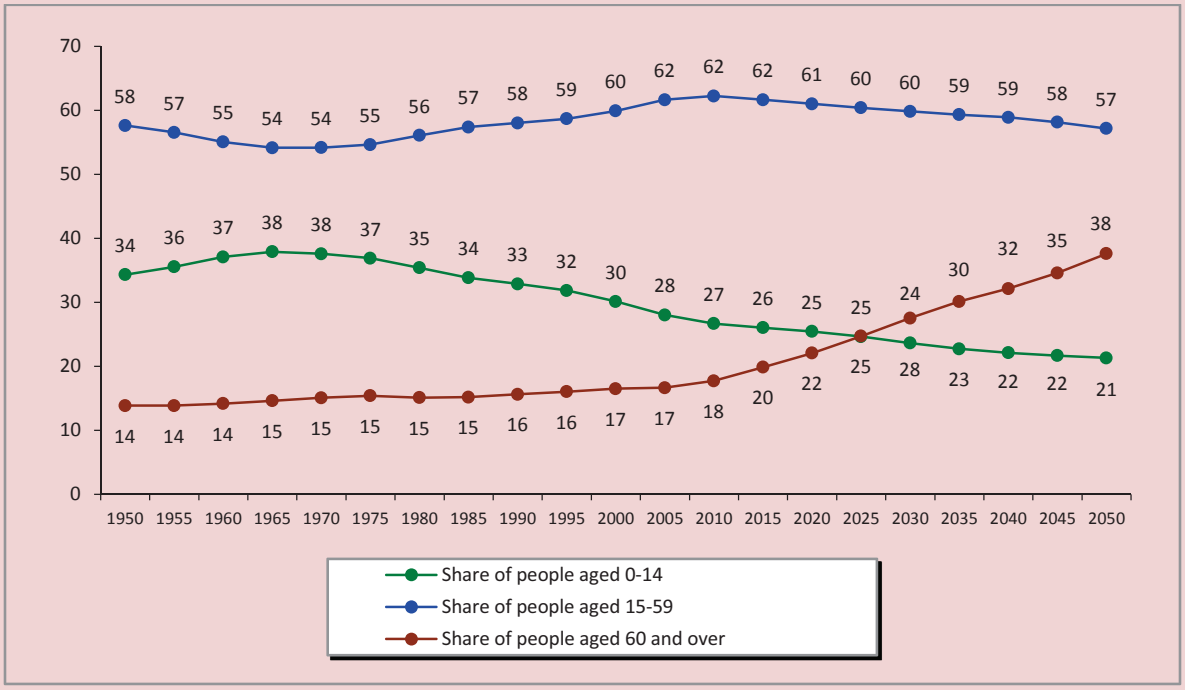
Introduction. Demographic ageing and active ageing

The twentieth century became a turning point in terms of demographic transformations. During this period, there was a huge increase in world population, scientists first mentioned controlling mortality and fertility, the social model of marriage and family relations was changed, the intensity of migration processes significantly increased [6]. One of the most important quality demographic changes was the transformation of the population's age structure. Changes in the mortality model (especially infant mortality) have led to an unprecedented increase in life expectancy at all ages [5]. At the same time, reducing fertility

became the main factor in decreasing the share of the population of younger age groups. As a result, the population of developed and developing countries which are characterized by the changes described above began to "age": the proportion of elderly people permanently increased, whereas the proportion of children was declining. This phenomenon was named "demographic ageing". Later, when the factors in this process were sufficiently studied, the scientists were forced to admit that amid the narrowed reproduction of the population it is irreversible. This is also evidenced by data of the UN medium variant forecast: *Figure* shows that by 2025 the proportion of the population aged 60 and older will exceed the proportion of children aged 0–14 and this gap will continue to increase. By analogy with the famous "Russian cross" this phenomenon can be called "generation crossroads".

Despite the decreasing share of children, the proportion of the working age population (15–59 years) has had a

Change of the proportion of main age groups in the total world population, fact and forecast



Source: World Population Prospects 2015. Available at: http://esa.un.org/unpd/wpp/DataSources/

tendency to increase until now, which explains the principle of "demographic window" [27]: amid sharp reduction of fertility and, respectively, the proportion of dependency groups, the share of the working age population reaches its maximum and then begins to decline as its increase reserves from the "bottom" (i.e., at the cost of the younger generation) are gradually exhausted. Most developed and developing countries have already received and used their demographic "dividends" and the share of the working age population will only be decreasing in the future.

The aging of the population in terms of its consequences is a very multidimensional phenomenon which impacts practically all spheres of life. In particular, the overall demographic burden on the working age population is significantly increasing [2]. Given the irreversibility of the process of demographic ageing, world's governments affected by it are forced to seek a solution to this issue by implementing appropriate reforms. Raising the retirement age seems to be the simplest and most effective solution, which artificially reduces the number of pensioners and, in its turn, increases the number of taxpayers. Of course, this reform has a sufficient economic base and provides a positive financial effect, but it is not always justified from the demographic point of view. For example, in Russia, life expectancy rates are significantly higher than healthy life expectancy rates: in 2013, the difference between them was 13 years [12]. This means that upon reaching the age of 61 the majority of the population can no longer continue working due to poor state of health. In this situation, the increase in the "verge of retirement" may cause even more deterioration in the health of elderly people, the increase in the number of the beneficiary of an invalidity pension, the transition of a certain part of elderly people to the informal economic sector, or unemployment due to pensioners' inability to find employment [18]. Thus, the decision to raise the retirement age should have a solid demographic basis. In this regard, particular importance is given to the problem of not just longevity, but also ***active*** ageing, which is reflected in both preservation of a satisfactory state of health of elderly people and the possibility of extending the period of old-age employment. This paper presents the results of a sociological study (a series of interviews with Vologda long-livers), the purpose of which was to identify the most important determinants of active ageing.

Longevity in numbers. Where the long-livers reside

There is a large number of papers [4, 21, 22, etc.] devoted to the study of human longevity, the main factors and conditions of this phenomenon. The papers consider the most prominent of the world's longevity "hot spots" or the so-called "blue zones": Japan (Okinawa Island), China (Tibet, the county of Bama), Italy (Sardinia), Greece (islands of Icaria and Rhodes), the Caucasus (mountain regions of Abkhazia and Georgia), Costa Rica (The Nicoya Peninsula), Cuba (the province of Villa Clara) and others. In this part of the article the authors focus on studying of longevity as a global phenomenon with distinct regional differences. Two indicators have been used in analysis: the number of people aged 90 and over per 100 thousand people (according to the WHO methodology [7]), and a similar indicator for the people aged 100 and over, the increase rates which show the intensification of "ageing depth" in terms of increase rate of the first indicator (*Tab. 1*).

As shown in the table, in 2015 the largest number of long-livers per 100 thousand people was recorded in developed countries. However, if we consider the changing trends, it can be stated growth rates for the age group of people aged 90 and over for the period from 1990 to 2015 in developed countries were somewhat lower than those in developing and least developed countries (2.7 times against 3.1 times and 3.3 times, respectively). This characteristic reaffirms the pattern of global development of the process of demographic ageing: although developed countries are faced with the problem of population ageing much earlier, in developing regions and the third-world countries, this process is more intensive, and territorial differentiation is gradually reducing. However, developed countries are characterized by a greater extent of "ageing depth": growth rate of long-livers aged 100 and over per 100 000 people were the highest in the period specified.

A more detailed study of "longevity map" from the point of view of geographic origins has shown that, according to estimates for 2015, Europe and North America became absolute leaders in all the indicators mentioned above. However, in the US and Canada the distribution of "longevity zones" is relatively homogenous, while in the European region a considerable differentiation is observed. The countries of Western, Southern and Northern Europe take leading places among the "eldest" territories, while Eastern Europe is 3 times inferior to them in the number of long-livers per 100 000 people. The same conclusion applies to the Russian

Table 2. Population dynamics of long-livers per 100 000 people in Russian federal districts, 1995–2015

Federal district	Type of population	Year							
		1995		2005		2015		Growth rate	
		1*	2**	1	2	1	2	3***	4****
Far Eastern	All population	64	2	110	2	146	3	228	150
	Urban population	50	1	116	2	153	4	306	400
	Rural population	105	5	92	2	121	2	115	40
Crimean	All population	-	-	-	-	295	5	-	-
	Urban population	-	-	-	-	343	5	-	-
	Rural population	-	-	-	-	227	4	-	-
Volga	All population	186	1	263	4	293	6	158	600
	Urban population	151	1	224	3	280	6	185	600
	Rural population	272	2	358	6	325	7	119	350
Northwestern	All population	139	2	244	5	369	14	265	700
	Urban population	124	2	239	5	379	16	306	800
	Rural population	208	3	267	4	311	4	150	133
Northern Caucasian	All population	-	-	193	23	184	8	-	-
	Urban population	-	-	164	11	187	5	-	-
	Rural population	-	-	221	34	181	11	-	-
Siberian	All population	123	1	189	3	238	5	193	500
	Urban population	111	1	190	3	242	6	218	600
	Rural population	153	2	186	4	228	4	149	200
Ural	All population	134	1	189	3	230	5	172	500
	Urban population	122	1	165	2	225	5	184	500
	Rural population	183	2	281	4	253	6	138	300
Central	All population	215	2	344	6	408	15	190	750
	Urban population	182	1	291	6	405	16	223	1600
	Rural population	336	3	563	7	418	8	124	267
Southern (up to 2009)	All population	216	5	256	17	-	-	-	-
	Urban population	181	3	238	10	-	-	-	-
	Rural population	264	8	279	27	-	-	-	-
Southern (since 2010)	All population	-	-	332	5	306	9	-	-
	Urban population	-	-	301	5	322	11	-	-
	Rural population	-	-	385	6	279	7	-	-

* Number of long-livers aged 90 and over, per 100 000 people;
** Number of long-livers aged 100 and over, per 100 000 people;
*** Growth rates of long-livers aged 90 and over per 100 000 people, %;
**** Growth rates of long-livers aged 100 and over per 100 000 people, %.
Sources: Unified Interdepartmental Statistical Information System. Available at: http://fedstat.ru/indicators/start.do; authors' calculations.

Federation where the indicators are lower than in Eastern European countries and are comparable to those of Central and South America.

Japan leads in the number of long-livers per 100 000 people, it is significantly superior to other countries of the Asian region. In respective regions, Australia, New Zealand and Caribbean island countries are also prominent. Longevity is less prevalent in Africa.

The analysis suggests that the number of long-livers largely correlates with the country's or region's level of socio-economic development and is often directly proportional to this number. For example, despite the extremely small overall prevalence of longevity in Africa, the indicators per 100 000 people are still significantly higher in North African countries and South Africa as the most developed African regions. A similar situation is observed in Australia and New Zealand, the countries far exceeding other Oceania territories in the level of economic and social development. Such examples can be found on any continent and in any climatic zone. Of course, genetic predisposition and place of residence are the most important factors in a long and active life, however, the experience of Western countries has shown [4] that behavioral (lifestyle, nutrition, etc.) and institutional factors (developed health care system and social infrastructure, high standard of live and the quality of living) on the global scale also make a significant contribution to the increase in the population's active life expectancy.

As mentioned earlier, the Russian Federation is far from leading positions by the studied indicator. Nevertheless, it is also characterized by a territorial differentiation based on the level of longevity (the number of long-livers aged 90 and over per 100 000 people). Contrary to the established opinion about "Caucasian longevity", North-Caucasian Federal District ranks last in the number of long-livers (184 long-livers per 100 000 people; *Tab. 2*), which is significantly less than the national average (253 long-livers per 100 000 people). The leaders are Central and North-Western Federal districts (369 and 408 long-livers per 100 000 people respectively), in which two of the largest mega-cities – Moscow and Saint Petersburg are the biggest contributors (534 and 535 long-livers per 100 000 people, respectively). This reaffirms the conclusion about the correlation between the number of long-livers and the level of socio-economic development of the territory. Longevity as a phenomenon is also characteristic of the rural areas of the

Таблица 2. Динамика изменения численности долгожителей в расчете на 100 тыс. населения в федеральных округах Российской Федерации, 1995, 2005, 2015 гг.

Федеральный округ	Тип населения	Год							
		1995		2005		2015		Темп прироста	
		1*	2**	1	2	1	2	3***	4****
Дальневосточный	Все население	64	2	110	2	146	3	228	150
	Городское население	50	1	116	2	153	4	306	400
	Сельское население	105	5	92	2	121	2	115	40
Крымский	Все население	-	-	-	-	295	5	-	-
	Городское население	-	-	-	-	343	5	-	-
	Сельское население	-	-	-	-	227	4	-	-
Приволжский	Все население	186	1	263	4	293	6	158	600
	Городское население	151	1	224	3	280	6	185	600
	Сельское население	272	2	358	6	325	7	119	350
Северо-Западный	Все население	139	2	244	5	369	14	265	700
	Городское население	124	2	239	5	379	16	306	800
	Сельское население	208	3	267	4	311	4	150	133
Северо-Кавказский	Все население	-	-	193	23	184	8	-	-
	Городское население	-	-	164	11	187	5	-	-
	Сельское население	-	-	221	34	181	11	-	-
Сибирский	Все население	123	1	189	3	238	5	193	500
	Городское население	111	1	190	3	242	6	218	600
	Сельское население	153	2	186	4	228	4	149	200
Уральский	Все население	134	1	189	3	230	5	172	500
	Городское население	122	1	165	2	225	5	184	500
	Сельское население	183	2	281	4	253	6	138	300
Центральный	Все население	215	2	344	6	408	15	190	750
	Городское население	182	1	291	6	405	16	223	1600
	Сельское население	336	3	563	7	418	8	124	267
Южный (по 2009 год)	Все население	216	5	256	17	-	-	-	-
	Городское население	181	3	238	10	-	-	-	-
	Сельское население	264	8	279	27	-	-	-	-
Южный (с 2010 года)	Все население	-	-	332	5	306	9	-	-
	Городское население	-	-	301	5	322	11	-	-
	Сельское население	-	-	385	6	279	7	-	-

* Численность долгожителей в возрасте 90 лет и старше, в расчете на 100 000 населения.
** Численность долгожителей в возрасте 100 лет и старше, в расчете на 100 000 населения.
*** Темпы прироста численности долгожителей в возрасте 90 лет и старше, в расчете на 100 000 населения, %.
**** Темпы прироста численности долгожителей в возрасте 100 лет и старше, в расчете на 100 000 населения, %.
Источники: Единая межведомственная информационно-статистическая система [Эл. рес]. – Реж. дост.: http://fedstat.ru/indicators/start.do; расчеты авторов.

Central Federal District (the Belgorod, Bryansk, Voronezh, Kaluga, Lipetsk, Ryazan, Smolensk, Tula and Yaroslavl oblasts) and the Northwestern Federal District (the Novgorod and Pskov oblasts): in these regions the level of longevity exceeds 400 long-livers per 100 000 people. As rural areas of these two districts are more developed in terms of socio-economic infrastructure and located closer to the growth "poles" (mega-cities and large cities) than similar territories of other federal districts, the number of long-livers in these districts is higher.

Regarding the centenarians, their largest number per 100 000 people is also recorded in the Central and Northwestern federal districts (15 and 14 centenarians per 100 000 people, respectively). In contrast to the age group of people aged 90 and over, centenarians often live in urban areas, probably due to the greater accessibility to health care and social services, which are of particular importance in old age. Moscow and Saint Petersburg (30 and 29 centenarians per 100 000 people respectively) gives the first place to the Astrakhan Oblast in the number of centenarians (32 centenarians per 100 000 people).

The Vologda Oblast is not included in the list of regions with the highest level of longevity (in 2015 the number of long-livers aged 90 and over per 100 000 people accounted for 311), however, this indicator is significantly higher than the national average (253 long-livers per 100 000 people). The gender distribution is normal for this age group: women account for 90% of all long-livers. Two thirds (65%) of the population aged 90 and over lives in urban areas, which also corresponds to the national indicators. In this study the authors attempt to study the phenomenon of active ageing and its determinants in the Vologda Oblast, in particular, as in the case of Vologda, which, on the one hand, is not a "longevity area" in the public perception, on the other hand, demonstrates rather high longevity indicators. Moreover, regional and municipal authorities pay much attention to the issue of active ageing (a unique concept of active ageing was developed in the Vologda territory for the period up to 2035 – "Vologda – a city of long-livers", which was approved by the decision of the Vologda City Duma No. 129, dated 29th December, 2014 [11]).

Factors in longevity. How long-livers live

In 2016, the Institute of Socio-Economic Development of Territories of the Russian Academy of Sciences (ISEDT RAS) on request of the Vologda city administration conducted a sociological research in the territory of the municipal unit (Vologda) of the determinants of active ageing. The study used *the method of*

semi-structured interviews[1] with long-livers of Vologda. It is an interview based on a particular plan (guide) with short-answer questions for the respondent. During the study 15 in-depth interviews have been conducted. The respondents' age varies between 77 to 102. It is important to note that the sample was not based on the principles of strict compliance of respondents' distribution with the proportions of long-livers' sex and age composition. The main criterion for selecting respondents was their level of activity in old age.

The structure of determinants defining active ageing was defined on the basis of systematization of scientific approaches [3, 8, 17, 21, 23, 24]:

1. Genetic (heredity).
2. Geographical, natural and climatic.
3. Lifestyle, behavioral stereotypes:

– physical activity (physical education and sports);

– eating habits (diet);

– "bad habits";

– medical activity;

– overcoming stress;

– labor activity;

– social activity (public activity, social relations).

4. Socio-economic and institutional:

– standard of living and living conditions;

– activity of institutions and social services.

The interview guide included questions blocks to identify the impacts of the defined factors on longevity. Scientists' research [1, 13, 14] confirm that different factors unevenly contribute to the population's life expectancy: 50–70% – lifestyle, 10–20% – heredity; 10–20% – environment, 8–12% – level of health care development. Let us consider the interview results in order to assess the influence of each factor on the longevity of Vologda citizens.

Genetic and geographical factors in longevity

When assessing a person's predisposition to longevity, genetic factor is considered prior since its relevance determines the influence of behavioral (secondary) and socio-economic/institutional (tertiary) factors. In this study, the authors tested two basic theses: the theory of heterosis (hybrid vigor[2]) and respondents' kinship with long-livers. The phenomenon of heterosis depends on the degree of

[1] A semi-structured interview, along with a structured one, implies a detailed planning of the whole interview, question sequence and structure, possible answers, but the interviewer may change the sequence of questions depending on the situation and reword the questions if necessary.

[2] According to the theory of heterosis (hybrid vigor), if it turns out that respondent's parents (or immediate relatives) come from geographically distant settlements, genetic factor becomes the most important. If it turns out that respondent's parents (or immediate relatives) are native Vologda citizens, other factors, including behavioral and socio-economic, gain importance.

kinship and geographical remoteness of a child's parents' birthplace: children whose ancestors lived at a considerable distance from each other are more predisposed to longevity [3]. According to the interview results, the theory of heterosis has not been confirmed. The majority of parents of the interviewed long-livers were born and raised either in the same or in a neighboring settlement. This is characteristic of both parents and more distant relatives. Geography of birth of the interviewed long-livers is also not very broad: they mostly come from either the Vologda Oblast or the adjacent territories (present-day Northwestern Federal District).

Almost all respondents mentioned that they had long-livers among their relatives, but they were mainly grandparents, uncles or aunts, overwhelmingly represented by females. No direct inheritance of longevity from parents has been revealed. As for the respondents' opinion, only a few of them note the genetic predisposition to longevity.

The study did not help prove the leading role of genetic or geographical factors. Therefore, additional determinants (which will be later discussed) related to the living conditions and lifestyle become primary.

An important research result is the noticeable difference between psychological and biological age. Almost all Vologda long-livers feel many years younger than they really are. Only very few were focused on a long life. Some of the respondents mentioned their "dream" to live to be 100, which, however, seemed very difficult for them to imagine. At the same time, the respondents noted that they do not live "in the moment" and constantly set new goals and objectives, always strive to improve, and this, according to them, gives them additional life energy.

Lifestyle and behavioral stereotypes

Behavioral factors can be different: physical activity (physical education and sports), balanced nutrition, daily regime, absence of bad habits, good emotional and psychological state, medical activity, etc. All these aspects form the basis of the concept "healthy lifestyle" (HLS).

Physical activity. All of the interviewed long-livers have been engaged in physical activities and sports: starting with daily morning exercise and finishing with professional sport. If we consider gender specifics, it is worth noting that women more often preferred individual sports (skiing, cycling, skating, gymnastics), while men tend to choose team sports (basketball, volleyball, hockey). Physical exercises were not limited to physical education and sports: each of the interviewed respondents lived through the Great Patriotic War (1941–1945)

and many were engaged in hard physical labor from an early age (working in fields, factories, etc.). Perhaps the events of those years formed a responsible attitude to work, healthy way of life and keeping fit. The study has showed that almost all respondents start their morning with every day exercise and gymnastics. Long-livers pay much attention to walking and other ways of maintaining physical activity in old age (e.g., Nordic walking, skiing), which reaffirms the thesis that "motion is life". The conducted interviews suggest a conclusion that one of the universal means of keeping feet in old age is working at the dacha. Apart from obvious benefits consisting in the cultivation of natural products, the dacha becomes a healthy hobby for many representatives of the older generation. The obtained results confirm the statement of the Doctor of Biology, Professor G.D. Berdyshev: "At all times, in all countries, in all nations long-livers are mostly those who have been engaged in intensive physical activity during their whole life" [3].

Diet and eating habits. An important element in the formation of the active ageing "foundation" is diet and eating habits. Data obtained from the interviews indicate that almost all of the respondents tried to keep to healthy eating habits in varying degrees throughout their live. With aging, more attention is given to healthy eating. No particular features in eating habits were detected: the majority of long-livers were not limited by the choice of products. At the same time, the respondents note that one should eat in moderation and should not overeat. And yet, some points concerning food should be considered in detail. First, many interviewees said that they ate mostly organic food, often grown in their own backyards. Second, the most important element of nutrition is a breakfast which must contain a lot of protein (eggs, cheese and milk). Garlic also deserves special attention. Several interviewees think that this spicy vegetable is one of the secrets of longevity. It may be used in various ways: from a simple supplement to foods to garlic tinctures.

Bad habits. When it comes to behavioral risk factors in old age, low physical activity is often complemented by alcohol and tobacco consumption. The absence of bad habits is one of the secrets of active ageing. This thesis was confirmed during the study: a vast majority of respondents noted that throughout their lives they never abused alcohol and tobacco. Some respondents said that at best, they could consume some alcoholic drinks on holidays and in small quantities. It is important to note that some of the long-lovers are convinced that alcohol and tobacco are the main barriers to active ageing.

Hobbies and interests. The study concludes that one of the determinants of active ageing is an elderly person's favorite hobby. The range of hobbies is really wide: amateur artistic talents (dancing, singing, acting), sports, crafts, reading and writing books, intellectual games, participation in various competitions ("Retiree of the year", "Grandma of the year"), gardening, hunting, fishing, etc. The majority of respondents have already acquired computer skills and use the Internet and technical advancements.

Having a hobby motivates long-livers to continuous improvement of their skills, promotes the formation of attitudes of continuous activity.

Social activity. Vologda long-livers are characterized by their participation in various public organizations including veteran's councils, groups on the basis of the "Care" leisure center, etc. The respondents' civil activism is worth mentioning: they continue to participate in federal and regional election and, in some cases, were elected to parliamentary positions and were heads or members of electoral commissions.

Social relations. Active ageing of Vologda long-livers contributes to expansion and maintaining of a wide range of social liaisons. First of all, it should be noted that the immediate circle of the respondents includes, as a rule, their relatives. They play an important role in the lives: some live with their relatives, some are regularly visited and assisted by their relative. In almost all cases, families of long-livers include a relatively large number of children, grandchildren and great-grandchildren. Practical wisdom is the basis for one of the most important socio-cultural functions of the older generation – the transmission of experience which is often implemented through the family circle. Long-livers play an important unifying role in their families, which forms family traditions.

In addition, the respondents' social circle includes a large number of people with whom they are connected either by common interests or professional activity. The circle of friends often includes interesting and famous people who owe a lot and are very grateful to long-livers. It is important to note that, regardless of the social circle and sphere of activity, long-livers are highly respected in their environment today.

The overcoming of stressful situations was facilitated by strong family and friendly ties. The respondents often turned to their friends and family when they had to overcome negative emotions or problems. Many tried to cope with an emotional crisis by immersing themselves in work or a hobby.

Labor activity. The most striking distinctive feature characteristic of the interviewed long-livers is the duration of their working life. Their working life began early, when they had to help their parents on the farm. Many of the respondents were confronted by the Great Patriotic War and had to work 10 hours or more every day. "Forged" in such difficult conditions, they continued their career throughout their long life. The range of occupations is quite wide, but one important feature unites all respondents who, regardless of the scope of activity, loved their work, always occupied leadership positions in their organizations or were highly respected among their colleagues. Apart from leadership qualities, long-livers also have a disciplined, proactive manner. It is important to note that, according to the survey on the quality of life of elderly people[3], working pensioners highly value their state of health, have a broad circle of friends and are happier than the representatives of the non-working older generation.

Many respondents were characterized by high labor mobility which is often reflected not only in the change of organizations and sphere of activity within the city limits, but also in frequent moving all over Russia. In such cases, spatial re-locations were favorable because the respondents were given an opportunity to meet new people, see new places and sometimes even new cultures. In absolutely all cases, without exception, they were able to find common ground with their colleagues, which certainly had a positive impact on working conditions assessment, which in most cases were satisfactory. The respondents still keep in touch with many of their colleagues to the present day.

A vast majority of respondents continue to work after retirement and have not experienced any problems concerning retirement. This was accomplished by both maintaining social relations with colleagues and maintaining the same level of income which was complemented by the retirement benefit. It is important to note that long-livers finished their careers due to natural reasons (most often due to health problems), rather than emotional fatigue or lack of competence.

Socio-economic and institutional determinants of active ageing

Standard of living. The long-livers' financial status and living conditions are

[3] A specialized survey "The quality of life of elderly people of the Vologda Oblast" was conducted by ISEDT RAS in 2015. The general population amounted to 427 861 people, the sampling size – 1500 people. The respondents' distribution by age and sex corresponds to the general population of the Vologda Oblast aged 50 and over (according to age and sex indicator of statistical books), which allows to assess the obtained results as valid. In order to identify territorial features, the study identifies two major cities – Vologda and Cherepovets; other regions of the Vologda Oblast are allocated to a separate group. Maximum sampling error is 4%.

currently considered satisfactory: they do not experience any inconveniences concerning comfortable living; there is no urgent need for any goods or services. Financial and residential well-being of the respondents is explained by socially-oriented nature of the state policy aimed at improving the long-livers' standard of life and the quality of living, as well as their individual merits in professional life, which have ensured a decent life not only for them, but also for their children, grandchildren and great-grandchildren.

Activity of institutions working with elderly people. Health care, social security and pension services play the most important role in the work with elderly people. In general, the study has shown that long-livers do not often directly experience the work of these institutions. The respondents said in the interviews that they often use medical services provided by doctors who are their good friends. From the point of view of the long-livers' medical activity, no gender differences were identified: men and women equally care about their health, following all doctors' recommendations.

Sanatorium and resort treatment is also essential for health in young and in old age. Almost all the respondents were or are treated this way; they often noted that this factor positively affected their health in old age.

It is important to note that the majority of long-livers are aware of the attention of city authorities. It is most often expressed in the invitations to various official events, congratulations on anniversaries and other important events, in awards for services to the residents of the city.

Thus, the study has confirmed the importance of behavioral factors in active ageing. The conversations with long-livers make it clear how much attention they have given to exercise, sports and nutrition. Absence of bad habits together with physical activity significantly reduces behavioral risk factors in old age.

Another secret of longevity is a broad social circle which is not limited to relatives, but includes a lot of acquaintances and friends with common interests, as well as former colleagues. Long working life and civil activism distinguish long-livers from an average resident of the city. A significant factor in active ageing, which is characteristic of all respondents, is surprising optimism and the willingness to improve (a hobby), the ability to manage time and life in general and set long-term goals.

Conclusion

According to the results of the research, the authors conclude that among the determinants of active ageing less important are biological (genetic) or geographic (although they are traditionally considered

as primary factors in longevity). Behavioral factors, including physical activity, balanced nutrition, healthy lifestyle, absence of bad habits, involvement in public activity and social relations, active working life, "anti-dependency" attitude, ambitiousness and resilience, are of great importance and contribute most to active longevity.

Factors and "secrets" of active ageing identified during the survey are generally confirmed by the results of modern research [8, 14, 17, 23, 24]. It should be noted that the respondents' responsible attitude to themselves, their health, setting of short- and long-term goals and objectives, as well as an their inexhaustible motivation for keeping their mental and physical health in a good condition, a broad circle of friends and, which is the most important, high cognitive activity give the long-livers an opportunity to effectively manage their lives, and therefore have confidence in the future.

Unlike genetic, behavioral factors in active ageing can be regulated; any person can form an attitude of longevity by using both personal experience and the experience of fellow citizens who managed to live up to old age and keeping their physical and spiritual vitality. The population's behavioral attitudes may be generally influenced by the adoption of strategic documents at the federal, regional and municipal level (for example, the concept of active ageing in the city of Vologda "Vologda – a city of long-livers"). It is important to remember about the institutional determinants of active ageing which include those supervised by the authorities and serve as an important tool for improving the system of cooperation with senior citizens.

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Received June 03, 2016

DOI: 10.15838/esc.2016.5.47.5
UDC 314.117:316.346.32-053.9, LBC 60.542.18

Research on Influence of Social Transformation on Rural Poor Aged People

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Abstract. China is in the acceleration period of social transformation. In this period, Chinese rural area is experiencing profound change in political system, production mode, living style, family structure and income composition, which is the progress of society. Meanwhile, due to the complexity and persistence of social transformation, it results in rural poor aged people and causes some difficulties for rural poor aged people to get rid of poverty. Problems and difficulties in the social transformation process must be solved and overcome in the process of social transformation.

Key words: social transformation, Chinese rural area, poor aged people.

Social transformation refers to a historical process changing from original society to more developed society full of vigor and spirit. Chinese society is in the historical process "changing and developing from traditional society to modern society, from agricultural society to industrial society and information society, from closed society to open society[1]", which is followed by the transition and development from rural society to urban society.

Chinese social transformation is a long historical process. It's generally divided into three stages by the academic circle: 1840–1949 was the first

[1] Guo Dehong. A review of research on Chinese modern society transformation., *Historiography Anhui*, 2003, volume 1.

For citation: Ma Xuesong. Research on influence of social transformation on rural poor aged people. *Economic and Social Changes: Facts, Trends, Forecast*, 2016, no. 5, pp. 95-102. DOI: 10.15838/esc.2016.5.47.5

stage, which was the initial stage of Chinese social transformation and the outstanding feature of the stage was the Opium War and foundation of new China; 1949-1978 was the second stage, which was the development stage at medium speed of Chinese social transformation, and the outstanding feature of the stage was preliminary construction of new China with many things waiting to be done and China experienced many turns and hardships; 1978-present is the third stage, which is rapid and accelerated development stage of Chinese social transformation and the outstanding feature of the stage is Third Plenary Session of the 11th Central Committee of the Chinese Communist Party and in- depth reform and opening-up. The time node studied is mainly in the third stage (1978-present).

I. Change of Chinese rural area in the social transformation period

In 1978, the Third Plenary Session of the 11th Central Committee of the Communist confirmed the guiding ideology of "emancipating the mind and seeking truth from facts", made major strategic decision of transforming key emphasis in work of the Party and county to the building of socialist modernization and implementing opening-up and reform, from then on, China go on the correct path of opening-up and reform and socialism with Chinese characteristics. Chinese social transformation entered rapid and accelerated stage and Chinese society experienced earth-shaking changes. The profound changes of Chinese rural area are mainly shown in the following aspects.

1. Abolishment of People Commune System

As for system reform, firstly, abolishment of people commune system greatly liberated various agricultural production factors including labor force. After national rural people commune system was popular in 1958, long-term highly centralized management system and average distribution method firmly fixed rural production factors in the scope of rural community, which greatly restrained and hindered farmers' production enthusiasm. The disintegration of people commune system provided the autonomous right for farmers to select occupation and relieved institutional constraint for farmers to transfer out from the agriculture.

2. Implementation of household contract responsibility system with remuneration linked to output

On Jan. 1, 1982, the No. 1 file about rural work in the history of Chinese Communist Party was launched, clearly specifying that fixing farm output quotas on the household basis and household-based contract system are production responsibility system of socialist collective economy. Thereafter, household contract responsibility system with remuneration linked to output was comprehensively promoted, so farmers possessed autonomous right, operation decision right, product sale right and income distribution right

and became relatively independent producers. With the implementation of household contract responsibility system with remuneration linked to output, the disadvantage that the long-term highly centralized management and operation mode is too dull was corrected, farmers were closely linked with the land and farmers changed from simple laborers to producers and operators in the collective economy, which greatly mobilize production enthusiasm of farmers.

3. Actual loose household registra-tion system

In 1984, No.1 document of Central Government specified that "farmers providing service, engaging in business and service industry" are allowed to settle down in towns by self-supply. In Oct. 1984, the State Council issued *Notice on Farmers Settling Down in Towns",* and specified that farmers and their relatives who work in the town (excluding county town), do business and engage in service industry would have fixed domicile in the town. The ones with operation ability or working for township enterprises and institutions for a long term were permitted by the Public Security Department to make registration as permanent residence and be regarded as non-agricultural household. The emergence of "registered permanent residence with self-supply in towns" marked the formal launch of reform of household registration system strictly separating rural area from urban area. Although it was the first step of the long march, it's the critical step for actual loose household registration system.

In Oct. 1985, China started to implement identity card system. The actual loose household registration system and implementation of identity card system granted legal identity to farmers moving between cities and countryside.

4. Establishment of market mecha-nism and reform of labor employment system

In 1993, *Decision of the Central Committee of the Communist Party of China on Several Issues of Establishing Socialist Market Economy System* made on the Third Plenary Session of the 14th Central Committee of the Chinese Communist Party specified that the country should encourage and lead surplus rural labor force to transfer to non-agricultural industries and orderly flow between regions. In Dec. 1993, *Overall Vision of Labor System Reform When Establishing Socialist Market Economy System* issued by the Ministry of Labor put forward: "the target mode of cultivating and developing labor force market is to establish the modern labor force market with fair competition, order operation, powerful regulation and complete service, break the employment policy of planning in production and distribution and break the identity boundary hindering labor force flowing among different ownership systems. The laborer can independently choose profession, freely flow and enterprises

can independently choose employees. The labor force supplier and demander shall establish labor relationship through fair competition and two-way selection. From the long-term development, to establish the labor force market under fair competition needs to gradually break the boundary of labor mobility between city and countryside and regions." The establishment of market mechanism and reform of labor employment system promote the surplus rural labor force to move to city. The magnificent migrant worker group has been moving in China for nearly 40 years. The migrant workers made giant contribution to the social transformation in China.

5. Outstanding change of farmers' income structure

Since reform and opening-up, the per capita net income of farmer was increased from 134 yuan in 1978 to 11,422 yuan in 2015, annually increasing by 12.77%, which maintain fast growth in general.

Since reform and opening-up, the income structure of farmer experienced profound change. The farmer's income structure was transformed from simplification to compound type, the income source was diversified, the family operation income was decreasing gradually and the salary income was increasing gradually. At present, the salary income makes stable contribution to farmers' income (above 50%).

6. Profound change of rural population and family structure

Chinese One-child Policy and Reform and Opening-up were launched almost simultaneously. Over 30 years' One-child Policy causes profound change of rural population and family structure in China.

In Chinese rural area, there is always the procreation viewpoint that "you may be happier with more children". The One-child Policy was launched in 1979, especially young farmers went to work and do business in the city and they were influenced by the urban modern civilization. Meanwhile, the economic condition and work nature of young farmers working in the city also influenced their fertility intension. "Late marriage and having fewer children" was the inevitable choice of young migrant workers. The family planning policy reduced 400 million persons in China; of course, it was also attributable to the contribution of countryside and farmers. It's a well established fact that new rural labor force is in down trend. Meanwhile, the rural family structure presented miniaturization and kernelization. Data shows that the rural family scale was decreased from 5.7[2] persons averagely in 1978 to 3.3[3] persons averagely in 2010.

In the social transformation, Chinese rural area experienced many other profound changes like removal of agricultural tax changes the relation between farmers and the country; in addition, the market economic development and social flow was increased, new hierarchy classification

[2] Han Jun. Research on rural economic and social transformation since the reform and opening-up. *Economic Research Guide*, 2008, volume 2.

[3] *National Health and Family Planning Commission, China Family Development Report 2014.* China Population Publishing House, 2014.

appeared in the rural area and the hierarchy is more complicated and the benefit is diversified, etc.

II. Influence of social transformation on rural poor aged people

1. Scale of rural poor aged people

To study the issue of rural poor aged people, a basic evaluation must be made on number of poor aged people.

To "know fairly well", we regard the number of people receiving rural minimum living guarantee can be the reference for study. As organizations above county-level in China shall report number of people receiving rural minimum living guarantee to the Ministry of Civil Affairs every month, including the number of people over 60 years' old receiving rural minimum living guarantee. Although the minimum living guarantee and difference supplementary standard in China are different, the aged people receiving rural minimum living guarantee are confirmed as per local economic development level and living level, which can accurately reflect the number of rural poor aged people in China. Data from the Ministry of Civil Affairs shows that at the end of 2015, the total people receiving rural minimum living guarantee was 49,031,599, including 20,043,541 aged people above 60 years old. At the end of 2015, there were 1.581 million persons in national five guarantees concentrated support and 3.581 million persons in scattered support. There are totally 25,205,541 aged people receiving rural minimum living guarantee and five guarantees, which are the total rural poor aged people in China at present. To be sure, although the number of people rural minimum living guarantee was calculated and reported monthly, it's just the minimum scale of poverty population and the actual poor aged people in rural areas may far exceed the number.

Since 1978, it's the accelerated social transformation period of China. In this period, Chinese economy experienced rapid development, the urbanization was stably promoted, the surplus rural labor force migrated as migrant bird in a large scale for a long term, the family planning policy was completely implemented, the New Rural Co-operative Medical System and new rural endowment insurance systems were established and implemented. Under the general background of rapid social transformation, some factors become poverty causes of rural poor aged people and some factors become obstacles hindering poverty elimination of rural poor aged people, therefore, rural poor aged people becomes a new issue in the social transformation period.

2. Accelerating coexistence of urbanization and rural hollowing"

Generally, if the urbanization rate is 30–60%, it's the acceleration period of urbanization. In 1998, the urbanization rate of China was 30.4% and China entered the acceleration period of urbanization. The People's Republic of China was founded in 1949, in which the urbanization rate was only 10.64%; the urbanization rate was 30.89% in 1999, only 20.25 percentage points were increased in 50 years and only

0.41 percentage points were increased per year. After entering the acceleration period, in 1998, the urbanization was gradually accelerated and the urbanization rate reached 56.10% in 2015; 25.21 percentage points were increased in 17 years, which exceeded the sum of previous 50 years, and averagely 1.48 percentage points were increased per year, presenting obvious acceleration trend.

With the acceleration of urbanization, the surplus rural labor force greatly moved to city, the rural hollowing has received high attention from the public; wherein, hollow village is an outstanding issue.

Hollow village increased the living difficulty for rural aged people, especially poor aged people. Firstly, as residence in hollow village was reduced gradually, the village clinic must stop operation or move to other places. Secondly, as the village scale was small, water, electricity, road, communication and other infrastructures cannot be improved. With the passage of time, original infrastructures were deteriorated. Thirdly, as the villagers were reduced gradually, some service systems (system of elderly care service, cultural service system, etc.) needing interaction with communities and residences cannot be established; even original service system cannot be maintained due to personnel reduction. Fourthly, the traditional rural entertainment activities in the past, like opera singing, dragon lantern dance, etc. were not performed and these activities were basically not handed down. The aged people may feel lonelier. If the aged people died, it's difficult to hold a funeral procession by eight persons as the tradition (commonly known as "Eight Immortals"), there is no "eight immortals" in the village.

3. Left-behind countryside with "left-behind" poverty

We've known that most floating population in China is rural migrant population. As "incomplete urbanization" system arrangement, they are working in the city but their household registration is in countryside. There is a floating family in the family and there is a left-behind family in the countryside. They work in city in young ages and return to the countryside in old age. Therefore, there is a huge number of left-behind aged people group in the countryside. *China Aging Development Report 2013* pointed out that there were about 50 million left-behind aged people in 2012, occupying 50%[4] of total rural aged people. There are three main types of rural left-behind aged people: elderly couple family, elderly single family and households of old grandparents with minor grandchildren.

With age increasing of left-behind aged people, the incidence was increasing year by year. However, limited by rural medical condition, it's inconvenient to seek medical advice. If the left-behind aged people want to see medical advice in hospitals in the city, they may be cumbered with grandchildren or

[4] Wu Yushao (Ed.). *China Ageing Development Report 2013*. Social Sciences Academic Press, 2013.

unable to go without escort, so many aged people endure minor illness and serious illness, their physical health was significantly influenced. The left-behind aged people is separated with children for a long time. They not only suffer economic poverty but also endure spiritual loneliness. The left-behind aged people without dependence is unable to receive the same treatment as other aged population "receiving treatment in case of illness and enjoying the life in old age".

4. Dual-poverty of loss of single-child family

"Loss of Single-Child Family" refers to the family that the couple only gave birth to or adopted a child but the child was dead due to disease or accident and the couple couldn't give birth to or adopt a child[5]. "Loss of Single-Child Family" is the new issue caused by family planning policy.

Professor Mu Guangzong in Institute of Population Research of Peking University regarded that single-child family is essentially risk family and the risk is the uniqueness[6]. Many loss-of single-child families are sorely bearing the risk.

Psychological trauma is difficult to be healed. Family endowment function is lost. It's difficult to enter nursing institution as there is no guarantor. The family suffers financial difficulty and will have a lonely and dreary life in old age. Family relationship is out of balance. The family is broken down which is to add insult to injury. The family suffers the pressure of caring the third generation.

5. Low remuneration from new rural social pension insurance

From 2009, China launched new rural social pension insurance pilot work. To the end of December 2012, all county level administrative regions carried out coverage of new rural social pension insurance. As the fund source of new rural social pension insurance consists of individual payment, collective subsidy and government subsidy. Therefore, the economic development condition and financial ability of different regions determined the remuneration level of new rural social pension insurance. The remuneration for farmers participating in pension insurance in underdeveloped area is always very low.

In 2014, the State Council issued *Opinion on Establishing Uniformed Basic Pension Insurance System for Urban and Rural Residents*, and decided to combine new rural pension insurance with urban resident pension insurance and establish uniform basic pension insurance system for urban and rural residents in the whole country. Personnel participating in the urban and rural resident pension insurance can pay the pension insurance as per regulations. There are 12 grades for pension insurance standard: 100 yuan, 200 yuan, 300 yuan, 400 yuan, 500 yuan,

[5] Wang Weiwei, Hu Cheng. Review of loss of single child family problem in China. *Journal of Chongqing City Management College*, 2013, volume 3.

[6] Mu Guangzong. Building people-oriented population policy and population strategy. *Study Times*. 4th edition. 2004. October 18.

600 yuan, 700 yuan, 800 yuan, 900 yuan, 1,000 yuan, 1,500 yuan and 2,000 yuan per year. The increased payment grades can better adapt to regions with different economic development levels and urban and rural residents with different income levels. Other contents are not significantly changed. Especially for rural poor aged people paying lower level of pension insurance, their remuneration is very low, which cannot change their poverty condition. Meanwhile, there is obstacle for the transfer and renewing of pension insurance for migrant workers, which cause hidden worry for receiving pension in the hometown. At present, among rural poor aged people, many people are migrant workers before.

6. New rural cooperative medical system is unable to fundamentally block the poverty causation and re-poverty channels

Poverty and re-poverty caused by disease is one of important factors causing poverty; it's especially true for rural poor aged people.

The aged people is a special group suffering high prevalence rate, diversified diseases and high proportion of hospitalization. The senile dementia for the aged people is increased, so the nursing pressure is great. Poverty and re-poverty caused by disease is prominent in rural areas.

The new rural cooperative medical system has alleviated economic burden caused by disease for rural poor aged people. However, according to our survey, many aged people suffer poverty and re-poverty caused by disease. As the guarantee level of new rural cooperative medical system is not high, and the formalities for applying for reimbursement are complicated. The reimbursement institution in remote countryside is far away, the cost for applying for reimbursement is increased so many patients give up treatment. The medical level of fixed medical institutions in some counties and towns is limited. If the patient go to the superior medical institution, the reimbursement proportion will be lowered, therefore the patient's burden is increased. The rural aged patients in poverty are caught in a dilemma.

The social transformation is characterized by integrity, complexity and persistence. On one hand, the social transformation will bring giant progress and development to Chinese rural area; on the other hand, it also cause some inducement causing poverty and hindering poverty elimination to rural poor aged people. The inducement and difficulty were generated in the transformation process and will be overcome and solved in the transformation process.

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Received July 18, 2016

DOI: 10.15838/esc.2016.5.47.6
UDC 332.14, LBC 65.292

Comprehensive Assessment of Integration Activity of Business Structures in Russian Regions*

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Abstract. In the context of economic sanctions and growing international isolation, the research into regional differences in integration development acquires special relevance for Russia; this fact determines the need for a comprehensive assessment of integration activity of business structures in Russian regions. The diversity of approaches to the study of problems and prospects of economic integration and the current debate about the role of integration processes in the development of regional economies determined a comprehensive approach to the concepts of "integration" and "integration activity" in order to create objective prerequisites for analyzing integration activity of business structures in the regions of Russia. The information base of the research is the data of Russian information and analytical agencies. The tools used in the research include methods for analyzing structural changes, methods for analyzing economic differentiation and concentration, nonparametric statistics methods, and econometric analysis methods. The first part of the paper shows that socio-economic development in constituent entities of Russia is closely connected with the operation of integrated business structures located on their territory. Having studied the structure and dynamics of integration activity, we reveal

* The work was performed under the grant of the RF President RF for state support of young Russian scientists – Ph.Ds (MK-5339.2016.6).

For citation: Karelina M.G. Comprehensive assessment of integration activity of business structures in Russian regions. *Economic and Social Changes: Facts, Trends, Forecast,* 2016, no. 5, pp. 103-121. DOI: 10.15838/esc.2016.5.47.6

the growing heterogeneity of integration activity of business structures in Russian regions. The hypothesis about significant divergence of mergers and acquisitions for corporate structures in Russian regions was confirmed by high values of the Gini coefficient, the Herfindahl index and the decile differentiation coefficient. The second part of the paper contains a comparative analysis and proposes an econometric approach to the measurement of integration activity of business structures in subjects of the Russian Federation on the basis of integral synthetic categories. The approach we propose focuses on the development of a system of indicators of integration activity that included five functional blocks: corporate control market, meso-economic indicators, finances of organizations, investment, economic crime and offences. The hierarchical system of statistical indicators and individual criteria of integration activity covers practically all the participants of market relations and comprehensively meets the requirements of state regulation institutions. The results of the study are of practical significance, because they can be used to improve current federal programs aimed to level the imbalances in socio-economic development of constituent entities of the Russian Federation. Based on the analysis presented in the paper it is possible to form an infrastructure of the market of mergers and acquisitions and to work out regional policies for enhancing the competitiveness of Russian regions.

Key words: business structure, integration activity, regional economy, mergers and acquisitions, structural changes, econometric approach.

In recent decades the role of economic integration in the system of economic relations of any state has increased significantly. The scope and level of economic integration are largely macro-economic indicators showing effective functioning of the national economy and its institutions. Integration processes in modern Russian conditions help restore the structural integrity of the national economy, align spatial characteristics of the country's industrial potential, boost innovative business activity, enhance competitiveness of domestic products, which is a crucial factor in domestic economic reindustrialization [3].

Research on integration activity of business structures in Russia's regions should begin with clarifying fundamental categories that describe it. The term "economic integration" appeared in the 1930s in the works of German and Swedish economists, but no general theory of integration has been established so far [6]. Theoretical schools focusing their attention on separate sides of the integration process give different definitions of integration as an economic phenomenon. Therefore, traditionally there exist different approaches to the interpretation of main categories characterizing the integration process [23]. A.B. Borisov's Comprehensive Dictionary of Economics contains one of the most succinct definitions of integration: *integration* (from the Latin word integer –

whole) is an association of economic subjects, deepening of their interaction, and development of relations between them. Economic integration takes place both at the level of national economies of entire countries and at the level of individual businesses [24].

According to the synergetic paradigm describing the laws of development of complex systems, evolutionary processes are based on the ability of such systems to streamline the internal structure by strengthening the relationships between structural elements. Applying this principle to the study of production integration process helps formulate the concept of *integration activity*, which refers to the economic activities of economic entities, aimed to deepen and promote cooperation, linkages and coordination to ensure that business entities make a more extensive use of their competitive advantages and achieve synergetic effect from the association.

As a matter of fact, the research on specifics of development of integrated corporate business structures in Russia and the studies of challenges for socio-economic development in Russian regions are mostly carried out independently from each other – by different scientists, experts and various research and analytical agencies. As a result, despite the fact that quite a few works on integration activity of economic entities at the level of the Russian economy as a whole have been recently published (for example, I.G. Vladimirova, Yu.V. Ignatishin, S.V. Gvardin, M.M. Musatova, N.B. Rudyk, etc.), the analysis of integration activity of business structures in the regions of Russia does not receive due attention[1].

It should be noted that at present, issues related to statistical analysis of structural differences in regional integration activity are not elaborated, as well as problems of integrated assessment of the M&A[2] transaction structure mobility by regions and federal districts (FD). Among the features of regional economic system one should pay special attention to integration activity indicators that influence economic growth and to efficient functioning of regional economies.

Thus, research into the differentiation of regional disparities of socio-economic indicators, including the integration activity of economic entities, becomes especially urgent for Russia. Moreover, research in this area should be based on comparable statistical information, since only in this case successive studies will be possible to perform. A comparative analysis of the data of information-analytical agencies has been carried out, and on its basis the database of the agency "Mergers and Acquisitions" has been chosen as a source of information for this study.

[1] The book by O.V. Kuznetsova, A.V. Kuznetsov, R.F. Turovsky and A.S. Chetverikov "Investment strategies of big business and the regional economy" (2013) is almost the only exception to this rule.

[2] American abbreviation for merger and acquisition transactions.

Statistical analysis of integration activity of business structures in the regional context

Uneven distribution of economic activity in Russia contributes to the differentiation of its constituent entities in terms of development. A growth in the differentiation of Russian regions can be explained by tough competition for scarce resources. In 2013, five regions contained 24.52% of Russia's labor resources. Five regions leading in the volume of investment had 64.53% of such investments [13].

In modern conditions, business structures are an essential attribute of economic development in Russian regions. They operate in virtually all economic sectors and implement their projects in a significant number of regions [12, 18]. At that, socio-economic development of constituent entities of the Russian Federation is closely connected with the activities of entities located on its territory, i.e. it depends directly on the quantitative and qualitative results of performance of enterprises within Russian business structures in the long term. This relationship is manifested through investment and innovation components, through the support of social sphere, and compensations that Russian business structures pay for the use of resources and infrastructure of the territory [5, 16].

About a quarter of all Russian regions where large vertically integrated structures are main budget donors have a diversified economy [11]. The analysis of the statistical relationship between the number of mergers and acquisitions of Russian business structures and tax deductions in each federal district on the basis of Spearman's rank correlation coefficient ($\rho = 0.772$) has shown that there is a direct relationship between the number of M&A transactions and tax deductions. It follows that mergers and acquisitions should be considered in the context of strategic interaction of regional authorities and companies.

Table 1 presents descriptive statistics of the total value of the regional market of mergers and acquisitions for 2006–2013. The data in the table show that the minimum value of the total value of the regional M&A market in 2013 amounted to 63 million US dollars. At the same time, the distribution of the regions was non-uniform throughout the analyzed period (coefficient of variation ranges from 311.15 to 426.48%).

Thus, the integration activity of Russian regions calculated as the total value of the regional M&A market is heterogeneous. The value of this indicator in the Central Federal District in 2013 was 49,594 million US dollars, in the Ural Federal District – 3,863 million US dollars, and in the North Caucasian Federal District – only 28 million US dollars. High integration activity in the Central Federal District is provided by the total value of the Moscow market of mergers and acquisitions. Low integration activity in the southern and North Caucasian federal districts is connected in first place with an almost

Table 1. Descriptive statistics of the total value of the regional market of mergers and acquisitions by RF subjects, 2006-2013

Indicator	Value							
	2006	2007	2008	2009	2010	2011	2012	2013
1. Minimum value x_{min}, mln US dollars	63	98	85	18	43	75	61	63
2. Maximum value x_{max}, mln US dollars	27651	71010.4	77154	42343.6	73619	68514	11811	12005
3. Average value $\overline{x}$,, mln US dollars	1015.3	2098.9	1910.6	922.1	912.3	1268.9	1368.9	1320.5
4. Variation coefficient υ, %	343.1	**426.48**	347.9	383.23	354.87	311.5	399.2	398.78
5. Standard deviation σ, mln US dollars	3483.6	8951.6	6648.9	3534.2	3237.4	3952.7	5463.8	5265.9
6. Asymmetry A	7.84	7.78	7.91	7.86	6.93	6.01	5.60	5.72
7. Excess E	10.94	11.35	12.71	12.13	11.05	11.35	11.56	11.48
Source: author's calculations using the data of the information-analytical agency "Mergers and acquisitions".								

complete lack of integration activity in constituent entities such as Stavropol Krai, the Volgograd and Rostov oblasts, and the Republic of Ingushetia.

Research carried out by O.V. Kuznetsova shows that there are two reasons for low integration activity of economic entities in the North Caucasian Federal District. The first reason lies in the difficult socio-political situation and the current opinion concerning the specifics of doing business in these regions. The second reason consists in the initially (at the beginning of market reforms in Russia) low level of industrial development. Republics in the Soviet times were mainly agricultural, and, consequently, they had virtually no assets attractive for business [8].

Let us consider individual factors in relative structural shifts with the variable base of comparison of the indicator "Total value of the regional M&A market" in each Federal District for 2004–2013 *(Tab. 2)*.

The North Caucasian Federal District was withdrawn from the Southern Federal District by the Presidential Decree dated January 19, 2010. Due to this fact and in order to ensure compatibility of the values and comparisons of the total value of the regional market in the Federal District the values of the total value of M&A market for the republics of Dagestan, Ingushetia, North Ossetia-Alania, Kabardino-Balkaria, Karachay-Cherkessia, Stavropol Krai and the Chechen Republic for 2003–2010 were extracted from the values of the total value of the market of mergers and acquisitions for the Southern Federal District and arranged in a separate group.

The analysis of the data in the table leads to the conclusion that despite the fact that the North Caucasian, Southern and Far Eastern federal districts are "outsiders" in the absolute value "Total value of the regional M&A market", they have the highest growth according to this

Table 2. Coefficients of relative structural changes of the indicator "Total value of the regional M&A market", p.p.

Federal District	2005/ 2004	2006/ 2005	2007/ 2006	2008/ 2007	2009/ 2008	2010/ 2009	2011/ 2010	2012/ 2011	2013/ 2012
Central	1.7	1.5	1.3	1.3	2.7	0.7	0.6	0.7	0.7
Northwestern	0.3	0.4	3.9	1.3	0.9	1.4	0.4	0.3	0.4
Southern	11.0	13.0	1.3	27.0	7.7	0.1	3.1	2.8	2.9
Volga	0.2	0.1	9.7	0.5	4.1	0.2	1.2	0.9	0.9
Ural	1.5	1.6	0.7	1.0	6.4	0.8	1.2	1.1	1.2
Siberian	0.2	0.1	1.6	5.3	9.0	0.1	0.7	0.6	0.5
Far Eastern	15.0	17.0	0.7	**56.6**	0.6	0.5	3.2	2.3	2.3
North Caucasian	13.5	11.0	1.1	23.0	6.8	0.3	2.8	1.7	1.8

Source: author's calculations using the data of the information-analytical agency "Mergers and acquisitions".

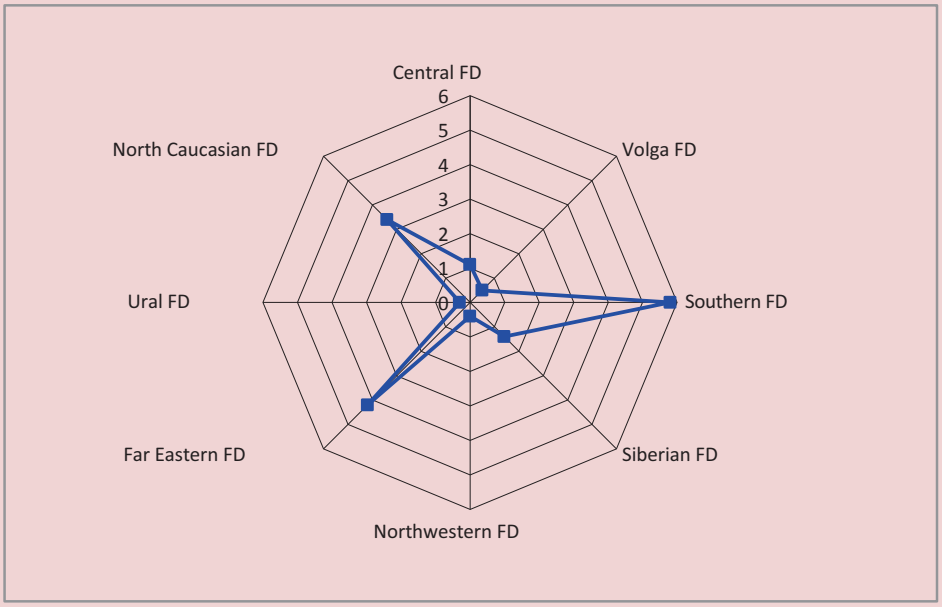
indicator. The maximum relative structural shift in 2004–2013 with the variable base of comparison was observed in the Far Eastern Federal District in 2008 (56.6 p.p.).

If we examine the contribution of each federal district in Russia's total number of merger and acquisition transactions in 2013, we see that the Central and Volga federal districts are leaders and the Southern and North Caucasian federal districts are outsiders. Among 18 subjects comprising the Central Federal District the largest number of concluded integration transactions belongs to Moscow (91.3% of the total number of M&A transactions in this district). Out of 11 regions comprising the Northwestern Federal District the maximum share of the number of M&A transactions belongs to Saint Petersburg (75.77%), the Novgorod (7.02%) and Pskov (6.38%) oblasts.

In order to study the mobility of structural changes of integration activity in regions of the federal districts we shall analyze structural changes in terms of the "number of merger and acquisition transactions". The analysis of linear shift relative to structural shift with the constant base of comparison shows that structural changes in all federal districts of Russia in 2004–2013 are characterized as large structural shifts. The distribution of federal districts in 2013 by the value of linear structural shift is presented in *Figure 1*.

The analysis of its data reveals that, as in the case of the total value of the regional M&A market, the greatest structural changes of the quantitative volume of the market for corporate control are observed in the Southern and Far Eastern federal districts. This may be due to the fact that these federal districts have many production assets, both those under bankruptcy and due to be sold and those dynamically developing and attractive for investors. The smallest structural changes of the quantitative volume of the market of mergers and acquisitions are observed in the Ural and Northwestern federal districts.

Figure 1. Linear relative structural (basic) changes in the quantitative volume of M&A market in the context of federal districts, 2013



Source: author's calculations using the data of the information-analytical agency "Mergers and acquisitions".

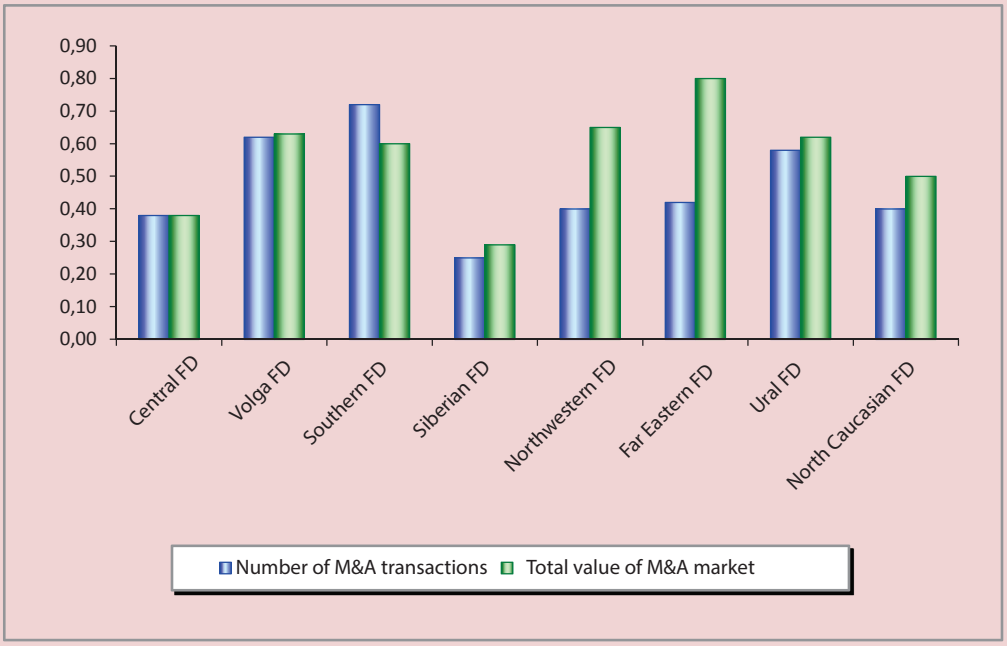
In order to avoid the cancellation of changes in the weights of individual items opposite in the sign in the total volume, quadratic relative structural shifts in the structure of the number of M&A transactions and total value of M&A market at the federal level in 2013 to 2009 were calculated *(Fig. 2)*.

The analysis of the figure shows that all federal districts of Russia reduced their integration activity as a result of the financial and economic crisis. The structure of the market of mergers and acquisitions in terms of "Total value of M&A market" has undergone more substantial changes than the structure of the market in terms of "Number of M&A transactions" in six out of eight federal districts.

The impact of macroeconomic factors on mergers and acquisitions was noted by many foreign researchers. For example, Wu Changqi, Xie Ningling [21] argue that mergers and acquisitions depend on the external environment, that is, on factors such as growth/crisis of the economy, level of competition, and political and economic changes. Some researchers emphasize the importance of noneconomic, namely political, legal, etc. factors (Liu Yan, Liu Ming [25]).

During the crisis Russian business structures have significantly reduced the scale of export expansion and focused on the domestic market to address the problems of debt and restructuring their assets. Residents has taken a wait-and-

Figure 2. Relative structural changes, calculated by quantitative volume and total value of the market of mergers and acquisitions (2013, 2009)



Source: author's calculations based on the information-analytical agency "Mergers and acquisitions".

see approach with regard to reducing or eliminating the gap between their price expectations and the expectations of sellers and therefore did not hurry to enter regional markets [10].

In order to support *a hypothesis that there exists a significant divergence of mergers and acquisitions for corporate structures in Russian regions* let us consider the dynamics of change in the coefficients of inequality of distribution of integration activity calculated in terms of "Total value of M&A market" for the quintile (20-percent) groups of regions for 2004–2013. The fifth quintile group (leading regions) included entities such as Moscow, the Moscow Oblast, Saint Petersburg, Yamalo-Nenets Autonomous Okrug, Republic of Tatarstan, etc.

The idea of the process of concentration of integration activity in the Russian Federation regions as a whole is given in *Table 3*. For the period 2003–2012 the share of the fourth quintile group was relatively constant. In this case, the proportion of the first, second and third quintile groups decreased from 5.71 to 5.46%, i.e. for the studied 10 years, it dropped in 1.28 times.

The least integration-active first quintile group of regions was characterized by the most significant drop from 1.08 to 0.62% (decline in 1.74 times). At the same time the share of the most integration-active fifth quintile group increased in 1.02 times.

Table 3. Shares of quintile groups of Russian regions in the total cost volume of the market of mergers and acquisitions, %

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total value of M&A market	100	100	100	100	100	100	100	100	100	100
Including by 20% groups of regions										
First (the least M&A activity)	1.08	0.96	0.86	0.39	0.49	1.32	0.53	1.34	0.60	0.62
Second	1.68	2.65	2.76	1.85	1.70	2.05	1.95	2.85	2.08	2.02
Third	2.95	2.89	3.05	3.12	2.28	3.35	4.29	4.04	3.08	2.82
Fourth	5.43	5.18	5.27	4.88	4.95	4.78	5.05	5.15	4.18	4.11
Fifth (the greatest M&A activity)	88.86	88.32	88.06	89.76	90.58	88.50	88.18	86.62	90.06	90.43
Source: author's calculations using the data of the information-analytical agency "Mergers and acquisitions".										

Thus, these data show that compared to 2004, in 2013 the situation in the area of distribution of the integration activity in Russian regions has changed in terms of increasing the integration activity in the fifth quintile group and decreasing the M&A activity in the first quintile group.

Along with the indicator "the share of the quintile groups in the total value of the M&A market" for the analysis of concentration by groups of regions, it is advisable to use special coefficients which characterize the phenomenon. These include, for example, "concentration ratio" (Gini coefficient).

The basis for calculating the Gini coefficient is to build the Lorenz curve, characterizing the accumulation of the feature depending on the accumulation of elements in the group [22]. According to the approach of V.A. Litvinov, the Gini coefficient, determining the degree of deviation of the actual distribution of the integration activity from the line of their possible uniform distribution, fully characterizing the process of concentration of integration activities for groups of subjects of the Russian Federation, only indirectly reflects the actual concentration in the narrow sense of the word, i.e. the desire to "pull" the entire integration activity of economic entities in one region [9].

Taking into account the above, we propose to use the Herfindahl concentration ratio in the study of regional integration in the activity of business structures when analyzing the concentration:

$$K = \sum_{i=1}^{5} d_i^2 , \qquad (1)$$

where d_i is the share of each group of regions in the total value of M&A.

This coefficient varies from 0 to 1. Unlike the Gini index, the Herfindahl coefficient is an indicator of "direct action" and indifferent to the line of a theoretically possible uniform distribution [20]. In other words, the Herfindahl coefficient takes the unequal distribution of integration activity as an axiom, and its

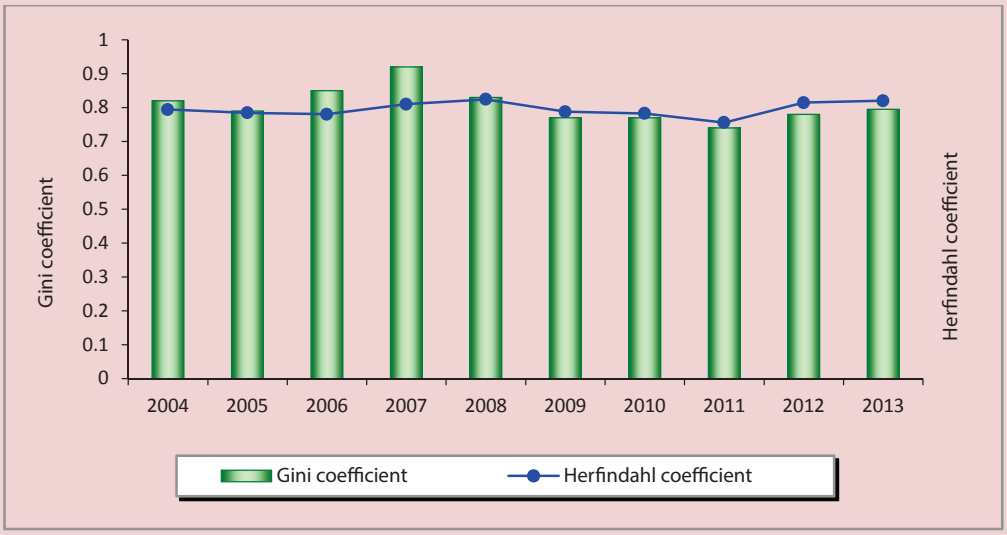
changes reflect changes in the proportions between the groups, i.e., in the ratios of proportions of selected groups of regions in the total cost volume of the market of mergers and acquisitions.

Throughout the period 2004–2013, the Gini coefficient showed high values, indicating the uneven distribution of the integration activity in Russian regions *(Fig. 3)*.

The highest value of the Gini coefficient is in 2007 (G_{2007}=0.92), the lowest – in 2011 (G_{2011}=0.74). During 2004–2013, the value of the Herfindahl coefficient did not fall below K_{2005} = 0.76, indicating a high concentration of the integration activity of Russian business structures. In addition, in 2013 there was an increase in the concentration of the integration activity by 1.92% compared to 2012.

The Gini index and the Herfindahl coefficient, describing the focus of the integration activity of economic entities in subjects of the Russian Federation, indirectly reflect the overall measure of differentiation M&A activity in the Russian regions. However, one should not confuse concentration as the concentration of anything with differentiation as a distinction (difference) between parts of the whole. Under the differentiation we mean mainly the difference of a varying characteristic (the volume of the total value of the regional M&A market) as the weighted values in the extreme groups. Consequently, the Gini index and the Herfindahl coefficient can not be used directly for characterizing the differentiation of integration activity,

Figure 3. Evolution of the values of the Gini coefficient and the Herfindahl coefficient for the integration activity of Russian regions in 2004–2013



Source: author's calculations according to the information-analytical agency "Mergers and acquisitions".

and, therefore, it is necessary in its study to apply special indicators, such as quantile differentiation factors.

The decile differentiation coefficient is the ratio of the total regional value of the market of mergers and acquisitions, above and below which there are 10% of the most and the least integration-active regions of Russia [14, 15]. The result is that the decile differentiation coefficient, equal to the ratio of the 9th and the 1st decile in 2013 increased by 1.16% compared to 2012 and amounted to D_{2013}=174, i.e., the minimum cost value of the market for corporate control of 10% of the most integration-active agents exceeds the maximum total value of the M&A market of the least integration active regions of the Russian Federation in 174 times.

Thus, the economy of Russia is characterized by deformed spatial structure of the integration activity of business structures in the regions. Existing state and regional policies for the development of integration activities do not have a sufficient influence on the smoothing of imbalances in the distribution of areas of implementation of integration projects. All this indicates the need to adjust the state policy on increasing integration activity of Russian business structures in the regions of the Russian Federation, which should be based on a reasonable approach to multidimensional ranking of Russian regions by the level of integration activity.

Econometric approach to the measurement of regional integration activity

The historically formed differences in socio-economic development of constituent entities of the Russian Federation have a major impact on the structure and efficiency of the market for corporate control in Russian regions. In particular, the modern view on the problem of development of ownership and control in transition economy of Russian regions is presented in the proceedings of the Institute for the Economy in Transition and proceedings of the Institute of Socio-Economic Development of Territories of RAS. The research on the features of development and the development of models for regional economic systems, taking into account the ongoing M&A processes are described in the works of N.I. Kalyuzhnova, G.V. Gutman, A.A. Miroedov, S.V. Fedin. Several of the first studies of the relationship between integration processes of the Russian business structures and drivers of development of Russian regions are presented in the works of O.V. Tyutyk.

However, a characteristic feature of research is the lack of works devoted to assessing the influence of integration processes on the economies of regions and the lack of classification of subjects of the Russian Federation by level of integration activity. At that, mathematical-statistical methods are a necessary tool for obtaining deeper and more complete knowledge

about the mechanism of the studied integration processes in the regional context. In this regard, the work has taken one of the first attempts to formulate *a methodology for multidimensional ranking of Russian regions by level of M&A activity based on the use of econometric approach that makes it possible to take into account different components of the integration activity of Russian business structures*.

On the basis of significant domestic and foreign experience in assessing the development of territories, the work proposes an ***econometric approach for estimating regional integration activity***, which helps not only estimate the value of the integration potential of the region, but also identify opportunities and reserves for regional economic growth, determine directions of the state policy in the field of promoting the integration development of business structures in Russia's regions.

The central place in the proposed approach belongs to the development of a system of indicators: defining the structure and content, identifying the relationships between them and endowing their set with systemic nature [4]. Based on the analysis of Russian and foreign experience, taking into account the above specifics of distribution of integration processes on the territory of Russia, as well as specifics of formation and implementation of integration policy by Russian constituent entities subjects of the Russian Federation, a system of indicators of regional integration activity was proposed *(Fig. 4)*.

This system is adapted to the existing and available statistical information of Rosstat and informational and analytical agency "Mergers and acquisitions" and includes 38 indicators, divided into 5 functional blocks:

1) market for corporate control (6 variables);

2) mesoeconomic indicators (10 variables);

3) finances of organizations (11 variables);

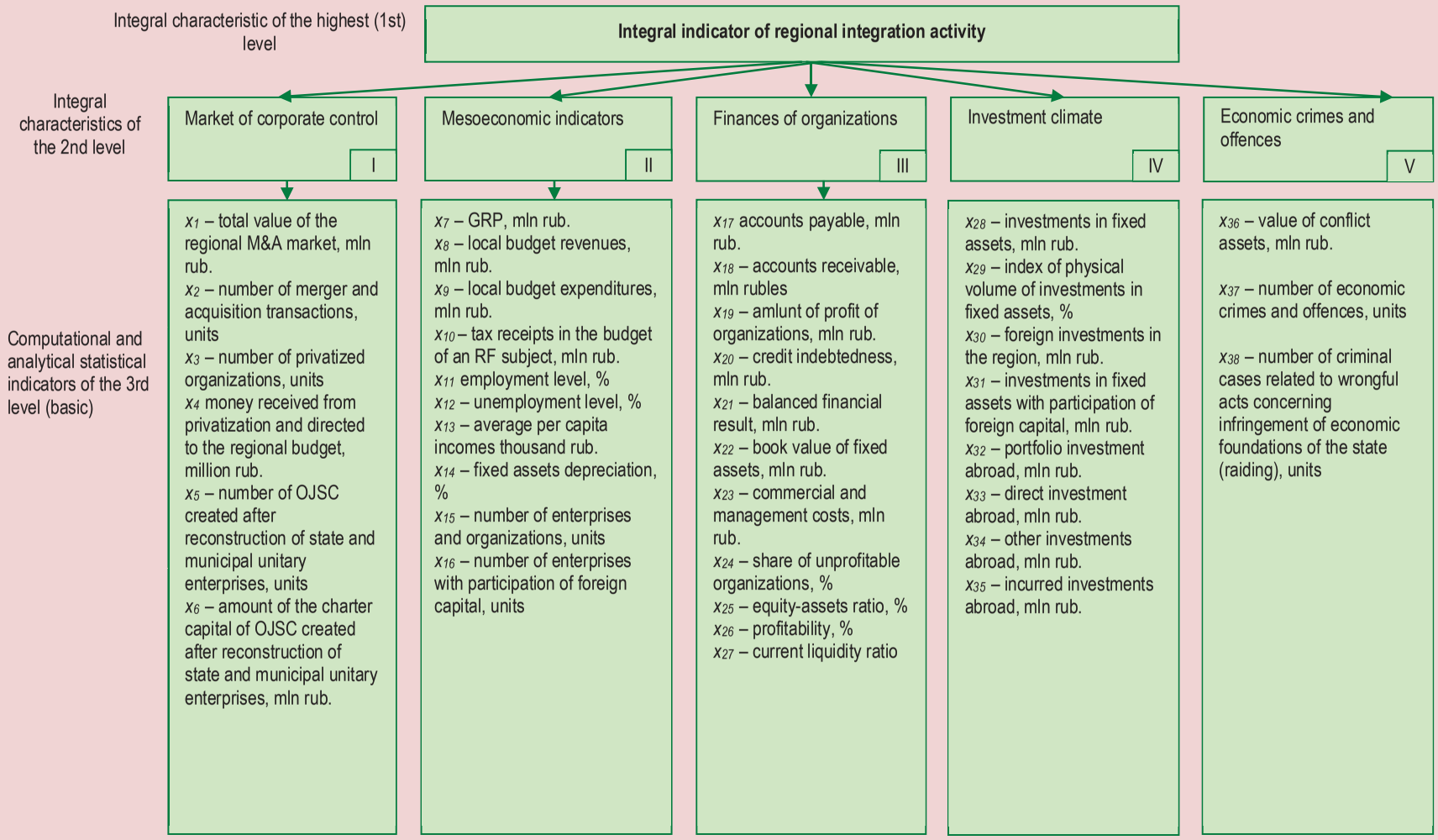
4) investments (8 variables);

5) economic crimes and offences (3 variables).

According to the works of S.A. Ayvazyan, an integral indicator of the feature under consideration is a particular kind of convolution of values of the more particular features and criteria that describe integration activity in detail [1, 19]. In the framework of the ongoing research into integration activity of business structures in the regions of Russia we chose the objectivist approach, which is based on structural-functionalist type of paradigms. Under this approach, researcher's interests are focused on analyzing and assessing the statistical indicators characterizing the whole conglomerates of the property under consideration.

The methodology for developing the integral indicator in the framework of the objectivist approach is a multistep procedure based on the convolution of statistically recorded indicators and on some methods for the multicriteria ranking

Figure 4. System of statistical indicators of integration activity in the region of the Russian Federation



Source: author's work.

of objects. In particular, the shares of initial indicators in the integral indicators are selected so that the value of the integral indicator could be used for the most accurate restoration of the values of all base indicators in the a priori set [7].

The work has considered only 61 Russian regions due to the fact that the completed mergers and acquisitions were registered only in these regions of the Russian Federation in 2003–2013. The aggregation of indicators characterizing the integrative activity of business structures in the Russian regions in 2013 was carried out in a time when the eigenvalue of the first main component exceeds 55% of the sum of all eigenvalues of the principal components [2]. For this purpose, an integrated indicator of "regional integration" was found for the standardized values of specific indicators.

According to *Table 4* the individual criteria within the block "Meso-economic indicators" have the greatest weight. In particular, the indicator "Tax receipts in the budget of a constituent entity of the Russian Federation" has the maximum weight $\omega_{10} = 0.0807$, this can be explained by the fact that the main taxpayers in Russia's constituent entities are represented by integrated business structures that affect the development and integration activities in the regions in general.

Integrated indicators were used to rank the Russian Federation subjects. As a result, it has been found out that regions with high integration activity include five subjects, regions with the median integration activity – 30 subjects, regions with low integration activity – 26

Table 4. Indicators with the highest weight in the integral indicator of "Regional integration activity", 2013

Indicator	Name of indicator	Integral feature	Weight coefficient
x_2	Number of M&A transactions	Market of corporate control	0.0735
x_6	Amount of the charter capital of JSC that were established as a result of transformation of state and municipal unitary enterprises		0.0735
x_7	Gross regional product	Mesoeconomic indicators	0.0779
x_{10}	Tax revenues in the budget of a constituent entity of the Russian Federation		0.0802
x_{19}	Amount of profit of organizations	Finances of organizations	0.0786
x_{21}	Balanced financial result		0.0781
x_{33}	Investments abroad incurred	Investment climate	0.0742
x_{34}	Direct investmens abroad		0.0709
x_{35}	Other investments abroad		0.0738
x_{36}	Value of disputed assets	Economic crimes and offences	0.0618
x_{38}	Number of criminal cases related to illegal acts concerning infringement on the economic foundations of the state (raiding)		0.0618

Source: author's developments.

subjects. The results of the generalized ranking assessment of the level of regional integration activity are presented in *Table 5*.

For instance, in 2013 the number of mergers and acquisitions in regions with high regional integration activity was 83.35% of Russia's total number of M&A transactions, and the total value of the market was 87.12% of the total Russian market volume of mergers and acquisitions. It is noteworthy that this group did not include any of the subjects from the Volga Federal District, which is among the most economically developed regions of Russia and includes several cities with a million-plus poopulation.

The majority of subjects within the Siberian Federal District are in the group with the median level of regional integration activity, where quite a few transactions are caused by processes occurring in the agricultural sector. First, the Siberian Federal District provides favorable ground for Russian agricultural companies to enter the most attractive Chinese market. Second, there are several strong players in Siberia, for example "Khleb Altaya", "Mel'nik", "OGO" and others.

Significant differences in the level of development of integration activity of Russia's regions depend on the current situation, the impact of which on the market of mergers and acquisitions will be offset in the medium term; they also depend on a situation in the long run. The opportunistic factor can be found in the presence of reserves of production capacities. This can provide an opportunity to increase the output in many types of economic activities only as a result of increasing demand, without any new construction, and reconstruction, and, as a consequence, it can give impetus to the revitalization of integration activity in the medium term.

Table 5. Results of the generalized ranking assessment of the level of regional integration activity of constituent entities of the Russian Federation, 2013

RF constituent entity	Level of regional integration activity
Moscow, Moscow Oblast, Saint Petersburg, Tyumen Oblast, Khanty-Mansi Autonomous Okrug (Yugra)	***High***
Oblasts: Amur, Vologda, Irkutsk, Kemerovo, Leningrad, Lipetsk, Novgorod, Novosibirsk, Orenburg, Penza, Samara, Saratov, Sverdlovsk, Tambov, Tomsk, Tula, Chelyabinsk, Ulyanovsk, Yaroslavl ***Republics:*** Bashkortostan, Mordovia, Tatarstan, Udmurtia, Khakassia, Chuvashia, Yakutia ***Krais:*** Krasnodar, Krasnoyarsk ***Autonomous Okrugs:*** Chukotka, Yamalo-Nenets	***Median***
Oblasts: Arkhangelsk, Astrakhan, Belgorod, Bryansk, Vladimir, Volgograd, Voronezh, Kaliningrad, Kaluga, Kostroma, Kursk, Nizhny Novgorod, Omsk, Orel, Pskov, Rostov, Smolensk, Tver ***Republics:*** Karelia, Tyva ***Krais:*** Altai, Zabaikalsky, Perm, Primorsky, Stavropol, Khabarovsk	***Low***
Source: author's developments.	

Factors of a long-term nature can include the sectoral structure of production. In the regions whose economies are dominated by extractive industries financial resources are invested in capital-intensive long-term integration projects. Investments in infrastructure are necessary for creating conditions for economic growth; at that, direct contribution from investment in the short term may not give a significant increase in value added.

In these circumstances, one of the most important conditions for solving the tasks at hand is to consolidate limited resources through the development of active interaction between the authorities and business structures. Partnership cooperation is characterized by coherence and presence of a certain balance of interests of the authorities and business structures, regulation of their rights, duties, cross risk-sharing, and solidarity [17].

In this context, of great interest for regional comparisons is the comparison of regional integration activity in 2013 to regional integration activities in 2008, due to the fact that in 2013 compared to 2008 in the technical and legal aspect of executing mergers and acquisitions of business structures it is possible to identify the following trends:

- transactions are made in a much shorter period of time than previously;
- transactions of Russian holdings become less formal and often more simple in structure.

The maximum contribution to the value of the integral indicator of regional integration activity in 2008 is made by the indicators within the "financial institutions" block. In particular, the indicator "Accounts receivable" has a maximum weight $\omega_{18} = 0.0824$, the indicator "Amount of profit of organizations" – $\omega_{19} = 0.0818$, the indicator "Net financial result" – $\omega_{21} = 0.0818$. This is due to the fact that 2008 accounted for the peak in the number of mergers and acquisitions and focused on the stability of the financial situation of the target company.

After the integral indicator of regional integration activity in 2008 was built, it has been found that regions with high integration activity comprise four subjects, regions with median integration activity – 38 subjects, regions with low integration activity – 19 subjects. It should be noted that in 2008, 62.30% of the regions had median integration activity. The regions leading in 2008 have retained their positions in 2013 (Moscow, Moscow Oblast, Tyumen Oblast, Khanty-Mansi Autonomous Okrug).

Thus, spatial integration development trends proved quite stable in relation to external factors; the financial and economic crisis and post-crisis economic recovery have not changed significantly the spatial proportions of development of M&A activity, despite the fact that the rate of decline in production during the crisis and post-crisis recovery is very

different in constituent entities of the Russian Federation.

Conclusions

The analysis described in the paper can serve as a basis for selecting the regions that require state support in order to enhance integration activity within minimum time and with maximum efficiency. Reduction of differences in the level of economic development of Russia's regions helps solve important tasks such as preservation of a single economic space of Russia, development of interregional economic integration, and formation of national and regional markets.

Comprehensive assessment of the evolution of integration activity of constituent entities of the Russian Federation can be the basis for the development of federal target programs to equalize economic development of the regions within the integration development, to create a favorable environment for business development and improvement of investment climate and to enhance the efficiency of providing state support to Russian Federation regions.

One of the main areas that could promote integration activity of business structures in the regions of Russia and enhance the efficiency of integration of business entities are as follows:

- improving the investment climate and development of competition in Russia's regions;
- introducing rational forms of participation of Russian business structures in the implementation of industrial policy priorities at both regional and federal levels;
- elaborating regional development policies for constituent entities of the Russian Federation, taking into account the specifics of integration processes in business structures within regions (there should be a clear relationship between strategic development plans for regions and consolidated development plans for the enterprises of integrated structures);
- improving the ways of participation of regional authorities in the activities of integrated structures when implementing regional projections of investment strategies;
- introducing the so-called individual support of integration projects, when representatives of regional administrations take active part in resolving various administrative issues in the implementation of integration projects for business entities.

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Received August 02, 2016

DOI: 10.15838/esc.2016.5.47.7
UDC 332.14, LBC 65.49

The Rationale for Comparative Effectiveness of Tourist Potential Realization (Case Study of the Volga Region)

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For citation: Polukhina A.N., Sheresheva M.Yu., Rukomoinikova V.P., Napol'skikh D.L. The rationale for comparative effectiveness of tourist potential realization (case study of the Volga Region). *Economic and Social Changes: Facts, Trends, Forecast*, 2016, no. 5, pp. 122-140. DOI: 10.15838/esc.2016.5.47.7

Abstract. The article presents the analysis of long-term tourism development programs of the Volga Region. Great attention is given to the sector's financing measures set out in development programs. Domestic and foreign tourist potential assessment methods are analyzed. Tourist potential dynamics of the Volga Region is studied based on expert opinion. Using econometric approach the authors study the correlation between tourism investments and incomes of the Volga Region for the past six years – from 2009 to 2014. The analysis was carried out using statistics provided by the Russian Tourism Association and the Federal State Statistics Service of the Russian Federation by category of profitability from paid tourist services and from hospitality and catering services. The conducted analysis helped construct the figures showing the differentiation of the Volga regions by tourism investment efficiency and tourist potential realization. It is shown that tourist potential of the territories and its realization are highly differentiated. The sub-regions of the Volga Region are divided into groups according to the effectiveness of potential realization. The effectiveness of implementation of natural recreational and historical and cultural potential is higher in the sub-regions where places of tourist accommodation and entertainment are developed enough, effective mechanisms for programs implementation control are formed and the indicators of expected effectiveness of measures implementation are elaborated. The study has revealed the need for the development of common indicators of expected final results of tourism development programs. The use of a unified system of standardized indicators should become the principle of monitoring the implementation of regional tourism development programs. Data obtained by the research will be useful for the improvement of the existing regional tourism development programs.

Key words: tourist potential, long-term tourism development program, tourism infrastructure, efficiency of investments, efficiency indicators.

Introduction. The current situation in the Russian economy influenced by international events of 2014–2015 has raised the urgent issue of import substitution. At first sight, this important strategy of the Russian economy does not include tourism and recreation. The authors, however, believe that this is a false statement. Tourism theoreticians and practitioners have for a long time spoken about the need to develop domestic, inbound and regional tourism, but any initiative in this sphere conflicted with the real state of affairs in the market of tourist services. Outbound tourism, especially recreational, to countries such as Turkey and Egypt, has been the leading direction of Russian tourism for the past 10–15 years. But the events of 2015 have dramatically changed the situation: according to the experts, the main trend of the last year was the shift towards domestic tourism[1]. In these circumstances, the

[1] The experts unanimously claim the shift to domestic tourism the main trend of the expiring year. **Available at:** http://www.dni.ru/culture/2015/12/17/323671.html

development of domestic tourism in Russia is the greatest challenge which in the short term will necessitate the revision of the existing programs of tourism development in the Russian regions and raise the issue of adequate assessment of their tourist resources.

Research methodology. The tourist potential of any territory is composed of natural and man-made objects and phenomena, as well as the conditions, opportunities and resources necessary and suitable for the formation of a tourism product. Therefore, scientific concepts put forward as a framework for assessing tourist potential, offer a comprehensive consideration of a number of factors. These include natural and climate resources (climate; landscape; water and mineral resources; flora; fauna; separate natural monuments, etc.), historical and cultural resources (tangible and intangible cultural heritage of the region) and socio-economic resources (infrastructure of the tourist sector; management, personnel and education, material, financial and information resources and conditions) [5]. Accordingly, the problem of developing uniform methodology for assessing tourist potential of the territory attracts the attention of specialists in different knowledge domains: geography, architecture, tourism, etc. [4]. The well-known methods of assessing tourist-recreational potential of territories developed by A.Y. Alexandrova [1], A.V. Drozdov [2], B.V. Robinson [8], models of comprehensive assessment of tourist resources offered by E.O. Ushakov [11], I.A. Selivanov [10], an integrated assessment model of M.A. Sarancha [9] are of particular interest. The author's method of assessing tourist potential based on the index method [7] may also be noted: based on calculations in the Vologda Oblast V.S. Orlova and E.G. Leonidova identify groups of territories (municipalities) by level of their tourist potential. This methodology helps identify the problems constraining the development and realization of tourist potential.

When considering the processes of tourist potential implementation in the Russian regions from the point of view of system approach, the authors determined that the adaptation of regional economic systems to the new format of tourist service provision in connection with foreign economic instability will require dynamic creation of new adaptive mechanisms. The mechanism of adaptation to a new type of tourist business development amid the import substitution policy, which is based on the implementation of investments as a long-term capital outlay is considered by the authors as a set of consistently implemented changes with a strategic focus on achieving a balance between economic interests of the business community and the state's social responsibility [21]. A combination of infrastructural, institutional, organizational and educational factors the driver which generates the processes of

adaptation of a regional economic system to the new conditions of tourism activities. A set of investment, financial, external-economic, social and cultural factors is an "adaptalizator" which increases the adaptive capacity of the Russian tourist business. Managerial and entrepreneurial factors underlie the effective adaptation technologies, while the informal "shadow" mechanisms constitute a "blockade units" which hamper constructive adaptation.

When studying tourist potential realization, the researchers mainly focus on economic assessment methods: increasing cash receipts from tourism, raising employment rates, increasing income of the local population and other economic consequences. Marketing factors are also used for assessing tourist potential: raising the awareness concerning the destination [16], the increasing number of positive tourist responses [15], the degree of the destination's attractiveness [18], and the number of images of brands in the minds of potential tourists [20]. Some foreign studies [17; 22] focus their attention on the fact that the assessment of tourist potential of the regions, the basis of attraction of which is the beauty of the landscapes must include the assessment of attributes of a natural resource and environmental requirements for soil conservation, protection of forests and wildlife. In particular, the New Zealand method of assessment of recreational and tourist resources [17] implies complex analysis of landscape attractiveness and related tourist activities. This is done with the use of the natural resource delimitation method based on the definition of vegetation borders using aerial photography and field examinations. When defining the quality of landscape views, the authors applied a subjective index with high, medium or low resource quality options. The study uses a scale of five points which reflect the overall suitability of a specific resource for recreation- and tourism-based activities, as well as its importance in terms of recreational and tourist potential at the national level.

J. Priskin [22] proposed a method for assessing the potential of coastal Australian regions based on comprehensive analysis of four assessment units: attractiveness of the region's natural resources, availability, supporting infrastructure, the degree of environment deterioration. Such an approach provides decision makers and people developing and implementing regional programs with a tool for assessing both positive and negative consequences of tourist potential development. It is important to understand that the balance of potential benefits and costs is the basis for success of regional tourism development programs. In particular, environmental load should be taken into account in those regions which do not place the territory's natural attractiveness at the forefront. This is because local communities are, according to the modern

approach of managing tourist destinations, the key stakeholders [14; 19], therefore, the system of indicators of effectiveness should include indicators such as water and energy[2] consumption growth rate, garbage disposal by the tourists of the recreation area, etc.

Analysis of regional and municipal Russian tourism legislation shows that regional tourism development programs contain plan indicators of the implementation of programs such as: the number of copies of published promotional materials about tourist potential; the number of Russian and international specialized exhibitions; the number advertising and information tours held for the Russian and foreign media and tour operators; the number of purchased tourist information terminals; the number of tourists visiting the region; the range of tourist services provided; investments attracted in the framework of state financial support in the form of compensation of interest rates for loans of commercial banks for the development of tourism. However, none of the regional laws clearly outline the assessment methodology. Thus, the problem of tourist potential realization effectiveness assessment remains acute at this level as well.

Research methods. In order to provide a scientific rationale for the possibility of applying the proposed indicators used in the study for assessing the comparative effectiveness of tourist potential implementation, the authors in 2014 conducted a correlation analysis of tourist business development indicators in the Russian regions based on the official statistics of the Federal Agency for Tourism [21]. The correlation analysis was carried out on the basis of Microsoft Excel analytical tools. A Subject of the Russian Federation serves as a basic research unit as it is the lowest-scale administrative-territorial unit by which relatively comprehensive and homogeneous statistics of tourism industry is gathered. Correlation-regression analysis was conducted in all 85 Subjects of the Russian Federation, including the Republic of Crimea and the Federal city of Sevastopol. As the main resultants of tourist potential realization effectiveness, the authors consider the following: "the range of paid tourist services", "investments in fixed capital aimed at the development of collective accommodation facilities (CAF), the range of paid CAF services", since these indicators are crucial for the formation of development potential of tourism clusters and for determining the vector of development of the region's territory in current economic conditions.

Expert evaluations of the territory's potential in tourism, as well as statistics presented at regional and national levels may serve as the the initial data for the analysis of comparative efficiency of tourist potential. In particular, the Russian rating agency "Expert-RA" is the most

[2] In Spain, for example, a tourist uses approximately 880 liters of water a day, as compared to 250 liters used by local residents [23].

recognized rating agency at the national level, which has kept records of regional tourist potential for the past ten years [3]. The regions under study are ranked by annual (monthly) indicators which take into account revenues and costs. The ranking results can be used for constructing various graphs, for example graphs showing the results of ranking of regions according to their tourist potential, as well as graphs describing revenues from paid tourism services and tourist destinations in the regions. At the same time, the x-axis reflects the values characterizing the regional ranking results by investment in tourism. The y-axis reflects the indicators corresponding to target characteristics of the above graphs. Border performance indicators of each graph can be indicators characterizing correspondence between investment ranks and ranks of profitable or potential component of the economic efficiency of tourism in the region. This characteristic can be checked by plotting a line in the graph which divides all the ranking results in two categories; the first, located above the line, is characterized by achieving expected results appropriate to their potential by the objects which fell into this category, and the second category located below the described line does not correspond to the expected indicators. The groups identified according to analysis results can be defined as the leading, average and outsider regions. For each group there are specific ways of improving efficiency.

Research results. Statistical indicators which, according to the authors' opinion, form the region's tourist potential have been chosen from the list of tourism development indicators in the subjects of the Russian Federation. *Table 1* presents statistical characteristics of the researched sample of statistical indicators of efficiency of formation and realization of tourist potential of the Russian regions.

For the purpose of in-depth study of determinants of tourist potential realization in the Russian regions in the framework of correlation analysis the differentiation between the indicators characterizing the operation of hotels and similar accommodation facilities and the operation of other CAF has been carried out. The permissibility of such separation of collective accommodation facilities into groups is also due to the specific nature of summary indicators by RF subjects formed by the Federal Agency for Tourism. The first block of indicators consists of the following tourism industry performance indicators: "number of hotels and similar accommodations", "bed capacity in hotels and similar accommodation", "number of residents in hotels and similar accommodations".

The second block consists of regional tourism operation parameters such as: "number of CAF", "bed capacity in CAF", "number of residents in CAF". The third block is formed by the indicators of staffing sufficiency of tourist potential realization processes

Table 1. Statistical characteristics of the sample of statistical indicators of efficiency of formation and realization of tourist potential of the Russian regions*

Indicators	Average	Median	Standard deviation	Kurtosis	Noncentrality	Interval	Minimum	Maximum
Number of hotels and similar accommodations	129.01	96	144.47	28.20	4.44	1135	3	1138
Bed capacity in hotels and similar accommodations	9758.16	4874	16748.11	25.13	4.63	118336	182	118518
Number of residents in hotels and similar accommodations, people	396646.11	197732	740218.18	30.16	5.04	5553232	6204	5559436
Number of CAF, units	186.55	129	211.52	29.60	4.53	1680	4	1684
Bed capacity in CAF	18700.91	9681	31523.33	39.63	5.62	257034	219	257253
Number of residents in CAF, people	527233.44	287663	859844.97	19.44	4.14	5610202	8584	5618786
Average CAF staff number	4745.31	2463	7810.46	24.30	4.42	56598	47	56645
Number of staff in tourist agencies	541.94	330	821.19	39.50	5.53	6754	6	6760
Range of paid tourist services, million rubles	1758.16	844	3081.28	25.15	4.53	22184	20	22204.6
Investments in fixed capital for CAF development, million rubles	2103.85	799	5768.63	32.96	5.63	39790	14	39804.5
Range of paid services of hotels and similar accommodations, million people	892.81	19	5834.66	82.46	9.02	53665	0	53664.9

* Compiled from: Russian Tourism: summary statistics by the subjects of the Russian Federation. Available at: http://www.russiatourism.ru/content/8/section/81/detail/4124/

in the RF regions, it consists of the following indicators: "number of staff in tourist agencies", "range of paid tourist services". Correlation analysis results are presented in *Table 2*.

Based on the results presented in the table the following conclusions may be drawn. In general, there is a strong statistical correlation between tourist potential formation and realization indicators of the RF subjects. Low values of the correlation coefficient characterize a weak interdependence between the "investment in fixed capital for CAF development" and indicators characterizing the number of residents in CAF during the reporting period. There is also no correlation dependence between investments in hotel business and the indicators characterizing tourist market: "number of staff in tourist agencies" and "range of paid tourist services". It should be emphasized that the last two indicators are generally characterized by a weak correlation with the CAF performance indicators against the background of a strong connection with each other (correlation coefficient 0.9).

Table 2. The results of correlation analysis of tourist potential formation and realization indicators in the Russian regions*

Indicators	Number of hotels and similar accommo-dations	Bed capacity in hotels and similar accommo-dations	Number of resi-dents in hotels and similar accommo-dations, people	Number of CAF, units	Bed capacity in CAF	Number of residents in CAF, people	Average CAF staff number	Number of staff in tourist agencies	Range of paid tourist services, million rubles	Investments in fixed capital for CAF development, million rubles	Range of paid services of ho-tels and similar accommo-dations, million people
Number of hotels and similar accommodations	1.00										
Bed capacity in hotels and similar accommodations	0.90	1.00									
Number of residents in hotels and similar accommodations, people	0.72	0.86	1.00								
Number of CAF, units	0.99	0.89	0.68	1.00							
Bed capacity in CAF	0.92	0.94	0.68	0.94	1.00						
Number of residents in CAF, people	0.82	0.92	0.98	0.80	0.81	1.00					
Average CAF staff number	0.86	0.89	0.72	0.89	0.95	0.84	1.00				
Number of staff in tourist agencies	0.66	0.76	0.95	0.63	0.60	0.91	0.66	1.00			
Range of paid tourist services, million rubles	0.57	0.64	0.86	0.55	0.47	0.82	0.54	0.90	1.00		
Investments in fixed capital for CAF development, million rubles	0.80	0.77	**0.43**	0.81	0.87	0.57	0.77	**0.32**	**0.20**	1.00	
Range of paid services of hotels and similar accommodations, million people	0.81	0.92	0.93	0.78	0.80	0.95	0.81	0.88	0.76	0.67	1.00

* Compiled from: Russian Tourism: results of correlation analysis of tourist potential formation and realization indicators in the Russian regions based summary statistics by the subjects of the Russian Federation.

Thus, the conclusions about a close correlation between tourist potential formation and realization indicators in the Russian regions made during the correlation analysis substantiate the possibility of applying the method of expert estimations to comparative efficiency of tourist potential realization. It has been concluded that comprehensive methods of tourist potential assessment undertaken by the Agency "Expert-RA" does not conflict with correlation analysis results and even complements them. Methodological coherence of the considered approaches allows the use of graphs displaying the results of regions' tourist potential ranking as well as graphs describing revenues from paid tourist services and tourist destinations in the regions.

The authors demonstrate the possibilities of the method of comparative efficiency of tourist potential realization[3] in the case of the Volga Federal District.

Over the past five years the Volga Federal District has ranked second, behind the Central Federal District by range of paid tourist services [6]. Thus, in 2013, the circulation of tourist services in the Volga Federal District amounted to 25 billion rubles, while the Central Federal District earned 44 billion rubles. High tourism profitability in the Volga Federal District is evidenced by the fact that eight regions of the Volga Federal District were among the top 20 Russian regions by tourism income over a billion rubles a year: the Nizhny Novgorod Oblast, republics of Bashkortostan and Tatarstan, Perm Krai, the Samara, Saratov, Ulyanovsk, Orenburg and Kirov oblasts.

Since 2005 tourist potential has been one of the nine types of private potential in the methodology of the "Expert-RA" Agency on the calculation of the regions' investment potential. According to "Expert-RA" criteria, tourist potential (*Table 3*) consists of four parameters: natural and recreational complex, historical and cultural complex, the degree of development of tourist accommodation and entertainment network. The first two parameters are the reasons for tourist visits to the region, the second two – the conditions which ensure that tourists stay in the region and spent the money saved up for this reason. The optimal combination and balanced development of these elements can make a tourist destination attractive for travellers and proportional development of these elements of tourism can.

According to "Expert-RA" rankings, the best regions' indicators correspond to the lowest rank values. For over nine years of ranking, the number of RF subjects ranged from 88 in 2005 to 83 in 2015. However, the distribution of leading positions has been quite stable. Among the regions of the Volga Federal District the top ranking lines are constantly

[3] The article is prepared in the framework of the project of the Ministry of Education and Science of the Russian Federation. Order no. 26.1378.2014/K to undertake a research work in the framework of the project part of the state order in the scientific field.

Table 3. Tourist potential dynamics in the regions of the Volga Federal District

Region of the Volga Federal District	Rank of tourist potential according to the "Expert-RA" assessment										
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Republic of Tatarstan	7	6	5	6	7	6	5	6	6	5	6
Republic of Bashkortostan	6	7	6	8	6	7	7	7	7	8	8
Nizhny Novgorod Oblast	11	12	17	15	9	10	12	12	11	11	12
Perm Krai	10	9	13	12	12	11	11	11	12	12	14
Samara Oblast	15	21	26	29	23	21	17	16	15	15	16
Saratov Oblast	23	26	31	31	34	25	27	26	26	27	28
Orenburg Oblast	47	47	49	51	40	33	30	31	29	26	31
Kirov Oblast	21	25	28	27	37	34	40	41	41	41	41
Chuvash Republic	52	54	47	48	49	41	46	46	45	48	48
Udmurt Republic	51	49	48	44	51	49	52	47	50	50	52
Penza Oblast	36	38	40	43	62	55	55	54	54	57	58
Republic of Mordovia	62	64	59	60	60	62	60	61	62	62	67
Ulyanovsk Oblast	40	44	53	50	64	54	61	63	66	63	62
Mari El Republic	64	66	67	69	68	71	70	70	71	72	73
Compiled from: Expert-RA: rankings of the Russian regions. Available at: http://raexpert.ru/rankings/#r_1108											

taken by the republics of Tatarstan and Bashkortostan, the Nizhny Novgorod and Samara oblasts and Perm Krai. The second group with medium tourist potential includes the Saratov, Orenburg and Kirov oblasts and the Chuvash Republic. The third group with low tourist potential consists of the Udmurt Republic, the Penza and Ulyanovsk oblasts, the republics of Mordovia and Mari El.

More attention should be given to financing the tourism industry laid down in the tourism development programs in the regions of the Volga Federal District. Funds laid down in tourism development programs, as well as annual tourism investment averages are presented in *Table 4*. The amount of financing activities is laid down in the programs of the regions under study within the means from republican and federal budgets.

Timely access to statistical data in the tourism sector was until recently a serious problem for experts. The official website of the Federal Agency for Tourism currently posts accumulated data for the past five years by category: tourist reception and accommodation, range of paid tourist services. As shown in *Table 5*, the Nizhny Novgorod and Samara oblasts, the republics of Bashkortostan and Tatarstan, Perm Krai are the leading in the Volga Federal District by range of paid tourist services.

Analysis of tourist service profitability dynamics over the last five years shows that the crisis of 2010–2011 was successful only for Perm Krai and the Republic of Tatarstan, while in other regions of the Volga Federal District tourism development rates declined. In 2012, profitability rates significantly rose in the Udmurt Republic

Table 4. Financial investment in tourism in the regions of the Volga Federal District

Region of the Volga Federal District	Investment in tourism, million rubles	
	Annual average	Total
Republic of Tatarstan	5739	22956
Chuvash Republic	902	7216
Perm Krai	518	2591
Nizhny Novgorod Oblast	421	2103
Republic of Bashkortostan	397	1987
Penza Oblast	220	1539
Samara Oblast	210	1262
Ulyanovsk Oblast	178	891
Republic of Mordovia	152	764
Mari El Republic	36	215
Kirov Oblast	17	133
Orenburg Oblast	11	68
Udmurt Republic	10	70
Saratov Oblast	10	34
Compiled from: strategic programs of tourism development in the regions of the Volga Federal District.		

Table 5. Range of paid tourist services in the regions of the Volga Federal District, million rubles

Region of the Volga Federal District	2009	2010	2011	2012	2013	2014
Nizhny Novgorod Oblast	2120	2620	2731	3866	5634	7243.8
Republic of Bashkortostan	2351	2395	2572	2742	3366	3870.5
Perm Krai	1411	1596	2229	2834	3335	3027.3
Republic of Tatarstan	1137	1239	1509	1932	2313	2477.5
Samara Oblast	1119	1322	1447	1624	1832	1608.7
Saratov Oblast	970	1145	1474	1408	1453	1244.8
Ulyanovsk Oblast	376	630	700	996	1305	1173.7
Orenburg Oblast	625	661	963	1092	1191	1287.3
Kirov Oblast	496	730	811	874	1052	1027.6
Penza Oblast	409	460	446	590	719	836.7
Mari El Republic	261	315	431	573	700	685.4
Chuvash Republic	391	470	542	596	691	701.8
Udmurt Republic	152	240	257	458	684	681.6
Republic of Mordovia	229	297	369	382	542	522.6
Compiled from: Russian tourism: summary statistics for 6 years (from 2009 to 2014) for the subjects of the Russian Federation. Available at: http://www.russiatourism.ru/content/8/section/81/detail/4124/						

(by 78%), in the Nizhny Novgorod and Ulyanovsk oblasts and the Republic of Mordovia (by 42%), in the Penza oblast and the Mari El Republic of (by 33%), in Perm Krai and the Republic of Tatarstan (by 28%). In 2013–2014, good progress rates were preserved in the Udmurt Republic, the Nizhny Novgorod Oblast and in the Republic of Bashkortostan. The Republic of Tatarstan, the Orenburg and Penza oblasts also demonstrated a positive dynamics, yet insignificant.

Another tourism income item is the sector of hotel and catering services. According to the Federal State Statistics Service [12], the five leading regions of the Volga Federal District are as follows: the republics of Bashkortostan and Tatarstan, the Nizhny Novgorod and Samara oblasts, Perm Krai (*Table 6*).

In order to determine tourism investment efficiency in the regions of the Volga Federal District, the indicators of investment and income in tourism for the past five years should be correlated (*Table 7*). On the basis of tourism investment indicators in the regions of the Volga Federal District presented in Table 4, the rank of investment activity of the region (investment rank) is defined. Income rank is determined on the basis of summary statistics for the range of paid tourist services (see Table 5) and turnover on income from hotels and restaurants (see Table 6).

On the basis of the analysed correlation between the indicators of income and investment in tourism, a figure has been plotted, demonstrating the differentiation of regions by tourism investment efficiency (*Fig. 1*). The numbers on the figure denote

Table 6. Turnover on income from hotels and restaurants in the Volga Federal District, billion rubles

Region of the Volga Federal District	2009	2010	2011	2012	2013	2014
Republic of Bashkortostan	7.7	12.3	12.2	26	37	30.3
Republic of Tatarstan	10.2	16.8	18.8	19.7	22.8	22.4
Perm Krai	7.7	5.8	6.5	6.8	25.8	21.7
Nizhny Novgorod Oblast	5.9	8.7	12.4	14.5	17.4	20
Samara Oblast	7.3	11.2	14	11.9	12.8	13.7
Udmurt Republic	2.9	3.7	4.9	6.8	6.7	7.4
Kirov Oblast	3.5	3.6	3.8	5.2	5.8	6.4
Chuvash Republic	2.5	3.1	3	4.1	5.7	5.9
Saratov Oblast	2.9	3.3	3.8	4.5	4.6	4.9
Orenburg Oblast	3.1	3.1	3.2	4.5	4.9	4.9
Ulyanovsk Oblast	1.4	2.1	3	2.6	3.2	3.2
Penza Oblast	2.2	2.4	3.3	3	3	3.1
Mari El Republic	1.5	1.7	2.1	2.3	2.5	2.8
Republic of Mordovia	0.7	0.9	0.8	1.2	1.3	2.7
Compiled from: Turnover on income from hotels and restaurants in the Volga Federal District. Federal State Statistics Service.						

Table 7. Tourism investment efficiency the regions of the Volga Federal District*

Region of the Volga Federal District	Investment rank	Income rank
Republic of Bashkortostan	10	14
Republic of Tatarstan	14	13
Nizhny Novgorod Oblast	11	12
Perm Krai	12	11
Samara Oblast	8	10
Udmurt Republic	2	9
Kirov Oblast	4	8
Chuvash Republic	13	7
Orenburg Oblast	3	6
Saratov Oblast	1	5
Ulyanovsk Oblast	7	4
Penza Oblast	9	3
Mari El Republic	5	2
Republic of Mordovia	6	1

* were used for ranking summary statistics for 6 years (from 2009 to 2014) presented in tables 4–6.

Figure 1. Efficiency of investment in tourism in the regions of the Volga region

the regions of the Volga Federal District by tourism income rank: 1 – Republic of Mordovia; 2 – Mari El Republic; 3 – Penza Oblast; 4 – Ulyanovsk Oblast; 5 – Saratov Oblast; 6 – Orenburg Oblast; 7 – Chuvash Republic; 8 – Kirov Oblast; 9 – Udmurt Republic; 10 – Samara Oblast; 11 – Perm Krai; 12 – Nizhny Novgorod Oblast; 13 – Republic of Tatarstan; 14 – Republic of Bashkortostan.

Among the subjects of the Volga region located in the zone above the diagonal line, which generally demonstrated investment efficiency over the past five years, the Republic of Bashkortostan is worth noting, which became the leader by income, while it is on the 5th place in top five by tourism investment. It is noteworthy that the Republic of Tatarstan leads by a large margin from other regions of the Volga Federal District by tourism investment; however, even such a major event like the Universiade–2013 did not allow the region to be rated first by income rank in the District. There is a one-spot difference between tourism investment and income of the Republic of Tatarstan; the coordinates of this Republic are below the diagonal line together with the regions of the Volga Federal District considered as actors which have not fully lived up to their investment activity so far.

Apparently, for a more accurate assessment in this case a longer period of time is required. In the Chuvash Republic, the Penza Oblast and the Republic of Mordovia, the level of investment activity is much higher than the income level. Income rank is six spots behind investment rank in the Chuvash Republic and the Penza Oblast, five spots – in the Republic of Mordovia. The Ulyanovsk Oblast and the Mari El Republic are in the same group, the difference between income rank and investment rank is three spots.

After assessing tourist potential dynamics, the region's financial activity in tourism and income dynamics, tourist potential realization efficiency in the regions of the Volga Federal District should be studied. Data on tourism income and expense presented above, as well as the information on tourist potential are summarized in *Table 8*.

Table 8. Tourist potential realization efficiency in the regions of the Volga Federal District*

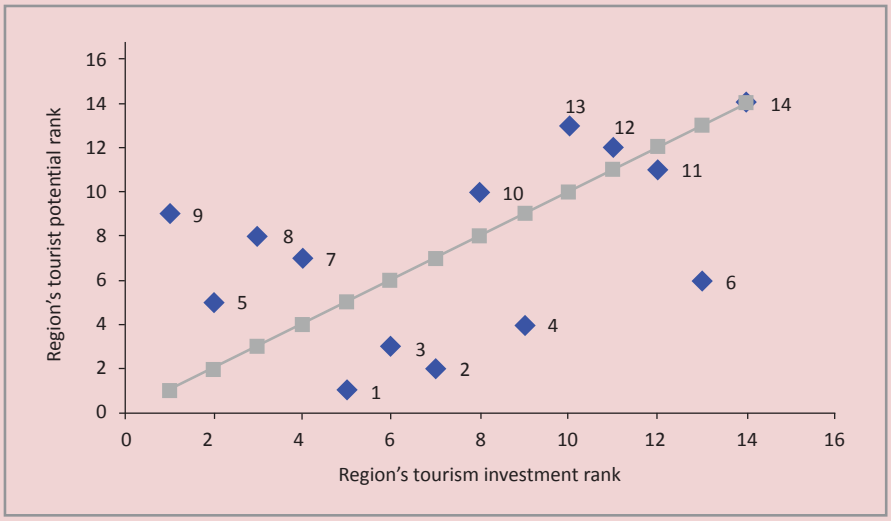
Region of the Volga Federal District	Region's tourism investment rank	Region's tourist potential rank
Republic of Tatarstan	14	14
Chuvash Republic	13	6
Perm Krai	12	11
Nizhny Novgorod Oblast	11	12
Republic of Bashkortostan	10	13
Penza Oblast	9	4
Samara Oblast	8	10
Ulyanovsk Oblast	7	2
Republic of Mordovia	6	3
Mari El Republic	5	1
Kirov Oblast	4	7
Orenburg Oblast	3	8
Udmurt Republic	2	5
Saratov Oblast	1	9
* Indicators presented in tables 3–4 were used for ranking.		

The figure presented below (*Fig. 2*) ranks the regions of the Volga Federal District on the basis of the ratio of region's tourism investment and region's tourist potential rank. The numbers on the figure denote the regions of the Volga Federal District by tourist potential rank: 1 – Mari El Republic; 2 – Ulyanovsk Oblast; 3 – Republic of Mordovia; 4 – Penza Oblast; 5 – Udmurt Republic; 6 – Chuvash Republic; 7 – Kirov Oblast; 8 – Orenburg Oblast; 9 – Saratov Oblast; 10 – Samara Oblast; 11 – Perm Krai; 12 – Nizhny Novgorod Oblast; 13 –Republic of Bashkortostan; 14 – Republic of Tatarstan.

The Republic of Tatarstan is located on the diagonal line, leading by both indicators in the district, which indicates good conditions prevailing in the region for investors and entrepreneurs, as well as great prospects for tourism development.

The regions coordinates of which are below the diagonal line (where the ranks correlate) can be considered as actors which do not fully use its tourist potential. The farthest from the diagonal line are Chuvash Republic, Penza and Ulyanovsk oblasts. The level of tourism financing in the Chuvash Republic is currently much higher than the income level. Here, tourism is relied upon as an innovative way of the Republic's development, since it does not possess any other significant natural resource potential. Tourist potential of the Penza and Ulyanovsk oblasts is rated by experts much lower than that of the Chuvash Republic; however, by tourism investment rank these regions are in the middle of the ranking scale among the regions of the Volga Federal District. Here, the level of investment activity is significantly higher than the level of tourist

Figure 2. Tourist potential realization efficiency in the regions of the Volga Federal District



potential. It appears that the tourism of the Penza and Ulyanovsk oblasts, where the emphasis is put on historical, cultural and event tourism, is provided with good conditions for attracting investors and entrepreneurs.

Republics of Mari El and Mordovia, with low indicators of investment activity and tourist potential, are characterized by the difference between investment and tourist potential ranks in four and three spots respectively. Lack of a number of significant parameters of tourist attractiveness requires the authorities of these regions to make additional efforts in planning and conducting measures to improve the conditions for investors and entrepreneurs prevailing in the region.

Perm Krai, highly ranked in the Volga Federal District ranking by tourism investment and having high tourist potential, is located slightly below the diagonal line. There is a one-spot difference between investment rank and tourist potential, which indicates good opportunities for tourism development in this region.

When analysing the group of regions above the diagonal line, we should note the Republic of Bashkortostan, the Nizhny Novgorod and Samara oblasts, where investment ranks and tourist potential ranks are high enough. Tourist potential indicators currently exceed investment indicators, which indicates high efficiency of potential realization in these territories, as well as development prospects, especially in attracting investors. Good tourist potential indicators are observed in the Kirov, Orenburg and Saratov oblasts; however, tourism investment rates are quite low. The fact that these regions do not pay much attention to the financing of the tourism industry could turn against them as they may be replaced from the group of regions above the diagonal line by the competing regions which invest more in tourism development.

Conclusion. It is evident in the case of the regions of the Volga Federal District that tourist potential of the territories and its realization efficiency are quite different. The first five leaders of the Volga Federal District which have already established themselves as leading in both tourist potential and tourism income over the past five years have long-term program of tourism development. They include the republics of Tatarstan, Bashkortostan, Perm Krai, the Nizhny Novgorod and Samara oblasts. The five leaders have developed detailed programs with several sub-programs, elaborately researched the indicators of expected measure effectiveness, mechanisms and program effects. The aforementioned regions have detailed, across all budget items, the activities, developed programs to promote the region as a tourist destination, scheduled their participation in Russian and international exhibitions and tourist forums, festivals and contests, advertising tourist potential in Russian and foreign media, publicity and information tours for

the Russian and foreign media and tour operators. Funds for Internet technology, website hosting, creation and support of tourism Internet portals, creation of interactive route planning maps, geographic information systems and virtual models of places of interest, as well as tourist information system creation and support have been used for tourist potential promotion of the regions mentioned above.

Tourism development programs in a number of regions (Chuvash Republic, Republic of Tatarstan and Bashkortostan, Nizhny Novgorod and Samara oblasts) include credit and financial mechanisms of state support for investors, rural and social tourism, grants for the development of tourism. However, tourism development programs in the Udmurt Republic, the Orenburg, Ulyanovsk and Penza oblasts little or no attention is given to scientific and research works on the creation of recreational areas, the development of technological and economic rationales for research projects of tourist clusters in order to include them in the Federal target program "Development of domestic and inbound tourism in the Russian Federation (2011–2018)". In addition, the aforementioned directions little attention is paid to improving the system of training, retraining and advanced training in the sphere of tourism and academic support, training seminars including those with participation of foreign experts, publishing methodological literature, international internships of experience exchange, establishment of the international exchange system.

Data obtained from plotting the figure on tourist potential realization efficiency of the regions of the Volga federal District may be helpful in improving the existing tourism development programs in the regions and the country as a whole. The relevance of assessing tourist potential realization efficiency raises the acute issue of the development of unified indicators characterizing the expected outcomes of tourism development programs implementation in regional strategic programs, as well as monitoring the programs' implementation. Transparency and immediate availability should become the most important principles of tourism development program monitoring; the results reports must be available to a wide range of users and posted on the websites of regional ministries for tourism. It is necessary to develop assessment tools which would allow considering both positive and negative impacts of tourist potential development, such as environmental load or deteriorating living conditions of local residents, as well as to create incentives for the development and implementation of regional, interregional and international tourism projects.

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Received August 03, 2016

MODELING AND FORECAST OF SOCIO-ECONOMIC PROCESSES

DOI: 10.15838/esc.2016.5.47.8
UDC 330.4, LBC 65.050.03

Russian and Foreign Experience of Integration of Agent-Based Models and Geographic Information Systems*

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Abstract. The article provides an overview of the mechanisms of integration of agent-based models and GIS technology developed by Russian and foreign researchers. The basic framework of the article is based on critical analysis of domestic and foreign literature (monographs, scientific articles). The study is based on the application of universal scientific research methods: system approach, analysis and synthesis, classification, systematization and grouping, generalization and comparison. The article presents theoretical and methodological bases of

* The research is conducted with financial support of the Russian Scientific Foundation in the framework of Project no. 16-18-10296 "The development of a set of agent-based models imitating the socio-economic system of the Eurasian continent and detailed to the level of individuals".

For citation: Gulin K.A., Rossoshanskii A.I. Russian and foreign experience of integration of agent-based models and geographic information systems. *Economic and Social Changes: Facts, Trends, Forecast*, 2016, no. 5, pp. 141-157. DOI: 10.15838/esc.2016.5.47.8

integration of agent-based models and geographic information systems. The concept and essence of agent-based models are explained; their main advantages (compared to other modeling methods) are identified. The paper characterizes the operating environment of agents as a key concept in the theory of agent-based modeling. It is shown that geographic information systems have a wide range of information resources for calculations, searching, modeling of the real world in various aspects, acting as an effective tool for displaying the agents' operating environment and allowing to bring the model as close as possible to the real conditions. The authors also focus on a wide range of possibilities for various researches in different spatial and temporal contexts. Comparative analysis of platforms supporting the integration of agent-based models and geographic information systems has been carried out. The authors give examples of complex socio-economic models: the model of a creative city, humanitarian assistance model. In the absence of standards for research results description, the authors focus on the models' elements such as the characteristics of the agents and their operation environment, agents' behavior, rules of interaction between the agents and the external environment. The paper describes the possibilities and prospects of implementing these models.

Key words: geographic information system, spatial development, agent-based models.

Currently, agent-based modeling is becoming a very popular tool; it is used in the scientific field and in the comprehensive managerial decision-making. This is largely due to the possibility to consider the activity of model elements, endowing them, besides the set of individual characteristics, with targets; whereby their response to changes in the environment in which they operate is simulated. Doctor of Economics *A.R. Bakhtizin* points out that the fundamental idea underlying agent-based models is to construct a "computing tool" (representing a set of agents with a specific set of properties) that help simulate real phenomena [1]. That is, agent-based modeling is used to study complex systems at the macro-level through the dynamic interaction of its elements at the micro-level (method "from below").

C. Castle and A. Crooks [14, 23] note that among the advantages of agent-based models compared to traditional modeling methods (e.g., downstream non-linear dynamical systems, discrete-event simulation, cellular automata, etc.) it is possible to highlight three main aspects: 1) fixation of the phenomenon; 2) maintenance of natural environment to study certain systems; 3) flexibility, which is especially important when interacting with geographic information systems (GIS).

One of the main directions in the development of agent-based models (ABM) is to design ABM on the basis of

geographic information systems. Many researchers prove the viewpoint that the real spatial data should not only be considered within the model, but also become elements of the model itself, and this involves static and exogeneity of spatial elements and their active and mutual participation. At first glance, the integration of ABM and GIS may look like a trivial task, but it helps to approximate the functioning of the agents to real processes and phenomena as close as possible.

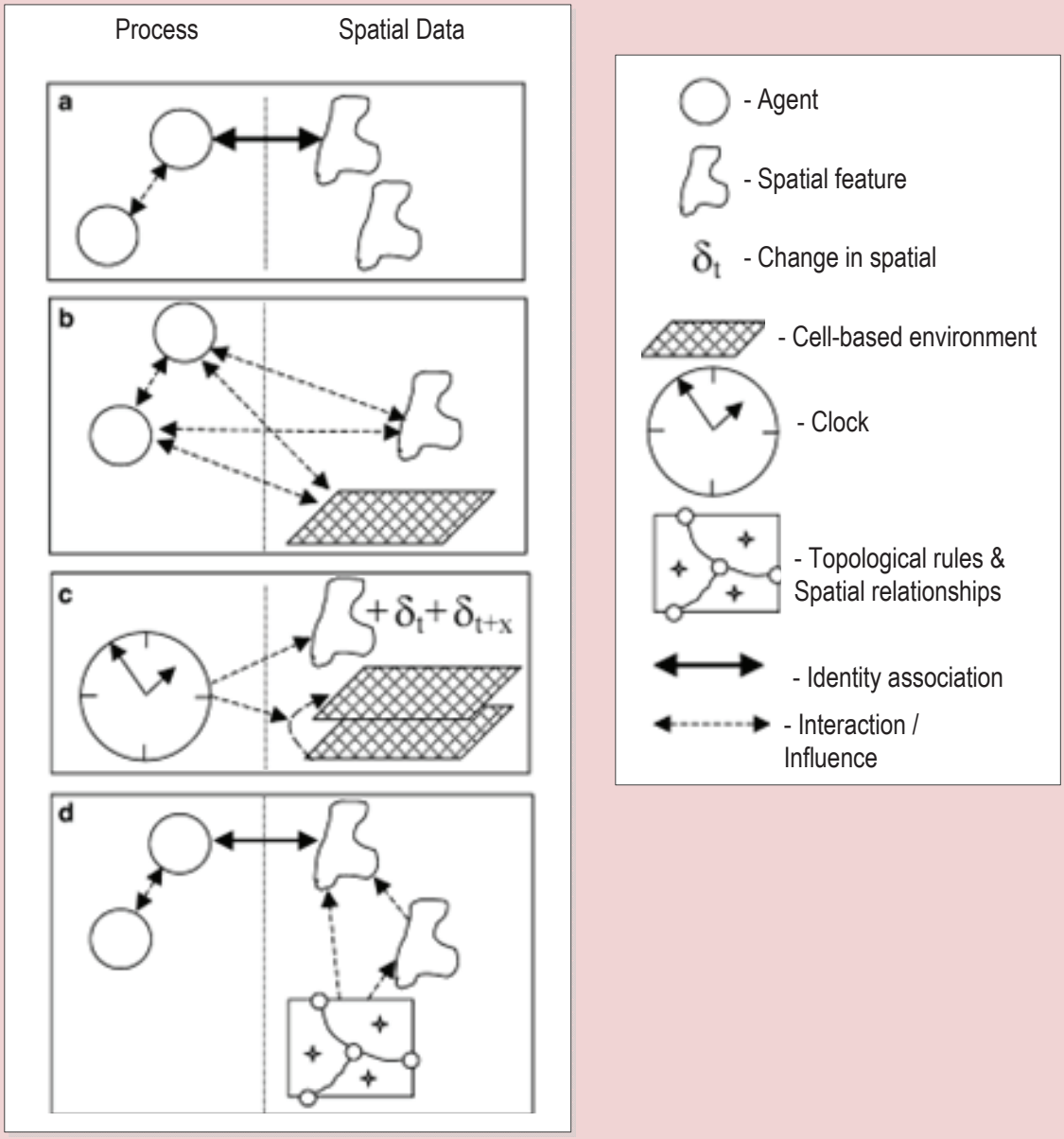
The aim of the present paper is to systematize modern domestic and foreign experience of integration of agent-based models and geographic information systems. To achieve this goal the authors consider potential and real areas of their application, give an overview of the most popular platforms for their integration, and consider the most successful agent-based models based on GIS.

Along with the "agent" as a central term and basic functioning unit in the theory and practice of agent-based modeling, the environment for their functioning is the major element in ABM. That is, the interaction between agents is not performed as if in a "vacuum" (where the "agent-agent" links are present), rather it takes place in a given space that also has a direct or indirect impact on the agent's decision-making ("agent-agent" and "agent-environment"). *Figure 1* presents a conceptual illustration of the key types of relationships between agents and environment. This interaction between agents in space is called "spatially explicit", even if the agent itself is static. At the same time, agent-based models do not rule out the possibility of interaction between agents without regard to spatial location, i.e. the agents can be "spatially implicit" [11]. The very environment in which the agents exist can be represented as a physical or social space of a given shape and size, characterized by the possible states, spheres of influence, definite rules of dynamic measurement, and many others [8, p. 32].

An essential tool in the effort of agent-based models to the fullest reflection of reality is the representation of the environment of agents in the form of geographic information systems. Academicians *V.L. Makarov* and *V.V. Okrepilov* note that such an integration is "absolutely natural" and essentially brings agent-based models to an environment that is close to reality [3, p. 713].

The term "geographic information system" was introduced into scientific practice in the 1960s by R.F. Tomlinson when electronic spatial information system was created in Canada [6]. This concept was consistent with a new technology of using computers for storing and processing data associated primarily with natural

Figure 1. Variants of interaction between the environment and the agents
a) identity relationships, b) causality, c) temporal relationships, d) topological relationships



Source: Brown D.G., Riolo R., Robinson D.T., North M., Rand W. Spatial process and data models: Toward integration of agent-based models and GIS. *Journal of Geographical Systems*, 2005, volume 7, pp. 25–47.

resource management (e.g., mapping of old-growth forests, the system for protected nature technologies in the United States, etc.). In this regard, it would have been difficult to imagine GIS that were initially used for the analysis and visualization of spatial data in the role of a dynamic simulation modeling tool and especially as an independent platform for agent-based modeling [5].

It should be noted that the term "geographic information system" can be considered from two perspectives [2, 6]. First, GIS is a hardware and software system that stores and uses data that describe objects in space. Second, GIS is an information and reference system.

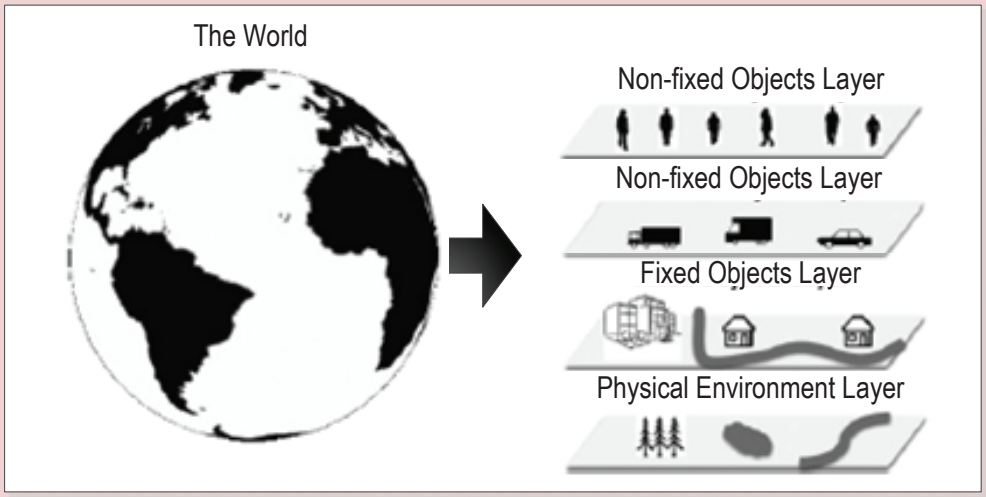
Currently, geographic information systems have heterogeneous information resources that are logically united with a cartographic basis and used for calculations, retrieval, and simulating the real world in various aspects. The most common software for developing and managing GIS are as follows: a family of software products of the American company ESRI (e.g., ArcGIS Online, ArcGIS for Desktop, ArcGIS for Server, ArcGIS Apps, and others); a family of software products Mapinfo GIS; GeoGraf GIS developed by the Center for Geo-Information Studies at the Institute of Geography, RAS; Geomedia developed by Intergraph Corporation, etc.

Modern GIS are able to solve a wide variety of tasks, such as tracking the movement of vehicles, searching for the optimal path taking into account transport characteristics, forecasting the environmental situation, etc. Due to the increasing functionality of the software, standard functions of any geographic information system include: import and export of data; data storage and management; data visualization; processing and analysis; modeling.

From researcher's point of view, the integration of ABM and GIS provides the ability to review the activities of agents in real geographic coordinates (within a given district, municipality, region, country, etc.). This in turn makes it possible to track the emergence of phenomena or processes in the course of individual interactions of agents in GIS in time and in space; this gives an opportunity to develop various mechanisms for decision-making, whether the rationale for the placement of a new shopping center, or the regulation of migration processes [3, 13].

A. Crooks proposes a model of the world [13] *(Fig. 2)* as an example of the most informative display of possible integration of ABM and GIS technology. The model is represented as a set of layers and objects of different types (e.g., vehicles or people – as non-fixed objects, and buildings or

Figure 2. Display of the world as a set of layers of fixed and non-fixed objects



Source: Brunsdon C., Singleton A.D. *Geocomputation: A practical Primer*. London: SAGE Publications Inc., 2015. Pp. 63–77.

structures – as fixed objects). The layers form an artificial world for the agents and may represent a well-defined space, such as the roads by means of which the agents can get from point A to point B, residential districts, or place of work.

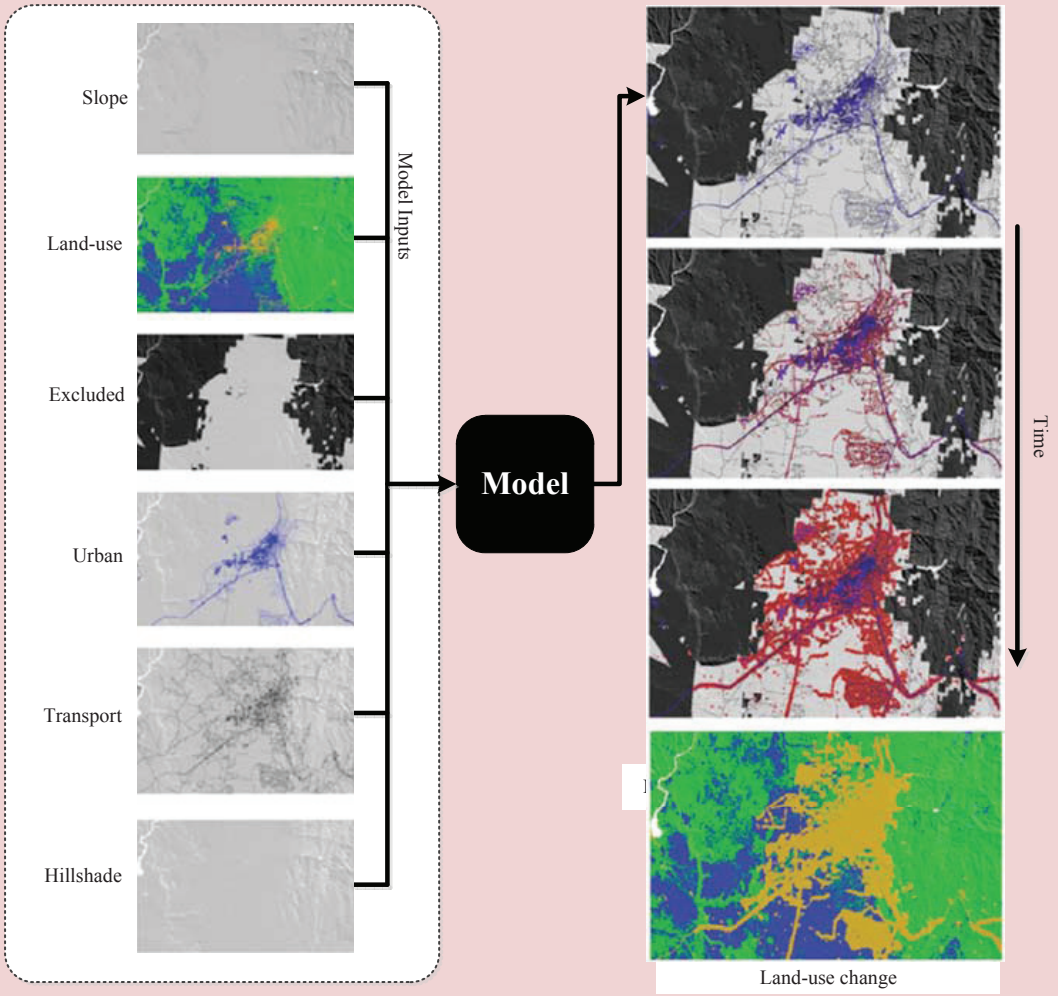
The following example *(Fig. 3)* illustrates the modified model SLEUTH[1], which forecasts the change in the scale of urbanization growth of the cities. In this case, the model is run with certain scenarios of growth of urbanization level of the cities, calculated according to specified growth factors. Spatial data allow for adjustment of the model, namely they help answer the question whether the developed growth scenarios are valid. That is, the growth rates used in the model can be calibrated so that the data calculated on the set of agents coincides with the real data [7]. Subsequently, the compliance of the model to reality will allow us to speak about the reliability of the forecasts.

Potential and actual applications of ABM based on GIS

Agent-based models provide a wide range of opportunities for the implementation of the diverse range of research in various spatial and temporal frameworks. The list of questions under consideration covers time ranges from short-term solutions in the process of movement of

[1] Self-Modifying Cellular Automaton Model of Historical Urbanization in the San Francisco Bay Area.
Details see in: Clarke K.C., Hoppen S., Gaydos L.J. A Self-modifying cellular automaton model of historical urbanization in the San Francisco Bay Area. *Environment and Planning B*, 1997, no. 24(2), pp. 247-261.

Figure 3. Land use dynamics in Santa Fe, New Mexico

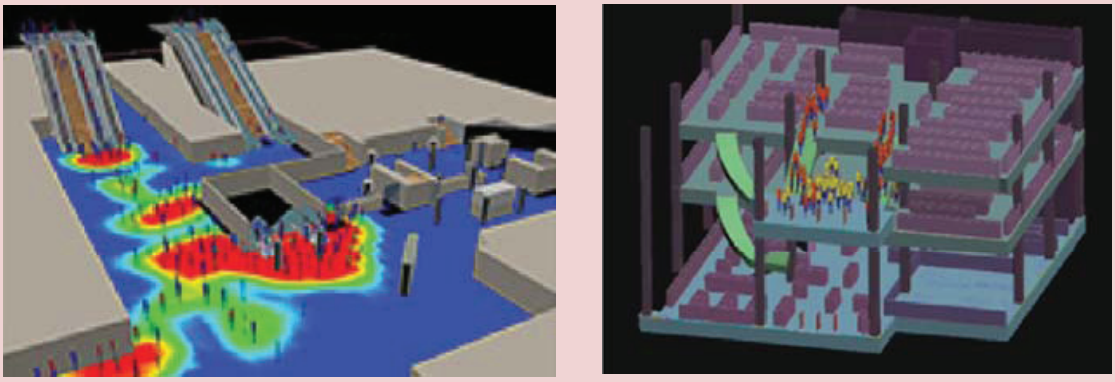


Source: Brunsdon, C., Singleton, D.A. Geocomputation: *A practical Primer*. London: SAGE Publications Inc., 2015. Pp. 63-77.

pedestrians [16] to migration processes [22] that last years or even decades. Agent-based models in conjunction with GIS-technology are successfully used in various fields of science, ranging from the natural and engineering sciences to the social and humanitarian sciences. ABM are artificial laboratories, a kind of artificial societies, allowing us to verify ideas and hypotheses about phenomena which are often very difficult to recreate in the real world[2]. A visual example is the case of simulation of evacuation of people from a building in case of fire. The reconstruction of an emergency situation in an artificially created world (in this case it is the building on fire), populated by artificial people (they can be people living

[2] In many cases, experiments with real objects can be unnecessarily expensive, dangerous or simply impossible.

Figure 4. Floor plans for the building: a – places of initial location of people; b – movement of people to the exits



a b

Source: Kholshchevnikov V.V., Samoshin D.A., Parfenenko A.P., Kudrin I.S., Istratov R.N., Belosokhov I.R. *Evakuatsiya i povedenie lyudei pri pozharakh : ucheb. posobie* [Emergency evacuation and rules of conduct in case of fire: training manual]. Moscow: Akademiya GPS MChS Rossii, 2015. 262 p.

or working in the building), helps identify potential problems, such as the influence of the density of flow of the people on the stairs and in the corridors on the dynamics of leaving the floor of the building. The accuracy of the models obtained is ensured through the use of natural observations verified by statistics and the experiments previously conducted.

Figure 4 shows the simulation-stochastic model "Evatek" which demonstrates the movement of the flows consisting of people of various degrees of mobility. The operating environment for the agents is presented in the form of two layers which clearly show the concentration of the agents in close proximity to stairways and narrow corridors.

It should be noted that this example is very revealing, because it shows the importance of visualization of the space in which the agents are involved, and in any case it does not limit the scope of its application only to security matters. Agent-based modeling in conjunction with geographic information systems allows us to solve a wide range of tasks such as: analysis and prevention of congestions during rush hours in the downtown, planning of the potential spread of disease, optimization of timber harvesting, analysis of crime rate to prevent future offenses.

Technical support of integration of ABM and GIS

Currently, there are two ways to integrate ABM and GIS [5]. The first method is to

create weak (incomplete) or strong connections between ABM and GIS, in this case software products work individually. The second method involves the creation of a unified system based on ABM or GIS.

Given the fact that "agent-based modeling does not require the use of specialized programs, which in principle allows for the use of a multiple types of development tools" [1], we shall take a closer look at modern platforms that support the creation of a unified system: ABM-centric and GIS-centric systems.

K. Kravari and *N. Bassiliades* in the article "A Survey of Agent Platforms" [25] conducted a comparative analysis of twenty-four most promising platforms for agent-based modeling. Note that seven of them (*AGLOBE, AnyLogic, GAMA, Repast, MASON, NetLogo* and *Swarm*) support the use of GIS-technologies, i.e. are ABM-centric models. For comparison, let us consider two variants of geographic information systems (ENVISION and ArcGIS) that allow for building agent-based models. Main characteristics of the aforementioned platforms are shown in *Table 1.*

The classification of platforms, from the point of view of the programming language is very convenient from viewpoint of the researcher who decides to model certain processes. As can be seen from the table, the majority of platforms under consideration are written in programming languages C, C++ and Java, which is true for ABM in general.

FIPA (The Foundation for Intelligent Physical Agents) is an international organization for standardization of interoperability of heterogeneous agents in ABM. Compliance with FIPA provides some advantage in promoting software products through guaranteeing the compliance with the architecture of the agents and work of the system. However, this condition is not necessary: for example, AGLOBE only supports the technical standards related to communication principles.

The use of agent-based models based on GIS in studies of socio-economic processes

Creative City Model. A group of researchers at George Mason University (*A. Malic, A. Crooks. H. Root, M. Swartz*) [19] uses an agent-based approach to study the influence of creative potential on the development of cities. The model is based on the assumption that the leading cities of the world attract the most talented people, offering them not only the best professional opportunities, but also a high level of development of cultural and leisure spheres (e.g., theaters, art galleries, exhibitions, concerts, etc.) and public services (e.g. health, education, etc.) [20]. Through the implementation of the model,

Table 1. Modern platforms that support the integration of ABM and GIS

Name (developer)	Year of product launch	Programming language	Open source	Required level of programming	Integration mechanism	Compliance with FIPA	Performance
AGLOBE (Czech Technical University)	2003	Java	Yes	Basic	ABM-centered	Partial	High
AnyLogic (The AnyLogic Company)	2003	Java, UML-RT (UML for real time)	No	Basic	ABM-centered	Absent	High
GAMA (IRD/UPMC International Research Unit UMMISCO)	2007	GAML	Yes	Basic	ABM-centered	Partial	Above median
Repast (University of Chicago)	2003	Java, C#, C++, Lisp, Prolog, Python	Yes	Basic	ABM-centered	Absent	High
MASON (George Mason University)	2003	Java	Yes	Basic	ABM-centered	Absent	Above median
NetLogo (The Center for Connected Learning (CCL) and Computer-Based Modeling, Northwestern University)	1999	NetLogo	No	Basic	ABM-centered	Absent	Above median
Swarm (Santa Fe Institute / SWARM Development Group, USA)	1994	Objective-C / Java	Yes	Basic	ABM-centered	Absent	Median
ENVISION (Oregon State Univeristy)	1998	C++, Delphi, Visual Basic и др. поддерживающие COM технологии	Yes	Advanced	GIS-centered	Absent	Median
ArcGIS (ESRI)	1999	C++, Python	Yes	Advanced	GIS-centered	Absent	Median

Sources: compiled by the authors with the use of the following source: Kravari K., Bassiliades N. A Survey of Agent Platforms. *Journal of Artificial Societies and Social Simulation*, 2015, no. 18 (1) 11. Available at: http://jasss.soc.surrey.ac.uk/18/1/11.html.

the authors try to answer several questions: what are the main factors that hinder the emergence of creative clusters in the cities of developing countries? What spatial and socio-economic conditions contribute to their emergence? The authors highlight the following factors that contribute to the formation of creative cities: population density, urban and regional mobility, social tolerance.

The model is designed as a tool for understanding the relationship between human creativity and urban development. Agents in the model represent people who are "spatially explicit" and possess the following set of characteristics:

1. Creativity: low, medium, high.
2. Education level: educated and uneducated.
3. Income level: 1,000 – 35,000 units.
4. Tolerance: 1 – 99%.

Due to increased attention to mega-cities of developing countries, we have chosen the city of Karachi as the environment for the functioning of agents. The zoning of the environment was carried out in accordance with current local legislation: residential area (60%), commercial area (10%), green area (10%), water area (10%), infrastructure (10%).

Visual representation of the environment was carried out with the help of Google Earth. The information base for the model was the data of a sociological survey of young people who live in Karachi [27], the survey reflects the following characteristics: education level, the brain drain, creativity level, income distribution, tolerance level. The number of agents in the model is 2,100, which comprises 0.01% of the population. The model is developed on the basis of the NetLogo platform.

The behavior of the agents in the model:

1. Mobility of the agents. The movement of the agents in the model is motivated by their desire to raise the level of general satisfaction, which depends on the cost of rent and monitoring of social segregation.

2. Spread of creativity. The development of multifunctional design (i.e. combining residential, commercial and other types of land usage), transport accessibility, pedestrian infrastructure, public areas creates the conditions to attract talented and creative people.

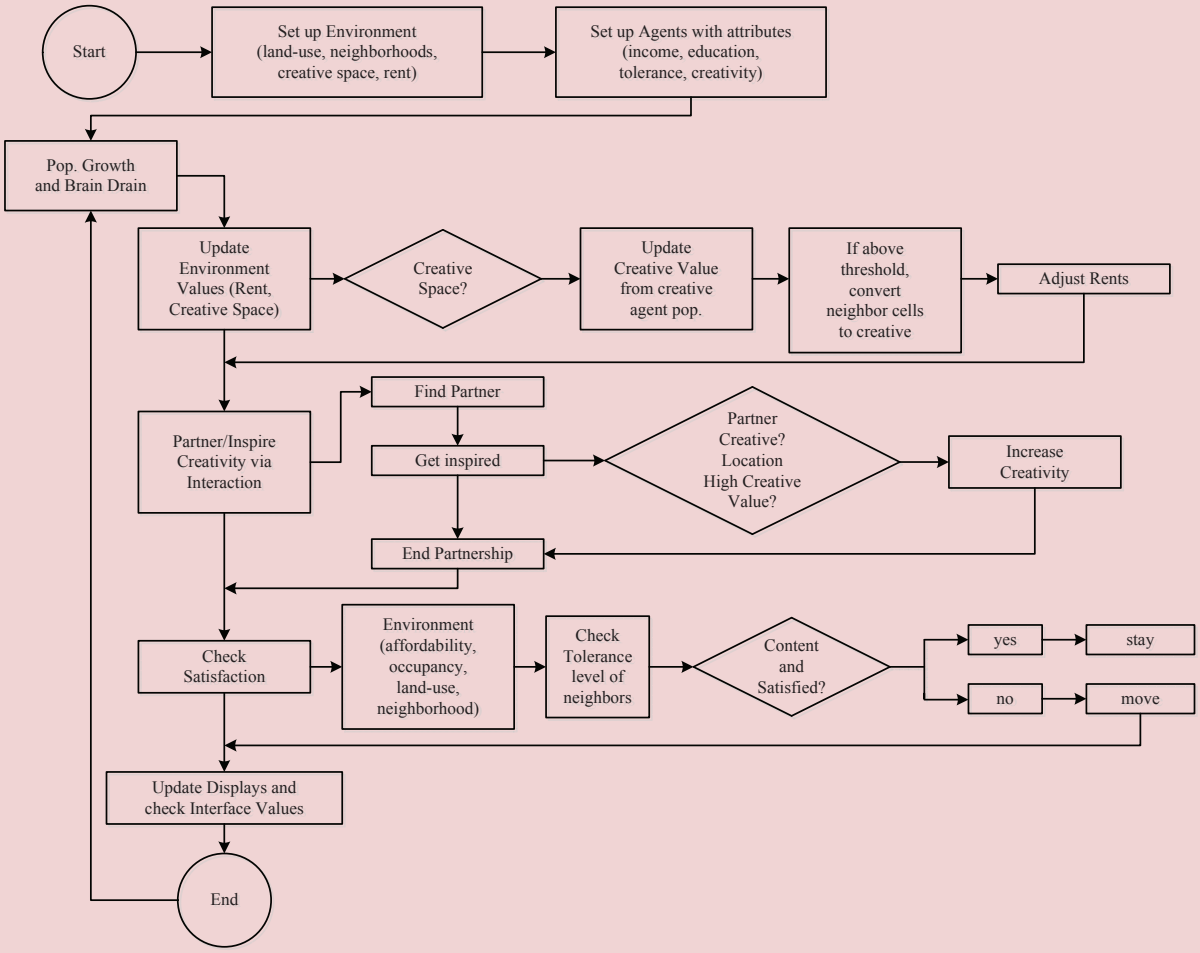
3. Income and the rental market. Increasing the level of creativity of agents (for example, due to the interaction with the agents of a higher level of creativity) leads to an increase in the level of incomes. The agents in the model can also lose a level of creativity in the absence of interaction with other agents. Increasing the creative potential of the agents leads to higher requirements to the housing conditions and the quality of the urban environment, which in turn increases the

cost of rent payments. As a consequence, less wealthy agents lose access to the highly productive creative clusters, which leads to increased income inequality.

4. Population growth and the brain drain. User-defined growth rate of agents in the model have an impact on all agents regardless of their level of creativity. However, the brain drain only affects agents whose creativity is low.

Ultimately, the interaction between the agents leads to the emergence of creative clusters, which has a positive impact on the economic development of cities *(Fig. 5)*. However, clustering also generates the problem of socio-economic inequality.

Figure 5. Creative City Model



Source: Malic A., Crooks A., Root H., Swartz M. Exploring Creativity and Urban Development with Agent-Based Modeling. *Journal of Artificial Societies and Social Simulation*, 2015, no.18 (2). Available at: http://jasss.soc.surrey.ac.uk/18/2/12.html

Humanitarian Assistance Model. Agent-based modeling using geographic information systems, exploring the effects of catastrophic events is considered in the work by *A. Crooks and S. Wise* [18]. The authors present a pilot model that simulates the behavior of agents in Port-au-Prince after the earthquake in January 2010. The model consists of several modules that cover physical and social processes in the delivery of humanitarian assistance.

In this model there are two types of agents:

1) centers of humanitarian assistance (centers);

2) victims.

The centers also act as immovable objects located in the environment, and, like the agents, endowed with a certain amount of resources that they distribute among the victims. Every center has its own coverage network of victims and the number of units of humanitarian assistance on one victim. The goal of the centers is to provide material resources to the victims, that is, to satisfy their basic need – the need for survival.

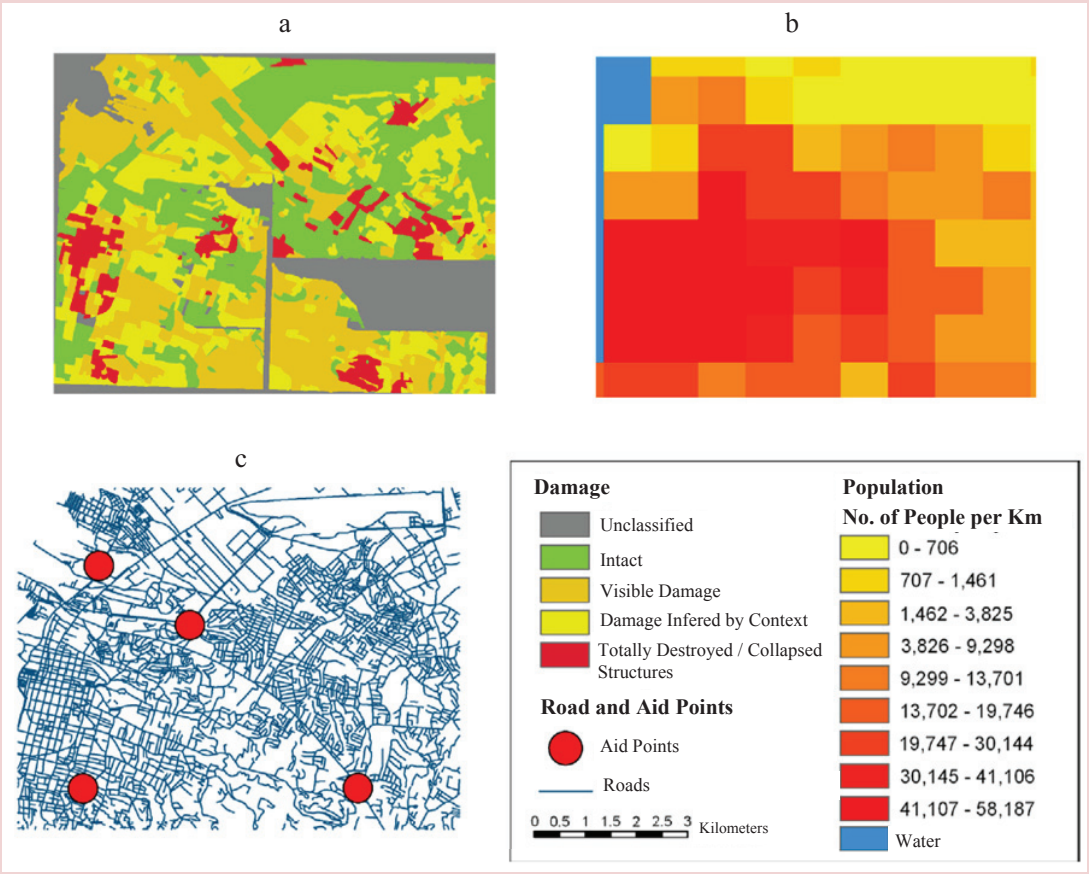
The victims have a certain energy level and knowledge about the environment, such as the location of their home and possible location of humanitarian assistance center. The key attribute of the victims is the energy level which characterizes their health. The achievement of zero values means the death of the agent and removal from the model. The initial energy level of agents is specified with regard to the proximity of their place of residence to the areas of disaster.

The victims make decisions in accordance with their goal – to maximize the energy level. They choose one of several actions: for example, to get to the help center or stay at home. The interaction of agents among themselves suggests there will be no cases when false information is given about the location of help centers, as well as the cases of deliberate concealment of information.

Figure 6 presents a detailed view of the operating environment for the agents. The input data is information about the level of damage *(Fig. 6a)*, population density *(Fig. 6b)*, existing transport networks and the location of humanitarian assistance centers *(Fig. 6c)*, and about several auxiliary parameters.

The authors emphasize that the regions affected by natural disasters experience a lack of informational resources necessary for the adequate and timely response. Information base for the model is generated through crowdsourcing and VGI data (the so-called volunteered geographic information [21]). In particular, the data on population density were obtained from

Figure 6. Fragment of GIS in Port-au-Prince



a) damage; b) population; c) transportation network and the location of aid points.

Source: Crooks A.T., Wise S. GIS and Agent-Based models for Humanitarian Assistance. *Computers, Environment and Urban Systems*, no. 41, 2013, pp. 100–111.

population distribution models LandScan; the data on the level of damage were taken from G-Mosaic; OpenStreetMap was used to display transport networks.

The result of the model is presented by several statistics facts: the number of deaths of the agents, the number of units of humanitarian assistance that the victims did not obtain, the total amount of energy used by the agents who survived. The model demonstrates the potential of using crowdsourcing and VGI data as sources for designing a realistic operating environment for the agents in order to simulate the behavior of individuals in case of critical situations. According to the authors, the developed model can be used as a support tool when making decisions about the provision of humanitarian assistance.

Summarizing the capabilities of agent-based modeling on the basis of geo-information systems, we note that this tool helps not only create the agents close to reality, but also integrate them into existing physical and social space in real time. This, in turn, speaks about the prospects of using agent-based modeling, including its use in making effective and timely management decisions. However, leading Russian *(V.L. Makarov, A.R. Bakhtizin)* and foreign *(A. Heppenstall, A. Crooks, M. Batty, etc.)* scientists point out that the key problem at the moment is the operating speed of agent-based models based on GIS, that is, the possibility to run complex models with thousands of spatially-aware agents. At the moment the solution is seen, first, in reducing the informative value of GIS to the required number of characteristics of the space that are accessed by agents during operation; second, in increasing performance of modern processors.

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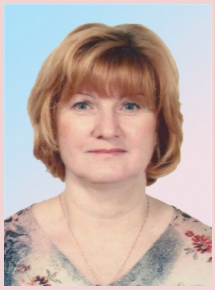
Received September 09, 2016

DOI: 10.15838/esc.2016.5.47.9
UDC 36 (470.13), LBC 65.261.55 (2Rus.Kom)

Issues of Formation and Use of Financial Resources of the Social Welfare System (Case Study of the Komi Republic)



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Abstract. Currently, the social welfare system in the Komi Republic and in the Russian Federation on the whole is undergoing gradual reforming, the main goals of which are as follows: improving the quality of life; supporting the poor and vulnerable segments of the population; mitigating possible negative consequences of reforms; improving pension provision; further improvement of targeted social assistance; streamlining social benefits; development of the social services market. In this regard, the study of methodological basis for the formation and use of financial resources of the social welfare system becomes more and more important. The goal of this work is to develop theoretical and methodical approaches to the improvement of financial mechanism for the social welfare system in the region. The paper considers the formation and use of financial resources for social protection of population in the Republic of Komi. The author reveals specifics of formation of budgets of all levels and the powers of federal and regional authorities in the field of mutual responsibility. The paper shows the imbalance of financial resources and obligations at all levels of the budgetary system of the Russian Federation. Scientific novelty of the work consists in the fact that it defines social protection as a financial category that provides

For citation: Tikhomirova V.V. Issues of formation and use of financial resources of the social welfare system (case study of the Komi Republic). *Economic and Social Changes: Facts, Trends, Forecast,* 2016, no. 5, pp. 158-172. DOI: 10.15838/esc.2016.5.47.9

redistribution of financial resources emerging in the process of formation of centralized and decentralized financial resources, through a set of forms and types of social protection aimed to ensure its targeted provision. On the basis of the national accounts system, which in terms of methodology focuses on a single international standard, the author develops a structure of forms and types of social protection, which are the basis of its financial mechanism: state social guarantees and minimum social standards; social benefits (social insurance and social assistance benefits); and social services. The paper considers main directions for improving the economic mechanism and organizational forms of management for the social welfare system, they are: targeted allocation of financial resources only to those households whose actual consumption is below the subsistence level. The author proposes to improve the funding of the social welfare system with the help of intergovernmental equalization. This work is based theoretically and methodologically on theories and practices of prominent Russian and foreign economists, sociologists and other scholars and professionals engaged in research in the field of social protection, data of the Federal State Statistics Service of Russia, its Territorial Office in the Komi Republic, and legislative and regulatory acts of the Russian Federation and the Republic of Komi. The study uses general scientific methods of system approach, analysis and synthesis, logical, historical and comparative analysis.

Key words: financial resources, social protection, types of social protection, targeted social assistance.

The concept "financial resources", which is widely used in the economic literature, has a variety of meanings – from the amount of cash on bank accounts and other account to other balance sheet indicators of enterprises [17].

The term "financial resources" has different interpretations in the wide use of this category in the economic science and in practice. The Financial and Credit Dictionary considers financial resources as the funds at the disposal of the state, enterprises, economic organizations and institutions, and these funds are used to cover the costs and establish various funds and reserves [25].

Financial mechanism is a set of methods, forms and types that help organize financial relations, i.e. the creation, distribution, redistribution and use of funds of financial resources. Financial mechanism refers to the superstructure category and it is an integral part of financial policy.

In order to reveal the specifics of functioning of social welfare system, it is of great importance to define the term "social protection", its specific forms and types of financial protection.

Scientific literature lacks a universally accepted understanding of social protection and its basic forms.

Research into the concept of "social protection" abroad has a much longer history than in the Russian science. For the first time the term "social security" was officially introduced in the USA in the framework of development of social programs under the policy of the New Deal implemented by Franklin D. Roosevelt in 1935 [27, 29]. Later, in the 1940s, in the documents of the International labour Organization, it became the basis of all concepts and recommendations on social policy. It is thanks to the ILO study that the term "social security" became widespread around the world, and the social standards developed by the ILO are still relevant.

The definition given by the ILO was later reflected in the documents of the European Union – the European Code of Social Security (1968), Charter of the Fundamental Social Rights of Workers, Green (1992) and White (1994), books on European social policy, European Code of Social Security (1968), Social Policy Protocol (1991) and other documents of the EU and the World Health Organization (WHO), the International Social Security Association (ISSA) and other organizations. Recently, along with the term "social security", the concept of "social protection" is used more and more frequently in Europe [30].

In Russia, some researchers distinguish three main forms of social protection: social insurance, social assistance and state support. Others call them differently: degrees, types, directions; others vary the adjectives "state" and "social"; others use similar terms: for example, instead of assistance, they use the terms aid or guardianship, instead of state support – social guarantees, etc.[3, 5, 12, 16, 26].

There exist other points of view. So, the team of authors under the supervision of V.G. Popov considers social maintenance to be an intermediate link between social protection, on the one hand, and social assistance and social support. Social maintenance, in their interpretation, represents one of the units of social protection of the population, but it has more narrow parameters of action; as for social assistance and social support, they belong to the blocks of social maintenance [15].

V. Roik points out not three but five main institutional forms of social protection: 1) state social assistance to persons who lack the necessary capacity to work, place of work, and sources of income and are not able to provide for their existence; 2) state social maintenance of service persons, employees of internal affairs agencies, tax service, public servants and some other categories of citizens taking into account the specific nature of their work in fulfilling the important functions of the state; 3) mandatory social

insurance as a form of social protection of economically active population from the risk of loss of income due to disability or loss of job; 4) the system of voluntary personal (collective) insurance for employees (accident, medical and pension provision); 5) the system of social protection of workers organized by enterprises and employers: medical and health care, payment for housing, transport, education and cultural services, and corporate pension payments [13].

A.V. Krestov builds a chain according to the increase in the quality and quantity of social services: social support, social assistance, and social protection; he includes in the latter term the network of in-patient institutions of social protection, medico-social expertise, employment service, pension provision, and the service for work conditions and labor protection [9]. T.S. Dymnich distinguishes forms of social protection such as social insurance, state social maintenance, and social services [4]. S.A. Yushkova considers the following forms: social maintenance, social assistance, social support and rehabilitation, social work, social benefits and the system for social monitoring of social protection [25]. Yu.A. Kosarev and N.V. Kuzyutkin speak about social insurance and social assistance [7, 10]; E.A. Nezhivenko – about social care provision, social services and social assistance [21]. G.S. Korepanov agrees with the latter option, but supplements it with social support and stresses that these activities are implemented in a variety of instrumental forms [6]. N.N. Abakumova and R.I. Podovalova define four subsystems of social protection: state social care provision, state, collective social insurance and private insurance [1].

The authors of the textbook "Social work: theory and practice" edited by E.I. Kholostova and A.S. Sorvina say that the leading organizational-legal forms of the social welfare system are pension provision, provision of social benefits and privileges to the most needy categories of the population, state social insurance, and social services [17].

S.V. Tetersky, the author of a textbook on social work, puts social protection on a par with other "special mechanisms of social policy implementation": social services, social rehabilitation, social assistance and self-help [18].

M.I. Liborakina considers social protection to be a function of the social sphere along with social insurance, social care provision and social support, and social services, in her view, are a mechanism that helps implement all these functions [11]. S.A. Shedenkov considers social protection (as well as social care provision, social insurance, donations, and social work) a type of social support [23].

Despite the diversity of viewpoints about the forms of social protection, almost all these definitions highlight forms such as social insurance, social assistance, social support, social care provision, social services, and social work.

In our opinion, major role in the financial mechanism of social protection belongs to economic methods. The main economic methods can include the introduction of a system for minimum socio-economic guarantees. In this case, the minimum subsistence level secured in legislation is of crucial importance. To implement social protection, the following economic methods are applied: the range of state benefits to certain categories of citizens, the system of benefits and compensations determined by the legislation.

The content of the social welfare system is revealed most fully by its forms. Forms of social protection express a particular combination of specific activities, actions, measures, methods of using financial resources of the subjects of social protection in accordance with emerging relevant tasks [19].

On the basis of the System of National Accounts [14], which in terms of methodology focuses on a single international standard, we have developed a structure of forms and types of social protection, which are the basis of its financial mechanism (Fig. 1.):

1. State social guarantees and minimum social standards.
2. Social allowances (social insurance allowances and social assistance allowances).
3. Social services.

We propose to consider social protection as a financial category, which helps organize the redistribution of financial resources emerging in the formation of centralized and decentralized financial resources, through a set of forms and types of social protection aimed to ensure its targeted provision.

Hence the main way to improve the financial mechanism and organizational forms of managing the social welfare system will be the targeted allocation of financial resources.

When the content and forms of social protection are considered, social protection is understood as the "legally established system of social guarantees and mechanism for their implementation, which provides any member of society with a decent standard of living and a right to exercise their basic social and civil rights" [24].

Currently, the basic state social guarantees are contained in the Constitution, the Labor Code of the Russian Federation and are also stipulated in international documents such as ILO Recommendations.

Social guarantees are the basis upon which social protection system in any

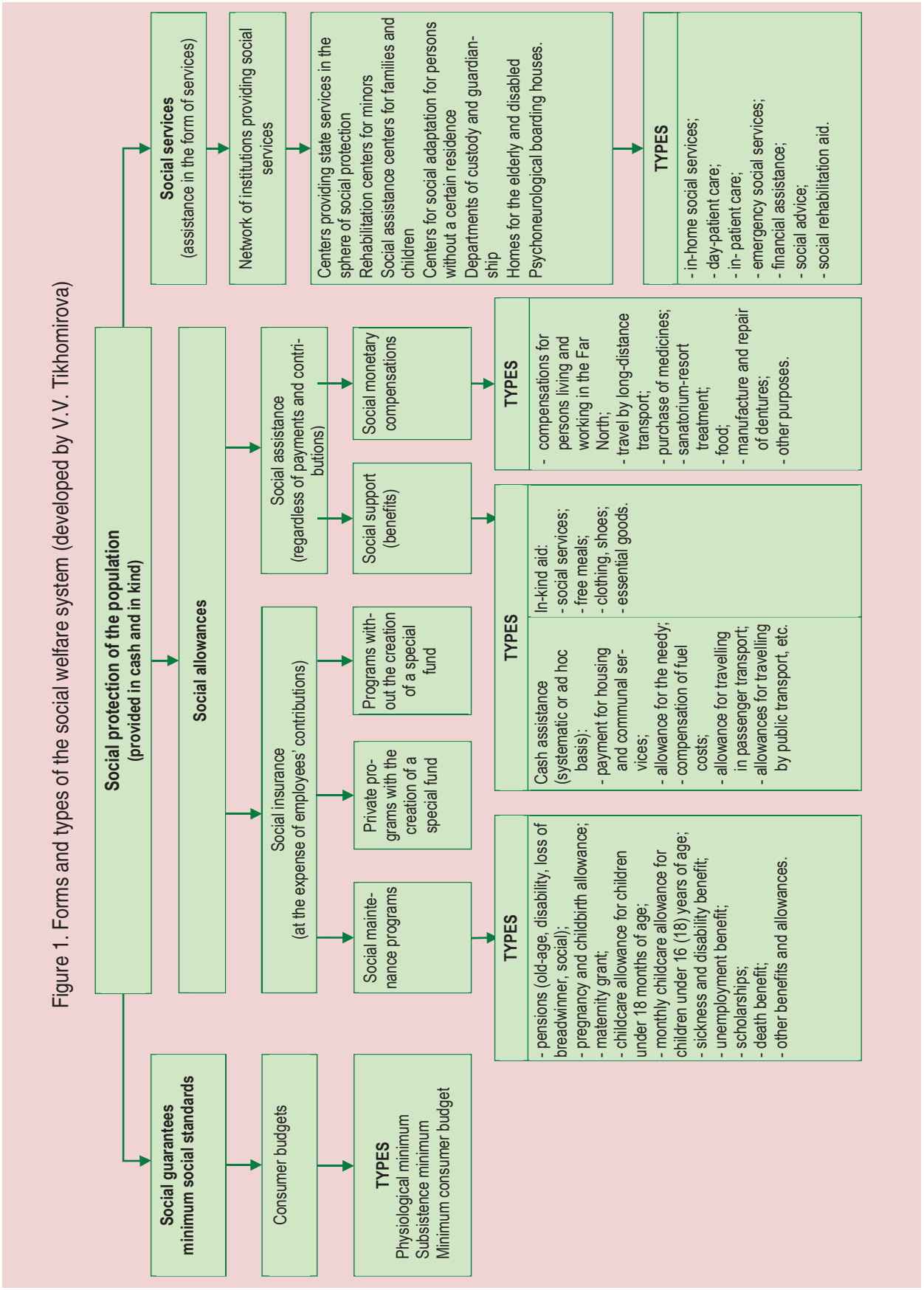


Figure 1. Forms and types of the social welfare system (developed by V.V. Tikhomirova)

country operates. Social guarantees are mechanisms of long-term action provided by law. State social guarantees are based on minimum social standards. Minimum social standards are rules and regulations established by the Legislation of the Russian Federation, they determine the minimum level of social protection. By consolidating the vital minimum social standard in the law "On the state minimum standards", the state makes it mandatory to provide and use by authorities at all levels.

Objectives of the financial mechanism are to provide a process of formation, distribution, redistribution and use of funds of financial resources.

Formation of financial resources for the social protection system is based on social obligations of the state. These obligations can be defined as a set of public goods that the state undertakes to make available to its citizens, this set being stipulated by the Constitution. These sources are based on the redistributive and savings principles. In order to implement social guarantees the state uses primarily the redistributive principle, i.e. budgetary resources.

The Budget Code of the Russian Federation is the main regulatory act, which establishes legal basis for the functioning of Russia's budgetary system. there are 250 bills that have been elaborated for the purpose of dealing with the financial crisis and providing social protection to the population of the Russian Federation.

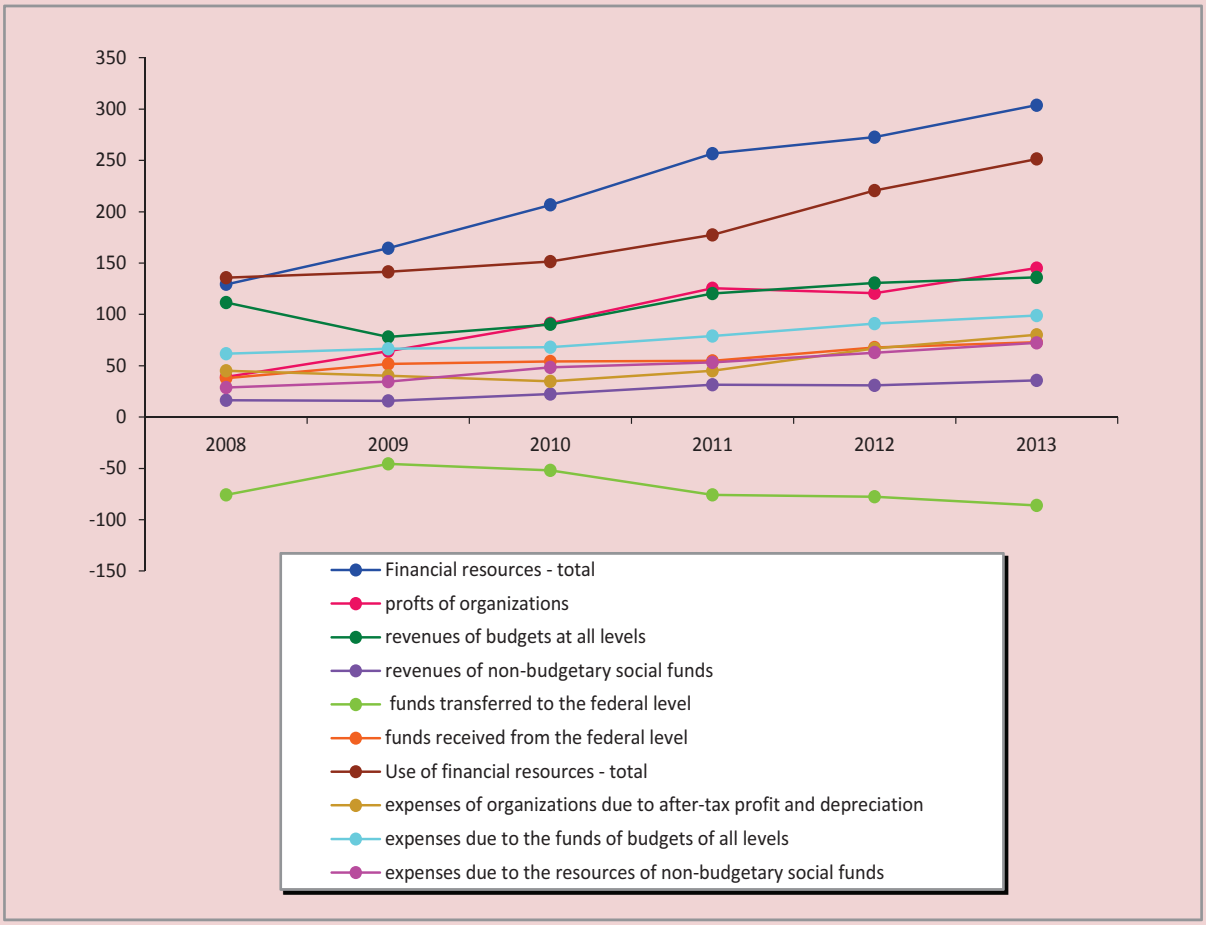
Major sources of formation of financial resources of the social protection system include the consolidated budget of the Russian Federation, which consists of the federal budget; budgets of 85 constituent entities of the Russian Federation; local budgets.

The implementation of social protection depends on the availability of financial resources. It is no coincidence that the attention of researchers is attracted to the issues of formation and use of resources allocated to social protection of the population.

The structure of financial resources of the Komi Republic is determined by the sources from which they are drawn. The Republic has developed positive trends in the formation of financial resources generated in the sphere of financial, non-financial institutions and public administration sector *(Fig. 2)*.

In 2014, 89% of consolidated budget revenues came from tax and non-tax payments (in 2009 – 78%). The main tax sources of consolidated budget revenues in the Republic were as follows: individual income tax, corporate profit tax and tax on the property of organizations; taken together, they formed 72% of all the

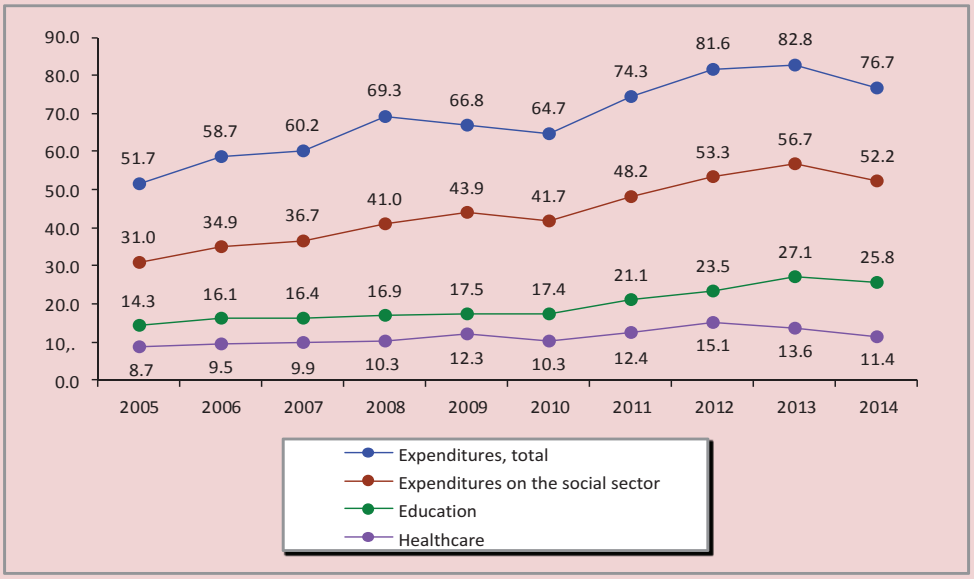
Figure 2. Financial resources and their use (billion rubles)



Source: Statistical Yearbook of the Komi Republic, 2014.

funds (in 2013 – 66%, in 2009 – 61%). Corporate profit tax receipts were by 37% higher than in 2013, property tax receipts – by 31%, individual income tax receipts decreased by 3%. Taxes on goods (works, services), sold (provided) on the territory of the Russian Federation, taxes on the total income increased by 6%, together having formed 9% of budget revenues. A group of non-tax revenues provided 7% of budget funds. Among them, the most significant are the incomes from the use of state and municipal property (98% of revenues by 2013) and payments for the use of natural resources, formed mainly by the allocations that organizations make to pay for a negative impact on the environment (141% to 2013).

Figure 3. Dynamics of expenditures of the consolidated budget of the Komi Republic, bln rubles*



* In the prices of 2014 (absolute values were indexed to the consumer price index in order to bring them in a comparable form).

Sources: Ministry of Finance of the Republic of Komi...; calculations by E.N. Timushev, V.V. Tikhomirova

In 2014, the dynamics of tax revenues was influenced by subdued economic growth, changes in the tax legislation, and completion of major phases of large investment projects on the territory of the Republic. The contribution of the oil factor was less significant than in 2012–2013. Major part of tax revenues was formed by the mining industries, manufacturing industries, organizations carrying out operations with real estate, transport and communications.

In 2014, there was a decrease in the share of transfers to the federal budget mainly as a result of reducing value added tax receipts. The indebtedness of economic entities to the budgets of all levels decreased. The Republic's consolidated budget was executed with a deficit. The volume of funds allocated from the federal budget was less than in 2013. Tax and non-tax revenues increased. The main expenditure items were education, health care, social policy, and national economy.

When studying budget expenditures, researchers identify social protection with expenditures on social services [2]. During 2005–2014, the share of social expenditures

(including inter-budget transfers of the Federal Compulsory Medical Insurance Fund) in the consolidated budget of the Komi Republic gradually increased from 31.0 to 52.2% of the total costs *(Fig. 3)*. The dynamics of this expenditure item is formed by the expenditures under the item "Social welfare of the population", followed by the item "Social services provided to population" and other expenditures. The real annual increase was similar to the rate of inflation, making financing on this item the most stable and independent from the behavior of the total amount of budget expenditures. The drop in 2014 can be explained by the outrunning reduction of costs in comparison with the dynamics of GRP of the Komi Republic.

In 2010–2014 the general dynamics of formation and use of budgetary funds in the Republic was in line with nationwide trends. The rate of growth of consolidated budget revenues in the Republic (145%) slightly lagged behind the increase in the revenues of consolidated budgets of constituent entities of the Russian Federation (150%).

A significant part of the Republic's budget revenues was formed by tax revenues. In order to form budget resources and use them in the system of social protection, the government redistributes the incomes of different social groups. The main government tool in this process is taxation of individuals. Here the reform of social tax has a more pronounced effect. In practice, the share of regional budgets in social assistance programs comprises 41%, the share of local budgets is 32%, other sources make up 21%, and the share of the federal budget is only 6%.

Over the past three years, tax remissions from the Republic's taxpayers to the budgetary system of the country increased by 20%, including in 2014 – by 7%. According to the Department of the Federal Tax Service in the Komi Republic, the receipts on taxes, duties and other mandatory payments to the budget system of the Russian Federation in 2014 amounted to 129.1 billion rubles. Compared to 2013, they increased by 7% (nationwide – by 12%). In 2014, the volume of funds transferred to the federal level, increased by 2%, but the share of transfers declined from 58% in 2013 to 56% as a result of reduction in the receipts of tax on the profit of organizations (in terms of payments to the federal budget) and value added tax.

At the end of the year, the consolidated budget of the Komi Republic received 44% of the funds collected in the region, the general figure for all constituent entities of the Russian Federation is 49%. Payments to the budgets of municipalities decreased

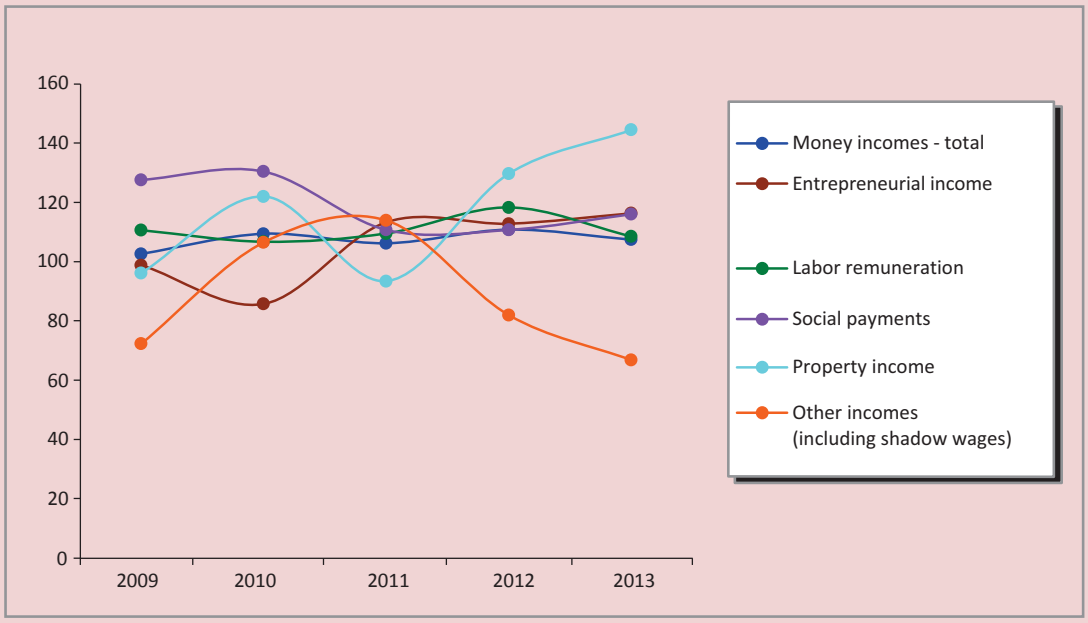
by 22% in connection with the change of the standard for deductions of individual income tax in favor of the budget of the Republic.

In 2010–2014, the general dynamics of formation and use of budgetary funds of the Republic was in line with national trends. The growth rate of the Republic's consolidated budget revenues (145%) slightly lagged behind the increase in consolidated budget revenues in constituent entities of the Russian Federation (150%). Consolidated budget expenditures per resident of the Republic traditionally exceeded the national average. In the period under consideration, the gap between the indicators increased from 16 to 38% and amounted to 88 thousand rubles in the Komi Republic and 64 thousand rubles in Russia as a whole.

Social welfare payments are continuously growing and in 2013 they amounted to 22.5% in the dynamics of monetary incomes of the population *(Fig. 4)*.

The Komi Republic uses treasury technology to bring budgetary funds to specific recipients. In accordance with the program for development of budget federalism in the Russian Federation in

Figure 4. Dynamics of monetary incomes of the population



Source: Statistical Yearbook of the Komi Republic, 2014; calculations by V.V. Tikhomirova.

2005 all regional and local budgets shifted to the treasury execution on the basis of uniform federal standards. Treasury system – is a system of comprehensive accounting and control of the movement of budgetary funds from their receipt and up to their usage.

The main functions of this system consist in bringing budget funds to the final recipients according to the law on the budget and control of the target use of budgetary resources. Treasury system uses the principle of cash unity: transfer of all incoming revenues to the single account of the budget and implementation of all expenditures using this account. Budgetary funds, bypassing the accounts of the relevant administrators across the vertical, are brought directly to each budget unit. There was a division of regulatory and executive functions without infringing on the amount of administrative rights, while maintaining the protection of budget funds from unauthorized use.

The research that we have performed shows that the Government of the Komi Republic carries out socially-oriented policy for the purpose of timely issuance of pensions, allowances, compensations and benefits, and this policy helps maintain the necessary social stability.

There are many sources of formation of financial resources for implementing social protection of the population, these sources are interrelated and interdependent and they ultimately form the basis of socio-economic reforms implemented in the country. The state remains the most important guarantor and coordinator of correct and effective use of these sources, identification of new ones and development of those already in use. However, the amount of social payments should be consistent with the financial capabilities of the regions [20].

It is revealed that the most pressing issue that defines the entire character of socio-economic relations between the state and society is the imbalance of financial resources and obligations at all levels of the budgetary system of the Russian Federation. The federal government is to use interbudgetary equalization to enhance the effectiveness of the system of social protection to reduce social differentiation in the interests of poverty alleviation. The balance of all the sources of formation of financial resources for the system of social protection will create a solid basis to enhance the standard of living and quality of life and implement all constitutional rights and freedoms of citizens.

Currently, social development of the country and its individual regions is largely determined by the efficiency of the system of social protection of the population. The mechanism of social maneuvering that artificially regulates the level of wages

and prices, employment, quantitative and qualitative components of an average standard of living is recognized as ineffective, because it only reduces social contradictions, but does not stimulate the economy.

Therefore, the primary method of social protection should consist in the targeted provision of social assistance only to those households whose actual consumption is below the subsistence level. People with disabilities or incapacitated persons should be protected by transfer programs for social insurance, social security, and social assistance. Thus we oppose indiscriminate social support (social security) and advocate targeted assistance to those in need.

Efficient measures for promoting people's activities in the labor market should become the main purpose of social protection. People themselves should make efforts in order to achieve their own financial security and well-being [28, 31].

On the background of the current crisis and in conditions of limited financial resources, conceptual approaches to creating the entire system of social protection (its scope, set of indicators, categories of receivers, financing sources and levels of responsibility), and also quantitative characteristics (number of recipients, amount of support) and direct provision forms (cash, in kind, services) acquire new and crucial importance and require adjustment.

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Received August 29, 2016

LABOR ECONOMICS

DOI: 10.15838/esc.2016.5.47.10
UDC 331.101.26(470.12), LBC 65.240(2Rus-4Vol)

Research into the Conditions and Drivers of Labor Potential Reproduction in the Vologda Oblast Municipal Districts*

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Abstract. The article presents the reproduction of labor potential of a municipal district as a continuous renewal process of its quantitative and qualitative features, consisting of three consecutive phases: formation, distribution (including redistribution) and exploitation. The research paper reveals the problems and specifics of labor potential reproduction at the municipal level on the basis of processing available statistical and sociological information on the districts of the Vologda Oblast. The materials of the territorial body of the Federal State Statistics Service in the Vologda Oblast and databases of questionnaire surveys conducted by ISEDT RAS served as an information base of the research. The analysis has allowed characterizing the modern structure of labor potential as a kind of "starter" state which largely determines future development prospects. Special attention is given to the formation, distribution and exploitation of labor potential qualitative characteristics which are assessed in the article on the basis of studies carried out by ISEDT RAS in eight municipal districts of the Vologda Oblast and the cities of Vologda and Cherepovets (sample size – 1,500 people of working age). The results of

* The research is conducted with financial support from the Russian Foundation for Basic Research (RFBR) in the framework of Project no. 16-36-60011 mol_a_dk.

For citation: Chekmareva E.A. Research into the conditions and drivers of labor potential reproduction in the Vologda Oblast municipal districts. *Economic and Social Changes: Facts, Trends, Forecast*, 2016, no. 5, pp. 173-194. DOI: 10.15838/esc.2016.5.47.10

questionnaire databases' processing with the use of a special technique help calculate physical and mental component summaries of the working age population, indices of cognitive potential, creativity, communication skills, cultural and moral levels, and the need for achievement. The study shows that the structure of labor potential and the tendencies of its reproduction in the Vologda Oblast municipal districts are extremely poor. Since 2000, working age population in half of the districts reduced by more than a quarter. There is no complete recovery and renewal of the functioning labor potential: contracted reproduction is observed. The peculiarity of labor potential reproduction in the Vologda Oblast municipal districts is a substantial differentiation based on age structure and rates of change working age population. This, along with the decline in labor potential, the reduction of creative potential and a significant gap between the actual level of development of the qualities of working age population and job requirements become the main issues of labor potential reproduction.

Key words: labor potential, reproduction, formation, distribution, exploitation, municipal district.

Labor potential is the main driving force of social and economic development of territories. According to the opinion of the global scientific community, including *M.S. Toksanbaeva*, a leading domestic expert on labor potential reproduction in modern Russia, "the value of human factor in the economy will increase intensively" [13, p. 3]. Recognition of the role of the human factor in economic development led to the emergence of one of the most important ideas in modern labor economics, according to *D. Acemoglu*, – the understanding of the set of skills and abilities of employees as a special form of capital [16, p. 3] and the introduction of the term "human capital" into scientific practice. The development of this idea in the foreign scientific literature formed a generally accepted approach that considers potential employment opportunities of the population in light of increasing production in the framework of the human capital theory, the foundations of which were laid in the works of American economists *T. Schultz* [20] and *G. Becker* [17] more than 50 years ago. In fact, the human capital theory consider workers abilities as a specific item that could be "bought and sold": knowledge, skills and abilities can be "bought" by investing in education [19], and then "sold" at a profit by finding a high-paid job [18]. This understanding of working man was alien to the Soviet economic science, which, in our opinion, is connected not only with the administrative-command economic system that existed in Russia in the period of formation of the human capital theory, but also with specifics of the Russian mentality [1]. As a result, the Russian economic thought went a slightly different way, and "in order to characterize a personal production

factor in a multidimensional expression" [9, p. 5] *A.S. Pankratov* proposed the concept of "labor potential".

In modern conditions, as *M.S. Toksanbaeva* notes, "paramount theoretical and practical importance is attached to the knowledge about qualitative and quantitative characteristics of labor potential, to the study of level and drivers of its effective reproduction. They (...) help find out what generated the changes (...) and, accordingly, what aspects of reproduction of labor potential require special attention and adjustment" [13, p. 3]. However, as we see, the analysis of labor potential reproduction is necessary to start from the municipal level, since the presentation of statistics in aggregate form in the context of regions, and real problems of labor potential reproduction in rural areas are smoothed out by the success of development of large cities. The problem outlined, along with the recognition of sustainable development of rural areas as one of the most important strategic goal of the state policy in the Russian Federation [5] and lack of scientific support for the question, determines the relevance of the study of labor potential reproduction at the municipal level. It should be understood that people live not in the region in general, but in a particular municipality, which has its own features and problems that shape a specific environment for labor potential reproduction.

In addition, we fully agree with *A.S. Marshalova* and *A.S. Novoselov* who state that "one of the problems of municipal management consists in the absence of a clear system for managing reproduction processes" [7, p. 171]. Therefore, we believe that the study of the problems and features of reproduction of labor potential in municipalities is of particular relevance and significance in practice, because it can become a good basis for the development of a scientifically sound system for managing reproduction processes at the municipal level.

The purpose of the present study is to identify main problems and features of formation, distribution and use of labor potential at the municipal level on the basis of processing available statistical and sociological information on the Vologda Oblast districts. To achieve this goal, the following objectives have been achieved: current structure of labor potential was studied as a kind of "initial" status, which determines future development prospects; main problems and features of individual phases of labor potential reproduction in the Vologda Oblast municipal districts were revealed.

Materials of the territorial office of the Federal State Statistics Service in the Vologda Oblast, and databases of questionnaire surveys carried out by ISEDT RAS served as the information basis for the research. The analyzed period is 2000–2015.

The present paper considers labor potential reproduction in a municipal district as a continuing process of renewal

of its quantitative and qualitative features, consisting of three consecutive phases: formation, distribution (including redistribution) and use. The labor potential of the territory is understood as a "generalized characteristic of the measure and quality of the set of abilities to work:" [8, p. 14], which is assessed quantitatively by the size of working age population and qualitatively – by level of development of qualitative characteristics of working age population. This corresponds to an integrated economic approach to the interpretation of this term [6].

In general, when analyzing the reproduction of labor potential, we follow the approach of *A.S. Pankratov*, according to which "the division of the overall process of labor potential reproduction into a series of independent phases allows us to study them in more detail and systematize those economic relations that are characteristic of the reproductive phase, and only then to synthesize inferences and theoretically substantiate directions for improving the reproductive process as a whole" [9, p. 16]. For this reason, next, we consider individual phases of labor potential reproduction in the Vologda Oblast municipal districts step by step.

It should be noted that we do not aim to carry out a comprehensive analysis of reproduction processes. In particular, some aspects of formation, distribution and use of labor potential are deliberately omitted from consideration. For example, the paper does not describe birth rate dynamics, because today's babies will enter into working age only 16 years later. However, the birth rate is taken into account when constructing demographic forecasts.

Formation of labor potential. Main quantitative and qualitative characteristics of labor potential are built up in the phase of its formation. Note that the principles of formation of labor potential are the same for any district, but the conditions are different depending on the territorial-geographical, historical, economic, demographic, social and other factors [9, p. 16]. However, despite the abundance of drivers of labor potential formation, it is the demographic development of the municipality that has the greatest influence on its quantitative characteristics.

Currently, demographic development in the majority of municipal districts comprising the Vologda Oblast is characterized by a decline in the total population. The increase in the number of residents is observed only in Vologodsky District. So, between 2000 and 2015, the total population increased by 1% from 51,296 to 51,930 people *(Tab. 1)*. For comparison, over the same period, the number of inhabitants of Vologda increased by 4%, of Cherepovets – 1% and reached 319 and 318 thousand, respectively. During this period, the population of Vashkinsky District decreased by almost a third (31%). Similar extent of population decline was

Table 1. Change in the number and share of working age population in municipal areas and urban districts of the Vologda Oblast in the period from early 2000 to early 2015

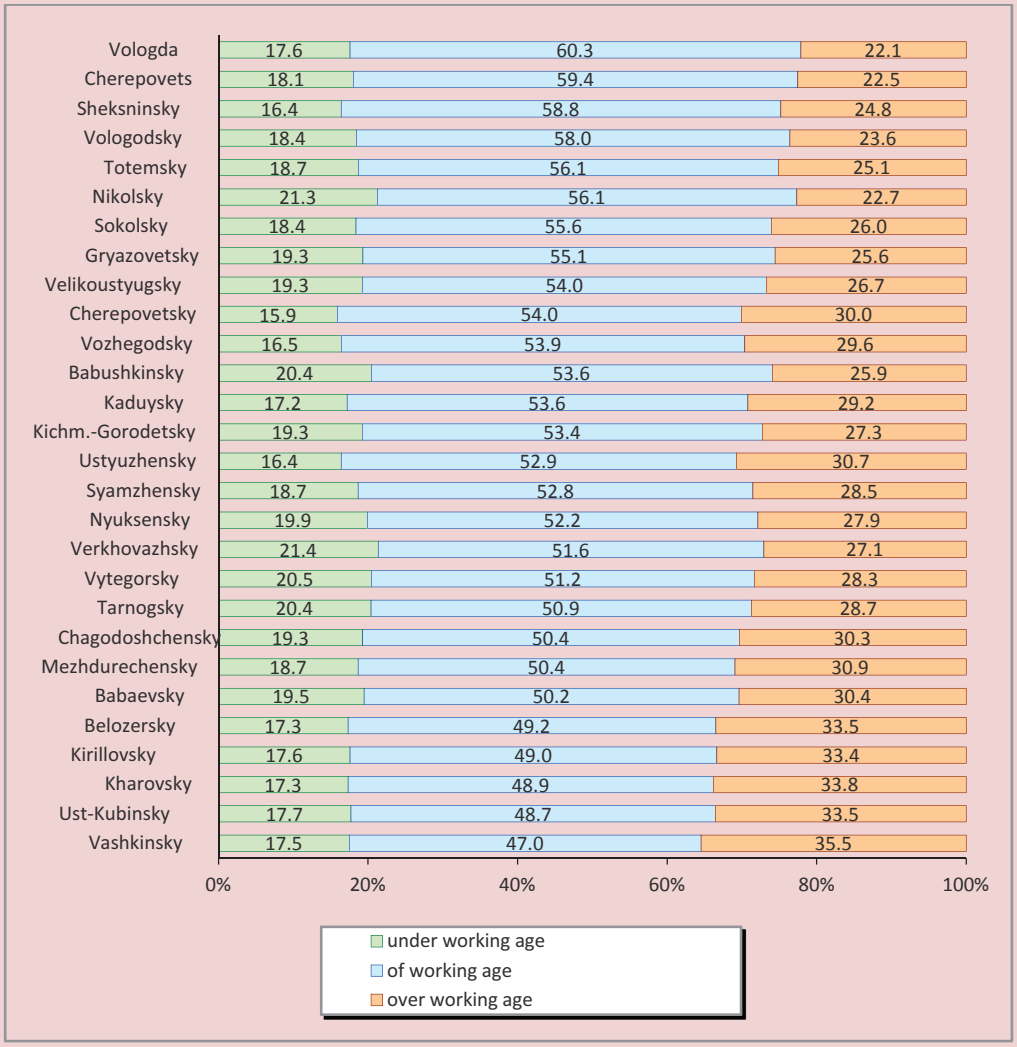
Municipal district / urban district	Total population, people			Working age population in total population						
				Number, people			Share, %			
	2000	2015	*Dynamics*	2000	2015	*Dynamics*	2000	2015	*Dynamics*	
									absolute	*relative.*
Vologodsky	51296	51930	*+1%*	29656	30119	*+2%*	57.8	58.0	*+0.2 p.p.*	*+0.3%*
Vologda	307182	319408	*+4%*	192291	192544	*0%*	62.6	60.3	*-2.3 p.p.*	*-3.7%*
Cherepovetsky	41992	40000	*-5%*	22406	21612	*-4%*	53.4	54.0	*+0.6 p.p.*	*+1.3%*
Cherepovets	315422	318107	*+1%*	196588	188938	*-4%*	62.3	59.4	*-2.9 p.p.*	*-4.7%*
Sheksninsky	35856	33211	*-7%*	21666	19521	*-10%*	60.4	58.8	*-1.6 p.p.*	*-2.7%*
Totemsky	26890	23083	*-14%*	15004	12960	*-14%*	55.8	56.1	*+0.3 p.p.*	*+0.6%*
Sokolsky	60503	49735	*-18%*	33707	27640	*-18%*	55.7	55.6	*-0.1 p.p.*	*-0.2%*
Kaduysky	19481	16997	*-13%*	11104	9104	*-18%*	57.0	53.6	*-3.4 p.p.*	*-6.0%*
Nikolsky	27506	20571	*-25%*	14082	11535	*-18%*	51.2	56.1	*+4.9 p.p.*	*+9.5%*
Vozhegodsky	19573	15218	*-22%*	10312	8205	*-20%*	52.7	53.9	*+1.2 p.p.*	*+2.3%*
Syamzhensky	10620	8344	*-21%*	5626	4402	*-22%*	53.0	52.8	*-0.2 p.p.*	*-0.4%*
Babushkinsky	15775	12064	*-24%*	8484	6469	*-24%*	53.8	53.6	*-0.2 p.p.*	*-0.3%*
Gryazovetsky	43264	33580	*-22%*	24309	18507	*-24%*	56.2	55.1	*-1.1 p.p.*	*-1.9%*
Verkhovazhsky	16653	13133	*-21%*	8936	6772	*-24%*	53.7	51.6	*-2.1 p.p.*	*-3.9%*
Ustyuzhensky	22553	17523	*-22%*	12243	9264	*-24%*	54.3	52.9	*-1.4 p.p.*	*-2.6%*
Kichm.-Gorodetsky	23280	16616	*-29%*	11759	8875	*-25%*	50.5	53.4	*+2.9 p.p.*	*+5.7%*
Velikoustyugsky	68823	55630	*-19%*	40321	30068	*-25%*	58.6	54.0	*-4.6 p.p.*	*-7.7%*
Ust-Kubinsky	9703	7912	*-18%*	5243	3856	*-26%*	54.0	48.7	*-5.3 p.p.*	*-9.8%*
Chagodoshchensky	16230	12823	*-21%*	8799	6462	*-27%*	54.2	50.4	*-3.8 p.p.*	*-7.0%*
Nyuksensky	12048	8944	*-26%*	6455	4669	*-28%*	53.6	52.2	*-1.4 p.p.*	*-2.6%*
Kirillovsky	19223	15223	*-21%*	10472	7465	*-29%*	54.5	49.0	*-5.5 p.p.*	*-10.0%*
Vytegorsky	32894	25302	*-23%*	18193	12958	*-29%*	55.3	51.2	*-4.1 p.p.*	*-7.4%*
Tarnogsky	15820	11795	*-25%*	8449	6002	*-29%*	53.4	50.9	*-2.5 p.p.*	*-4.7%*
Babaevsky	25964	20150	*-22%*	14312	10106	*-29%*	55.1	50.2	*-4.9 p.p.*	*-9.0%*
Mezhdurechensky	7858	5716	*-27%*	4153	2880	*-31%*	52.9	50.4	*-2.5 p.p.*	*-4.7%*
Kharovsky	21623	15041	*-30%*	11268	7353	*-35%*	52.1	48.9	*-3.2 p.p.*	*-6.2%*
Belozersky	22642	15752	*-30%*	11986	7745	*-35%*	52.9	49.2	*+3.7 p.p.*	*-7.1%*
Vashkinsky	10469	7202	*-31%*	5769	3388	*-41%*	55.1	47.0	*-8.1 p.p.*	*-14.6%*

Note. Arranged according to the change in the number of working age population.
Sources: *Vozrastno-polovoi sostav naseleniya Vologodskoi oblasti v 2014 godu: stat. sbornik* [Age-sex composition of the population of the Vologda Oblast in 2014: statistics collection]. Vologdastat. Vologda, 2015. 97 p.; Vologdastat data; author's calculations.

observed in Belozersky (-30%), Kharovsky (-30%) and Kichmengsko-Gorodetsky (-29%) districts.

The decline in the total population was accompanied by a decline in working age population, the main quantitative characteristic of labor potential of the territory. The volume of labor potential is declining almost everywhere at a more rapid pace than the total population. So, in Vashkinsky District, the decline was 41%, in Belozersky and Kharovsky districts – 35%, in Mezhdurechensky District – 31%. In 15 years, half of the districts in the Vologda Oblast lost at least a quarter of their working age population.

Figure 1. Age structure of population in the Vologda Oblast municipal districts at the beginning of 2015



Note. Sorted in descending order of the share of working age population.

Sources: *Vozrastno-polovoi sostav naseleniya Vologodskoi oblasti v 2014 godu*: *stat. sbornik* [Age-sex composition of the population of the Vologda Oblast in 2014: statistics collection]. Vologdastat. Vologda, 2015. 97 p.; author's calculations.

However, in some districts where demographic dynamics is negative (Nikolsky, Kichmengsko-Gorodetsky, Vozhegodsky, Cherepovetsky, Totemsky), the decline in total population was more rapid than the reduction in labor potential; as a result, the share of working age population in the total population in these areas increased, which, in this case, can by no means be regarded as a positive change.

To date, age structure of the population is most unfavorable in Vashkinsky, Ust-Kubinsky, Kharovsky, Kirillovsky and Belozersky districts: in these territories, the share of working age population is less than half; that is, for each working

Table 2. Age structure of working age population in municipal districts of the Vologda Oblast at the beginning of 2015, %

Municipal district / urban district	Age, years					Average age, years
	16–19	20–29	30–39	40–49	50 and older*	
Vologda	6.9	29.9	28.4	19.0	15.8	*35.2*
Cherepovets	6.4	24.7	29.7	22.2	17.0	*36.4*
Vologodsky	5.7	24.6	27.0	22.0	20.7	*37.3*
Velikoustyugsky	6.8	23.3	26.1	22.5	21.2	*37.4*
Sokolsky	6.0	23.3	27.4	22.1	21.2	*37.6*
Sheksninsky	4.5	23.3	29.5	22.6	20.2	*37.7*
Ustyuzhensky	5.0	24.7	25.2	22.7	22.4	*37.9*
Kaduysky	7.2	20.7	25.1	24.8	22.3	*38.1*
Totemsky	7.6	21.0	24.5	22.1	24.7	*38.1*
Cherepovetsky	4.7	23.4	26.6	21.7	23.5	*38.2*
Gryazovetsky	6.4	20.1	25.6	24.7	23.2	*38.5*
Vytegorsky	6.2	18.6	28.1	24.4	22.8	*38.6*
Chagodoshchensky	4.7	16.6	29.8	24.9	24.0	*39.4*
Vozhegodsky	5.1	21.0	22.8	23.8	27.3	*39.4*
Babaevsky	4.0	17.9	28.2	24.5	25.4	*39.6*
Nikolsky	6.2	16.0	21.1	29.2	27.4	*40.2*
Kichm.-Gorodetsky	6.5	16.4	19.9	29.4	27.9	*40.2*
Belozersky	6.1	17.2	20.7	25.9	30.0	*40.4*
Kirillovsky	5.1	15.6	25.0	24.6	29.7	*40.5*
Verkhovazhsky	5.9	14.3	24.3	26.3	29.1	*40.5*
Tarnogsky	5.9	13.6	24.3	28.4	27.9	*40.6*
Kharovsky	6.1	14.3	22.9	27.8	29.0	*40.6*
Ust-Kubinsky	5.8	14.5	23.7	26.8	29.3	*40.7*
Nyuksensky	6.0	14.1	23.6	27.2	29.0	*40.7*
Mezhdurechensky	5.6	15.2	21.6	27.8	29.9	*40.9*
Syamzhensky	4.5	15.4	23.2	26.7	30.3	*41.0*
Babushkinsky	4.8	14.5	24.7	24.6	31.4	*41.0*
Vashkinsky	4.9	10.1	24.2	27.8	33.0	*42.2*

Note. Arranged according to the increase in average age. *50–54 years – for women, 50–59 years – for men.
Sources: *Vozrastno-polovoi sostav naseleniya Vologodskoi oblasti v 2014 godu: stat. sbornik* [Age-sex composition of the population of the Vologda Oblast in 2014: statistics collection]. Vologdastat. Vologda, 2015. 97 p.; author's calculations.

age person there is at least one person of unemployable age, and most of them are pensioners, who have already implemented their employment potential and cannot be considered as a reserve to replenish labor resources of the district *(Fig. 1)*.

The age structure of working age population arouses concerns. For instance, in Vashkinsky District, one-third of labor potential is represented by persons 50 years of age and older, and they will soon retire *(Tab. 2)*. Moreover, in 15 out of 26 municipal districts in the Vologda Oblast, the proportion of persons of this age group exceeds 25%.

Annual losses of labor potential, associated with migration outflow and mortality of working age population, as

Table 3. Assessment of changes in the number of working age population in municipal districts of the Vologda Oblast in 2015

Municipal district / urban district	Replenishment of labor potential		Losses of labor potential			Balance	
	Entered into working age	Migration inflow	Lived beyond working age	Died at working age	Migration outflow	*people*	*%**
Vologodsky	464	1878	838	168	1388	*-52*	*-0.2*
Sheksninsky	270	1224	492	127	1067	*-192*	*-1.0*
Cherepovets	2656	4561	4461	1079	5073	*-3396*	*-1.8*
Vologda	2375	5500	4647	860	6327	*-3959*	*-2.1*
Kaduysky	132	615	308	61	587	*-209*	*-2.3*
Babaevsky	175	626	360	89	609	*-257*	*-2.5*
Ustyuzhensky	118	567	315	74	545	*-249*	*-2.7*
Sokolsky	434	825	851	189	980	*-761*	*-2.8*
Kirillovsky	113	498	347	57	424	*-217*	*-2.9*
Velikoustyugsky	585	1268	933	222	1589	*-891*	*-3.0*
Cherepovetsky	291	910	727	130	989	*-645*	*-3.0*
Totemsky	211	781	453	103	834	*-398*	*-3.1*
Babushkinsky	118	264	236	55	292	*-201*	*-3.1*
Verkhovazhsky	117	468	267	58	471	*-211*	*-3.1*
Chagodoshchensky	113	199	204	55	259	*-206*	*-3.2*
Mezhdurechensky	63	192	121	29	197	*-92*	*-3.2*
Ust-Kubinsky	70	237	170	33	228	*-124*	*-3.2*
Vytegorsky	275	503	428	133	634	*-417*	*-3.2*
Kichm.-Gorodetsky	162	502	302	83	568	*-289*	*-3.3*
Syamzhensky	84	237	165	48	252	*-144*	*-3.3*
Tarnogsky	117	352	222	46	398	*-197*	*-3.3*
Gryazovetsky	363	568	629	131	786	*-615*	*-3.3*
Nikolsky	215	669	368	96	807	*-387*	*-3.4*
Vozhegodsky	153	448	362	56	522	*-339*	*-4.1*
Kharovsky	138	354	315	71	416	*-310*	*-4.2*
Nyuksensky	100	218	187	35	303	*-207*	*-4.4*
Belozersky	160	281	342	65	380	*-346*	*-4.5*
Vashkinsky	59	148	173	35	209	*-210*	*-6.2*

* Percentage of working age population at the beginning of the year.
Note. All persons who, at the beginning of the year, reached 15 years old are considered to be of working age in 2015; women and men who at the beginning of the year were 54 and 59 years old, respectively were considered to be out of working age during the year; the data are sorted according to the increase in the relative losses of labor potential.
Source: Vologdastat data on the age and sex composition of the population, age-specific migration and death rate.

well as their retirement, are not compensated by migratory inflow and by the small cohorts of adolescents who enter working age.

For example, in Vashkinsky District, the loss of the labor potential in 2015 is estimated at 210 people or 6% of working age population at the beginning of the year *(Tab. 3)*. In just a year in Belozersky District, working age population fell by 4.5%. Similar rate of decline is observed in Vozhegodsky, Kharovsky and Nyuksensky districts.

Currently, the majority of districts have an extremely unfavorable population structure. Here it is important to understand

Table 4. Forecast of the number of working age population in municipal districts of the Vologda Oblast at the beginning of the year, people

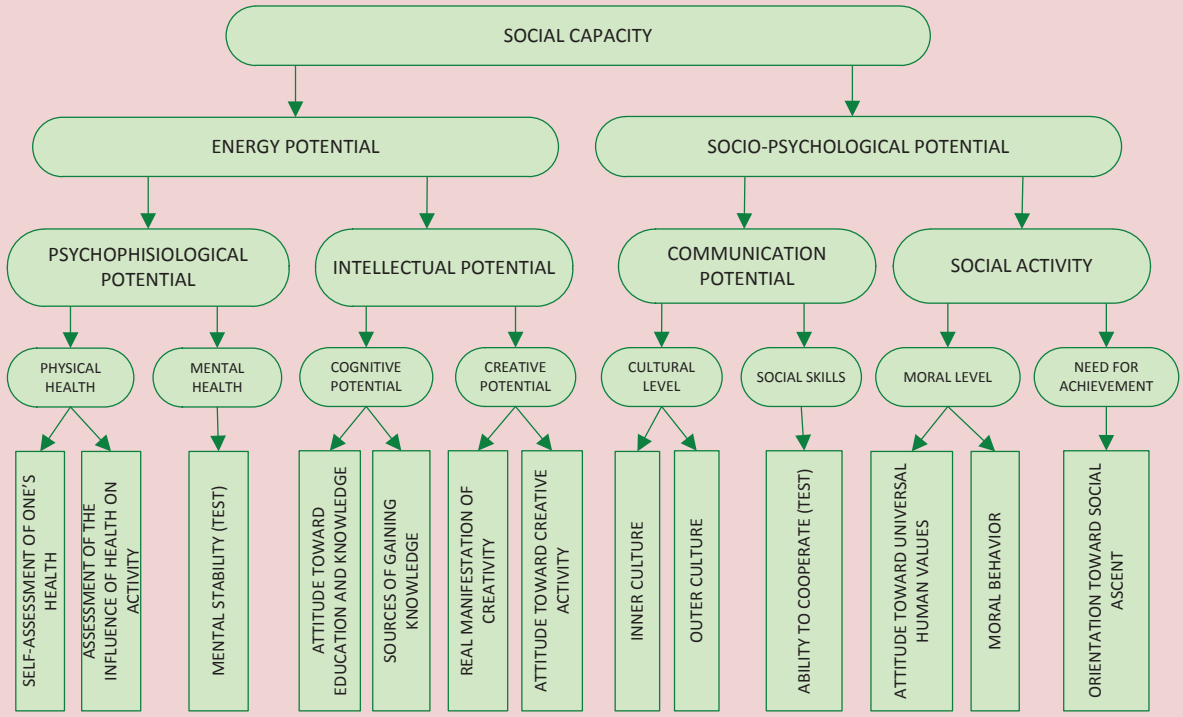
Municipal district / urban district	Year											*Gain / loss, %*
	2015 (fact)	2016 (estimate)	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Vologodsky	30119	30066	30070	30084	30112	30173	30171	30273	30429	30634	30948	*3*
Kirillovsky	7465	7248	7112	7005	6927	6880	6880	6895	6929	6950	6998	*-6*
Sheksninsky	19521	19325	19091	18892	18678	18552	18360	18288	18187	18143	18153	*-7*
Kaduysky	9104	8908	8729	8617	8492	8452	8408	8367	8395	8360	8357	*-8*
Babaevsky	10106	9847	9648	9432	9302	9233	9156	9071	9090	9106	9167	*-9*
Vologda	192544	188693	185607	183101	181021	179343	177914	176401	175383	174774	174279	*-9*
Verkhovazhsky	6772	6566	6413	6259	6165	6090	6028	6004	6003	6030	6079	*-10*
Cherepovets	188938	185618	182564	179855	177413	174884	172682	170784	169251	168081	166917	*-12*
Ust-Kubinsky	3856	3732	3639	3584	3487	3469	3440	3386	3337	3312	3301	*-14*
Tarnogsky	6002	5801	5611	5446	5361	5289	5213	5163	5127	5103	5108	*-15*
Ustyuzhensky	9264	9012	8832	8700	8528	8395	8241	8104	8003	7920	7827	*-16*
Totemsky	12960	12574	12271	11970	11706	11483	11227	11067	10945	10827	10737	*-17*
Mezhdurechensky	2880	2789	2705	2636	2561	2522	2483	2437	2386	2378	2383	*-17*
Sokolsky	27640	26893	26208	25619	25086	24563	24100	23663	23332	23068	22798	*-18*
Nyuksensky	4669	4464	4296	4129	4044	3940	3906	3868	3816	3792	3790	*-19*
Cherepovetsky	21612	20974	20440	19870	19462	18993	18598	18185	17876	17596	17356	*-20*
Vytegorsky	12958	12544	12204	11825	11515	11212	10945	10766	10625	10512	10393	*-20*
Velikoustyugsky	30068	29199	28398	27620	27016	26392	25839	25294	24792	24396	24059	*-20*
Vashkinsky	3388	3178	3007	2881	2771	2706	2699	2665	2692	2684	2669	*-21*
Gryazovetsky	18507	17890	17377	16850	16350	15939	15537	15133	14821	14634	14382	*-22*
Chagodoshchensky	6462	6253	6052	5860	5674	5517	5369	5275	5176	5078	4978	*-23*
Kichm.-Gorodetsky	8875	8587	8318	8089	7874	7648	7442	7231	7073	6887	6754	*-24*
Kharovsky	7353	7049	6813	6590	6415	6264	6106	5962	5814	5678	5572	*-24*
Syamzhensky	4402	4256	4106	3956	3825	3686	3611	3507	3422	3354	3314	*-25*
Babushkinsky	6469	6266	6058	5840	5601	5411	5221	5083	4947	4885	4853	*-25*
Nikolsky	11535	11144	10757	10464	10108	9790	9471	9194	8920	8629	8405	*-27*
Vozhegodsky	8205	7865	7576	7290	7036	6812	6589	6399	6208	6074	5932	*-28*
Belozersky	7745	7404	7085	6765	6469	6178	5947	5707	5530	5361	5187	*-33*

Note. Sorted in ascending order of the relative decline in labor potential; the forecast was made by the method of shifting ages under the assumption that the 2015 mode of reproduction will be preserved (age-sex structure, migration and mortality, and age structure of fertility) for the whole forecast period.
Sources: *Vozrastno-polovoi sostav naseleniya Vologodskoi oblasti v 2014 godu: stat. sbornik* [Age-sex composition of the population of the Vologda Oblast in 2014: statistics collection]. Vologdastat. Vologda, 2015. 97 p.; author's calculations.

that modern labor potential structure defines a kind of "initial" state that largely determines further development prospects.

Forecasting the number of population using the classical method of shifting ages shows that given the current population structure in municipal districts, modern reproduction parameters will lead to significant losses of labor potential in the near future *(Tab. 4)*. An increase in the number of working age population is expected only in Vologodsky District.

Figure 2. Structure of labor potential quality



Source: Shabunova A.A. (Ed.), Leonidova G.V., Ustinova K.A., Popov A.V., Panov A.M., Golovchin M.A., Solov'eva T.S., Chekmareva E.A. *Problemy effektivnosti gosudarstvennogo upravleniya. Chelovecheskii kapital territorii: problemy formirovaniya i ispol'zovaniya: monografiya* [Issues of public administration effectiveness. Human capital of the territory: problems of accumulation and exploitation: monograph]. Vologda: ISERT RAN, 2013. 184 p.

Reproduction of labor potential quality in municipal districts of the Vologda Oblast arouses concern as well. As noted above, in qualitative terms, the employment potential in a municipal district is determined by qualitative characteristics of working age population. In this study, we adhered to the theoretical and methodological approach to structuring and assessing qualitative characteristics of population, developed by researchers at RAS Institute of Social and Economic Studies of Population under the leadership of N.M. Rimashevskaya [3, 11]; thus we highlighted the following qualitative components in labor potential: physical and mental health, cognitive capacity, creativity, communication skills, cultural and moral levels, and the need for achievement. Thus, social capacity is considered an integral characteristic of labor potential quality *(Fig. 2)*.

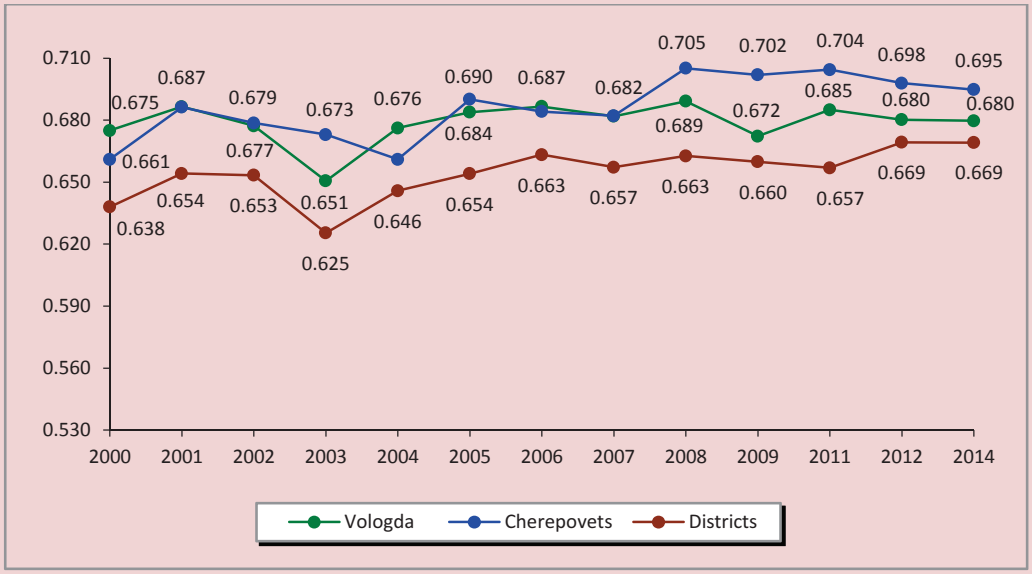
These qualities can be assessed with the help of a tested methodology for sociological measurement; as a result of its application, the components of the labor potential components receive a numerical score in the form of indices from zero to one. In Vologda, such measurements are conducted by the Institute of Socio-

Economic Development of Territories of RAS [2, 4, 14] since 1996. A survey of the first year was pilot, and since 1997 sociological assessment labor potential quality are carried out in a monitoring mode (until 2009 – annually, then – once in two years).

Monitoring of the regional labor potential is carried out with the help of questionnaire survey of working age population. The survey is characterized by the following features: the object of study is the working age population of the Vologda Oblast. The surveys are carried out annually in August – September in the cities of Vologda and Cherepovets and in eight districts (Babaevsky, Velikoustyugsky, Vozhegodsky, Gryazovetsky, Kirillovsky, Nikolsky, Tarnogsky and Sheksninsky). The sample size is 1,500 people. The sampling method is zoning with the proportional location of observation units. The quota sample by sex and age is used. The magnitude of random sampling error is 3–4% under the confidence interval of 4–5%.

The assessments have shown that the quality of labor potential has its differences in terms of municipalities. Thus, among the territories of the oblast, the highest index values of capacity are observed traditionally in the major cities – in Vologda and Cherepovets. Moreover, since 2008, labor potential quality in Cherepovets residents exceeds that in Vologda residents. In particular, in 2014 the index of social capacity for Cherepovets residents was equal to 0.695 units, and for Vologda residents – only 0.680 units *(Fig. 3)*. In municipal districts of the

Figure 3. Dynamics of social capacity indices in the territorial aspect



Source: Monitoring of the qualitative condition of labor potential of the population in the Vologda Oblast. ISEDT RAS.

Vologda oblast, the quality of labor potential is consistently lower (in 2014 – 0.669 units), which is due, primarily, to educational and labor migration to big cities that offer a wide range of educational services and a higher standard of living, and attract the best employees from the districts.

If we consider the primary qualitative characteristics of labor potential, which make up an integrated index, we can see that currently (according to the monitoring results, 2014) the districts lag behind the cities according to the majority of indicators *(Tab. 5)*.

The indices of social skills, and cultural and moral level are an exception. That is, residents who live in the districts compared to those who live in Vologda and Cherepovets are more sociable and are on average more conservative in matters of culture and morality.

In comparison with the indicators of 2000, the quality of labor potential in the oblast has grown according to the majority of indicators, except for the creative

Table 5. Indices of labor potential quality in municipal districts and city districts of the Vologda Oblast in 2000 and 2014

Quality	2000			2014			*Dynamics, in % to 2000*		
	Vologda	Cherepovets	Districts	Vologda	Cherepovets	Districts	*Vologda*	*Cherepovets*	*Districts*
Basic qualities of the 1st level									
Physical health	0.686	0.666	0.678	0.750	0.771	0.747	*+9.3*	*+15.7*	*+10.2*
Mental health	0.715	0.690	0.675	0.793	0.802	0.738	*+10.8*	*+16.3*	*+9.3*
Cognitive potential	0.665	0.648	0.614	0.627	0.635	0.617	*-5.7*	*-1.9*	*+0.5*
Creative potential	0.620	0.589	0.560	0.597	0.583	0.535	*-3.8*	*-0.9*	*-4.5*
Social skills	0.739	0.738	0.718	0.739	0.760	0.767	*+0.1*	*+3.0*	*+6.8*
Cultural level	0.651	0.649	0.589	0.650	0.683	0.697	*-0.1*	*+5.2*	*+18.3*
Moral level	0.759	0.782	0.774	0.772	0.782	0.788	*+1.7*	*+0.02*	*+1.8*
Need for achievement	0.644	0.615	0.611	0.661	0.665	0.634	*+2.7*	*+8.2*	*+3.7*
Qualities of the 2nd level									
Psychophysiological potential	0.697	0.674	0.672	0.766	0.781	0.736	*+9.8*	*+15.9*	*+9.6*
Intellectual potential	0.638	0.614	0.582	0.606	0.604	0.570	*-5.0*	*-1.7*	*-2.1*
Communication potential	0.690	0.689	0.645	0.688	0.716	0.724	*-0.3*	*+4.0*	*+12.3*
Social activity	0.694	0.688	0.681	0.705	0.716	0.697	*+1.7*	*+4.1*	*+2.2*
Qualities of the 3rd level									
Energy potential	0.663	0.639	0.620	0.676	0.682	0.642	*+1.9*	*+6.8*	*+3.5*
Socio-psychological potential	0.689	0.686	0.660	0.691	0.712	0.705	*+0.2*	*+3.9*	*+6.9*
Integral indicator of labor potential quality									
Capacity	0.675	0.661	0.638	0.680	0.695	0.669	*+0.7*	*+5.2*	*+4.9*

Source: Monitoring of the qualitative condition of labor potential of the population in the Vologda Oblast. ISEDT RAS.

Table 6. Correspondence of labor potential quality to job requirements in the municipal districts and urban districts of the Vologda Oblast in 2014, indices

Quality	Vologda			Cherepovets			Districts		
	LP	JR	*Gap*	LP	JR	*Gap*	LP	JR	*Gap*
Basic qualities of the 1st level									
Physical health	0.750	0.734	*0.016*	0.771	0.799	*-0.028*	0.747	0.743	*0.004*
Mental health	0.793	0.762	*0.031*	0.802	0.812	*-0.010*	0.738	0.742	*-0.004*
Cognitive potential	0.627	0.742	*-0.116*	0.635	0.773	*-0.138*	0.617	0.695	*-0.078*
Creative potential	0.597	0.661	*-0.065*	0.583	0.683	*-0.099*	0.535	0.654	*-0.119*
Social skills	0.739	0.801	*-0.061*	0.760	0.829	*-0.069*	0.767	0.768	*-0.001*
Cultural level	0.650	0.755	*-0.105*	0.683	0.777	*-0.094*	0.697	0.734	*-0.038*
Moral level	0.772	0.749	*0.023*	0.782	0.792	*-0.010*	0.788	0.739	*0.050*
Need for achievement	0.661	0.687	*-0.026*	0.665	0.736	*-0.071*	0.634	0.687	*-0.054*
Qualities of the 2nd level									
Psychophysiological potential	0.766	0.738	*0.028*	0.781	0.799	*-0.017*	0.736	0.737	*-0.002*
Intellectual potential	0.606	0.693	*-0.087*	0.604	0.716	*-0.113*	0.570	0.668	*-0.098*
Communication potential	0.688	0.775	*-0.087*	0.716	0.798	*-0.082*	0.724	0.748	*-0.024*
Social activity	0.705	0.710	*-0.005*	0.716	0.756	*-0.041*	0.697	0.707	*-0.010*
Qualities of the 3rd level									
Energy potential	0.676	0.706	*-0.030*	0.682	0.749	*-0.066*	0.642	0.695	*-0.053*
Socio-psychological potential	0.691	0.739	*-0.048*	0.712	0.773	*-0.061*	0.705	0.724	*-0.018*
Integral indicator of labor potential quality									
Capacity	0.680	0.718	*-0.039*	0.695	0.758	*-0.063*	0.669	0.707	*-0.038*

Legend: LP – labor potential, JR – job requirements.
Source: Monitoring of the qualitative condition of labor potential of the population in the Vologda Oblast. ISEDT RAS.

potential of working age population, the index value of which declined by 4.5%. This decline, coupled with a relatively low and almost non-developing cognitive capacity, has led to reduction in the intellectual potential of municipal districts. However, the declining trend of intellectual potential is observed in urban districts as well, which can be a serious obstacle to the successful innovation development of the oblast.

Furthermore, comparison of indices of labor potential quality with the indices of job requirements leads to the conclusion that labor potential in the Vologda Oblast municipal districts does not meet the requirements of jobs in all positions, with the exception of physical health *(Tab. 6)*.

The largest gap is observed in the creative potential of the population, the second place belongs to cognitive potential. In urban districts, on the contrary, employers' requirements to cognitive potential are much higher, so the difference between the existing level of knowledge development and the level that is required becomes especially relevant. That is, in districts and cities of the Vologda Oblast the intellectual potential of employees

corresponds least of all to job requirements. Social skills and mental health of working age population are factors that are closest by level of their development to employers' requirements.

The lack of correspondence between labor potential quality and job requirements causes problems in the distribution and redistribution of labor resources, creating obstacles to the full and effective use of labor potential.

Distribution of labor potential. Distribution of labor potential includes the following aspects: territorial and geographical distribution of workforce; distribution of employees by types of economic activity and sectors of the economy; distribution between the public and private sectors; professional-qualification distribution; distribution by specific jobs in enterprises and institutions, and others. Here, a full-fledged analysis of labor potential distribution depends significantly on the statistics available.

Statistical estimation of distribution of the number of people employed in the economy by sex and age, types economic activity, level of education, status in the main job, type of employment contract, groups of occupations on the main job and by other criteria is carried out by the Federal State Statistics Service in the framework of the *Survey of population on employment issues (Labor Force Survey)*[1] carried out since 1992 in all regions of the Russian Federation on the basis of the sample method of observation with the subsequent distribution of the results to the entire population of the surveyed age. The observation units are presented by households and the persons 15 to 72 years of age are members of these households; and data weighting and distribution is carried out at the level of constituent entity of the Russian Federation. The procedure consists in comparing the sample by constituent entity of the Russian Federation (the number of surveyed citizens) with the general population according to current calculations, stratified by these same characteristics[2].

Thus the sample is representative only at the level of the whole region and unrepresentative at the level of individual municipalities, that is, statistics on the distribution of employed in the economy in the context of municipalities is not collected.

Among the data on the distribution of labor potential by districts of the Vologda Oblast we should note the distribution of employees by types of economic activity, which is calculated by Vologdastat in all the districts of the oblast on the basis of the data collected in statistical observation form No. 1-T "Data on the number and wages of workers by types of activity".

[1] http://www.gks.ru/bgd/free/b99_10/isswww.exe/stg/d030/i030110r.htm

[2] *Ekonomicheskaya aktivnost' naseleniya Vologodskoi oblasti v 2015 godu (po materialam vyborochnogo obsledovaniya naseleniya po problemam zanyatosti): stat. byulleten'* [Economic activity of population of the Vologda Oblast in 2015 (on the materials of a sample survey of population on employment issues): statistics newsletter]. Vologda, 2016. 50 p. P. 5.

Table 7 shows that the distribution of labor potential by types of economic activity has its own specific features in the districts. For example, in Babaevsky District, the highest proportion of the population is employed in transport and communications (31%); and in Sokolsky District, about one third of employees work in industry, this is associated with economic structure of these districts.

Economic restructuring is a complex process, it takes a long time, whereby the proportions of the quantitative distribution of labor potential by economic activities

Table 7. Distribution of the number of employees of organizations by types of economic activity in 2014, %

Municipal district	Type of economic activity												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Babaevsky	7.1	2.9	5.0	2.2	8.6	0.5	31.1	0.4	2.5	13.0	13.0	10.2	3.5
Babushkinsky	5.1	5.0	5.5	4.3	16.7	1.9	3.3	0.9	0.5	10.7	23.8	18.3	4.0
Belozersky	12.5	7.8	6.6	2.2	9.5	0.7	10.7	0.4	4.6	14.4	14.8	11.3	3.7
Vashkinsky	14.6	7.3	7.1	1.1	10.9	0.4	3.5	0.4	1.6	14.4	17.8	14.3	6.7
Velikoustyugsky	6.4	16.6	5.8	3.3	8.2	2.3	5.6	2.1	4.8	9.1	16.3	13.6	5.8
Verkhovazhsky	24.0	8.2	5.3	2.5	10.2	0.2	3.2	0.8	1.3	11.3	18.6	9.3	5.1
Vozhegodsky	19.8	3.7	9.4	0.7	12.5	x	5.0	0.5	3.5	12.4	13.1	14.4	3.9
Vologodsky	32.2	5.9	5.2	1.9	7.4	0.9	6.1	0.1	4.8	5.7	12.9	13.5	3.3
Vytegorsky	22.1	5.1	6.5	3.8	11.8	1.0	11.6	0.5	2.3	9.2	13.2	6.7	3.9
Gryazovetsky	16.5	13.4	6.8	2.4	6.9	1.1	17.9	0.5	4.1	7.4	12.8	6.3	3.9
Kaduysky	3.9	21.4	17.8	4.6	7.0	1.0	5.2	0.4	6.5	6.8	12.6	5.2	4.3
Kirillovsky	12.0	3.8	10.1	3.5	9.0	1.8	5.4	0.4	2.0	14.7	12.8	13.8	8.8
Kichm.-Gorodetsky	17.0	11.3	x	x	14.1	x	3.3	0.8	3.0	8.4	20.0	14.1	4.7
Mezhdurechensky	17.3	2.4	10.2	x	8.0	x	4.5	1.0	3.2	16.3	18.2	12.5	6.0
Nicholsky	12.7	5.0	5.3	0.4	10.2	0.9	7.4	0.6	2.4	13.2	23.5	14.6	4.0
Nyuksensky	5.7	2.6	5.8	7.1	7.2	0.8	27.7	0.7	3.9	9.1	14.4	9.4	5.4
Sokolsky	3.8	32.3	6.8	3.3	5.3	0.8	5.8	0.4	2.6	10.2	13.6	11.5	3.1
Syamzhensky	18.8	5.1	6.2	0.2	11.1	x	5.9	0.9	2.8	15.1	14.6	14.0	4.3
Tarnogsky	16.7	6.4	7.1	4.2	13.3	x	1.6	1.0	2.3	10.1	17.5	13.4	5.4
Totemsky	11.8	6.6	8.5	4.8	10.2	0.9	13.5	0.7	1.9	11.3	16.5	8.7	4.1
Ust-Kubinsky	12.6	7.4	6.3	2.9	11.0	x	3.6	0.7	0.9	16.1	16.5	14.7	7.4
Ustyuzhensky	15.3	13.6	8.1	0.4	8.2	x	2.4	0.9	2.8	12.1	17.3	14.3	4.6
Kharovsky	5.7	14.9	8.7	1.0	8.6	x	7.2	0.7	4.9	15.4	15.8	12.0	4.9
Chagodoshchensky	10.1	32.6	5.7	x	11.8	0.9	3.0	0.8	2.9	5.8	12.2	8.3	5.6
Cherepovetsky	24.8	8.2	6.1	1.5	10.8	1.7	4.6	x	3.1	4.6	17.9	10.2	5.8
Sheksninsky	10.3	22.5	5.2	2.0	7.0	3.1	9.5	0.5	4.7	10.9	10.7	9.6	3.8

Legend: 1 – agriculture, hunting and forestry, 2 – manufacturing, 3 – production and distribution of electricity, gas and water 4 – construction 5 – wholesale and retail trade; repair of motor vehicles and household goods, 6 – hotels and restaurants, 7 – transport and communication, 8 – financial activity, 9 – real estate transactions, renting and provision of services, 10 – public administration and military security, social insurance, 11 – education 12 – health care and social services, 13 – other housing and utilities, social and personal services.
Sources: *Trud i zanyatost' v razreze raionov i gorodov Vologodskoi oblasti v 2014 godu: stat. byulleten'* [Labor and employment in districts, cities and town of the Vologda Oblast in 2014: statistics newsletter]. Vologdastat. Vologda, 2015. 62 p. Pp. 11-12; author's calculations.

are relatively stable in the short term. The situation becomes very different, if we consider the annual movement of workers in the enterprises and organizations of the oblast. Thus, according to Vologdastat, from 16% (in Tarnogsky District) to 50% (in Cherepovets) of the average staffing number of employees were renovated in 2014 in the municipal districts. That is the number of new people employed in a year at the newly created workplaces or instead of those who quitted their job *(Tab. 8)*.

At the same time from 43 to 80% of those who resigned from their position on their own accord. The reasons for this personnel rotation can be very different and require further study. In general, we have to admit that the scarcity of available

Table 8. Movement of employees in municipal and urban districts of the Vologda Oblast in 2014*

Municipal district / urban district	Workers employed		Workers who quitted their job		Resigned from their position on their own accord, in % of the total number of those who quitted their job
	people	in % of average payroll count	people	in % of average payroll count	
Tarnogsky	273	16.2	324	19.3	74.7
Kichm.-Gorodetsky	437	18.8	547	23.5	57.4
Kirillovsky	792	19.5	883	21.8	57.4
Vashkinsky	237	20.0	271	22.9	76.4
Mezhdurechensky	191	20.8	229	24.9	77.7
Vologodsky	1839	20.9	2307	26.2	73.1
Babushkinsky	293	21.6	299	22.1	53.5
Ust-Kubinsky	246	22.4	271	24.7	70.8
Nikolsky	793	22.7	1068	30.5	57.0
Babaevsky	1315	23.5	1528	27.3	56.1
Cherepovets	22489	24.1	36668	39.3	43.3
Syamzhensky	418	24.2	486	28.1	71.6
Velikoustyugsky	2942	24.8	3253	27.4	62.8
Sheksninsky	1877	25.0	1909	25.5	60.1
Gryazovetsky	2297	25.5	2872	31.9	50.0
Vozhegodsky	583	25.6	664	29.2	56.3
Verkhovazhsky	664	26.7	705	28.3	65.8
Ustyuzhensky	752	27.1	930	33.5	79.9
Belozersky	948	27.3	1163	33.5	55.0
Totemsky	1676	27.6	1857	30.6	65.5
Vologda	28645	29.2	32382	33.0	70.6
Kaduysky	1217	31.7	1359	35.4	66.2
Vytegorsky	1731	32.2	2338	43.5	44.1
Sokolsky	3877	32.9	4547	38.6	66.5
Chagodoshchensky	748	33.4	683	30.5	60.9
Nyuksensky	774	35.6	585	26.9	55.0
Kharovsky	960	37.5	1186	46.4	59.3
Cherepovetsky	2272	50.5	3115	69.2	49.7

* Excluding small businesses and organizations with average number of employees up to 15 people, not related to small businesses; sorted by ascending order of the share of employed workers.
Source: *Trud i zanyatost' v razreze raionov i gorodov Vologodskoi oblasti v 2014 godu: stat. byulleten'* [Labor and employment in districts, cities and town of the Vologda Oblast in 2014: statistics newsletter]. Vologdastat. Vologda, 2015. 62 p. P. 37.

statistical data makes it difficult to analyze the phases of distribution of labor potential, especially at the municipal level. To solve this problem, it is necessary to resort to sociological polls, and in some cases with a certain degree of conditionality it is possible to use the data for the region as a whole.

According to the results of the monitoring of the quality status of labor potential in the Vologda Oblast, a specific feature of labor mobility of working population compared with residents of large cities consists in a lower prevalence of the practice of work in the same place and in a greater proportion of those who changed jobs at least four times *(Tab. 9)*. Thus as the reason due to which they changed jobs, the employed residents of districts more often indicate low wages (47% vs. 41% in urban districts) and are less likely to complain about hard work (4% vs 8% in Cherepovets and 11% – in Vologda).

When searching for employment, district residents are much less likely to turn to recruitment agencies (in particular, because of their low prevalence), and instead they prefer to seek employment independently or through the state employment service. So, according to the 2014 survey, 13.5% of working population of municipal districts of the Vologda Oblast found a job with the help of the state employment service, while in Vologda this method of job search was used by 12.7% of workers and in Cherepovets – by 10.2% *(Tab. 10)*.

Table 9. Labor mobility of the working population of working age in municipal districts and urban districts of the Vologda Oblast in 2014, %

Territory	Did you change your place of employment during your working life?				
	No, I've always been in one and the same profession	I changed one place of employment	I changed two places of employment	I changed three places of employment	I changed four and more places of employment
Vologda	29.6	16.0	18.3	20.4	15.7
Cherepovets	33.2	19.7	18.4	15.1	13.5
Districts	27.6	14.3	15.3	14.1	28.8
Source: Monitoring of the qualitative condition of labor potential of the population in the Vologda Oblast. ISEDT RAS.					

Table 10. Distribution of the working population of working age by way of finding a job in municipal districts and urban districts of the Vologda Oblast in 2014, %

Territory	How did you find you present job?				
	Through the state employment service	Through a recruiting agency	With the help of friends and acquaintances	On my own, without any intermediaries	Other
Vologda	12.7	4.1	31.7	50.3	1.2
Cherepovets	10.2	10.9	36.5	41.4	1.0
Districts	13.5	1.6	28.6	55.1	1.2
Source: Monitoring of the qualitative condition of labor potential of the population in the Vologda Oblast. ISEDT RAS.					

If we consider the distribution of workers according to forms of ownership, we will notice the following feature: currently, only 35% of workers are employed at state or municipal enterprises in the districts. For comparison: in Vologda the figure is 10% higher – 45%, in Cherepovets – 34%. This similarity between the districts and the city of Cherepovets is not the only one. There is another one: the proportion of working professions in Cherepovets and districts is 48%, while in Vologda – only 27%. Thus, regardless of territory, the proportion of people working within their obtained specialty in the districts and urban districts of the Vologda Oblast is approximately 60% of the number of employees who have obtained a specialty. That is, about 40% of employees work not within their obtained specialty. This indicated the presence of significant problems in the formation and allocation of labor resources, and raises a question of efficiency of labor potential utilization.

Use of labor potential. The use (or implementation) is the final phase of the reproductive movement of labor potential. The rate of registered unemployment (Tab. 11) is often wrongly applied as an indicator of the rate of utilization of labor potential of the territory.

Actually, this figure reflects not the level of utilization of labor capacity of society, but the level of under-utilization of labor force. The estimate of employment rate of working age population – the main indicator of the degree of utilization of the quantitative aspect of labor potential – is not carried out for the municipal districts by the Federal State Statistics Service.

In order to assess the extent to which the people implement their qualities and skills in a specific labor activity in the framework of the monitoring of labor potential we have developed a special methodology based on the unit of questions, "How much do you "commit yourself" to work? To what extent do you use your qualities and skills?" Having applied this methodology, we obtained an indicator that reflects the percentage by which the quality of labor potential is implemented – a kind of equivalent of the level of employment showing the percentage by which the amount of labor potential is implemented. The indicator calculated in this way was conventionally called the level of implementation of labor potential quality [15].

Currently, the population of the Vologda Oblast mostly uses social skills in *(Tab. 12)*, which, in our opinion, is connected with the development of the services sector. Creativity (resourcefulness, ability to solve unfamiliar tasks, etc.) and the need for achievement (desire for promotion, initiative and entrepreneurship) are used least of all according to people's assessments.

Among the oblast's territories, its municipal districts have the lowest level of implementation of the majority of components of labor potential quality. That is, in the regions of the Vologda Oblast,

Table 11. Registered unemployment rate in municipal districts and urban districts of the Vologda Oblast, in % to economically active population*

Municipal district / urban district	2000	2005	2009	2010	2011	2012	2013	2014
Sheksninsky	2.2	1.5	2.1	1.7	1.0	0.8	0.7	0.6
Vologodsky	3.0	2.5	3.0	2.3	1.8	1.2	0.9	0.9
Vologda	1.3	0.9	3.1	2.0	1.4	1.1	0.8	0.9
Totemsky	1.9	2.2	3.2	2.5	1.6	1.4	1.1	1.1
Cherepovetsky	0.3	0.7	3.5	1.8	1.3	1.2	1.1	1.1
Cherepovets	0.9	0.7	4.1	2.0	1.4	1.1	1.1	1.1
Nyuksensky	1.7	1.7	2.9	2.6	1.1	1.0	1.5	1.3
Babaevsky	1.5	2.4	2.8	2.2	1.4	1.1	1.0	1.4
Babushkinsky	1.1	1.9	2.7	2.0	1.4	1.6	1.9	1.4
Ust-Kubinsky	7.4	2.0	2.5	2.2	1.7	1.3	1.6	1.6
Kharovsky	2.5	4.0	3.1	4.4	3.4	2.0	1.8	1.6
Vozhegodsky	2.7	4.3	3.5	3.7	2.9	1.9	1.3	1.7
Nikolsky	1.5	1.8	2.3	1.9	1.9	1.5	1.7	1.7
Sokolsky	1.6	1.8	5.6	2.8	2.0	1.5	1.1	1.7
Verkhovazhsky	1.3	3.6	3.6	2.8	2.2	2.6	2.0	1.8
Kaduysky	2.5	2.9	3.9	2.9	2.4	1.8	1.4	1.8
Tarnogsky	1.5	2.2	2.5	1.8	1.6	1.5	1.7	1.8
Gryazovetsky	3.7	3.1	5.9	3.8	2.6	2.0	1.7	1.9
Kichm.-Gorodetsky	1.3	1.9	3.3	2.0	2.2	2.4	1.7	1.9
Syamzhensky	3.0	3.6	3.9	3.8	2.6	2.0	1.7	1.9
Vashkinsky	2.7	4.2	3.6	3.3	2.6	1.5	1.7	2.0
Kirillovsky	2.0	3.5	3.3	3.9	2.7	2.2	1.8	2.0
Velikoustyugsky	2.1	4.4	5.3	3.2	2.2	3.1	2.5	2.3
Ustyuzhensky	4.0	3.7	3.4	3.4	3.2	2.6	2.0	2.4
Chagodoshchensky	3.6	6.6	4.9	3.2	2.9	2.5	6.5	2.4
Vytegorsky	1.4	3.9	3.5	2.6	2.7	2.6	2.3	2.5
Belozersky	3.0	2.9	4.3	3.6	3.0	2.5	2.4	2.6
Mezhdurechensky	2.6	3.0	4.4	3.7	3.4	3.2	2.7	2.6

* Sorted by the data for 2014 by increase in unemployment level.
Source: *Munitsipal'nye raiony i gorodskie okruga Vologodskoi oblasti. Sotsial'no-ekonomicheskie pokazateli. 2000–2014: stat. sb.*[Municipal districts and urban districts of the Vologda Oblast. Socio-economic indicators. 2000-2014: statistics collection]. Vologdastat. Vologda, 2015. 307 p. P. 24.

there is such a situation when the low quality of labor potential is accompanied by low level of its implementation in work activity, that is, in our opinion, a very negative phenomenon. Residents of the city of Cherepovets are leaders in the implementation of labor potential.

As we seen, the low level of labor potential utilization in municipal districts of the Vologda Oblast is a natural result of problems that have accumulated in the formation and distribution of labor potential. The source of these problems and their underlying causes should be

Table 12. Level of implementation of labor potential quality in municipal districts and urban districts of the Vologda Oblast in 2014, %

Territory	Property								Average
	Physical health	Mental health	Cognitive potential	Creative potential	Social skills	Cultural level	Moral level	Need for achievement	
Vologda	78.0	81.7	80.1	71.5	83.2	82.5	81.8	71.0	78.7
Cherepovets	79.4	82.0	82.3	71.3	84.2	80.7	81.5	73.0	79.3
Districts	76.6	76.6	74.7	72.6	82.0	81.2	81.4	73.1	77.3

Source: Monitoring of the qualitative condition of labor potential of the population in the Vologda Oblast. ISEDT RAS.

searched at both the macro- and micro-levels. The analysis of behavior of individual human agents living in the territory of a particular municipality is no less important than the analysis of the macroeconomic conditions and the environment for functioning of labor potential.

The analysis of labor potential reproduction and the consideration of the three successive phases of this process allow us to conclude that the structure of labor potential and trends in its formation, distribution and use in the municipal districts of the Vologda Oblast are extremely unfavorable. Since 2000, the population of working age in half of the districts of the oblast has reduced by more than a quarter. There is no full recovery and resumption of the functioning of labor potential: we are witnessing its narrowed reproduction. A feature of labor potential reproduction in the municipal districts consists in the substantial differentiation in age structure and rate of change of the number of working age population. Along with the decline in the amount of labor potential, the main problems of its reproduction in the districts include the reduction of creative potential and a significant gap between the actual level of development of qualities of working age population and job requirements. The reasons for these adverse changes require further research, but the main reason, in our opinion, is accurately formulated by scientists of the National Research University Higher School of Economics: "In the period of systemwide transformation a significant part of human capital inherited from the previous era has undergone partial or complete erosion, because under the new market conditions it actually turned out to be useless". [12, p. 24].

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Received July 08, 2016

DOI: 10.15838/esc.2016.5.47.11
UDC 331.103, LBC 65.242.1

Implementing Workplace Innovation across Europe: Why, How and What?

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For citation: Oeij P. R.A., Dhondt S., Žiauberytė-Jakštienė R., Corral A., Totterdill P. Implementing workplace innovation across Europe: Why, How and What? *Economic and Social Changes: Facts, Trends, Forecast,* 2016, no. 5, pp. 195-218. DOI: 10.15838/esc.2016.5.47.11

Abstract. Based on a 51-case study research in 10 EU Member States this article demonstrates the implementation of workplace innovation. Why do companies apply workplace innovation and what different strategies can be discerned? How do these companies implement workplace innovation interventions and who are involved in that process? Finally, what types of workplace innovation interventions are being implemented, and what is known about the (expected) effects. The article concludes that successful workplace innovation is interplay of management driven business goals and employee driven quality of work goals. The implication for both companies and policy makers is that constructive cooperation between management and employees is a key success factor for innovation, competitiveness and active jobs. We close by providing policy makers and practitioners with a few suggestions to improve the dissemination and implementation of workplace innovation respectively.

Key words: workplace innovation, implementation, European Union, European Company Survey.

1. Introduction

1.1. Why should companies implement workplace innovation?

The immediate answer to why companies should adopt and implement workplace innovation (WPI) is that it is beneficial for both business performance and the quality of jobs. But there is more than 'nice to have'. The need of workplace innovation arises from ongoing change and the urgency to compete or function efficiently, against the growing experience that technological and business (model) innovation alone are insufficient to face today's demands. A combination of clever organizing and applying human talents in smarter ways is what is asked for, as a 'need to have'.

Pot and colleagues (2011; Pot, Dhondt & Oeij, 2012 and Pot, Totterdill & Dhondt, 2016) sketched developments over time in European countries that carried out national innovation programmes to combat declining economic growth, employment and competitiveness. The background of these programmes is the understanding that competitiveness is not realised through merely stimulating new technological developments and cost-cutting efficiency policies. In order to realise sustainable economic growth and welfare provision continuous innovation and growth in productivity is needed. According to Pot, there are several reasons for the emerging attention to workplace development (Pot et al, 2012). First, there is the need to enhance labour productivity to maintain our level of welfare and social security. Second, the need to develop and utilise the skills and competences of the potential workforce to increase

added value is crucial. Third, to fully benefit from technological innovation, this needs to be embedded in workplace innovation, i.e. making technology work by means of proper organising. Fourth, workplace innovation itself appears to associate positively with innovation success, namely innovation in general.

Redesigning organisations and work processes matter for performance and jobs in general (e.g., Bloom & van Reenen 2010; Boxall, 2012; Boxall & Macky, 2009), but what does the evidence say about workplace innovation? The benefits of WPI have been documented for both individual employees and organizations and in a range of organizational and national contexts. For example, WPI has been linked to both improved individual level outcomes such as indices of quality of working life and also improved organizational performance (Ramstad, 2009; Eeckelaert, Dhondt, Oeij, Pot et al, 2012), quality of working life (Kalmi & Kauhanen, 2008), better organisational performance as a result of implementing WPI (Dhondt & van Hootegem, 2015; Oeij, Dhondt & Korver, 2011; Oeij & Vaas, 2016), and applicability in SMEs (Oeij, de Vroome, Bolland, Gründemann, & van Teeffelen, 2014). A recent Eurofound report gives strong indications that the presence of WPI practices associate with better organisational performance and employee engagement. Moreover, companies used different paths to arrive at becoming a WPI-mature organisation according to this report, meaning they applied different combinations of WPI-practices and stressed different organisational choices (Oeij, Žiauberytė-Jakštienė, Dhondt, Corral et al, 2015a). The findings underline the idea that organising can be used as a strategic tool to induce not only higher performance, but also better quality of work (Pot, 2011, also see Chapter 3 of this volume). Workplace innovation can lead to more 'active jobs' as a purposive form of work organisation, which could be characterised as 'complex jobs' – which are rich and meaningful – in 'simple organisations' – which are clear in management structure, division of labour and transparent responsibilities (de Sitter, den Hertog & Dankbaar, 1997). Organisations can choose production systems that enable these results, like flow structures and teams (Achterbergh & Vriens, 2010: 227-280; Christis, 2010), which implies that WPI is related to organisational changes at the 'root cause' of the production process of making products and delivering services (MacDuffie, 1997). Workplace innovation, however,

is a slippery concept (European Commission, August 2014), that needs some theoretical boundary setting, as we try to do in the next section.

1.2. Definition

The applied definition of *workplace innovation practices* is: a developed and implemented practice or combination of practices that structurally (division of labour) and/or culturally (empowerment) enable employees to participate in organisational change and renewal to improve quality of working life and organisational performance (Oeij et al, 2015a: 8, 14).

This conceptualisation of WPI implies that one needs to look at the organization as a whole and consider the reciprocal effects of strategy, structure and culture, if they are to reap the benefits associated with WPI (Howaldt, Oeij, Dhondt & Fruytier, 2016). For instance, hierarchical organisational structures may lead to more directive leadership styles and Human Resource Management (HRM) practices that focus on a clear division of labour and control, whereas less hierarchical structures may lead to leadership styles and HRM practices that are geared at promoting employee involvement, engagement and commitment (MacDuffie, 1997; Pot, 2011 more on the relationship between HRM and WPI in Chapter 3 and 13 in this volume). Therefore, to fully understand WPI, it might be fruitful to not only focus on certain types of HRM practices and their consequences, but to also take into consideration the organisational structure and the management philosophy underlying strategic choices. Too often WPI is narrowed down as an 'HR-toy'. As a consequence, decision makers on technological innovation, business model innovation and marketing innovation underestimate and underuse the potential of workplace innovation (Dhondt & Oeij, September 2014), as they are largely unaware of the role of organisation and people to make non-technical innovations a success. Within organisations HR-managers and line- and operational managers too strongly function within separate silos (Howaldt et al, 2016).

The workplace innovation's 'structure orientation' contains practices that structure work organisation and job design (Oeij et al, 2015a; de Sitter et al, 1997). As described, these practices concern the division of labour, the division of controlling ('managing') and executing tasks, and provide employees with structural decision latitude or control capacity (Dhondt, Pot & Kraan, 2014). Such an approach goes beyond HR-dominated streams (such as High Performance

Work Practices and High Involvement Work Practices), as its root causes lie in the choices made about how to design the production system. Structure-oriented practices can stimulate employee-control or autonomy, and provide a ground for voice of employees (and employee representatives).

The workplace innovation's 'culture orientation' contains practices that provide opportunities for employees to participate in various ways, for example, in organisational decision-making (Oeij et al, 2015a). It not only concerns employees, but it could include employee representatives as well, as in the case of social dialogue and collective bargaining. Culture-oriented practices can stimulate commitment and provide employees (and employee representatives) with voice (Totterdill & Exton, 2014). Not merely in the meaning of contracts and pay for performance, but also including psychological rewards, such as appreciation, recognition and professional acknowledgement.

1.3. Introducing the Eurofound study

The Eurofound study *'Workplace innovation in European companies'* (Oeij et al, 2015a, Oeij, Žiauberytė-Jakštienė, Dhondt, Corral et al, 2015b) is a case study of 51 companies from 10 EU Member States, according to the following regional breakdown:

• Continental and Western Europe – Denmark, Germany, Ireland, the Netherlands, United Kingdom

• Southern Europe – Greece, Spain

• Central and Eastern Europe – Bulgaria, Lithuania, Poland

The sampling of countries was based on the purpose to achieve a certain degree of variation in WPI across Europe – and is based on the wider regional grouping (seven groups) employed in earlier reports on work organization by Eurofound, 2013. The aim of the sampling was to ensure variation in terms of context, culture, institutions and entrepreneurial behaviour.

The purpose of the research was to explore why and how companies apply WPI, and what were the impacts for the organisation and for the employees. Another goal was to demarcate WPI as a theoretical concept in order to contribute to a better understanding of WPI and building on common agreement of WPI. A final target was to offer policy makers in Europe recommendations how to further pursue and stimulate WPI across Europe. The companies were selected from the European

Company Survey 2013 (ECS-survey) database comprising about 30.000 companies (Eurofound, 2015). For this purpose a WPI-index score was constructed to rank all companies in terms of their WPI-features, which could be calculated from present indicators (survey items) of the ECS-questionnaire[1] (Dhondt, Preenen, Oeij, Corral et al, February 2014; Oeij et al, 2015b). This enabled us to select those companies from the top 5% of the ranking of WPI-index scores. Therefore each selected company is, compared to the majority of companies in the database, a relatively 'good example' of a WPI-company. This means that, according to the ECS-survey data, these companies are rather active or rather mature in terms of WPI-features.

The final cases were selected through direct contacts with the companies explaining the purposes of the project. In the end, the cases retained come from a variety of European regions, operating in different sectors, having distinct products and services, and varying in size:

• company size: SMEs with between 50 and 249 employees (27 companies) and large companies with 250 employees or more (24 companies);

• branch: industry (comprising manufacturing, construction, pharmaceuticals, energy, agro-business – 21 companies); commercial services (comprising retail, finance information, consultancy, transport, waste management, hotels – 14 companies); social services (comprising education, social work, arts, administrative, testing, science, journalism, libraries – 16 companies).

• Country Continental and western Europe – Denmark, Germany, Ireland, the Netherlands, UK (22 companies); Mediterranean – Greece, Spain (12 companies); Central and eastern Europe – Bulgaria, Lithuania, Poland (17 companies).

In each company face-to-face or group interviews[2] were intended with a manager, a group of employees, and employee representatives; these were always persons who were involved and knowledgeable of the WPI practices to

[1] The WPI-Index score (Oeij et al, 2015b) is constructed of separate items derived from the ECS Management Questionnaire, which are connected to the theory of high performance work systems. Use of Principal Component Analysis (PCA, factor analysis, applying varimax rotation) resulted in a latent structure in the data consisting of seven factors:1) innovation (product and organisational innovation), 2) voice (employees /employee representatives having a say in decisions and changes), 3) learning and reflection (training and feedback), 4) structure and system (variable pay), 5) work organisation autonomy (autonomy), 6) work organisation career (long-term career plans), 7) hierarchy. The WPI-Index score was calculated as the sum score of these separate factors, implying that each of these elements was given the same weight in the WPI-index.

[2] The interviews were done with a structured checklist by the interviewer; afterwards the interviewer imputed the answers of the interviewee into a pre-coded survey, the so-called coding matrix. The coding matrix contained quantitative and qualitative data. The quantitative data were used for statistical analysis (SPSS) and QCA analyses (Oeij et al, 2015b).

be studied. However, for diverse reasons (usually operational difficulties during the field work), in five companies it was impossible to talk to employees and in 16 companies no employee representatives were available.

The fieldwork across the 10 countries mentioned above was carried out by nine European research institutes using a standardized methodology (Oeij et al, 2015b). All in all about 200 people were interviewed, following specific questionnaires for each interviewee category (in general, 3 questionnaires per firm). The information gathered was imputed into a data file (the 'coding matrix') and each case was described in a mini-case study report (2–3 pages)[3]. In each company, specific WPI practices were identified (up to 168 practices in total). Subsequently, using qualitative comparative analysis (QCA), the questionnaires were analysed, studying the 'conditions' within these companies that explain the presence of substantial WPI practices. These conditions together constitute 'configurational paths' that can be regarded as implicit strategies applied to be or become a WPI company. Case study reports were used to assess whether types of WPI practices could be distinguished. Qualitative information from interviews was used to get a richer description of contextual factors, drivers and motivations, ways of developing and implementing WPI, and the impacts of WPI. It enabled an in-depth analysis of the companies and their WPI practices.

1.4. Central question

In this contribution our central question is how do companies implement WPI? To address this question we will pay attention to the process of the implementation of WPI. The role of participants in developing and implementing WPI is of main interest. In order to understand how the implementation takes place, it is relevant to know the reasons of participants why to start with WPI in the first place, and, also, to get a view on their expectations of the implementation of WPI. We will start with looking into why companies implement WPI.

2. WPI implementation in practice

2.1. Why do companies want to implement WPI?

To see why companies introduced WPI-practices a distinction was made between two drivers or targets, namely to improve the quality of performance of the organisation or to improve the quality of working life and employee engagement. The analysis of the

[3] All cases can be found on the Eurofound website at: https://www.eurofound.europa.eu/workplace-innovation-in-european-companies-case-studies

Table 1. Types of practices applied and drivers (percentages)

Drivers	not HPWP	High Performance Work Practices (HPWP)				Other	Total
		WPI		Total WPI	HR		
	WPI-structure	WPI-culture	WPI-mixed				
Quality of Performance	1.8	1.2	3.6	6.5	3.6	3.6	13.7
Quality of Work	3.0	3.6	4.2	10.7	6.5	0.6	17.9
Both: Quality of Work and Performance	8.9	15.5	11.3	35.7	28.6	4.2	68.5
Total	13.7	20.2	19.0	53.0	38.7	8.3	100.0
N	23	34	32	89	65	14	168

Source: Oeij et al, 2015b : 21.

questionnaires completed in the case studies showed the existence of a third category as well that combined both drivers. Although economic reasons drive the decision to introduce WPI, most practices identified in the case studies (69%) are eventually targeted to both goals, the enhancement of company's performance and quality of working life, while the remaining practices are approximately equally divided into those that focus on quality of working life (18%) and quality of performance (14%) (See *Table 1*).

Table 1 presents a total of 168 WPI-practices that where identified in the selected companies. Half of these practices (53%) are either focusing on WPI-structure elements (14%), WPI-culture elements (20%) or are a mixture of structure and culture practices (19%). Quite a high proportion of practices are assessed as exclusively HR-practices (39%), which we see as too limited to qualify as a genuine WPI-practice. The practices in this category are 'typical' or 'traditional' HR-practices in the field of, for example, personnel recruitment, training, competence development, performance appraisal, working conditions, remuneration, flexibility and health, risk and safety measures. The category 'other' (8%) comprises examples of cost-effectiveness, efficiency improvement and ICT-practices that neither qualify as WPI.

The close reader of Table 1 will have noticed that WPI-practices partly overlap with High Performance Work Practices (HPWP): first, there is overlap with high-involvement work practices (HIWPs) regarding the structuring of work and jobs to enhance employee autonomy; second, WPI overlaps with high-commitment management

(HCM) regarding 'culture' aspects, such as participatory employment relations and giving employees voice. WPI differs from HPWP in relation to 'traditional' HR practices, meaning HR measures that are not focusing on employee engagement and not on organisational design ('structure') (Oeij et al, 2015: 13-17).

Table 2 provides some concrete examples of the 168 practices identified. The complete list of practices (including HR-practices) can be found in the Annex to the report (Oeij et al, 2015b).

The consequence of the fact that most WPI-practices are both directed at economic goals and better work, is that not only economic goals are

Table 2. Examples of WPI-practices

Types of practices	Examples*
WPI: structure orientation	DE-SERV-TEST-L made a structural change of the organisation and workplaces lead to 'subject or theme related teams' across the different departments.
	BG-EDUC-UNI-S: Self-managing teams is a system for organising day-to-day duties and activities. This approach ensures that the team members will have sufficient flexibility to decide how to implement their tasks taking into account their own capacities and time schedule.
	ES-SCI-ENVIRONM-L: Minimising organisational levels and enhancing autonomous teams is done by ensuring that there are no more than two hierarchical levels between the lowest and the highest levels. This also facilitates the existence of self-managed working teams that have the freedom to organise themselves.
	NL-INFO-NEWS-L: Job enlargement by expanding sales jobs with account management tasks; also cross functional teams were installed to realise innovation projects across departments
WPI: culture orientation	DK-ART-MUSEUM-S: Partnership with unions. New projects and organisational changes are debated in a joint committee with union representatives, OHS representatives and management representatives. This committee is initiating new practices such as training and support for new employees.
	BG-ENER-GAS-S: The Knowledge Management System, OGpedia, is a voluntarily developed IT-based information sharing measure. All employees can share and gain new knowledge.
	PL-ADM-TAX-S: Monthly meeting with managers and union representatives help to communicate changes and current situation status, consult decisions and initiatives.
	LT-SERV-POST-L: "Loyalty Day" aims to enhance communication and knowledge sharing between managers and first line workers. Managers voluntarily visit workers on their working site and gather information about specific processes and possible issues. This raises sustainability, efficiency and good organisational communication.
WPI: mixed	ES-SCI-WORK-L: Flexitime practices allow workers to have a say on their working times: they can adjust their starting and exiting hours, also ad-hoc exits (with manager's permission) are allowed.
	EL-FIN-BANK-L: An initiative for personal development: every year teams of 1-2 people take part in a challenge defined by the top leaders. In this way ideas can be passed from young talents to the top management. Young talents are supported by coaching sessions and assessment tools, they gain experience.
	DE-AGRO-PETFOOD-S: Overall Competences: Ready to do any job in the production line, an overall qualification was given to the production staff, enabling the employees to take over every job in the production. After the mechanisation of production most of the employees had the chance to upskill and take over a skilled workers´ task.

* Company codes are indicative of country, branch of activity and size and to ensure anonimity.
Source: Oeij et al, 2015a: 25-26.

achieved, but also more employee engagement and regularly a better quality of working life as well. Workplace innovators are almost naturally bonding with employee interest and there is an agreement among managers, employees and employee representatives on what has priority and what is less important, as we will show soon.

Comparing the drivers there is no difference between WPI-practices and HR-practices. Interestingly, the HPWP-literature reports on the dominance of organisational performance goals as drivers (Boxall & Macky, 2009). Possibly our sample of relatively high WPI-companies differs from most companies researched in that stream. Finally, although the category of 'other' practices is very small it seems to be more directed at organisational performance than at quality of working life.

Returning to the mentioning of different paths leading to becoming a mature WPI-company, all companies in their paths applied more than one WPI-practice, often a combination of structure oriented, culture oriented and HR-measures. This may be an indication that 'bundling' measures matters, as is proposed in the HPWP-literature. No conclusions about combinations of WPI-practices can be drawn, however, as there is quite some variety of WPI-practices within paths (Oeij et al, 2015a).

Now let us look closer at the motives, leverage factors and impacts of WPI, before we turn to the 'how' question. The opinions of managers, employees and employee representatives have been compared and much agreement was reported.

2.2. What are reasons or motives to implement WPI?

Although companies did choose varying paths to WPI and selected different (combinations of) WPI-practices, the reasons why they initiate WPI conversely reflect much commonality. The analysis carried out (both quantitative and qualitative) show that there is a dominance of economic oriented motives *(Table 3)*. However, many companies understand that achieving economic goals largely depends on the role that employees play, so that WPI appears as a precondition to reach other economic and managerial goals. In this sense, from the viewpoint of the 'organisation as a whole', the most prominent three general motives identified by the three groups of interviewees (managers, employees and employee representatives) for initiating a WPI implementation, were efficiency improvement, to gain competitive advantage and to enhance innovative capability.

Table 3. General motives for the implementation of WPI

Мотивы	Manager	Group of Employees	Employee Representatives
	Percentage of companies		
…for the 'organisation as a whole'			
To improve efficiency	80	80	74
To gain competitive advantage	78	58	65
To enhance innovative capability	75	58	65
To become an attractive employer	57	53	44
To enable the acceptance by employees	37	31	47
To enable the embedment of new technology and ICT	37	33	35
To improve industrial relations with unions	18	9	47
…from managers' and employees' perspective			
Economic and business goals	94	89	88
Learning and development opportunities	78	71	74
Performance	61	62	59
Public goals	31	33	32
Flexibility	31	42	38
Shareholder interests	25	24	29
Labour market position	25	18	35
Balance private-work life situation	25	24	32
N of respondents	51	45	34

Source: Oeij et al, 2015b: 27.

Apart from looking at motives for 'the organisation as a whole', the investigation of 'motives' was also approached as possibly desired impacts for each group of stakeholders separately (management, employees and employee representatives) (Table 3). It proved that motives for WPI implementation from both the managers' and employees' perspectives overlap[4], and, moreover, show resemblance with the general reasons to initiate WPI[5]. The three most salient motives are economic and business goals, learning and development opportunities, and performance.

[4] McNemar test is a statistical test used on paired nominal data to determine whether the row and column marginal frequencies (matched pairs of subjects) are equal ("marginal homogeneity"). Results indicated that there are no significant differences in how frequently managers, employee groups and employee representatives selected the top-3 motives (economic and business goals, learning and development opportunities, performance).

[5] All three groups indicated the improvement of efficiency as the most important motive for the "organization as a whole", while gaining competitive advantage and enhancing innovative capability were the second two most important motives. No differences were found among the three groups in the frequency of selecting the improvement of efficiency (McNemar tests non-significant, all $p>.05$). Managers' selected gaining competitive advantage more often than groups of employees and employee representatives (respectively $p=.049$ and $p=.039$); managers also selected enhancing innovative capability more often than employee representatives ($p=.039$). Here and in further comparisons attention should be given to the multiple data missings among employee representatives (>30%).

Motives that are related to quality of organisational performance were regarded as more prominent than the ones related to quality of working life according to all three actor groups.

2.3. What are important leverage factors for the implementation of WPI?

Leverage factors are actions, measures or means that drive the successful implementation of WPI-practices. The most important three leverage factors for WPI implementation are employee involvement, top management commitment, and, at a distance, leadership or the involvement of a powerful person, as was reported by all three groups of interviewees *(Table 4)*[6]. While reasons and motives to start WPI point to business related arguments, employee involvement seems a sine qua non when it comes to adoption and implementation, as perceived by respondents.

Some examples (extracted from the case studies) of the top three leverage factors are presented in the following text box (Oeij et al, 2015a: 48).

1. Employee involvement

PL-EDUC-MED-SCHOOL-S had to create new curricula. Employees were the main force behind this change: they actively participated in sharing their knowledge and formalizing new programmes. The school started to actively participate in various external projects (related to other institutions), because of workers who were enthusiastic about new activities.

2. Top management commitment

LT-SERV-POST-L initiated WPI practice ("Loyalty Day") that relies on management's willingness to

Table 4. Leverage factors for WPI implementation

Factors	Manager	Group of Employees	Employee Representatives
	Percentage of companies		
Employee involvement	82	84	88
Top management commitment	80	69	68
Leadership, powerful person	67	56	65
Organisational, non-conflictive climate	49	42	50
Resources, enough money and people	33	38	29
Time, no interference from reorganisation	18	20	24
N of respondents	51	45	34
Source: Oeij et al, 2015b: 27.			

[6] McNemar test indicated that there are no significant differences in how frequently managers, employee groups and employee representatives selected the top-3 leverage factors (employee involvement, top management commitment, and leadership, powerful person).

participate in the activity. Managers are expected to visit various companies' locations and get information from the front line workers. Since management paid attention and spent time on this activity, the company was able to learn from this practice.

3. Leadership, powerful person

UK-CONST-BUILD-L has been on a sustained journey of transformation since a new CEO appointment in 2009, distancing itself from traditional industry practices by embracing high ethical principles relating to safety, the environment, transparency and quality.

2.4. What are the impacts or expected impact of WPI?

Impacts of WPI-practices, like drivers, can be divided into effects for organisational performance and for the benefits of employees. Four types of impacts are researched: impacts for the organisation, for management, for employees, and for employee representatives. *Table 5* presents the top three-to-five for each type.

Table 5. Impacts of WPI

Impacts	Manager	Group of Employees	Employee Representatives
	Percentage of companies		
for the organisation			
Employee engagement	82	78	85
Longer term sustainability	73	64	62
High performance	67	56	59
Establishing good work	63	47	62
for managers/managers' interests			
Efficiency	73	64	74
More sustainability	71	60	62
Competitiveness	65	53	59
Innovation/innovation capability	61	47	59
Satisfied client, customer	61	53	59
for employees/employees interests			
Learning opportunities	71	67	59
Voice, participation	59	56	59
Challenging, active jobs	57	64	44
Healthy work	43	49	56
for employee representatives/union interests			
Employees voice	79	67	85
Sustainable organisation	56	33	50
Equality, fairness	35	33	41

Source: Oeij et al, 2015b: 28-29.

For the organisation, according to managers, employees and employee representatives, employee engagement was the most important outcome of WPI followed by long term sustainability[7] , and, with some distance high performance, better customer focus/client focus, efficiency, and profitability. For employee representatives notable outcomes were also the establishment of good work and more positive employment relations. Remarkable maybe, but according to employees establishing good work is ranked lower than efficiency, profitability and high performance (not visible in Table 5, see Oeij et al, 2015b; 28-29).

The most important impacts of WPI for 'managers interests' are efficiency and sustainability; for 'employees interests' are learning opportunities, voice/participation, and challenging and active jobs; and for 'employee representatives/union interests' is employee voice.

When we summarize why companies implement WPI, what they see as most important leverage factors, and which are the (expected) impacts of WPI for the organisation, managers, employees and employee representatives it becomes clear that there is much commonality in the answers from the three different respondent groups. Given that economic goals are triggering the initiation of WPI and that employee involvement is a key factor in the introduction of WPI, it is intriguing to see how much accord emerges when we look at the impacts for, respectively, the organisation, the managers' interest, the employees' interests and the employee representatives' interest.

All three actors regard:

– employee engagement (with a remarkable difference above any other factor), longer term sustainability and high performance as the most important impacts for the organisation;

– efficiency, more sustainability and competitiveness as the most important impacts for the managers;

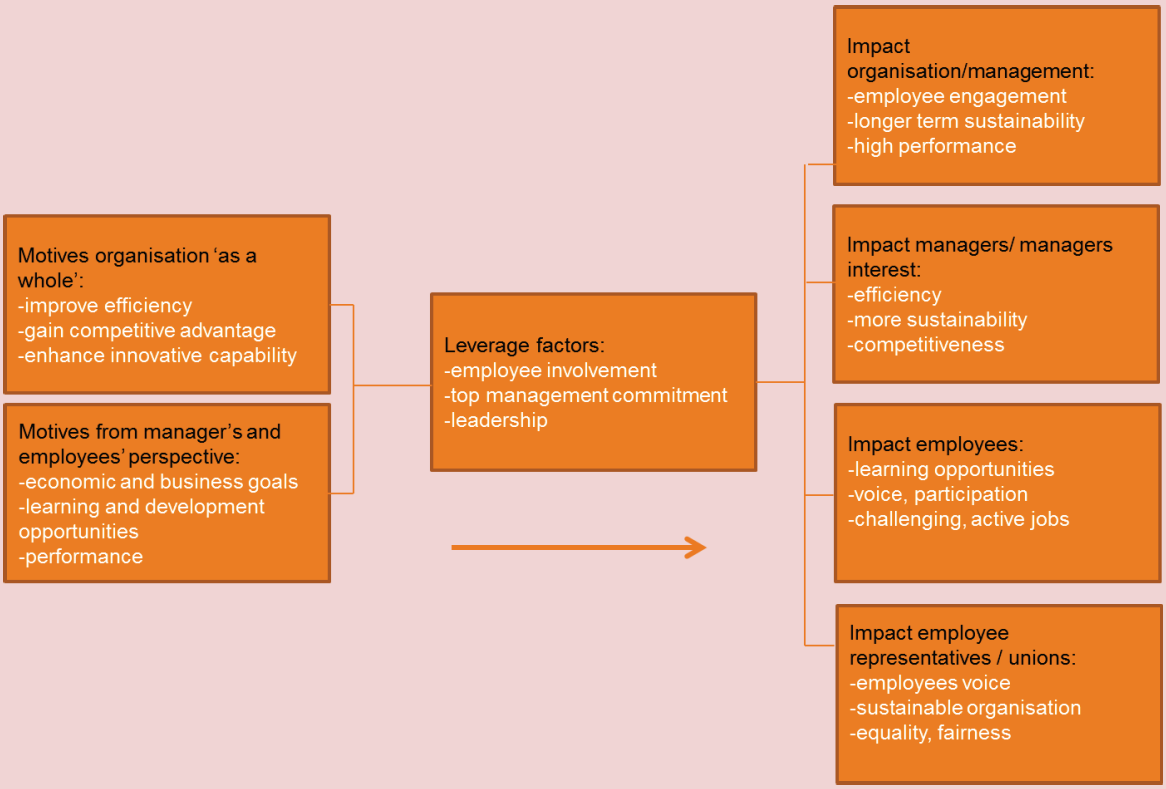
– learning opportunities, voice/participation and challenging and active jobs as the most important impacts for employees;

– employees voice as the most important impact for employee representatives.

In the process of introducing the WPI-practices in many instances, the eventual impacts both improve the economic performance, employee engagement and quality of working life. *Figure 1* captures these findings.

[7] McNemar test indicated that there are no significant differences in how frequently managers, employees and employee representatives selected the two top outcomes (employee engagement and longer term sustainability), so there is agreement among groups.

Figure 1. Agreement about the main motives, leverage factors and impacts of WPI according to three respondent groups (managers, employees, employee representatives)



2.5. How do companies implement WPI?

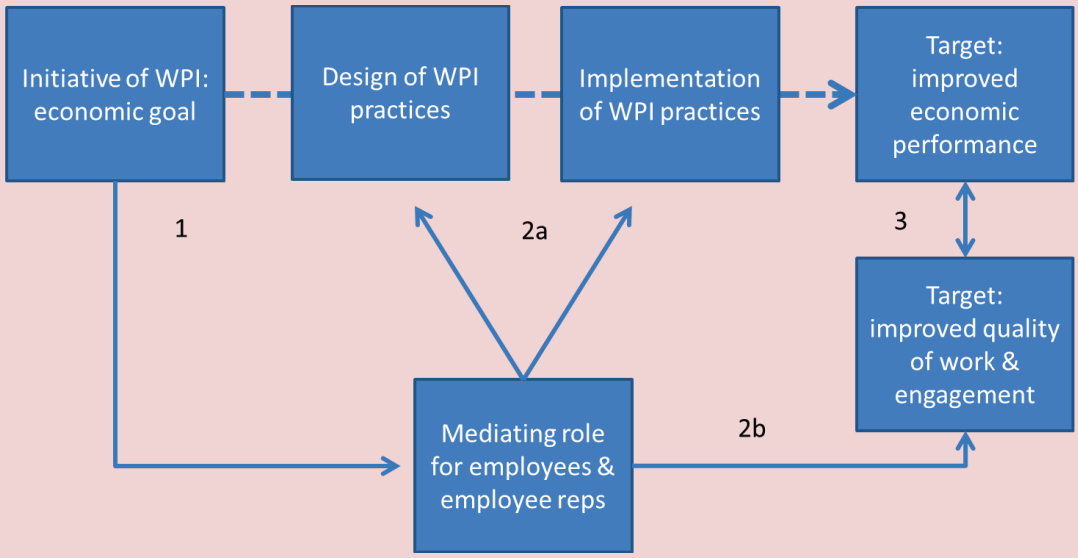
Now we know what are the motives and leverage factors of WPI let us have a look at the 'how' issue. The process of initiation, adoption and implementation of WPI-practices reveals a common pattern. As described, companies chose paths that differ but conversely within companies there is agreement among managers, employees and employee representatives about why to introduce WPI, how to do it, and what impacts are desired. The research suggests that often the initiative for WPI lies with management, and that the main motive has an economic background. Once this decision is taken employees roll in to help design and implement the intervention. Consulting employee representatives is common among those companies who advocate communication and employee interests. Be reminded that our sample is from the top 5% of the ECS-database ranked according to the WPI-index score. Our 51 cases

belong to those companies who score the highest on WPI. Many of these companies are WPI-mature and form the case studies we learned that they have often come this far after many years. The way that WPI-practices get implemented seems to reveal a generally applied pattern *(Figure 2):*

1. The initiative of a WPI often has an economic purpose (see 1 in Figure 2), although in many cases WPI-practices are not purely targeted at economic goals alone. Not seldom they are combined with or embedded in organisational, job and HR-related measures. Many WPI-practices are a combination of HR-related measures that on the one side may improve employee skills and competences, and on the other hand consist of appraisal and performance instruments. In short, where WPI-practices do aim at more than one goal there is almost always an economic purpose present and very often it is dominant.

2. Once the WPI-initiative is uplifted into a measure or set of measures employees – and often employee representatives –play an important role in (co-)designing and developing the WPI-practice and its implementation (see 2a the Figure 2). Management realises it is often impossible to get WPI implemented without the engagement of employees. In the first place the measure often deals with employees and their interests, and in the second place because management realises that employee participation is crucial for support and

Figure 2. Pattern of implementing WPI-practices (Oeij et al, 2015a: 59)



success. As employee participation in the design and implementation phase is inescapably connected to employee engagement and possibly improved quality of working life (as a result), there is an immediate link with employee-favourable targets (see 2a in Figure 2).

3. The target of improved economic performance is often not a direct effect of the implemented WPI-practice but in most cases influenced and supported ('mediated') by employees and employee representatives. When economic targets are achieved, it may well coincide with the target of improve quality of working life and employee engagement. Vice versa, an improved quality of working life and employee engagement can contribute to improved economic targets (see 3 in Figure 2).

Therefore it can be concluded that (initial) reasons and motives for WPI are mainly economic. Then, as a next phase, concrete WPI-practices are designed and implemented. Here, it becomes apparent that employees get to play a major role. The most important leverage factor for adoption and implementation is namely employee involvement. And again managers, employees and employee representatives seem to look through the same lens. Engagement of employees is a necessary condition for WPI. Other significant leverage factors are top management commitment and leadership.

2.6. Examples of the process of implementation

Companies adopt and implement WPI in their own specific way. Three examples from the United Kingdom,

Examples of the process of implementation:

Leadership

UK-ENER-ELEC-L: "We want this to be a business where views are listened to and where communications are open and honest. We also want this to be a workplace where positive ideas are encouraged and where achievements are celebrated" says the Head of HR. Open Forums replaced the previous company-wide meetings and suggestion schemes which had struggled to stimulate open and constructive dialogue and feedback. The CEO's open leadership creates trust and employees feel confident about the future. According to one employee: "It is interesting isn't it, you go to the Open Forums and people will say what they think and absolutely nobody will turn round and go, I can't believe he said that . . . they might not agree with you but nobody will actually knock anyone for having a view because we are encouraged to have a view. That's really empowering I think."

Partnership with unions

DK-SERV-PARK-S: Organisational changes are discussed by the manager and the union representatives. They have a partnership and value each other's opinions. The manager explains: "It is nice to have representatives who are not afraid to step up against me in a constructive dialogue". The implementation approach was that 1) management took initiative, 2) external consultants supported the process, 3) 'experiments' were conducted (a work gang tested new meeting practices or the like), 4) 'invitation' to the same knowledge for all (training) and 5) implementation of the practices, but not necessarily in the same way everywhere. No evaluation was done but adjustments were made along the way. Both management and employees believe that it is important to design the process in a manner that creates 'enthusiasts' amongst the employees. The union representative explains: "It gives a huge boost to the company that we work together to create a great workplace. ... That's what made us 'the best workplace' (a Danish award) in 2004". The employees believe that, even though management determines the direction, they have to have the trust to be able to discuss it: "It should be perfectly legal to say our outspoken opinion to our manager – and it is. There may well be disagreement, but you have to be able to discuss things" (employee).

Dialogue with personnel

LT-ACCOM-HOTELS-S: The WPI practice, Think Guest Feedback, consists of regular middle management meetings where middle managers from all departments (Front Office, Reservations, Conference Hall, Lobby, Restaurant, Sky Restaurant, Room Service, Marketing and others) regularly meet and review Hotel ratings in dedicated social media platforms. They discuss particular guest feedback cases and joint actions that could improve guest stay experience (and feedback as a result), together brainstorm on how guest feedback could be stimulated and collectively addressed, take important information back to the teams of their departments for further action, produce minutes of their observations and recommendations to top management on improvement of various hotel operational aspects and share experience with each other. Think Guest Feedback involves, for example, prompt reaction to guest feedback (especially when negative) before they leave the hotel, and constant organisational learning from any mistakes made. It implies staff empowerment, not only that they could solve emerging problems straight away, but that each of them could feel like owners of the business and be pro-active in preventing negative guest experiences. Mutual trust, goodwill and respect across departments (not to solve your own issues at other's costs) and between all levels of organisational management were stimulated. According to the Director General, the initiative is still very new, but after a few months, it is already showing benefits.

Denmark and Lithuania give a flavour of cultural differences (Oeij et al, 2015a: 53-54). From the UK an example is presented that shows how leadership enables employee participation, while the Danish example mirrors a stepwise approach that was agreed with unions. The Lithuanian case exemplifies the taking up of dialogue between management and employees, which is relatively new to the region.

These examples show differences in the interplay between management, employees and their representatives. They agree in the sense that cooperation between actors is fundamental to improve the business.

3. Conclusion and lessons for policy and practice

The general view that emerges from the research can be captured in a few lines (Oeij et al, 2015a: 62). The initiative to start WPI practices comes from the management or ownership of the company. In only a minority of the studied companies does the first step come from the employees' side. However, these managers/owners have understood that the role and participation of the employees and their representatives is crucial for WPI to be a success and in the end for the companies' performance and sustainability. The reasons behind the management's decision to implement WPI practices are mainly related to efficiency, competitiveness and innovation enhancement. In a number of cases, the management decision to implement WPI is triggered by factors such as:

– a situation of crisis or difficulties in the company's performance that requires significant changes to survive and remain competitive in a changing and globalised market, where the traditional products/services and ways of working need to be revised and adapted in order to satisfy the requirements of increasingly exigent and sophisticated customers;

– sometimes, the former is also combined with a take-over from (or merger with) another (multinational) company which brings in new forms of work organisation and new work practices, systems, etc. that involve workplace innovation. In these cases there is a kind of 'WPI know-how transfer' from the headquarters to the subsidiary.

In several of the Eastern European case studies, the privatisation of public enterprises and the associated re-organisation processes have served as a background to the implementation of WPI, seeking greater efficiency and employee involvement that were previously lacking.

Factors related to job quality and good working conditions do not appear as primary reasons or motives for WPI, but more as a pre-condition or a result of WPI. This means that the objective of WPI introduction is not to improve the working conditions or the working environment as such, but that, in order to enhance employee involvement and their contribution to the company's performance and innovation processes, a good set of working conditions is required.

The results are in line with economic research saying that 'organisation matters' to performance (Bloom and van Reenen, 2010) and with HPWP-research that more or less shares similar opinions (Boxall, 2012). This implies that organisations can make strategic choices with their organisational structure. It seems beneficial to the emergence of WPI to strengthen the position of employees and employee representatives: this can help boost WPI-practices, which in turn may improve both economic performance and quality of working life.

3.1. Some policy pointers

Although workplace innovation has gained currency in Europe as a relevant boost to support the innovative capability of firms and organisations (see EUWIN, EUropean Workplace Innovation Network[8] , and for other initiatives see Chapters 3 and 4), more attention to improve workplaces is still needed. The reason for this is that the innovative capability can contribute to economic growth, high quality employment, adaptive capabilities and improved employment relationships, but we know that such improvement and innovation can no longer be built solely on economic, business model and technological innovation. Better use should be made of the human potential to innovate and organize work processes: in short social innovation in the workplace (European Commission, August 2014). Several policy pointers are proposed in the Eurofound study *Workplace innovation in European companies* (Oeij et al, 2015a), but the most relevant pointers are directed at policymakers to help practitioners is to make WPI practical for them. Policy makers can do this in three ways. As a precondition they must urge to put the topic higher on the EU and national innovation agenda's, as technological and business innovation will need workplace innovation to make them successful and accepted. In the second place policy makers can improve business assistance programmes that help companies and organisations in the uptake of WPI-practices. Third, policy makers can stimulate to develop tools for companies, by which companies can diagnose their situation, develop their own WPI-practices, be supported in the process of implementation, and are enabled to evaluate the effects of their WPI-practices.

3.2. Some pointers for practitioners

WPI in our sample is supported by all actors in the companies: managers, employees and employee representatives. This clearly indicates good employment relationships and industrial relations among the company stakeholders, resulting in constructive

[8] http://ec.europa.eu/growth/industry/innovation/policy/workplace/index_en.htm

cooperation, communication and collaboration, containing labour conflicts and seeking for common interests and goals. From the employer's side this requires management and leadership behaviours that not only bring the business forward but simultaneously stimulate trust and engagement of employees. From employees this demands entrepreneurial and intrapreneurial behaviours to apply their human talents in support of innovation, co-creating change and work motivation in general. From employee representatives and unions it asks for balancing the interests of employees, companies and themselves.

Choosing the right WPI-practices to implement is not an easy job. It requires to link an organisation's strategy to the management philosophy, and then to its structure and culture; and to do this while taking into account the viewpoints of management, employees and external stakeholders – unions, customers, etc. – at the same time. What do we mean by this? First, the management philosophy determines the strategy, in terms of achieving the organisation's goals top down or bottom up, to put it in a simplified way. That same philosophy is the basis for the design on the working processes, the structure. Again, one can choose a more top down versus a bottom up approach regards the division of labour and how to manage these working processes. That all boils down to the culture of an organisation if one looks at leadership styles and ways to engage employees, which can be more control oriented versus commitment oriented, depending on former choices. Eventually this will determine whether employees will be more pro-active or risk avoidant. Strategy, structure and culture together constitute a kind of causal link, or 'system' if one likes. Merely implementing employee friendly HR-measures, like innovation competitions, job performance interviews or company suggestion boxes that leave a top down structure intact, will therefore render more disappointment than satisfaction in the long run.

When developing WPI-practices one should take into account this 'root cause' character of the causal link. It is nonetheless hard to assess the impacts of WPI-practice of measures in advance, when one is designing such practices. Partly because it is hard to predict the outcomes, partly because how WPI-practices associate with other organisational factors is complex, and partly because some effects can be quantified, but many others cannot and remain 'qualitative' evaluations. To be able to build a

proper 'business case' for such WPI-practices in which a trade-off can be made between quantitative and qualitative aspects, and by which the viewpoints of different stakeholders can be addressed, employers and employees can together apply a stepwise approach (Oeij, de Looze, ten Have, van Rhijn et al, 2012). In this approach employers and employees analyze the (future) productivity challenge and strategy of the organisation, and link this to possible workplace innovation practices, and its effects on performance and quality of work. By making a trade off between the advantages and disadvantages, applying a dialogue approach (Oeij, Wiezer, Elo, Nielsen et al, 2006: 258-259), they can build a solid business case for their final choice. The dialogue approach means that viewpoints from different perspectives are taken into account.

3.3. Coda

This contribution tried to make clear why leading WPI-companies apply WPI, how they implement it, and what are the impacts that they expect. WPI-mature companies have mature relations between management and employees, and often with employee representatives. These companies have built on such relations perhaps for many years. They understand that as stakeholders they need each other. We tried to underline the importance of the link between strategy, structure and culture and state these links can best be seen as a system. Chandler stated that 'structure follows strategy'. Not solely favouring limited linear thinking, we would like to add that culture follows strategy, and structure, as well. Workplace innovation thus requires a holistic or integral view on change.

The authors and publisher gratefully acknowledge the following permission to use the material in this book:

Oeij P.R.A., Dhondt S., Žiauberytė-Jakštienė R., Corral A., Preenen P. Implementing Workplace Innovation Across Europe; Why, How and What? In: *European Work and Organisational Psychology in Practice*. Special issue on Workplace Innovation (2017).

Oeij P.R.A., Dhondt S., Žiauberytė-Jakštienė R., Corral A., Preenen P. Implementing Workplace Innovation Across Europe; Why, How and What? In: Oeij P., Rus D., Pot F. (Eds.) *Workplace Innovation – Theory, Research and Practice. Series "Aligning Perspectives on Health, Safety and Well-Being"*. Springer Science+Business Media: Dordrecht, 2017.

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Received August 29, 2016

DOI: 10.15838/esc.2016.5.47.12
UDC 336.6:504, LBC 65.28

Development of Green Business as an Approach to Financing the Greening of Economy

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Abstract. The issues of green economy development are in the focus of attention of Russian and foreign scientists. Its formation was influenced by environmental activities financing sources. The article presents the description of budgetary and extra-budgetary environmental protection financing. Special attention is paid to the need to strengthen private financial support of environmentally determined activities, which can be implemented as part of development of ecopreneurship. The purpose of this article is to identify the trends in budgetary and extra-budgetary environmental protection financing and resource conservation in the Russian Federation and to rationalize theoretically the necessity of business participation in financing of environment-related business ideas, which is aimed at supporting the greening of economic

For citation: Yashalova N.N., Ruban D.A. Development of green business as an approach to financing the greening of economy. *Economic and Social Changes: Facts, Trends, Forecast*, 2016, no. 5, pp. 219-237. DOI: 10.15838/esc.2016.5.47.12

activity at the regional level. The methods of empirical and statistical research, systematization and generalization of information have been used. SWOT analysis has identified the strengths and weaknesses of green business, as well as the opportunities for and threats to its development. The study systematizes the information on the sources of financing of environment-related activities, identifies their strengths and weaknesses, and analyzes statistical data on financial aspects of environmental protection. It has been established that the financing of environmental activities in the regions is carried out according to the residual principle; most of the sources of environment financing are unavailable to economic entities; indirect assistance in the implementation of environment-related management finds absolutely no application. The material presented in this paper can be used by public authorities in the development of measures to facilitate the transition to green economy and may also be applicable in the educational process. The authors conclude that the successful transition of Russian regions to the path of sustainable economic development depends on the development in their territories of small and medium enterprises investing in activities focused on environment-related production revenues, environmental services and environmental management.

Key words: financing, environmental protection, green economy, green business.

Introduction. The recent global economic crisis has formed an additional incentive for the transition of the domestic economy to an innovative, environmentally sustainable path of development which implies evasion from the development model based on the export of raw materials. Strategic objectives set by the government are related to the rational consumption of natural resources and are not fully implemented. The severity of environmental problems, natural and man-induced disasters in the Russian Federation is not reduced. These problems are complemented by economic and social issues affecting the population's standard of living and quality of life. These facts indicate a significant depletion of the current model of economic development. In order to achieve development and preserve favorable environment it is necessary to introduce a new economic model focused on improving the population's well-being and reducing environmental risks.

The term "green economy" used in recent years is no longer questionable among Russian and foreign scientists and politicians searching for ways out of a systemic crisis for world powers. Green economy aims to become a new vector of economic development of all countries, including Russia. This implies structural changes in economic systems of the country towards the development of eco-friendly activities, including the recycling of production and consumption wastes, the development of organic farming, sustainable forest exploitation, promotion

of eco-tourism, extensive use of alternative energy sources, etc. One of the main fundamental sources focusing on key issues of green economy is the study of well-known English economists, D. Pearce, A. Markandia and E. Barbier called "the Project of Green Economy" (1989) [22]. Among the works of modern researchers, the most noteworthy is the one that connects the ideas of green economy, natural capital and neoliberalism [12]. A group of Belgian scientists analyzes the concept of "bio-economy" and concludes that its development through innovation is under the influence of some specific factors [24]. The work of M.I. Aceleanu demonstrates that "green" jobs assume primary role in "green" economy and "green" jobs creation contributes to sustainable development [11]. Finally, the example of the Chinese experience shows the correlation of crisis phenomena in the financial market and environmental problems [18].

The term "green" economy currently does not have a full and indisputable definition. The corresponding concept is still at an early stage of development and have not yet received clear public assessment. In simple terms, "green" economy is the low-carbon economy adapted to public interests which effectively and efficiently uses natural resources. This ecological-economic model will help save, enhance and restore the Earth's natural capital. It is also worth noting that the concept of "green" economy does not replace the ideas of sustainable development, but rather complements them. Rational choice of economic priorities[1] is required for achieving sustainability, environmental in particular.

For the transition to a "green" economy is it highly important to ensure financial provision of costs associated with the implementation of resource-saving and ecologically oriented investment projects in all economic spheres. Reliable sources of financing the transition to "green" economy will accelerate the process of reducing energy and natural resource intensity in constituent entities of the Russian Federation. Full financial support is an immediate need of "green" economy formation and one of the most important and difficult issues in achieving sustainable regional development. Moreover, there is a concept of sustainable growth of financial markets which has been forming recently, as well as the concepts of "green" financial markets closely related to it [17]. All this determines the relevance of issues reviewed in this paper.

The purpose for this research is to identify trends in budgetary and extra-budgetary financing of environmental protection and resource conservation in

[1] UNEP report "Towards "green economy": ways of achieving sustainable development and poverty eradication", 2011. Available at: http://www.unepcom.ru/wdownloads/ger_synthesis_ru.pdf.

the Russian Federation and to theoretically justify the involvement of small and medium enterprises in financing environment-related business ideas in support of the greening of economic activity at the regional level.

Sources of financing for environmental protection. In the framework of the research, the sources of financing for environmental protection are defined as stable ways and streams of receiving funds for the implementation of measures related to the greening of economic activities. Currently, there is a sufficient number of budgetary and non-budgetary sources of financing for ecological and economic development. Each has its own peculiarities, advantages and disadvantages.

Aggregate environmental costs include direct investments in fixed capital, current expenditures, thorough repairs of fixed assets, expenditures of executive authorities for the maintenance of the system of environmental protection, costs for scientific research and development, as well as the cost of environmental education. In recent years, according to the Federal State Statistics Service of the Russian Federation, aggregate costs in absolute terms for programs and activities related to atmosphere protection, climate change prevention, wastewater treatment and collection, waste management, land, surface and groundwater protection and rehabilitation, biodiversity conservation and protection of natural areas increase every year. However, there is a negative trend in relative terms towards gross domestic product (GDP). Thus, the share of costs for environmental protection towards GDP amounted to 1.6% in 2000, and in 2015 – 0.7% (*table 1*).

National financial policy for rational exploitation of natural resources began to emerge in the late 1980s in the USSR period when state extra-budgetary environmental funds for central capital investments financing in the sphere of environmental protection were established. The funds were established at three levels – federal, regional and municipal. The main funds – fees and payments for environmental pollution, fines for violating environmental laws – were spent for the intended purpose. It is worth noting that such an optimistic situation for financing environmental protection did not remain long. At the beginning of the 21st century, all environmental funds in the Russian Federation were abolished. After the elimination of the system of environmental funds, funds from fees for negative impact on the environment began to flow to the federal budget and budgets of the RF constituent entities where they were redistributed and directed for addressing state objectives, including those not associated with environmental activities.

Table 1. Environmental protection costs in the Russian Federation implemented at the expense of all sources of financing

Indicators	Year										
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Costs of environmental protection at then-current prices, billion rubles	233.9	259.2	295.2	368.6	343.4	372.4	412.0	445.8	479.4	**536.3**	**562.4**
Including											
of atmosphere protection and climate change prevention	53.8	60.7	64.1	76.8	60.1	80.1	88.4	89.2	93.3	**112.4**	**104.0**
of wastewater treatment and collection	105.4	111.7	126.8	159.3	162.2	169.2	197.1	186.4	204.4	**223.4**	**234.1**
of waste management	22.7	26.1	28.2	40.3	38.8	41.5	44.2	41.0	51.6	**61.8**	**68.5**
of land, surface and groundwater protection and rehabilitation	13.4	16.8	21.6	27.3	18.7	17.2	23.4	36.5	33.5	**36.1**	**38.0**
of biodiversity conservation and protection of natural areas	12.5	16.1	21.7	26.6	21.5	23.0	13.4	28.1	28.1	**34.2**	**45.9**
Other expenditures	26.1	27.9	32.8	38.3	42.1	41.5	45.6	64.5	68.6	**68.3**	**72.1**
Environmental protection costs as % of GDP	1.1	1.0	0.9	0.9	0.9	0.8	0.8	0.7	0.7	**0.8**	**0.7**

Compiled from: Official website of the Federal State Statistics Service of the Russian Federation. Available at: http://www.gks.ru;
Annual state reports "On the state and protection of environment in the Russian Federation". Available at: http://www.mnr.gov.ru/ regulatory/list.php.

Currently, according to Article 162 of the Budget Code of the Russian Federation, the main recipients of budget funds are budget organizations or other organizations financed by funds allocated from the Federal budget, budget of an RF constituent entity, local budget or the budget of a state extra-budgetary fund. Budgetary funds can be granted either within federal national projects or in the framework of competitive allocation of investment resources. Target programs are considered one of the most effective mechanisms of financing of budget investment. Targeted funding helps link particular goals and objectives with financial support of budget program in periods, implementation spheres and executors. In Russia, budgetary investments in environmental protection at the expense of the federal budget are carried out in accordance with the state programs. Basic environment-related state programs which are simultaneously being implemented in the country's regions are presented in *table 2*.

According to analytical data of the Ministry of Finance of the Russian Federation engaged in the execution of federal budget and budgets of the country's budgetary system, the dynamics of the share of expenditures on environmental protection in the total costs of consolidated budget during the period from 2005 to 2015 did not exceed 0.2 percentage points.

The benefits of budgetary allocations for environmental purposes include: the application of the principle of target approach; accounting for the priority

Table 2. Main list of programs and sub-programs on the greening of the Russian economy

Program's objectives	Sub-programs
"Environment protection" for 2012–2020 (approved by the decree of the Government of the Russian Federation no. 326, dated April 15th, 2014). Budget allocation – 289 billion rubles	
Decrease in total man-induced load on the environment based on environmental efficiency of the economy Biodiversity conservation and restoration in Russia Increase in efficient functioning of the system of hydrometeorology and environmental monitoring	Regulation of environmental quality Biological diversity of Russia Hydrometeorology and environmental monitoring Federal Target Program "Protection of Lake Baikal and socio-economic development of the Baikal natural area in 2012–2020"
"Energy efficiency and energy development" (approved by the decree of the Government of the Russian Federation no. 512-p , dated April 3rd, 2013). Budget allocation – 28 659 billion rubles	
Development of energy saving and improvement of energy efficiency Ensuring the needs of the domestic market for safe high-quality and economically sound electricity and heat supply	Energy saving and improvement of energy efficiency Development of renewable energy sources
"Natural resources reproduction and management" (approved by the decree of the Government of the Russian Federation no. 322, dated April 15th, 2014). Budget allocation – 595 billion rubles	
Ensuring the reproduction of mineral resources Ensuring rational use of mineral resources Provision of socio-economic needs for water resources, protection and restoration of water bodies Security of water management systems and hydraulic engineering structures Protecting the population and economic facilities from adverse impact of water Achieving and maintaining population balances of hunting resources in ecosystems along with increasing resource potential.	Reproduction of mineral resources base, geological study of mineral resources Water resource management Development of water utilization system of the Russian Federation in 2012–2020
"Forestry development" for 2013–2020 (approved by the decree of the Government of the Russian Federation no. 318, dated April 15th, 2014) Budget allocation – 262 billion rubles	
Reduction of forest cover losses from fires, pests and illegal logging Creating conditions for rational and intensive forest use while preserving its environmental functions and biological diversity, improving control efficiency over forest use and reproduction Ensuring balance between forest loss and restoration. improving forest productivity and quality Improving forest management efficiency.	Forest protection Ensuring forest use; Forest reproduction; Implementation of the state program of the Russian Federation "Forestry Development for 2013–2020".
Compiled from: Section "State Programs" at the website of the Government of the Russian Federation. Available at: http://government.ru/programs/	

of objectives when selecting program solutions; exclusively target use of budgetary funds; provision of funds from budgets of different levels of budgetary system of the Russian Federation on a pro bono, non-repayable basis; transparency of target program financing of expenditures on environmentally significant projects; achievement of quantitative indicators in order to identify the effective use of budgetary funds; minimization of corruption in terms of budget spending.

It is also important to note the disadvantages of direct budgetary funding including the labor-intensive process of raising budget allocations; incoherence of budget expenditures on the implementation of target programs and budgets capacity at all levels (this may result in the decline in funding of state programs); absence of strict obligations for the state customer under financing target programs at the expense of budgetary allocations, which does not guarantee the availability of financial resources; maximum allowable shifts in terms and adjustments of volumes of budgetary financing, which help partially achieve target indicators of state programs; imperfect procedures for the evaluation of the effectiveness of budget-funded target programs due to absence of a unified methodology.

Direct, target financing for environmental activities is also carried out at the expense of budget subsidies. In case of their application to the RF constituent entities one should consider that the subsidies for environment-related purposes can function inefficiently. A subsidy for environmental activities should have a specific purpose, be limited in terms of financing volumes and terms. In other cases, this method of financing may enhance the development of polluting activities. For example, subsidies in agriculture may contribute to increased consumption of ecosystem services. This negative practice developed at the beginning of the 21st century in the countries of the Organization for Economic Cooperation and Development. The result of allocation of state subsidies of more than 320 billion dollars a year to agriculture was the accelerating ecosystem degradation due to excessive use of pesticides, fertilizers, poor water management [1]. Another example of the negative impact of environmental subsidies is the experience of Sweden as the leading country in selling eco-cars. A considerable amount of "green" subsidies allocated by this state in the form of tax benefits, discounts on vehicle insurance, cash bonuses for the consumers significantly increased sales volume of vehicles that use ethanol. However, choosing a more economical vehicle, the country's population became more and more likely to travel by car, which, in its turn, increased carbon dioxide emissions [5].

Moreover, considering environmental aspects of economic activity in the process of management decision-making or, speaking more generally, the greening of management not only create benefits (the main of them being the possibility of a more favorable position on the market), but also act as a sort of a challenge. It is possible to respond to the latter, however, it requires sufficient flexibility of the entire management structure [8]. Finally, the results of economic modelling undertaken by a well-known Canadian scientist R. Winter are also noteworthy [25]. He has clearly demonstrated that investing in the development of the so-called "clean" technology really has quite the opposite effect. In particular, oddly enough, this is the way the intensification of the so-called "global warming" takes place, rather than the slowing-down of the same process. It is extremely important to take this fact into consideration regarding Russia, as the expected impacts of "global warming" are very significant in this very country's territory, which is a significant risk for sustainable development.

Direct budgetary funding for environmental management is undoubtedly a sought after but at the same time scarce financial resource. At the present stage, enterprises which use natural resources participate directly in financing environmental and resource-saving activities. In order to obtain Environment Management System ISO 14001 certification which helps improve the company's image, work closely with foreign partners, expand the presence of the products in foreign markets, business entities are required to implement the environmental management system. In the framework of this system, the companies implement investment commitments of financing environmental protection activities while developing environmentally responsible business. It is worth noting that the owners of industrial companies perceive resource-saving technologies as economically irrational, so the renewal process of environment-related fixed assets carried out by enterprises is extremely slow. *Table 3,* compiled from data of the Federal State Statistics Service of the Russian Federation, presents information on environment-related investment.

There is a gradual decrease in the already small share of environment-related investments in the total amount of investments in fixed assets. This ratio between total capital investments and investments in environment protection demonstrates that economic entities are not interested in improving the environmental situation in the RF constituent entities.

A financially stable enterprise's own funds are one of the most reliable sources of investments in environment protection. However, it should be noted that in business or other need, the company's owner can

Table 3. Environment-related investments in the Russian Federation (in then-current prices)

Indicators	Year										
	2000	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Environment-related investments, billion rubles	22.3	68.2	76.9	102.4	81.9	89.1	95.7	116.4	123.8	158.6	151.8
Cumulative value of investments in fixed assets, billion rubles	1165	4730	6716	8782	7976	9152	11035	12569	13256	13903	14556
Share of environment-related investments in the cumulative value of investments in fixed assets, %	1.9	1.4	1.1	1.2	1.0	0.9	0.9	0.9	0.9	1.1	1.0
Compiled from: official website of the Federal State Statistics Service of the Russian Federation. Available at: http://www.gks.ru.											

adjust strategic goals and objectives of the company by themselves, thereby cutting the budget for environment-related programs.

The main source of "long" money for environmentally significant projects in world's leading countries is commercial banks. In our country, the situation with crediting is the opposite: loans are provided in small amounts and mainly for financing reliable and fast-payback (within 2–3 years) investment projects. As a rule, environmental projects have a long period of payback of initial investment due to the fact that they do not return substantial profits right after their implementation. As a result, it becomes rather difficult for enterprises to obtain a loan for environmental purposes. Russian banks also have high interest rates, that is why not every economic entity can pay the accumulated debt. Domestic commercial banks are absolutely not aimed at the development and promotion of "green" loans.

Foreign banking practice (Germany, USA, UK, Australia) demonstrates the opening of private "green" banks, including investment banks, in order to increase private investments in environment-related infrastructure [6]. Employee of the London School of Economics, E. Campiglio notes that banking sector needs adjustment, a kind of "tuning" on financing of eco-business; it is required to implement the specific monetary policy, the implementation of which in countries with significant state's participation in the economy is a simple task due to a wider range of available management tools [13].

Russian enterprises can solve the problem of financial support for environmental protection and resource saving with the help of international credit and financial organizations. Among the most well-known are: International Bank for Reconstruction and Development; European Bank for Reconstruction and Development; EIB (European Investment Bank); International Finance Corporation. International environmental funds such as Global Environment Facility, Global Climate Partnership Fund, NEFCO (Nordic Environment Finance Corporation), Green for Growth fund provide grant support for the countries and soft loans for financing environment-related projects. The advantages of financing from the funds of international organizations are: the possibility of obtaining investment resources on concessional terms (longer period, low interest rates, large sums) and strict control over the use of funds. Attracting international sources of financing in the RF constituent entities is currently hindered by political and economic risks [4].

In addition to the above mentioned sources of financing of environment-related activities, indirect economic assistance should also be mentioned as it is carried out by means of various privileges and preferences. In the authors' opinion, indirect financing for environmental protection should be called financial stimulation. As a rule, the methods of indirect state stimulation include various tax incentives, investment tax credit, tax holiday, accelerated capita; allowances, customs privileges (customs duties, fees) and other measures. Non-tax measures of supporting the greening of economic activity may include issue of guarantees and warrantees to finance resource-saving in the RF constituent entities, privileged lease of state or municipal property, provision of land for ecologically relevant enterprises (for example, a solid waste treatment plant).

It is worth noting that tax and customs legislation of the Russian Federation to a small extent takes into account the environmental factor when specifying the system of customs and tax benefits. For instance, Russian customs policy in terms of foreign equipment does not create enabling conditions for solving environmental management problems. When considering tax incentives, special attention should be paid to the accelerated capital allowances which helps a taxpayer write off specific cost of capital investments to production costs within a shorter period of time in comparison with the standard rules. The use of accelerated capital allowances provides an opportunity to accelerate the process of raising capital to replace obsolete technologies with waste-free energy-saving equipment. The main

advantage of capital allowances over other sources of environmental financing is that the deprecation fund is always available among business entities and is at the disposal of business owners.

Having considered the financing of environmental activities, the authors made the following conclusions. First, financing of environment-related activities in the country's regions is conducted according to the residual principle. Second, a significant share of environmental financing sources is unavailable to business entities. Third, indirect support in the implementation of environment-related management has absolutely no use.

Unfortunately, such a situation in environmental financing in the Russian Federation already lasts for more than a quarter of a century and, in the authors' opinion, there is no point in waiting for significant improvements in this process in coming years. Amid economic crisis the problems of protecting forests, water reservoirs, atmosphere, lands, etc. are considered insignificant. Addressing acute national issues in the economy and national security requires attention to not only environment itself, but also to the greening of economic processes and the development of environment-related activities. In the authors' opinion, a special role in financing the greening of the national economy should be given to small and medium businesses.

Participation of businesses in financing environment-related economic projects. Small and medium businesses, due to their rapid response to the ongoing economic changes, as a rule, contribute to the acceleration of innovative processes in the national economy. In the authors' opinion, environment-related or "green" business may become a priority area for sustainable regional development and address simultaneously environmental, social and economic issues. It is important to note that fundamental changes in the understanding of key approaches to business management take place. In particular, American experts E.E. Lawler and C.G. Worley [21] demonstrate that environmental judgment together with economic (financial) and social ones should play an important role in modern management (including management of business entities). The same problem is the focus of attention of other works [7, 10]. In international and domestic practice, eco-business is becoming more and more competitive and popular every day due to the fact that consumers gradually give preference to eco-friendly high-quality products. As a rule, "green" business is not only aimed at generating revenue from manufacturing eco-friendly products and environmental services, but also at preserving the environment and preserving natural resources. Examples of this are the following: environmental education,

land improvement taking into account its environmental characteristics, use of alternative energy sources, manufacturing of resource-saving equipment, "green" construction, eco-tourism, etc.

In recent years, ideas about ecopreneurship are gradually developing. Initially, they were represented in the works of Australian [23] and American [16] scientists and later substantially expanded [14, 15, 19, 20]. The above mentioned scientists develop the idea that business community is a catalyst for the greening of the economy simultaneously being its tools.

Basic principles of environment-related business were registered in 1990 in the ICC Business Charter for Sustainable Development [2]. In the 1990s, small businesses in Russia were established mainly for running one's own business. At present, the situation is changing dramatically. Large business entities set up small businesses which are branches of the parent organization performing the functions of sub-contractors or sub-suppliers. Article 4 of the Federal Law no. 209-FZ "On the development of small and medium business in the Russian Federation" specifies the attributes according to which a business entity is classified as a small or medium business entity. They include the total proportion of business participants in the authorized capital stock, the number of employees in the organization, the limit value of revenues from selling products (works, services).

For a long time in the RF constituent entities small businesses associated with the development of retail trade "prospered". However, in recent years this type of activity is significantly reduced. Small retail businesses are replaced by big retail chains. Business is slowly shifting from trade and service sector towards production sector. Manufacturing entrepreneurship is the most sought-after but at the same time it is quite risky and complicated; therefore, for its successful development it is necessary to search for new business ideas. In the authors' view, special attention in this process should be given to environment-related projects.

Ecopreneurship is focused on the implementation of environmental (environment protection, resource saving) and economic activity. In the RF constituent entities the opportunities for running eco-business are not fully exploited. Small manufacturing eco-business is mostly focused on scientific and technical developments, "green" products output, provision of eco-services. The example is cultivation of organic agricultural products, making biofuels, production of bio-fertilizers, solid waste recycling. Let us consider these aspects in detail.

1. *Production of organic agricultural products*. Russian regions have great potential for organic farming which is

becoming increasingly popular every year. Eco-friendly products are becoming sought-after among people keeping a healthy lifestyle. The prefix "eco-" is more common in labelling of both food and non-foods. However, it is worth noting that Russia has not yet produced any clear legislative criteria for eco-products. A consumer is forced to either believe or not to believe the products' manufacturer who, for advertising purposes uses elements of eco-marketing.

The main problem of domestic producers of organic agricultural products is absence of an individual regulatory framework for organic farming. In Russia, a bill on manufacturing of organic agricultural products is currently making its way through Parliament; this bill gives an idea of organic agricultural products, considers the system of its control and certification and proposes measures of state support of this type of activity.

Some Russian regions have developed their own regulatory framework. In particular, in the Ulyanovsk Oblast there is a regional law no. 106–ZO "On the measures of state support of organic products manufacturers", dated July 5th, 2013. According to this law, the status of organic products manufactures is accorded to an economic entity which produced at least 50% of products certified in accordance with the required standards for the preceding calendar year. In this situation, the region bears half of costs associated with the manufacturer's certification, provides property tax exemptions to the business and free training to manufacture organic products, etc.

A little later, Krasnodar Krai adopted law no. 2826-KZ "On manufacturing of organic agricultural products in Krasnodar Krai", dated November 1st, 2013. The regulation act states that organic products manufacturing must be based on the principles of prevention and minimization of environmental pollution, elimination of genetically modified organisms, conservation and maintenance of soil fertility. Manufacturers of organic products can receive state support including methodology, information and consulting support, as well as manufacturing risk insurance.

The example of business of manufacturing bio-organic agricultural products are private farms such as "Vkusnyatina iz Derevni" (Ryazan Oblast), "Andreevskoe podvor'e" (Orenburg Oblast), "Kartoshino" (Tver Oblast), "Pervaya Ekoferma Kubani" (Krasnodar), "Alekhovshchina" (Leningrad Oblast), "Zhivoe pole" (Leningrad Oblast), "DIK" (Kaluga Oblast), etc. Most of the farmers try to create small processing enterprises.

2. *The production of fuel pellets, briquettes and chippers.* In recent years, there is a worldwide rapid development of bioenergy – energy industry based on the use of biofuels. Eco-friendly business of

manufacturing of fuel pellets is becoming increasingly popular. As a rule, fuel pellets are produced by using wood industry waste. Another source of raw materials for eco-business are sunflower husk, cereal waste, straw and other wastes. Eco-business of producing alternative fuels has significant chances of succeeding because the solid fuel pellets have a wide scope of application – space heating for the needs of housing and communal services, power generation at power plants.

The fuel pellet market in Russia is predominantly export-oriented, 70–80% of production is exported to European countries. The main fuel pellet producing enterprises are located in the Northwestern Federal District and Krasnoyarsk Krai. The most famous are: "Bioexpert" LLC (Arkhangelsk), "Vologdabioexport" (Veliky Ustyug, Vologda Oblast), "Vyborgskaya lesopromyshlennaya kompaniya" LLC (Leningrad Oblast), "Green Energy" LLC (Novgorod Oblast), etc.

It should be noted that eco-business of manufacturing fuel pellets, briquettes and chippers is the most cost-effective if certain conditions exist such as proximity of a business entity to the sources of raw materials, markets and transport routes. These factors significantly reduce transport costs.

3. *Production of bio-fertilizers.* Another promising "green" business, especially in rural areas, is production of organic fertilizers. There is no strong competition in this type of ecopreneurship in Russia. Highly effective eco-friendly fertilizers can be produced on the basis of domestic animals and birds droppings, sawdust, crop residues, silt, lake sapropels, peat, oil sludge, etc. The demand for bio-fertilizers depends on eco-farming development rates. The famous manufacturers of organic fertilizers in Russia are "NPO Green-PIK" LLC (Vladimir Oblast), "Biogen" LLC (Vladivostok), "Dubrava lyuks" LLC (Krasnodar Krai), "Biogran" LLC (Kaluga Oblast), "Organic Farming" LLC (Tula Oblast).

4. *Solid waste recycling.* The traditional approach to waste disposal (trash container – trash dump – soil reclamation) is inefficient. Toxic wastes have adverse impact on human health and environment. For the past few years Russian entrepreneurs have demonstrated considerable interest in collecting and recycling secondary raw materials (plastic, glass, aluminum cans, paper and textile waste, electronic waste). For example, second hand plastic containers are raw materials for the production of flex which is further used for producing chemical fiber. Waste paper is a good basis for producing construction and heat-insulating materials. Aluminum cans recycling technology helps obtain pure aluminum. Various electronic wastes serve a source of iron, copper, aluminum, glass.

It should be noted that the volume of solid waste is increasing every year [3]. The amount of household waste per one inhabitant in Russia is more than 300 kg. That is why waste processing businesses are positively treated by public authorities and local administrations. One of the difficulties in this type of "green" business is connected with waste sorting. The population is hardly interested in sorting household wastes; therefore it is necessary to build sorting facilities.

For the implementation of measures to increase financing and development of "green" business it is necessary to identify and analyze the main factors influencing the development of ecopreneurship in the RF constituent entities. In foreign and domestic practice, the method of strategic planning – SWOT analysis – is frequently used for assessing factors in internal and external business environment. The use of this method helps evaluate the strengths, weaknesses, opportunities and threats of a particular type of activity. The authors denote the main advantages and disadvantages of ecopreneurship based on SWOT analysis (*Table 4*). It can be used to identify the most promising actions for public authorities in terms of "green" business intensification.

The factors in eco-business development can be divided into two large groups: positive and negative impacts. Taking into account the identified strengths, weaknesses, opportunities and threats, the

Table 4. Eco-business SWOT-analysis matrix

Strengths	***Opportunities***
Small initial capital Direct contacts with partners High degree of job motivation A more flexible response to scientific and technological advances Support from regional and local authorities Small competition Possibility of implementing a simplified system of taxation Availability of "green" image	Growth potential to a big business entity Promotion of environment protecting activities Strengthening of scientific developments in eco-innovation technologies Possibility if having leading positions in global manufacturing of organic products Compliance with international environment standards Implementation of federal, regional and local programs related to rational management of natural resources.
Weaknesses	***Threats***
Lack of qualified staff for business management Lack of material and financial resources for starting a business Difficulties in drafting design and estimate documentation for enterprise construction Limited opportunities for business diversification Problem of product certification Difficulties in addressing institutional issues Low effectiveness of state innovation policy Absence of a unifies statistical and information base on ecopreneurship	High risk of bankruptcy Administrative barriers Unstable economic situation Problem of marketing in small shipments Higher product costs compared to traditional technology
Source: compiled by the authors.	

authors offer a number of recommendations to stimulate the development of "green" business in Russia:

1. Economic measures (a pricing mechanism of organic products and services, financial support of "green" economic activities, the greening of taxation policy, etc.).

2. Institutional measures (development and implementation of regulation acts on "green" business, state support of ecopreneurship, increasing eco-business investment appeal, addressing the problem of qualified personnel shortage, offering municipal property for a long-term lease, etc.).

3. Administrative measures (consent to build environment facilities, utility connection, etc.).

Almost any industrial business, including eco-business, requires initial capital. Many years of experience in holding training courses on business planning and new enterprise creation in Russian universities make it possible for the authors to conclude that most of beginning and current entrepreneurs are not familiar with the programs aimed at supporting small businesses in the Russian regions. The students often demonstrate their unawareness and even ignorance in terms of alternative sources of financing for small businesses, existing benefits and preferences for small businesses, opportunities of appealing to state authorities with own legislative initiatives. It also appears that many businessmen are not aware of the opportunities of public-private partnerships (PPPs), although, in the authors' opinion, this form of interaction between business and government can significantly enhance the development of eco-business in the RF constituent entities. For example, high-tech recycling facilities became the object of PPP in the Yaroslavl Oblast. In Stavropol Krai the problem of unauthorized dumps will be solved through the establishment in the framework of PPP of about 18 waste transfer stations for primary waste processing. Two waste treatment plants are being built on the PPP basis in the Novosibirsk Oblast. Krasnodar Krai, the Republic of Crimea and other Russian regions[2] assume a pro-active approach to the construction of municipal solid waste landfills (MSW landfills) in the framework of concession agreements.

It seems particularly important to point out the fact that the perceived need to implement eco-initiatives by the representatives of small and medium businesses and public authorities is directly determined by environmental culture and environmental education of society (the study of the so-called "public awareness" and "business awareness" in particular

[2] Unified Information System of Public-Private Partnership in the Russian Federation. Available at: http://www.pppi.ru/otrasl/zhkh-utilizaciya-othodov

in relation to the environment is one of the most dynamic areas of global socio-economic research). In particular, this issue is reviewed in detail in the works of a Russian scientist A.V. Yachmenev [9]. Thus, stimulating the expansion of eco-business is largely determined by investments (primarily, government) in relevant educational (including in the form of media promotion) projects. This is especially important for Russia where the level of the population's interest in environmental issues appears to be low and limited to rather superficial judgments.

Conclusion. In recent years, significant changes are observed in terms of understanding the "nature" of the environment and its role for society. Many countries are beginning to develop a comprehensive environmental policy implemented by the government in all spheres of economic activity and activate the transition to the "green" economy. Innovative environment-oriented path of sustainable development is, in the authors' opinion, one of the main ways of overcoming the systemic crisis in Russia. "Green" economy should be based on innovation because without innovative resource-saving technologies it is impossible to improve the efficiency of natural resources distribution and consumption. Large Russian companies ("Gazprom", "Lukoil", "Rosneft", "RusHydro", "Severstal", "Mechel", etc.) while introducing the developed economic strategies also implement environmental programs and corporate standards of environmental management. However, for most of them environmental protection is not the main purpose and source of profit. Therefore, the main catalysts for creating environmental, or "green", economic sector, in the authors' opinion, should be small and medium business enterprises. Without their involvement in the financing and implementation of eco-business ideas it is impossible to shift from resource-based to resource-saving economy.

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Received August 09, 2016

HISTORY OF ECONOMIC AND SOCIOLOGICAL THOUGHT

DOI: 10.15838/esc.2016.5.47.13
UDC 94 (47), LBC 63.3(2)6

Revisiting the Type of Economic System in the USSR*

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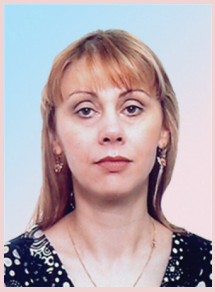

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Abstract. The article characterizes the type of economic system of the Soviet Union. In the authors' view, modern historiography has reached the impasse trying to address the issue. The overwhelming majority of researchers recognize that the USSR economic system was socialist, with all the attendant "positive" and "negative" aspects. The article proposes to characterize the type of economic system of the Soviet period through the analysis of correlation of important production factors such as labor and capital. This analysis is based on data of the USSR input-output balances of the national economy in the 1970–1980s. This source is introduced into scientific parlance for the first time; previously, it belonged to the category of "confidential". In order to address the issue of the USSR type of economic system, the authors refer to the content of the tables containing data on common indicators of national economy during 1980–1986,

* The article is prepared with financial support from the Russian Humanitarian Science Foundation, Project 14-01-00341-a "Social relations in Russian villages in the 1930–1980s and their interpretation in the levels of social consciousness".

For citation: Beznin M.A., Dimoni T.M. Revisiting the type of economic system in the USSR. *Economic and Social Changes: Facts, Trends, Forecast,* 2016, no. 5, pp. 238-250. DOI: 10.15838/esc.2016.5.47.13

the proportion of direct and materialized labor in total labor costs for 1975–1985, and the ratio of the number of the Soviet workers involved in mechanized and manual labor for 1975–1985. The data presented in tables reveal a major gap between industries in terms of labor costs and capital ratio: the share of capital was larger in industry; in agriculture it did not exceed half of total labor cost. In general, the level of direct labor costs in material production sectors of the USSR was slightly higher than the level of capital expenditure. Another important indicator which characterizes the type of economic system is the authors' description of the ratio of manual and mechanized labor in the national economy. In industry and construction the share of those who worked with machines and mechanisms comprised about 2/3 of the total number of workers, whereas in agriculture it did not exceed 1/3. These statistics help move forward in the formulation and resolution of the issue of the USSR type of economic system. However, the issue itself remains open.

Key words: USSR economy, USSR socio-economic system, input-output balances of the national economy.

The peculiarity of the present interpretation of the USSR economic system by social science consists in the increased attention to the underreported in modern historiography characteristics of the Soviet type of economic management. The scientific literature views the development dynamics of the national economy, changes in sectoral proportions of the economy, spatial distribution, enterprise performance; the system of the five-year planning, economic reforms, the history of economic ideas, etc. are examined. A series of the USSR macroeconomic characteristics is also a focus of attention [1; 11; 12; 15; 18; 20]. The understanding of the Soviet history is developing in multiple directions, some of which have quite a long-standing tradition. The first direction was cultivated during the Soviet era. It is well-known and is associated with the presentation of the country's history as a series of ongoing stages of building socialism. The second was formed abroad in the Russian emigration research centers (for example, in the Munich Institute for the Study of the History and Culture of the USSR) and the Sovietology centers in the United States and Western Europe. This approach involved the search for the negative aspects in the Soviet socialism; it has not developed any new conceptual landmarks. This approach was backed by modern Western historians [10; 13]. The third direction is the search for the new explanations of the USSR–Russia history. In that context the idea was expressed about the history of the USSR as a country that is developing towards state capitalism. Ideas about the role of state capitalism in the history of the country were for the first time conceptually formulated by V.I.

Lenin. Since 1918 he constantly addressed the inevitability of capitalism "to a certain extent" and the idea that it should be used "especially by deflecting it towards the direction of state capitalism". In fact, in Lenin's understanding, the Soviet government in the early 1920s involves state capitalism combined with proletariat dictatorship. Without state capitalism (this "vestibule" from a material, economic and production standpoint) Lenin could not see the way to socialism. Until the mid-1920s the idea of building state capitalism in the USSR was a subject of quite heated debate, but since 1925 the idea about the formation of the system of state capitalism in the economy of the Soviet Russia ceased to exist. Nevertheless, in the world of social thought of the 1930–1980s the common idea that the USSR was the country of state capitalism was still present. Since the mid-1930s the proponents of L. Trotsky and foreign authors (E. Goldman, T. Cliff, J. Schumpeter, etc.) wrote about the transition (deformation) of the Soviet system to state capitalism. Their ideas mostly included critical assessments, linking the process of the Soviet state capitalism development with the establishment of "a new class of state capitalists" and the exploitation of the USSR workers (see, for example, T. Cliff "State capitalism in Russia", 1947). A new wave of evidence of the capitalist nature of the Soviet economy is related to the development in the 1970-1980s of a world-systems approach by I. Wallerstein and the influence of this theory. Wallerstein's world-systems approach, A. Callinicos's concept of state capitalism, P. Taylor's, Ch. Chase-Dunn's and P. Binns's developments argue that state socialist countries were part of the world economic capitalist system [6; 7; 17; 19; 21]. At the beginning of the 21st century Russian historiography also gives arguments about state capitalism in the USSR [14; 16].

However, in the vast majority of works on socio-economic history of our country there is no reference to the issue of the USSR economic system. The socialist nature of the USSR economic system is recognized by default, taking into account all the attendant "positive" and "negative" aspects. The trend of the Russian historiography to depart from a political-economic view of the processes of the country's economic development is not accidental – lack of attention to such subjects is connected with the political situation, lack of interest of the main political forces in the reconsideration of the existing political-economic patterns of interpretation of the Soviet economic system.

However, in our view, the objective of reaching a new level of consolidated studies of the Soviet type of economy is extremely important in terms of scientific and practical significance of the post-

Soviet transformations. Claims about the socialist nature of Russia's socio-economic system in the period of the Soviet Union, about the non-capitalist character of capital assets, lack of market mechanisms, classic financial tools, etc. (and, hence, gaps in exploring these issues) hamper the development of Russian social science, increasing its gap from the world research trends.

In the last decade, the authors of the article have done the work on studying the agricultural system of the Soviet Russia of the 1930–1980s [2; 3; 4]. The conducted research led to the conclusion on the capitalization of the Russian village of the 1930–1980s: the processes of capital accumulation, the increasing role of this factor compared to other factors of production, especially to direct labor. The latter was revealed according to the aggregate of Soviet statistics such as the cost of agricultural products (calculated on the basis of direct labor costs and capital for production). The study of capitalization processes of the village has demonstrated the different role of economic structures in this process. The state has approbated different capitalization and defarming schemes through the state structure (state owned farms, machine-tractor stations), and the collective-farm system played the pivotal role in the processes of initial capital accumulation in the country. Accomplished within collective-farms, the type of exploitation based on public responsibility resulted in a large-scale "milking" of agriculture. The change in the village structure, when state owned farms come to the fore in terms of capital value and the mount of the manufactured products (that occurred in the 1970–1980s), indicated the accelerated process of state capitalism formation in agriculture. Occurring economic changes led to the social restructuring of the village, the formation of new social classes. On the basis of economic and legal parameters, the authors have described the class structure of the agricultural society as a five-class society with the presence of classes of proto-bourgeoisie, managers, intellectuals, aristocracy of the working class and proletariat. Analysis of the agricultural system of Russia in the 1930–1980s has helped arrive at a conclusion about the formation of state capitalism in the Russian village.

The purpose of this article is the introduction into scientific parlance of previously unused sources, which would serve as an important tool in the implementation of new approaches to the analysis of the USSR economic structure. The objectives are to test the sources which help reveal the correlation of factors of production in the Soviet economic mechanism (primarily, direct labor and

capital). This refers, primarily, to the balances of the national economy as well as to the input-output economic balances[1].

Input-output balances of the national economy are of great importance for the historians. An input-output balance (input-output method) is an economic-mathematical balance model which characterizes cross-sectoral production correlation in the economy. It describes the correlation between the output of one sector and production costs of all participating sectors required to ensure this output. Input-output balance was produced in money and kind and represented a table which reflected the process of formation and use of Global Social Product (GSP) by industry breakdown. The table demonstrated the cost structure for each product and the structure of its distribution in the economy [5].

The origins of this method date back to the works of Soviet economists and statisticians of the 1920s. The theoretical basis of the input-output method was developed by V. V. Leont'ev in Berlin. The Russian version of his article entitled "Balance of the Soviet national economy" was published by the journal "Planned economy" in no. 12 in 1925. The scholar showed that the coefficients which reflect the correlation economic sectors are quite stable and can be predicted.

The first input-output balance was produced in the USSR in 1959 by the Central Statistical Administration of the USSR (TsSU USSR) by the Department of input-output balance under the direction of M. R. Eidelman. It was the world's first performance input-output balance in physical terms (by 157 products) and performance input-output balance in value terms (by 83 economic sectors)[2]. Balance data were partially published in 1961[3], and the document was fully declassified in 2008[4]. The first plan input-output balances in value and physical terms were produced in 1962. Later, this practice was extended to the republics and regions. According to the 1966 data, input-output balances were produced by all Union Republics and economic regions of the RSFSR. Soviet scientists created the groundwork for wider application of input-output models (including dynamic, optimization, physical-value, inter-

[1] The history of the development of the input-output method in the USSR is described in the article: Beznin M.A., Dimoni T.M. Istochnikovye vozmozhnosti balansov narodnogo khozyaistva v kontekste izucheniya sotsial'no-ekonomicheskoi istorii SSSR (pilotnoe issledovanie) [Possibilities of using balances of the national economy as a research source in the context of studying social and economic history of the USSR (a pilot study)]. *Vestnik Vologodskogo gosudarstvennogo universiteta. Seriya: Gumanitarnye, obshchestvennye i pedagogicheskie nauki* Vologda State University Bulletin. Series: Humanities, social nd pedagogical sciences], Vologda, 2016, no. 1/16, pp. 6-11.

[2] Russian State Economics Archive. F. 1562. Op. 41. D. 1430.

[3] *Narodnoe khozyaistvo SSSR v 1960 godu: stat. Ezhegodnik*. TsSU SSSR [USSR national economy in 1960: statistical yearbook. TsSu USSR]. Moscow: Gosstatizdat, 1961. Pp. 103–151.

[4] V.L. Sokolin, Chairman of Interstate Statistical Committee of the Commonwealth of Independent States, commented this in his speech at the International Scientific Conference "Input-output balance – history and prospects":"I don't know why M. Eidelman classified it previously". Moscow, April 15th, 2010.

Table 1. Key indicators of the national economy balance in 1980–1986 (in then-current prices)

Indicator	1980	1981	1982	1983	1984	1985	1986
GSP, billion rubles	1079	1123	1237	1293	1346	1384	1426
Final social product, billion rubles	535	565	607	638	666	684	701
Manufacturing of production means (1st unit), billion rubles	678	697	791	825	860	886	923
Manufacturing of commodities (2nd unit), billion rubles	401	426	446	468	486	498	503
National generated income, billion rubles Including:	462	487	524	548	570	579	587
remuneration	225	236	248	258	264	272	284
surplus product	237	251	276	290	306	307	303
National generated income per capita, rubles	1741	1818	1940	2012	2074	2084	2096
National income spent on consumption and accumulation, billion rubles Including:	454	478	513	536	559	569	576
consumption fund	345	365	379	393	407	419	428
accumulation fund	109	113	134	143	152	150	148
National income spent on consumption and accumulation per capita, rubles	1710	1785	1900	1968	2032	2049	2056
National wealth (excluding land, mineral resource and forest value) at the year-end, billion rubles	2732	2913	3127	3330	3537	3738	3933
All fixed assets (including livestock)at the year-end, billion rubles Including:	1747	1857	1975	2101	2236	2373	2516
fixed production assets	1158	1237	1322	1411	1505	1600	1695
fixed non-production assets	589	620	653	690	731	773	821
Material production costs, billion rubles Including:	617	636	713	745	776	805	839
costs of material and supplies (raw materials, supplies, fuel, etc.)	542	536	628	654	678	697	723
depreciation*	75	80	85	91	98	108	116
GSP materials-output ratio, kopeks per 1 ruble of GSP:							
including depreciation*	57.1	56.7	57.6	57.6	57.6	58.2	58.8
excluding depreciation*	50.2	49.5	50.8	50.5	50.3	50.4	50.7

* depreciation, including written-off value of fixed assets

Source: Key input-output balance indicators of the national economy: statistical yearbook. Moscow, 1987, p. 7.

regional models, etc.). Part of the balance data was published in restricted circulation (for official use only)[5].

The most general basic indicators of the balance of the national economy over the 1980s are presented in *Table 1*. They characterize GSP, the manufacturing of production means and commodities, national income, fixed assets, material costs and GSP materials-output ratio. All these characteristics are important for the study the type of economic structure of the society.

One of the parts balance data was labor costs input-output balance, which represented an economic table in which the process of production manufacturing (or service delivery) and the correlation between economic sectors were expressed in labor costs. The labor cost input-output balance data helped determine the total costs of direct and materialized labor on the production of individual products (service delivery) and establish the correlation between these costs by each economic sector separately. Materialized labor costs indicators by each economic sector were identified on the basis of direct labor costs data of a particular sector, which were distributed in proportion to the use of the products of this sector in other economic sectors. Each row of the labor costs input-output balance table showed the distribution of direct labor costs for product manufacturing of a particular sector between other sectors consuming the production of the former, as well as for final consumption and gross capital formation. If we consider balance data vertically, the same labor costs are as well the costs of past labor, embodied in products used by different sectors in intermediate consumption. In addition, direct labor costs are displayed vertically in each column. At the end of the table each group of sectors included a sum of direct and materialized labor costs for product manufacturing in each sector (aggregate labor costs). The main source of information for producing the labor costs input-output balance were data from input-output balance and labor statistics[6].

Let us consider one of such sources characterizing important aspects of the completion of the capitalization process in the USSR at the end of the existence of the "socialist" type of economic management (*Tab. 2*).

Data from the table characterize the dynamics of the share of direct and materialized labor costs in the total labor costs in a relatively short period of time – the last decade before perestroika. They are calculated according to the USSR labor costs input-output balance. This calculation, as shown by the note

5 *Osnovnye pokazateli balansa narodnogo khozyaistva: stat. sbornik* [Key input-output balance indicators of the national economy: statistical yearbook]. Moscow, 1987.

6 Azriliyan A.N. (Ed.) *Balans zatrat truda, mezhotraslevoi* [Labor costs input-output balance]. Bol'shoi ekonomicheskii slovar' [Big economic dictionary]. Moscow, 1997.

Table 2. Proportion of direct and materialized labor in total labor costs for 1975–1985 according to labor costs input-output balance of the USSR* (as a percentage of total labor costs)

Industry (sector)	1975		1980		1985	
	Direct labor costs	Materiali zed labor costs (direct)	Direct labor costs	Materialized labor costs (direct)	Direct labor costs	Materialized labor costs (direct)
Total in production industries	59.9	40.1	60.3	39.7	60.4	39.6
Including:						
Industry	43.1	56.9	45.0	55.0	45.0	55.0
including:						
power engineering	49.1	50.9	48.3	51.7	48.9	51.1
oil and gas industry	13.9	86.1	13.0	87.0	11.8	88.2
coal mining	50.8	49.2	52.2	47.5	53.8	46.2
ferrous metallurgy	40.8	59.2	41.2	58.8	41.5	58.5
non-ferrous metallurgy	44.8	55.2	47.7	52.3	47.5	52.5
chemical and petrochemical industry	47.8	52.2	47.1	52.9	45.5	54.5
mechanical engineering and metalworking	66.2	33.8	65.4	34.6	66.1	33.9
forest, woodworking and pulp and paper industries	56.9	43.1	58.3	41.7	58.7	41.3
construction and building materials industry (including glass and porcelain and pottery industry)	53.6	46.4	53.1	46.9	53.8	46.2
light industry	44.3	55.7	45.5	54.5	45.6	54.4
food industry	13.5	86.5	15.4	84.3	15.4	84.6
Construction	77.4	22.6	79.3	20.7	79.7	20.3
Agriculture and forestry	73.9	26.1	72.1	27.9	72.4	27.6
Transport and communications	82.8	17.2	82.6	17.4	82.5	17.5

* The calculation of labor costs input-output balances is produced on the basis of the indicators of input-output performance balances of in then-current prices.
Source: Key input-output balance indicators of the national economy: statistical yearbook. Moscow, 1987. P. 21.

to Table 2, on the basis of the indicators of input-output performance balances of in then-current prices. According to these calculations, the ratio of direct and materialized labor in total labor costs in all sectors of material production appears very stable over the decade under analysis, with only slight deviations of the direct labor costs in 1975, the indicators of 1980 and 1985 vary around the share of 60% and direct materialized labor costs – around 40%. The situation varies dramatically for main groups and sectors of material production. The situation in industry for the past decade is the following: a small increase in the share of direct labor costs,

from 43% in 1975 to 45% in 1985, and a respective small decline in the share of materialized labor in the total labor costs – from some 57% in 1975 to 55% in 1985. The calculation reflects a marked predominance of direct materialized labor costs over direct labor costs in industry.

Within industry the trend is rather diverse: from the absolute predominance of direct labor costs (in mechanical engineering in 1985 its share was 66%, in construction and building materials industry and coal mining – 54%) to prevailing materialized labor costs (in 1985 in oil and gas industry its share was 88%, in food industry – 85%, in ferrous metallurgy – 58%, in chemical and petrochemical industry – 55%). In some industrial sectors the share of direct and materialized labor costs was approximately equal: in 1985 in power engineering – 49 and 51% respectively; in non-ferrous metallurgy 48 and 52%.

The situation in construction, agriculture and forestry, transport and communications was specific. At the beginning of the decade and at its end, direct labor costs prevailed accounting for 75%–80% of the total labor costs.

Of course, the described tendency needs to be connected with other characteristics in order to solve political and economic problems, in particular to study the type of economic system. Therefore, we will refer to the problem of the ratio of the number of workers involved in mechanized and manual labor (*Table 3*).

Data from the table show that in the country's industry of the 1970–1980s, the share of workers involved in work with machines and mechanism, as well as automation device maintenance, approached 50% of the total number of workers, and in the middle of the 1980s this share rose to over 50%. If the number of workers engaged in machine and mechanism repair and setting-up is taken into account, this share amounted to more than 60% in the 1980s. The share of workers involved in manual labor in industry fell from 42% in 1975 to 35% in the mid-1980s; in other words, by the end of the Soviet period only about 1\3 of industrial workers were involved in manual labor (both on and off machines and mechanisms). Balance indicators for the calculation of the ratio of the number of workers involved in mechanized and manual labor highlighted another industry – construction, where the share of manual labor over the decade (1975–1985) also considerably decreased and approached the 50%-point.

A completely different situation is reflected in agriculture in terms of the same indicators. First of all, the proximity of the characteristics of the shares of manual and mechanized labor in collective farms and state farms should be noted: the

Table 3. Ratio of the number of the USSR workers involved in mechanized and manual labor (1975–1985) (according to one-time surveys, %)

Economic sector	Total number of workers	Including workers engaged in		
		work with machines and mechanism, as well as automation device maintenance	manual labor (on and off machines and mechanisms)	machine and mechanism repair and setting-up
Industry				
1975	100	45.7	41.5	12.7
1982	100	48.8	37.4	13.8
1985	100	51.0	34.9	14.1
Agriculture Collective farms Crop husbandry				
1982	100	23.6	75.2	1.2
1985	100	25.5	73.3	1.2
Animal husbandry				
1982	100	23.5	73.9	2.6
1985	100	28.3	68.5	3.2
Collective farms Crop husbandry				
1975	100	24.9	75.1	-
1982	100	27.0	71.2	1.8
1985	100	28.5	69.8	1.7
Animal husbandry				
1975	100	17.7	78.8	3.5
1982	100	19.4	76.9	3.7
1985	100	23.6	72.4	4.0
Construction				
1975	100	36.8	59.9	3.3
1982	100	38.8	57.4	3.8
1985	100	40.0	56.4	3.6

Source: Key input-output balance indicators of the national economy: statistical yearbook. Moscow, 1987. P. 118.

share of the former varies around 70–80%, the latter amount to 20–30%. The underlying dynamics is the growing share of mechanized labor and, respectively, the reducing share of manual labor. The gradual and slow pace of the process should be noted. In collective farms, the share of mechanized labor in animal husbandry at the end of the reporting period exceeded the mechanized nature of crop husbandry, but in state farms in 1975 and in the middle of the 1980s, that share was less than the former. A very small share of labor costs of repair and setting-up of machinery in agriculture exponentially less than the corresponding indicator in industry. Thus,

it can be noted that mechanized labor in the USSR becomes predominant only at the end of the Soviet period and only in the industrial sector. Most agricultural workers were involved in manual labor. This is evident from the ratio of occupational groups of agricultural workers. In 1970, there were 1 837 000 tractor drivers and other machine operators in the RSFSR agriculture and the number of crop husbandry workers, forage workers and workers without a qualification totaled 4 346 000 people, the number of milkmaids and other personnel mainly engaged in manual labor – about 2.5 million people; in 1979, the number of tractor drivers, combine and machine operators in the RSFSR agricultural plants amounted to 2 250 000 people, and the number of crop husbandry workers mainly engaged in manual labor – to 2.7 million, in animal husbandry – approximately 2.4 million people[7].

The materials of the USSR input-output balance of the national economy for the end of the Soviet period suggested in the article provide a reasoned approach to speculating about the role of major production factors – labor and capital – with new historical and economic data. The level of socio-economic development of our country in the 1970–1980s can now be assessed using the calculations of direct and materialized labor costs, rather than by a "rough" estimation. The study of the methods of producing such calculations, of the comparison with the shares of manual and mechanized labor in production and with data on capital depreciation etc. deserves serious further research. Of course, the type of economic system is characterized not only by the ratio of the factors of production. It is also determined by other economic parameters: methods of regulation, types of marketability, mechanisms of workforce mobilization, etc. When it comes to social and economic system, for capitalized economy it is important to determine the type of property relations, peculiarities of enforcement of the right of ownership. These factors were more relevant in the so-called state ownership in the USSR, which only "disguised" the possession, disposal and use of means of production by a particular social class which became a source of post-Soviet Russian classic bourgeoisie.

[7] *Itogi Vsesoyuznoi perepisi naseleniya 1970 goda. T. VI. Raspredelenie naseleniya SSSR po zanyatiyam* [1970 All-Union Census of the Soviet Union. Volume 6. Distribution of population by occupation]. P. 28. *Russain Gosudarstvennyi arkhiv Rossiiskoi Federatsii (GARF)* [State Archive of the Russian Federation (GARF)]. F. A-374. Op. 39. D. 6129. L. 28 ob.

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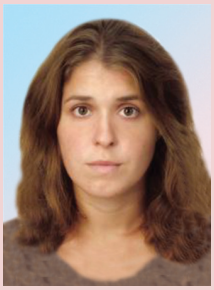
Received September 08, 2016

DOI: 10.15838/esc.2016.5.47.14
UDC 658.7, LBC 65.291

Supply Chain Management as a Driving Force for Generating Competitive Advantage for Dairy Companies



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Abstract. The study aims to uncover the reserves to generate competitive advantages for the participants of the market of perishables in the case of the dairy sector due to the formation of effective supply chains, as this category of goods is the most demanding in terms of periods and conditions of transportation and terms of preservation. The research technique is based on the concepts of value chains and supply chain management. In order to optimize the distribution of functions between the participants of the dairy chain a process-based approach has been applied. The research has revealed the main reasons for high aggregate costs and the places of their formation at each stage of the dairy supply chain. The article proposes the mechanisms to address three main problems arising from the process of building relations between the participants of the dairy supply chain in Russia. These problems are associated with a disproportionate margin distribution between the participants of the chain, with non-compliance of the quality of raw milk with the requirements for the production of specific types of dairy products, and with distrust of the supply chain participants, which increases transaction costs and forces to create reserve supplies which reduce the competitiveness of the whole dairy supply chain in general. In order to improve the competitiveness of all participants in the dairy chain, the article presents several mechanisms for solving these problems. The first is margin distribution based on the costs

For citation: Poleshkina I.O. Supply chain management as a driving force for generating competitive advantage for dairy companies. *Economic and Social Changes: Facts, Trends, Forecast*, 2016, no. 5, pp. 251-271. DOI: 10.15838/esc.2016.5.47.14

incurred by each participant of the dairy chain. The second is the use of a mathematical model to determine the assortment of goods of a dairy enterprise on the basis of the incoming volume and quality of raw milk according to the seasonal factor and the demand for dairy products. The third is the feasibility of refusal from the formation of reserve supplies by all participants of the dairy chain, which will not only minimize aggregate costs, but also significantly improve the quality of dairy products actually available to consumers in retail trade.

Key words: competitive advantage, logistics costs, supply chain management, value chain, dairy products.

Introduction

Nowadays, the world community is experiencing increased global competition, the aggravation of geopolitical problems, the declining prices of raw material, which forces the Russian economy to find new drivers of economic development, an important component of which are new management technology.

One of the main reasons for low competitiveness of Russian commodities both in the world and domestic market is their high cost which is formed in the process of production and product sales based on the manufacturing, logistics and transaction costs. Production cost management is carried out mainly at the level of an enterprise. The formation of logistics and transaction costs takes place outside an individual organization as a result of implementation of market relations. Insufficient attention has been given to the management of these components in Russia, which led to the fact that logistics costs are 2–3 times higher than those in developed countries. This is explained by the underestimation of capacity for the use of logistics as a technology of management, integration, cooperation and coordination of business processes not only at the level of individual organizations, but also, and especially, in the entire supply chain as a whole.

As a result, the share of logistics costs in Russia's GDP is approximately 20%, while in the USA it amounts to 8.5%, and in Germany – 8.3%. The world's average value of this indicator is 11.4%. The share of transportation costs in product price ranges from 1 to 50%, the average value is 10% of the total value of transaction. According to the World Bank estimations in 2014, the level of logistics development in Russia is low (the 90th position out of 160 in the ranking, compiled on the basis of the LPI[1] calculation).

Today optimization of costs of delivery and storage of production resources and end products in Russia is one of the main reserves of cost saving, and, consequently, of reduction of product retail prices. However, according to experts, "in countries with high logistics costs, the

[1] LPI – Logistics Performance Index calculated by the World Bank Group on international trade every one or two years since 2007.

main factor in determining their value is often the reliability of a supply chain, rather than the distance between trade partners" [4].

The share of logistics costs in Russia is particularly high in the price of perishable goods sales, as it is necessary to carefully coordinate the actions and interests of all supply chain participants in order to minimize logistics costs in this sector. Lack of such coordination forces supply chain participants to find ways of creating insurance supplies to provide the continuity in processes. However, the fact that a product is perishable makes it impossible to create insurance supplies even for a short period of time without compromising the product's quality. As a result of creation of such supplies at least at one stage of the supply chain the product's consumer properties are deteriorated and its cost is raised due to inevitable increase in storage losses.

It would seem, that manufacturers and resellers have to increase their end product insurance supplies to a greater extent as they are furthest from the consumer and do not have accurate information about the level of real demand. Retail chains should have a lesser need for creating insurance supplies as they are closest to the source of demand change. However, given the absence of understanding of strategic prospects from creating an effective system of supply chain management by all its participants, the situation is the opposite. For example, even if major reliable partners such as Danon are involved in building a supply chain, retail chains are not ready to completely abandon the stocks of dairy products (DP) at their own warehouses because they are afraid of suffering losses from commodity deficiency. As a result, the consumer of a retail chain does not have access to fresh dairy products as the retailer provides them only with the three-day old supplies. The customer's dissatisfaction leads to the decrease in consumer demand and causes distrust of the trademark which is reflected in the image and profitability of dairy producers and all participants in the supply chain.

It is possible to solve this problem through the full implementation of the strategy of supply chain management – SCM (Supply Chain Management) at all stages of production and distribution of perishable products, which will allow all participants of the supply chain to give up the creation of insurance supplies and significantly reduce logistics costs. Moreover, the use of SCM strategy will reduce transaction costs by enhancing mutual trust between chain supply participants on the basis of stable repetitive cooperation. Additional competitive advantage is created due to consistent optimization of production processes of each supply chain participant. The use of this approach makes it possible to organize production at every stage of supply chain for the received products

to fully meet the requirements of the subsequent stage, in view of achieving total costs minimization of the entire supply chain. Amid economic recession, declining population's incomes and consumer demand, reducing production costs without compromising the quality of the end product is the most preferable strategy.

Furthermore, the implementation of SCM strategy will provide additional competitive advantages to the participants due to the focus of creating the end product value during all stages of the product's life cycle on the preferences of particular consumers.

In order to implement this strategy it is necessary to establish a system of rapid information exchange between the participants of retail and supply chains, as well as to design highly flexible supply chains able to quickly respond to the changing market conditions. Not for nothing do many experts bring management of any processes, logistics in particular, in line with information exchange management.

Different product manufacturing includes different number of manufacturing stages, that is why it has different need for network communication. Each economic sphere requires the development of its own models of effective network interaction appropriate to sectoral characteristics of business processes organization. The longest product manufacturing chains are established in the food industry. For example, in the U.S. the longest production chain has established in meat production: from developing forage, manufacturing food additives and vitamins for cattle fattening to manufacturing a variety of end meat products and delivering supplies to supermarkets, restaurants and hotels [16]. The purpose for this study is to identify the reserves for creating competitive advantages for the participants of the market of perishable products through the formation of efficient supply chains, as this category of products puts the largest amount of requirements to transportation and storage terms and conditions.

The largest share of raw materials for food production is supplied by agriculture. Meat, fish and milk are considered to be the most perishable food products. The most stringent requirements are imposed to the terms and conditions of raw milk transportation and storage because its composition determines the possibility of producing a particular dairy product and processing costs. Moreover, from the point of view of food security in Russia the dairy sector is the one experiencing a very difficult situation. Therefore, the research subject is dairy industry which manufactures perishable dairy products. In the author's opinion, the issue of efficient distribution of production and logistics processes and margin between the participants in the dairy chain.

Research methodology

The research is based on the use of the concept of value chain (VC) as a tool for determining the place of a company in the market and creating a competitive advantage proposed by Michael Porter in 1985 [10], and the concept of supply chain management. Nowadays, the boundaries between these two concepts are blurred, although the main difference was the concept of "margin" which initially was not considered in SCM. According to the Porter's VC concept, the long-term company's return is provided by the created product value, rather than by cost reduction, because, by focusing the company's activities on reducing costs the company may lose additional profit derived from manufacturing costly products with unique properties.

The VC concept's management object is the process of value creation, while the SCM concept considers material, financial and information flows as its management object. Recently, however, the idea of value creation has also been embodied in the SCM concept, as evidenced by the modern definition of SCM. For example, according to the definition suggested by G. Kott, supply chain management is the integration of key business processes, starting from the end-user and covering all suppliers of goods, services and information which add value for the customer and other parties concerned [5]. That is, the use of the SCM approach is aimed at increasing the level of customer satisfaction and optimizing the costs of this process.

Another difference between these concepts is the use of VC at both intra- and inter-firm levels, while the SCM concept is used only in reference to relations management at the inter-organizational level. At the intra-organizational level these ideas are implemented in the approaches of integrated logistics.

However, singling out the concept of "margin" as a management object in the VC concept is not only important for assessing the profitability of production with higher costs and more valuable consumer properties, but also absolutely necessary for the development of inter-firm relations in the market, especially in long-term strategic partnership. Strategic partnership reliability is determined by the efficiency of each participant's functioning and their competitive advantages in the market which are created due to this integration. Effective functioning of all chain participants is possible only on condition of objective margin distribution, the basis for which should be the size of the value created by each participant. From this point of view, the management of margin distribution between value chain participants is a prerequisite for the establishment of reliable strategic partnership and a supply chain. This factor was not initially considered in the SCM approaches, however, it was seamlessly integrated into the SCM concept erasing

the boundaries between VC and SCM concepts. This is evidenced by the definition of SCM given by R. Handfield and E. Nichols: "...It is integration and management of all activities within the supply chain on the basis of mutual cooperation, effective business processes and extensive information sharing for establishing high-performance systems of value creation, which would provide member organizations with a significant competitive advantage" [18].

This definition ensures a more precise perception of the purpose for the creation of a supply chain system, which consists primarily in creating value for participant companies by combining efforts on manufacturing demanded goods with optimal production costs. On the basis of setting this objective, with regard to the principle of objective margin distribution between supply chain participants, the SCM system itself can be considered as the main driver in creating competitive advantages for companies in the market, especially in crisis, which helps reduce aggregate logistics costs, as well as ensure equal distribution of benefits derived from its creation among all chain participants.

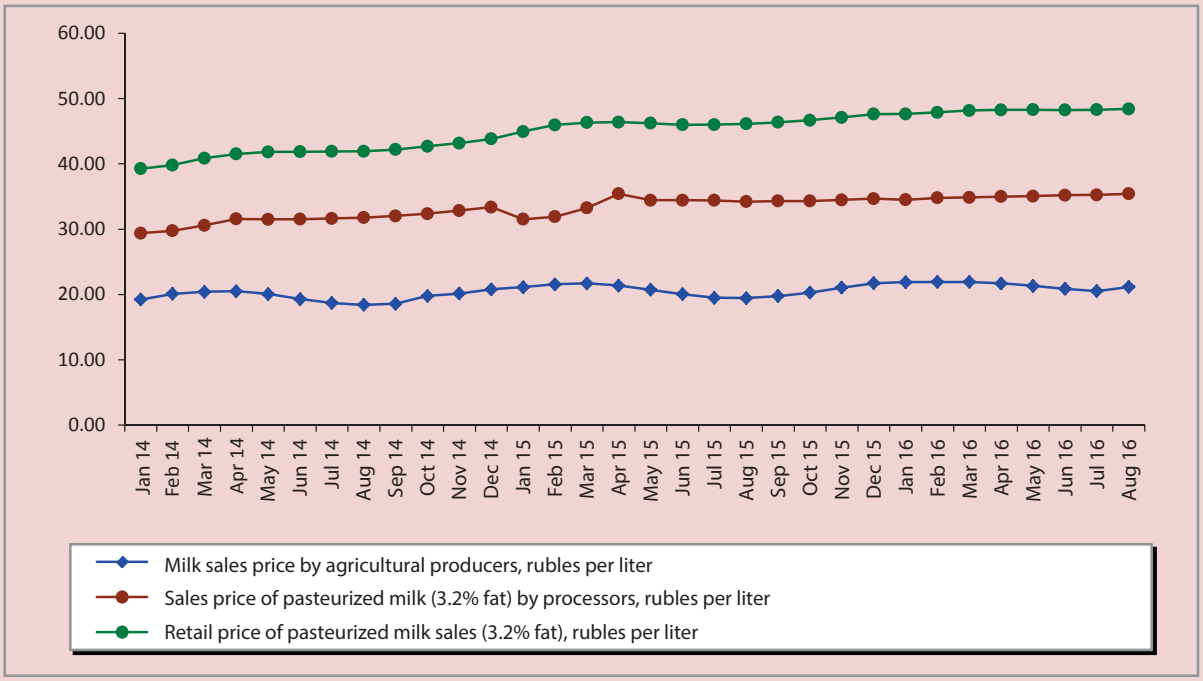
In this paper, supply chain management is considered as a process of integration of participant organizations and management of all types of their activity based on mutual cooperation aimed at establishing high-performance value creation systems for meeting customer needs, achieved with optimal aggregate costs, which would provide participant organizations with a significant competitive advantage.

SCM is the main mechanism for creating competitive advantages in the market economy which, according to experts, helps the participants reduce the cost of order processing by 20–40%, reduce procurement costs by 5–15%, reduce the market entry period by 15–30%, reduce stock reserves by 20–40%, reduce production costs and increase profits by 515% [11].

In economically developed countries, modern market competition has become kind of a competition between supply chains, rather than individual organizations. Namely, it has become impossible for an individual organization outside the supply chain to achieve a significant competitive advantage.

In relation to the dairy industry, the issue of supply chain management and value chain is particularly relevant in connection with stringent requirements to product quality at each stage of the chain and with unequal competitive positions of participants on the market. Low consolidation of agricultural producers, limited technological development of processors (except for national leaders in dairy products manufacturing) and a favorable position of retailers leads to disproportionate margin distribution between the participants in favor of the latter. The distribution does not reflect the

Figure 1. Price dynamics of milk sales by major dairy chain participants



Source: Rosstat data.

real contribution of each chain participant in the creation of end product value. This is confirmed by a sharp stunting of procurement prices for raw milk of agricultural producers from retail sales prices of dairy products (*Figure 1*) and, consequently, by a reduced production of organic milk in the country due to agricultural producers' lack of funds for investing in expanded reproduction [3, 19].

The problem in the dairy market is common not only for Russian reality, as evidenced by numerous studies conducted in countries of both developed and developing economies [20, 21, 22, 23, 24, 25].

However, the profitability of the dairy industry not only affects the interests of participant enterprises, but is also a strategic objective for ensuring food security of the countries. For example, "The Food Security Doctrine of the Russian Federation" identifies a 90% or more production threshold of own milk and dairy products in the total volume of commodity resources of the domestic market to ensure food security of the country [2], which is impossible to achieve in conditions of unbalanced profits distribution among its participants. Milk and dairy products are an integral element in the menu of every Russian, however, milk

self-sufficiency of the Russian population that the most important health product is at risk. Over the part 20 years this industry has experienced rather negative trends characterized by a reduced number of dairy herd, milk production and, consequently, of organic dairy products. Russia's milk and dairy self-sufficiency in 2015 amounted to less than 60%. The main reason for such a significant milk underproduction is low agricultural production efficiency mainly caused by lack of coordination between dairy market participants' interests and monopoly raw milk procurement prices underpricing which is easy to achieve amid low industry consolidation [9].

Producers' and retailers' dependence on the availability and quality of raw milk is very high. In Russia, there are about 1000 enterprises engaged in dairy products manufacturing. They annually process an average of 19.7 tons of milk [7]. Dairy products comprise more than 15% of retail turnover. Underestimation by trade and processing industry of strategic importance of raw milk producers' stable position aggravates the situation in the industry.

To optimize the relations in the dairy products value chain it is necessary to identify the main supply chain participants and their functions. However, the number of supply chain participants may vary depending on the number of intermediaries; at the same time, the number of operations and processes which must be implemented in order to produce a particular type of a dairy product is relatively constant. The number of supply chain participants depends on the distribution of these processes between the performers. Therefore, to improve the efficiency of a supply chain, the author proposes to use the process approach based on identifying all the necessary processes which create added value in the supply chain. Further, these processes should be optimally distributed among the performers taking into account the possibility of outsourcing some operations, added value created by each performer should be defined, and parameters underlying each process and influencing end product manufacturing should be identified.

Dairy product value chain includes four basic stages: milk production and storage in agriculture; milk collection and delivery for processing; raw milk processing and dairy products manufacturing; transportation of finished dairy products to sale points; dairy products sales to consumers *(Figure 2)*.

During the process of raw milk production biological value of raw materials is created, milk quality (its grade) is formed and its environmental properties[2] are ensured. The performers of this process are agricultural producers which determine the volume of production and the produced milk type (cow's, goat's, etc.). During

[2] Environmental properties of dairy products – a set of properties of production satisfying environmental safety requirements.

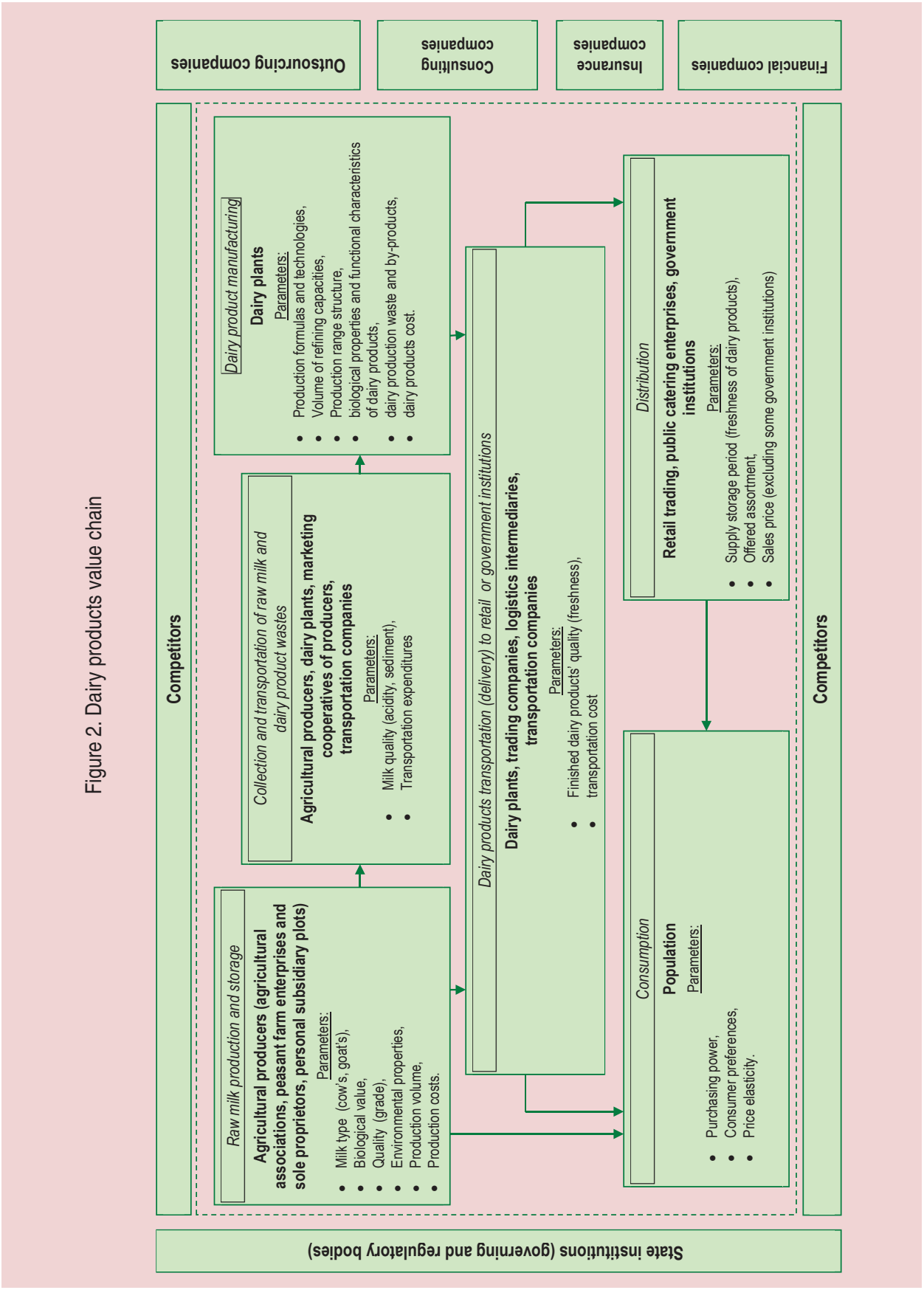


Figure 2. Dairy products value chain

production process the cost of raw milk is identified, as well as milk procurement price and milk producers' margin level on the basis of relations within a supply chain. Thus, milk producers' performance may be enhanced by optimizing the cost of milk production through the improvement of production technology and determining the optimum margin level.

During the process of raw milk collection and transportation raw materials become available for reprocessing in its sites; quality parameters of milk (acidity, bacterization, sediment, etc.) are retained or worsened. Raw milk quality retention is ensured through controlling sanitary conditions of milk collection and transportation temperature requirements, as well as analyzing the collected milk from different manufacturers. The performers of this process may include milk producers themselves, marketing cooperatives of milk producers, dairy plants or transportation companies. During the process of milk collection and transportation costs are formed, which are determined by the transportation distance and depend on the location of dairy plants and their raw-product purchase area. The efficiency of transportation can be enhanced by optimizing the conditions, volumes and routes of milk transportation. During the process of dairy products manufacturing raw milk is transformed into a wide range of finished dairy products with specified biological properties and functional characteristics. The performers of this process are milk processing plants which define production formulas and technology and dairy products assortment structure depending on the raw milk quality parameters and consumer demand. The selected production assortment and production technology affect the amount of waste and by-products, the rational use of which also influences the efficiency of the entire production process. Moreover, dairy plants often develop convenient forms of filling and packaging themselves. Production process determines the cost of dairy products and the price of dairy products delivery to retail chains is determined a supply chain.

The process of dairy products delivery to retailers or government institutions ensures the availability of finished dairy products of a particular quality (freshness) to the consumers. The performers of this process may be dairy plants, trading companies, logistics intermediaries (3PL providers, logistics centers) and transportation companies. During the transportation process of diary products the quality of finished dairy products is retained of worsened, which is determined by the temperature and time parameters of product delivery. Transportation time and temperature requirements, as well as appropriate temperature maintaining and keeping within waiting time during loading and unloading are of equal importance.

The distribution process creates added value of dairy products, which is associated with the possibility of their convenient purchase by end users. The performers of this process are various retailers, catering enterprises and government institutions (hospitals, schools, kindergartens, etc.). Retailers and catering enterprises set the price of finished dairy products, sometimes by holding demand stimulation campaigns through granting various discounts. The retailers determine the time of supply storage in their warehouses, i.e. the freshness of the product offered to the consumer and dairy products assortment available for sale.

The process of consumption determines the purchasing power, consumer preferences and price elasticity of each group of dairy products.

Thus, the retail price of finished dairy products sales is formed on the basis of production costs determined at the stages of production process, transaction and logistics costs determined during the process of building contract relations and product movement between the stages of production process in a value chain [1]. The majority if modern Russian companies in the dairy market use the supply chain management mainly to optimize transaction and logistics costs. However, the full implementation of the SCM strategic approach implies coordinated development and optimization of production processes of each supply chain participant aimed at meeting customers' needs and optimizing aggregate costs in a value chain.

Major logistics costs in the dairy industry consist of transportation costs of raw milk and finished products delivery, costs for stockpiling and maintaining product supplies in warehouses, filling, packaging and labelling costs, order processing costs and administrative costs.

According to the concepts of VC and SCM, the purpose for implementing a supply chain management system is the balanced and coordinated development of its participants and the design of a unified strategy of creating competitive advantages in two directions:

1. Improving the quality of consumer satisfaction by: building strong feedback mechanisms; management of new product development taking in account the adjustment of raw milk production technology to meet the requirements of the processing industry; reducing the time of perishable product movement with in a supply chain; joint creation of by all participants of an effective continuous "cold chain" with the required temperature requirements at every stage of a supply chain. The end user of a supply chain should be regarded as the main chain participant as all the process is focused on their satisfaction.

2. Reducing aggregate costs of all supply chain participants: inventory optimization; consistency and optimization

of technological and logistics operations; minimization of transportation and transaction costs; reduction in the number of intermediaries in a chain; reassignment of logistics functions between chain participants; management of repayable funds which reduce the losses associated with short expiration terms of dairy products; scaling down the activities which do not add value to the goods; reducing risks of unfair cooperation.

During the process of building contract relations between dairy market participants, major logistics and transaction costs are usually borne by dairy plants which occupy an intermediate position in a supply chain. In relations with agricultural producers, this is explained by weak financial and human capacities, while in relations with retailers, refusal of there costs is associated with their dominant position in a supply chain, as they are the main sales channels of dairy products.

From the perspective of dairy plants, the distribution of logistics costs in their favor in their relations with agricultural producers is justified from the point of view of the transactional approach, as it gives them an opportunity to influence individual price and non-price parameters of raw milk or the conditions of their formation. This approach supports the theory of O. Williamson on the formation of transaction costs who believes that "... a producer rooted in the industry must invest in long-term transaction-specific assets if they want to strengthen their position on the market and successfully deter the entry of other companies" [13]. Apart from logistics costs reallocation aimed at stimulating the development of their suppliers in the dairy chain, dairy plants can use the following mechanisms: provision of advisory services, investing in technology and equipment, equipment leasing, provision of guarantees for obtaining bank loans, provision of production resources.

Distribution of logistics costs between dairy plants and retailers on the Russian dairy market cannot be called optimal as retail trading which contributes the least to the product's added value receives an disproportionately big proportion of the profits, which results in imbalance in the entire chain performance. Optimization of margin distribution between the participants of the dairy market requires a deep study of gaining synergy potential during the integration process in this sphere.

The obtained results

As a result of the research the main reasons for the formation of high aggregate costs in dairy products manufacturing and sales in Russia have been identified. They are listed below:

• Disproportionate distribution of margin from dairy products sales among dairy chain participants (mainly agricultural milk producers). Income distribution from sales of 1 liter of pasteurized milk in Russia before the

announcement of sanctions was as follows: agricultural producers' share accounted for 36.9% of retail price, the processors' share – 36.3%, the share of retailers – 26.8%. Since the introduction of sanctions, the situation has slightly changed but there is still no optimal income distribution between dairy chain participants. Thus, for 8 months of 2016 the retail price share of agricultural producers amounted to 44.5%, of processors – 28.2%, the retailers' share – 27.3% (*Tab.*).

These changes are associated with reducing the milk supply in the Russian market. According to experts, given the level of expenditures and the contribution of each dairy chain participant in added value of finished dairy products, the favorable ratio is: 50% – the share in retail price of sales price of raw milk manufactured by agricultural producers, 30% – the share of milk sold by processing companies, 20% – the retail share [17]. For comparison: in the UK, the producers' share of retail price of pasteurized milk sales amounts to 55% , in the US – 56%, in Germany – 46% [8, 20, 25]. Milk producers' low revenues hampers the investment of funds in the development and implementation of innovative production technologies which significantly hinders the reduction of production costs and the improvement of raw milk quality, thereby increasing the costs of dairy products manufacturing.

• Spontaneously formed distribution channels of finished products, the vast majority of which are resellers, i.e. small-scale wholesale intermediaries whose services result in the appreciation of finished products in the whole process of product distribution. Unjustified from the point of view of consumers, the

Retail price structure on the Russian dairy market in 2016*

Period	National average sales price, rubles per liter			Share of each market participant in retail price of pasteurized milk (3.2% fat), %		
	Raw milk of agricultural producers	3.2% fat pasteurized milk sold by processing companies	3.2% fat pasteurized milk sold by retail traders	Agricultural producers	Processing companies	Retail traders
January	21.91	34.51	47.65	46.0	26.5	27.6
February	21.93	34.78	47.88	45.8	26.8	27.4
March	21.92	34.86	48.17	45.5	26.9	27.6
April	21.71	34.99	48.26	45.0	27.5	27.5
May	21.32	35.07	48.28	44.2	28.5	27.4
June	20.86	35.21	48.25	43.2	29.7	27.0
July	20.52	35.24	48.28	42.5	30.5	27.0
August	21.15	35.41	48.40	43.7	29.5	26.8
Average price for 8 months	21.42	35.01	48.15	44.5	28.2	27.3

* Author's calculations based on Rosstat data.

increase in retail sales prices of goods forces the consumers to reduce demand and accentuates the imbalance of profit distribution between the dairy market participants.

• Low development efficiency of raw materials zones of existing dairy plants (i.e., insufficient volume of milk production within the range of processing plants where the milk purchasing in terms of transportation costs is economically feasible), on the one hand, forces them to purchase raw materials in adjacent regions, creating additional transportation costs, on the other hand, results in the under-utilization of production capacities of dairy plants and the decreasing dairy production efficiency. If there is certain remoteness of dairy production from the point of sale, its fresh transportation to processing enterprises generally becomes unprofitable.

• Low raw milk quality and its non-compliance with the requirements for certain dairy products manufacturing (whole-milk products, cheese, etc.) compels processing enterprises to increase production costs of dairy products due to the need to provide deeper raw milk processing and hampers their ability to widen the assortment of finished products. For example, coagulation period of milk optimal for manufacturing hard rennet cheese should range from 16 to 40 minutes (normal coagulating property). Milk with coagulation period less than 15 minutes (good coagulating property) or more than 40 minutes or not coagulative at all (poor coagulating property) requires additional processing and therefore additional costs. Technological process for cheese production implies slight thermal treatment of milk by employing the pasteurization method which does not allow to get rid of spore microorganisms and a share of thermophilic microflora. Raising pasteurization temperature significantly increases the period of milk coagulation and deteriorates the quality of the finished product. Therefore, efficient organization of cheese production requires the creation of a sustainable, uniform resource base which would meet the specific requirements of technological process to the quality of raw milk.

• Loss of a certain part of income by the dairy industry due to low logistics efficiency (inventory management, optimization of transportation, etc.) and inefficient use of production waste. Aiming at manufacturing high-margin products, dairy plants excessively expand the assortment of whole-milk products by reducing the manufacturing of milk intensive products and almost completely renouncing the manufacturing of products of secondary raw milk extensive processing. This leads to incomplete use of milk biological value potential, increases the volume of non-recoverable waste the cost of which affects the cost of finished dairy products. Secondary raw milk (protein

and carbohydrate) or dairy industry by-products are: skimmed milk, buttermilk and milk whey.

Worldwide, secondary raw milk is used for nutritional purposes, to feed animals and produce chemical substances. Owing to modern scientific advances another innovative area for the use of secondary dairy raw milk has emerged – development of bioactive substances used to produce pharmaceuticals and cosmetics; in Russia, however, dairy production recycle streams are practically not used.

• High competition in the dairy market from foreign producers with significant competitive advantages due to their effective global supply chain management based on years of experience. Since the introduction of sanctions targeting the restriction of food supplies delivery from particular European countries, dairy products supplied from Belarus became the main competitive force on the Russian market. However, a large amount of dairy products is still produced in the EU [9].

• A large amount of counterfeit dairy products and extremely low punitive measures for their sales lead, on the one hand, to the bankruptcy of bona fide producers of milk and dairy products, on the other hand, to the drop in consumer demand due to the consumers' dissatisfaction with the quality of dairy products. This trend exists due to uneven distribution of information between the participants; and dairy market functions similar to the G. Akerlof's market for "lemons" [14]. According to the estimates of the Federal Veterinary and Phytosanitary Monitoring Service (Rosselkhoznadzor), the volume of counterfeit dairy products in the Russian market comprises 11%, and by some dairy products this proportion exceeds 50% [6]. The higher the fat content of dairy products, the greater the volume of counterfeit products in the market. This situation arises from the fact that product's quality is not considered as a competitive advantage by most Russian producers of dairy products. The purpose for counterfeiting dairy products is to receive illegal profits by reducing production costs resulting from unauthorized replacement of high-quality, biologically valuable raw materials with less valuable ones.

• Creation of additional insurance supplies in the elements of logistics chain due to mutual uncertainty about the partners in the supply chain leads to the inability to satisfy the consumers' needs to buy fresh dairy products and increases expenses related to supply maintenance and inevitable percentage of their spoilage.

The implementation of the principles of logistics management throughout the whole supply chain from producers of raw milk to dairy product sales will help the participants to mitigate the negative impact of these restrictions. In the author's opinion, the system of supply chain

management can be considered as a partial alternative of objectively necessary state regulation of the dairy market and the processes of vertical integration aimed at even profit distribution among the participants [8].

The introduction of the system of supply chain management in the dairy market in Russia is hampered, on the one hand, due to the peculiarities of milk as an asset. Milk is a perishable product which requires processing in a short time and a strictly standardized asset which imposes special requirements on the production technology, collection, cooling, storage, packaging and transportation and affects the quality properties of milk – all this puts special demands on its logistics. On the other hand, the introduction of supply chain management system in Russia is complicated because of the low level of transport infrastructure development, insufficient technical capacity of the market participants, underdeveloped culture of market relations, poor communication processes, lack of trust between the participants, lack of participants' awareness about common goals and low degree of implementation of management strategies when building supply chains at the inter-firm level, differences in corporate cultures, partners' distance barriers, etc. Furthermore, modern Russian logistics market has not yet completely formed and is not transparent enough, which significantly reduces the efficiency of external logistics services of different providers on the milk market.

The process of formation of an effectively operating supply chain requires a long period of time during which it is necessary to choose reliable partners assessed on the basis of the results of joint work. In Russia, however, the issue of designing an efficient supply chain is often considered by the enterprises only when they need to implement crisis management.

Analysis of the situation in the Russian dairy sector demonstrates an urgent need to implement supply chain management principles and develop a value chain when building long-term partnership relations between its participants in order to increase of level of profitability of each participant. The implementation of SCM principles in the dairy sector will help meet state objectives of ensuring the country's food security and dairy production competitive in both global and domestic markets amid Russia's accession to the WTO, establishment of the Customs Union and the implementation of the import substitution strategy.

Conclusions and suggestions

The main problem of the Russian dairy sector is uneven margin distribution between the participants in the dairy supply chain. Most profits are concentrated around traders and processors, which makes raw milk production a low-income business

activity. Low profitability in agriculture results in a decline in production volumes and a reduction in the quality of raw milk, which, in its turn, entails an increase in dairy production costs due to insufficient loading capacities of milk processing enterprises or very high transportation and production costs. Therefore, the first way of creating a competitive advantage for dairy enterprises is to optimize total margin distribution between all elements of the value chain. Each chain participant's cost (investment) level is used as a base for margin distribution. This distribution will help increase the level of profitability of agricultural dairy producers participating in the supply chain and thereby stimulate the increase in production volumes and milk quality. Stability of raw milk supplies creates significant competitive advantages for the whole chain in general.

The second major problem which determines high transportation and production costs in the dairy sector is associated with insufficient and disproportionate development of raw-product areas of dairy enterprises and non-compliance of raw milk quality with the requirements of competitive dairy products. There are two ways of solving this problem.

The first is the development by milk producers together with processing enterprises of a rational standardized milk production technology (technology of maintenance, feeding, milking, etc.) allowing to produce milk with set biological parameters (fat, protein content), required for the production of certain types of dairy products. The example of the implementation of such programs in Russia is the Pepsi-Co company.

The second way is the optimization of the range of products of dairy processing enterprises aimed at increasing its incomes through a more rational use of resources and maximum satisfaction of customers' needs. Optimization of the product range should be carried out taking into account the main constraints on the development of the dairy sector: quality (biological composition) and quantity of milk produced in a rationally defined resource area of a dairy plant, taking into account the cost of daily transportation of both raw materials and waste from its production; seasonal changes in the qualitative composition of milk and its production volumes in the resource area of a dairy processing plant; by-products accompanying the production of each type of dairy product as they can be used as raw materials for producing other types of dairy products; fluctuations of seasonal retail price of dairy product sales and demand in the market. Given the constraints described above, the author proposes to implement the optimization of the product range of dairy processing plants on the basis of a mathematical model developed by G. Classen and J. Kampmann [17]. This model was practically tested on the example

of assortment formation of an international dairy company FrieslandCampina and showed a potential significant increase in the profit of this manufacturer. An increase in profit was achieved due to optimal distribution of raw milk for manufacturing dairy products, improvement of the quality of communication between the planning centre and operational units, considering the influence of a fluctuation in the qualitative composition of milk on the cost of of dairy products, forecasting of the changes in demand on the market and the possibility to evaluate investment strategies. The distribution of income throughout the whole supply chain will significantly enhance the competitive position of its participants in the dairy sector.

This approach can be implemented by introducing the systems of supply chain management of dairy products. This model was used to optimize the profit of the supply chain of dairy products in New Zealand through the management of seasonal fluctuation in the qualitative composition of milk produced on farms, and the optimization of the range of dairy products manufactured by processing enterprises taking into account consumer demand, market prices for dairy products and qualitative composition of milk supplied for processing. The model implies the implementation of a mechanism of commodity management in a supply chain. The results of using this mechanism show that, for example, a 1% increase in casein in milk's composition without changing other quality parameters will change the range of dairy products produced by a processing plant in terms of increasing its price. This will result in the increase in the aggregate profit in a supply chain by 1.27%, in the operating profit – by 1.57%, in inventory management costs – only by 0.3% [22].

The third problem lies is lack of trust between the participants of supply chains and their willingness to insure themselves against cooperation, which leads to increased transaction costs and the creation of insurance supplies (in the production of milk powder and vegetable fat as an alternative to raw milk, in retail – finished dairy products). The result is the loss of competitive advantages derived from management of the entire supply chain operation under the concept of "just in time" due to elimination of supplies at each production stage. In addition, the quality of finished dairy products is significantly reduced due to the use of substitutes for raw milk and the increase in period of dairy products storage in warehouses of trade enterprises. This causes the reduction in consumer demand and the decline in aggregate income of all dairy chain participants. Addressing this problem requires quite a long time, during which each participant's approach to the assessment of their role in a value chain should be reconsidered; it also

requires the awareness that it is only possible to gain significant competitive advantages amid economic crisis through coordinated efforts of all participants of this chain [12].

The implementation of the supply chain management mechanism will to some extent help solve the whole range of identified problems. Using this system, the milk processing plant Dimitar Madzarov Ltd which produces organic dairy products in Bulgaria where the situation in the dairy sector is similar to the Russian reality, managed to increase their production volumes and milk tradability on farms participation in the supply chain. The average increase in production amounted to 195.4%, and the level of tradability – 115.1%.

According to the surveys of farmers involved in the supply chain of Dimitar Madzarov Ltd, the main factors ensuring milk production volume increase are: long-term contracts with the processing plants, milk collection in sufficient proximity to the farm, good processor's reputation, high level of trust, better milk quality control, timely payments, high purchase prices and low risks. Fifty per cent of the interviewed farmers involved in the supply chain of Dimitar Madzarov Ltd. stated that they plan to increase the production of milk, 30% reported about their intention to maintain the existing volume of production, and none of the respondents is going to shift to production of other agricultural products.

The use of supply chain management mechanisms is implemented with a view to ensuring an even income distribution between the participants of the chain. Therefore, the purchasing prices of the Dimitar Madzarov Ltd are established at a significantly higher level than average prices of raw milk in Bulgaria. A long-term contract fixes the volume of milk supplies, its quality, prices and gives a detailed description of sanctions for non-compliance of the quality of supplied milk to the established requirements [15].

Building close relations between milk producers and processors in a supply chain through active communication, coordination and use of incentive mechanisms helps dairy plants to introduce new requirements for the suppliers to the quality, time and ways of raw milk delivery, which increases the supply chain's aggregate profit which is later evenly distributed among the participants.

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Received June 28, 2016

DOI: 10.15838/esc.2016.5.47.15
UDC 330.4, LBC 65.050.03

Using Agent-Based Models in the Analysis and Forecast of Socio-Economic Development of Territories*

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Abstract. The purpose of the paper is to study the essence of agent-based modeling, defining its features and prospects of usage in the modeling of socio-economic development of territories and systematization of domestic and foreign approaches to the development of prototypes for agent-based models of territories. Information basis for the research comprised the works on agent-based modeling by Russian and foreign scholars, especially articles and monographs of scientists of the Central Economics and Mathematics Institute under the Russian Academy of Sciences, papers presented in an international journal The Journal of Artificial Societies and Social Simulation and other sources available on the Internet. The article presents theoretical and methodological foundations of agent-based models of territories. The author considers the concepts of "agent-based modeling" and "agent" and defines specifics of agent-based models in comparison with other types of simulation modeling. The paper also describes major stages of building agent-based models for territories and considers qualification requirements to a modeling subject. Furthermore, it reviews Russian and foreign approaches to the development of prototypes for agent-based models of territories. It has been determined that most of them deal with the modeling of spatial,

* The research received support from the Russian Science Foundation in the framework of research project # 16-18-10296 "Development of a set of agent-based models that simulate socio-economic system on the Eurasian continent and that are detailed to the level of individuals".

For citation: Makoveev V.N. Using agent-based models in the analysis and forecast of socio-economic development of territories. *Economic and Social Changes: Facts, Trends, Forecast*, 2016, no. 5, pp. 272-289. DOI: 10.15838/esc.2016.5.47.15

territorial and socio-economic development of regions, cities and municipal entities. Agents in such models are presented by households, residents of regions and cities, enterprises and organizations operating in their territory, and public administration authorities (their inclusion in the model makes it possible to test different options of management impacts on territories by changing the model parameters, for instance, the introduction of certain prohibitions and quotas, issuance of permits, distribution of financial resources, etc.). At the end of the paper, the author formulates major conclusions. He shows the complexity faced by developers of agent-based models of socio-economic development and prospects for further research in this field. It has been established that the agent-based approach to the modeling of socio-economic development of territories is very promising, it helps improve the efficiency of forecasting regional development and management decisions due to a very detailed and realistic reconstruction of the internal structure of a region in the form of separate independent economic entities that interact with each other and with external environment, and also due to the possibility of fast processing and analysis of large amounts of data.

Key words: economy, mathematical modeling, agent-based models of socio-economic development.

In the post-Soviet period, the growth of the domestic economy was mainly achieved by increasing exports of raw materials, particularly hydrocarbons, and a favorable pricing environment for energy products. The domestic economy has evolved over the last 25 years under this model of raw materials export. However, the financial crisis of 2008–2009 and the events of 2014 demonstrated the vulnerability and instability of this type of development. The sharp decline in oil prices in 2014 led to a significant reduction of budget funds at all levels and reduction of investment activity that adversely affected the dynamics of economic growth and people's welfare. The situation was aggravated by the restrictions on imports of new technology and high-tech equipment from some foreign countries introduced against Russia.

This situation necessitates a more effective use of available resources, especially in the regions. In turn, this is impossible without the development of systems for simulation and forecasting of socio-economic development at the regional level.

In 2014, the law "On strategic planning in the Russian Federation" was adopted, it "establishes the legal framework for strategic planning in the Russian Federation, coordination of state and municipal strategic management and budget policy, powers of the federal bodies of state power, bodies of state power of subjects of the Russian Federation, bodies of local self-government and their cooperation with non-governmental, scientific and other organizations in the field of strategic planning" [18].

Currently, for the purpose of forecasting socio-economic development of territories, state authorities mostly use methods of time series (trending), input-output balances, production functions and expert interviews. A lot of models for socio-economic development of territories have been developed on the basis of these methods (Cross-sectoral interactions model (Central Economics and Mathematics Institute, RAS), Balance-econometric forecasting model (Center for Macroeconomic Analysis and Short-term Forecasting), Macroeconomic inter-industry model RIM (Institute of Economic Forecasting, RAS), the Model of the modern Russian economy (Dorodnicyn Computing Centre of RAS), the System for analyzing and forecasting socio-economic development of the region (KSTU), "Input-output" model by W. Leontief (USA), the Interindustry model of the U.S. economy LIFT (USA), AIDADS demand model (China), the Model of the Eurozone (EU), etc.) [9, 21, 22, 30, 37, 41]. However, it should be noted that many of such models are not applicable at the regional level because their calculations are based on the data from expert surveys and on the number of indicators, for which it is extremely difficult to obtain information. This creates the need to design socio-economic development models that would be applicable at the regional level and would take into account specific features of the territory and a wide variety of relationships between economic agents located there.

It is necessary to note that such models should be capable to perform a quick and efficient analysis of very large volumes of information. This is due to a rapid growth of the total amount of information in various economic sectors in recent years. According to a market research company IDC[1], the total amount of data will increase 29-fold in 10 years: from 1,200 exabytes in 2010 to 35,000 exabytes in 2020. Analysts say that the greatest increase in information will be observed in the Internet, financial sector, healthcare, astronomy, and bioinformatics. The need for processing and analyzing such considerable amounts of data sets makes it necessary to create information-analytical systems of a new level based on advanced computing methods, methods of pattern recognition, organization of storages, gathering statistical information with the goal of extracting meaning from data and obtaining information context [1].

Since the human brain is not capable of perceiving more than three or four interrelated parameters of a dynamic process, the creation of such systems at the regional level will improve the efficiency of decision-making, including public administration in a given territory, and a more efficient use of available resources in the region [16].

[1] International Data Corporation.

When building such models, one of the key elements of the new information-analytical systems can be the agent-based approach to the simulation of socio-economic development of territories, which is relatively new in simulation modeling and becomes increasingly popular. According to researchers from CEMI RAS, the emergence of this approach can be viewed as a result of a long evolution of modeling methodology: the transition from mono-models (one model describes a single algorithm) to multi-models (one model contains multiple independent algorithms) [13].

In accordance with this approach, the economic system can be represented as a set of interacting agent subsystems. By modeling the behavior of individual elements in a system, setting the parameters of their interaction, it is possible to investigate regularities in the behavior of a global system and analyze its features [7]. In other words, agent-based modeling approach is an artificial society that consists of independent agents that interact with one another and can simulate a system as close to reality as possible [20].

In building agent-based models researchers do not describe the behavior of the system as a whole (this applies in the development of traditional simulation models by using linear or differential equations that establish relationships between items), rather, they describe the behavior only of its elements and their independence. The behavior of the entire system is determined by the system itself in the course of emulation experiment, and functional relationships arising in the course of interaction of the system elements remain beyond the narrative part and, in fact, are the subject of research [8].

Thus, the relevance of studying the issues of development of agent-based modeling of socio-economic systems for various territories is due primarily to a significant increase in the volume of information, the need for its processing and analysis, and the increase in the efficiency of managerial decisions.

The purpose of the present paper is to study the nature of agent-based modeling, determine its specifics and prospects of use in the modeling of socio-economic development of territories, as well as to review domestic and foreign approaches to the development of prototypes for agent-based models of territories.

Information base of research is presented by the works of domestic and foreign scholars on agent-based modeling; first of all, these include articles and monographs of scientists of the Central Economics and Mathematics Institute of the Russian Academy of Sciences, proceedings of the international *Journal of Artificial Societies and Social Simulation*, as well as other sources available on the Internet.

The essence of simulation process, according to A.G. Granberg, is reduced to the cyclic and sequential execution of the following phases: construction of a model, study of the model, transfer of knowledge from the model to original, and validation and application of knowledge [5].

Let us try and find out which models can be named agent-based models and in what ways they differ from other types of simulation.

Domestic and foreign researchers formulated various definitions of agent-based models.

For example, A.R. Bakhtizin, and M.R. Fattakhov define agent-based models as a special class of models based on the individual behavior of agents and created for computer simulations [2; 25].

V.L. Makarov specifies the agent-based model by enumerating its properties among which he points out autonomy, limited intelligence of the agents, location in space, and heterogeneity. The author points out that the main difference between agent-based models and other types of simulation is "the presence of a large number of agents interacting with one another" [11].

E.D. Sushko specifies the agent-based model as "an artificial society of interacting independent agents, each of which has a given set of personal characteristics ("resources"), an objective function ("interests") and is subject to the rules of behavior that determine its reactions in various situations involving the scope of its interests" [23].

According to N. Gilbert, agent-based modeling is a computational method that allows the researcher to create and analyze a model composed of agents interacting in the environment, and conduct experiments using the models constructed. The main feature of agent-based models, according to N. Gilbert, is the ability of the agents to interact with each other and with the environment, to carry information messages and perform actions on their basis. In this case, information messages can present a direct "dialogue" between the agents, and indirect means of obtaining information (impact of another agent, observation over another agent). According to N. Gilbert, the possibility of modelling agent interactions is the main difference between agent-based modeling and other types of computational models [36].

A.R. Bakhtizin says that "the ultimate goal of the process of creating agent-based models is to track the influence of fluctuations of the agents operating at the micro-level on the indicators at the macro-level" [2].

The concept of "agent" is one of the main terms in agent-based modeling. M.R. Fattakhov believes that currently there is no precise definition of this term in agent-based modeling. According to his viewpoint, "the agent is an intelligent autonomous computerized entity located

in its surrounding environment and interacting with other similar entities to achieve the goals of its existence" [25].

According to V. D. Boev, the "agent" is an active object that possesses its own behavior and has the opportunity to interact with other agents and with the environment [3].

Exploring the term "agent", V.L. Makarov emphasizes that each agent has a given set of characteristics and an objective function. On this basis, there is an imitation of the agent's reaction to changes in the external environment that affects its interests [13].

According to M.R. Fattakhov, the main properties and attributes of agents are "autonomy, intelligence, representativeness, location in time and space, the presence of life cycle, independence from the model developer or an external operator, interaction, purpose, perception of the world, the ability to learn and adapt, the availability of a resource in the agent" [25].

Thus, researchers engaged in agent-based modeling and defining the term "agent", name among its main features the ability to behave individually and interact with other agents and with the environment. Bearing this in mind, we can point out the following key characteristics that distinguish agent-based models from other computational models [12]:

1. Heterogeneity of the agents (including those within one class). In the class of enterprises, each agent (a company) is different while possessing the appropriate set of characteristics of behavior inherent in this class. In non-agent simulation models an entire class of companies is represented by a single enterprise, i.e., all agents in this class act synchronously and equally as one, which does not correspond to reality. For example, when solving the problem in the economy by using computable models describing the connection between its two sectors – industry and agriculture – these sectors behave like two huge enterprises. In an agent-based model in each of these classes there will be many agent enterprises that will differ from each other by the number of workers, amount of profit, production efficiency, types of products, etc.

2. Autonomy (independence of the actions of one agent from the actions of other agents). The actions of the agents in the model (e.g., humans) occur simultaneously and in parallel. Also, the agents' actions vary even within the same class. For example, in the class of enterprises, ceteris paribus, one agent enterprise can make a decision about investing all profits into the modernization of its production, another agent enterprise can decide to send all profits to the payment of dividends, and a third one will implement both these decisions in a certain proportion.

3. Implementation of actions of the agents in a given space that has a certain structure. For example, if the agents in a

model (people, cars, etc.) use roads and rivers where they exist in a given space, then mountains are a barrier for them.

4. Local interactions. Each agent in the model interacts with other agents in a certain neighborhood, and interaction of this type does not occur with agents outside of it. This brings the model closer to real life, because interaction between people is carried out within a certain territory (even the interaction via the Internet does not occur simultaneously with the entire population of the world).

5. Bounded rationality. This feature in the model refers to individuals, enterprises and the government. In contrast to the concept of the economic man (homo economicus), the concept of bounded rationality proceeds from the fact that an individual fails to achieve the maximum individual utility function due to natural objective constraints (constraint of time and speed in decision-making, limitations of memory and the availability of information about possible options, etc.). It helps bring an agent-based model closer to reality.

6. Non-equilibrium nature of the dynamics of the processes. Whereas conventional modeling problems (for example, general equilibrium problems) are busy looking for equilibrium solutions, the dynamics of processes in agent-based models is non-equilibrium in nature [8].

The specifics of constructing agent-based models lead to the presence of several stages in this process. Along with the general stages of simulation modeling (analysis of the system; formulation of a goal for the simulation of the system; development of conceptual structure for the model; implementation of the model in the modeling environment; implementation of animated representation of the model; validation of the model's implementation; calibration of the model; planning and carrying out computer experiment [3]), for developing agent-based models the researcher has to determine individual characteristics of the agents, to simulate their behavior and rules of interaction with the environment, to calibrate the model (at this stage the correspondence between the actually observed data on the simulated object and the data calculated using the results of individual actions of agents in the model is achieved).

Despite the complexity of building agent-based models, interest in them is increasing, as evidenced by the increasing number of publications on this topic [39]. It should be noted that about half of the prototypes of agent-based models are developed in the social and economic spheres.

The *Table* presents the most interesting and sophisticated, in our opinion, domestic and foreign agent-based models in the social and economic development of various territories.

Domestic and foreign agent-based models

No.	Model	Model structure	Authors
		Russian models	
1.	Regional model "Governor"	Individuals (people – the region's inhabitants), legal entities (enterprises and organizations) and municipal districts	E.D. Sushko
2.	Demographic agent-based model "Russia"	Two types of agents that differ in reproductive strategies. The first type of agents follows the traditional strategy and the second – the modern strategy.	V.L. Makarov, E.D. Sushko, A.R. Bakhtizin
3.	Complex Agent-Based Model of Urban Development (CUBMUD)	Enterprises and people, and three types of environment: public transport, city sectors, roads	M.R. Fattakhov
4.	Multi-agent model for development of the territorial system	Economic regions that consist of territorial production complexes and sites where they can be placed	K.S. Chirkunov
5.	Interregional inter-industry "input-output" model	Firms, households, foreign markets, and commodity markets	V.I. Suslov
		Foreign models	
6.	Model for the European economy – EURACE (Italy, France, Germany, UK, Turkey, USA)	Households, firms and banks	Researchers from European countries, Nobel laureate J. Stiglitz
7.	Agent-based model of the virtual economy in Hradec Králové (Czech Republic)	Consumers; producers; mining companies; transportation	P. Cech, P. Tucmk, V. Bures, M. Husrakova
8.	Model for expanding urban territory (China)	Urban residents, farmers and authorities	H. Zhang, Y. Zeng, L. Bian, X. Yu
9.	Intra-Urban Migration Model (USA)	Households, developers and government	S. Sun, S. M. Manson.
10.	Shrinking City Model (Germany)	Population, space, decision-making	D. Haase, S. Lautenbach, R. Seppelt

Source: compiled by the author.

Let us consider each of the presented agent-based models in more detail.

1. The regional model "Governor", developed by E.D. Sushko, [14] is designed to simulate the socio-economic state of the region based on the reconstruction of its internal structure and simulating the behavior of autonomous economic agents operating in its territory [23]. The model includes three types of agents: individuals (people – the region's inhabitants), legal entities (enterprises and organizations) and municipal districts. The high degree of elaboration of the model is proved by the fact that it has a very complex structure and includes a model of demographic development of the region and its individual municipal districts; the model of labor potential and work behavior of an individual; the labor market model; production model; the model of formation and use of the budget.

The model "Governor" is intended for testing different options of management actions at the regional level, the model can also be used as a planning tool in the result-oriented budgeting, i.e. in the allocation of resources in accordance with the goals, objectives and functions of the authorities.

The model is tested on the example of the Vologda Oblast. It helped carry out numerical experiments on simulating the dynamics of the status of the population in the oblast, its municipalities and enterprises in their territories under different values of the model's managed parameters. The results of the testing showed that the model accurately reflects characteristics of regional socio-economic development and can be used in its simulation [23].

2. Demographic agent-based model "Russia" developed by researchers at CEMI RAS to simulate people's reproductive behavior based on their internal attitudes [15].

The agents in the model are divided into two types that differ in reproductive strategies. The first type of agents follows the traditional strategy and the second – the modern strategy.

At the first stage of the work of the model the initial state of the environment is established and the agents are generated, the features of which (age, gender, the sign of belonging to a certain type, desired number of children) are assigned in such a way as to reproduce a given sex-age and social structure of the population in the modeled region.

At the second stage the processes of natural movement of population – the death and birth rates – are simulated by using the method of regrouping ages and probabilistic mechanisms. According to the authors, "extinction of the agents takes place in accordance with the death rates differentiated by sex and age, but the same for the entire population. The creation of new agents (child birth) in the model is a result of the agents' actions. First, agent people interact in the formation of couples when the partners agree on the desired number of children. And then, "family couples" agree on the time of birth of each child, and this choice depends on their internal settings associated with their belonging to a certain type" [15].

3. Complex Agent-Based Model of Urban Development (CUBMUD) [25] developed by M.R. Fattakhov consists of two types of agents: people (inhabitants of the metropolis), city enterprises and organizations, and three types of environment: city sectors, public transport and public roads, which are situated in these sectors. In the operation of the model, one kind of agents interacts with the other ("agent-agent" type of connection), i.e. they are either working and receiving a monthly income or are on the job market and looking for a job,

interacting with the environment of the model ("agent-environment" type of connection). Here they pay for the cost of living (utility bills, rent). In the model, human agents can change their area of residence based on their preferences or financial situation. When they commute between home and work, human agents interact with the environment – public transport and roads. The choice of the type of vehicle determines the amount of time they spend on the road and the amount of monthly expenses. Human agents have the following set of characteristics: age, memory, monthly income, monthly transport expenses, cash balance, area of work, area of residence, time when their working day starts, presence or absence of a personal vehicle. Human agents can be in one of four states: satisfaction, frustration, waiting, and neutral state [27].

This model was tested on the example of Moscow [24]. The CABMUD model that has been designed helps make long-term forecasts and develop scenarios of socio-economic development of cities, and to make a quantitative assessment of the results of management decisions.

4. Multi-agent model for development of the territorial system was developed and tested by K.S. Chirkunov [29]. The main agents in it are economic regions that consist of agents of the lower level of the hierarchy: territorial production complexes and sites where they can be placed. The sites are characterized by geographical location and available natural and human resources. The external environment in the model is represented by a variety of external resources and markets. In the process of functioning of the territorial system, agents interact with each other, for example, they can agree on a set of production specializations of the system and thereby determine the behavior of the territorial system as a whole [28].

5. Interregional inter-industry "input-output" model developed by V.I. Suslov and his colleagues to solve the problems of modeling the spatial structure of Russia's economic system taking into account its vast territory. The model contains four types of agents: firms, households, foreign markets, and commodity markets. The model has a geographical structure and is attached to the conventional map of Russia using GIS approach [19].

6. *In September 2006, a project was launched to develop a model for the European economy – EURACE (Agent-based Computational Economics)*. In this model, many autonomous agents interact in the framework of the socio-economic system [34]. The project involves experts from eight research centers in Germany, Italy, UK, France and Turkey, and a consultant from Columbia University, Nobel laureate Joseph Stiglitz [20].

The model uses a geographical information system that covers a wide range of facilities: shops, enterprises, schools, transportation networks, etc.

In its scale and complexity EURACE is unique because it presents the whole European Union. In order to fill the model with statistical information, the data (presented by GIS maps) of the statistical service of the European Union of the NUTS-2 level representing data on the 268 regions of 27 countries were used[2].

The model has three types of agents: households, firms and banks. They all have a geographical reference and relate to each other through social networks, business relationships, etc. With the help of the developed model a series of experiments were carried out in order to study the labor market. One of the main conclusions of the study consists in the fact that the macroeconomic indicators of the two regions with similar conditions (resources, economic development, etc.) for an extended period (10 years or more) can significantly differ because of the initial heterogeneity of the agents.

7. Agent-based model of the virtual economy developed by P. Cech, P. Tucmk, V. Bures and M. Husrakova, recreates the processes of production and consumption in the real economy. It is designed to study economic processes in the Czech town of Hradec Králové [45].

In the model, the authors identify four types of agents: consumers (C-agents); factory agents (F-agents); mining companies (M-agents); transportation (T-agents). *C-agents* can purchase essential goods, normal goods and luxury items. The structure and rate of consumption are determined by the individual consumption function that depends on the welfare of the agents. The level of welfare is determined by the job and qualifications. Making a choice between investment into consumption or investment in training, the agents can manage their well-being. *F-agents*, consuming raw materials and other products, produce the final product that is purchased by C-agents, or the intermediate product that is purchased by other manufacturers. With the help of the consumption function, the proportions of purchased raw materials and products are determined, and the range of products is specified with the help of the production function. The output volume depends on the technology used and on the skills of C-agents employed in the production. *M-agents in the model* convert natural resources into commodities that F-agents use, and each M-agent supplies only one type of raw material. The cost of production is determined by the consumption function that reflects the necessary energy and technology. *T-agents* in the model act as intermediaries between producer agents and mining companies. The task

[2] NUTS (French: Nomenclature des unites territoriales statistiques) is a geocode standard for referencing the subdivisions of countries for statistical purposes. The standard is developed by the European Union, and covers the member states of the EU. There are three levels of NUTS, the second level (NUTS-2) corresponds to administrative districts in Germany, counties in the UK, etc.

of T-agents is to find the optimal route. Capacity, travel speed and technology define the performance of T-agents. Transportation costs depend on distance.

The authors have implemented a simplified computer model of the virtual economy on the NetLogo platform. It simulates the processes of raw materials production, their transfer to transport agents, transportation, obstacle detection during transportation, production of products, purchase, sale and final consumption of products by consumer agents. According to the intent of the researchers, the final model should be based on real statistical data and be consistent with the behavior of economic entities of Hradec Králové [27].

8. Agent-based model of the Chinese city of Changsha developed by H. Zhang, Y. Zeng, L. Bian, and X. Yu [46]. The model includes three types of agents: residents, farmers and authorities. One of the main driving forces behind the expansion of the city in the model is inhabitant agents who choose a new place of residence.

Farmer agents in search of a more comfortable life want, on the one hand, to live closer to the city and "civilization" and on the other – not to lose the lands that "feed" them, because these very lands near the city limits and major roads are most likely to be transferred to the city. Decision-making by farmer agents in the model depends on a set of factors: proportion of protected agricultural land, proportion of the land for development and the areas of possible development, distances to railroads and highways, distances to main urban roads and to the city center, population density, etc. The authorities in the model are an agent of a special type, which has no spatial characteristics in contrast to the agents of the other two types; however, it can make decisions that promote the most rational use of land and ensure sustainable development of the city while protecting and preserving fertile agricultural lands [27].

The described model is based on statistical data on the socio-economic development of the city of Changsha in China (since 1990) and uses a GIS map of the city.

9. Intra-Urban Migration Model developed by American scientists S. Sun and S. M. Manson. The main agents in the model are households (they create demand in the real estate market), developers (creates supply of new housing) and government (regulates land use). The process of modeling intra-urban migration is carried out in several stages: first, features of the environment and spatio-temporal framework are defined; second, data about the agents is loaded; third, the model is run and, fourth, the results of the simulation are analyzed. The model is verified and calibrated on data from the Minneapolis–St. Paul metropolitan area, Minessota [50].

10. Shrinking City Model designed by German researchers D. Haase, S. Lautenbach and R. Seppelt, is used to study migration and land use in Leipzig. The model is based on three blocks of components: "Population" (population dynamics affect the life cycles and types of households and is determined by migration growth, birth and death rates), "Space" (every point of the urban space, with the exception of the territorial jurisdiction, is described by the composition of households, type of residential development, transportation access, cost of purchase and rent of real estate, security, crime situation, medical and educational institutions, shopping centers, places for recreation and leisure), "Decision-Making" (on the basis of assessing the attractiveness of the place of residence each household makes a choice between relocation and preservation of its former residence) [38].

The model helps assess the level of release of the housing in the city based on the relocation of households, and in the absence of demand for the housing for more than 5 years – the level of its demolition.

Based on the analysis of approaches of domestic and foreign researchers to the development of agent-based models in the social and economic spheres, we can conclude that the majority of them are devoted to the modeling of spatial, territorial and socio-economic development of regions, cities and municipalities. The main agents in such models are households, inhabitants of regions and cities, enterprises and organizations operating in their territory, and state authorities (their inclusion in the model helps test different options of management actions in the territory by changing the model parameters, such as the introduction of certain prohibitions and quotas, issue of permits, allocation of financial resources, etc.).

In order to implement agent-based models of socio-economic development at the regional level, the developers must overcome the difficulties associated with the definition of agent types, their number and characteristics, understanding of the mechanism of interaction between the agents and the external environment, implementation of model calibration and selection of simulation period. The situation is also complicated by the problem of filling agent-based models of socio-economic development of territories with real data. This problem can be partially solved by carrying out surveys. However, techniques of their realization not always help ensure the comparability of the data obtained at different levels of modeling. One of the problems hindering the use of the agent-based approach in the forecasting of socio-economic development of territories is the lack of awareness of public authorities and

management on the opportunities and prospects of this method and feasibility of its application in the study of economic dynamics, management decision-making and selecting strategic priorities.

Summarizing all of the above, we can conclude that the agent-based approach to the modeling of socio-economic development of territories is very promising, it improves the efficiency of forecasting of regional development and management decisions due to very detailed and realistic reconstruction of the internal structure of the region in the form of separate independent economic entities that interact with each other and with the external environment, and also due to the possibility of fast processing and analyzing large amounts of data

In our opinion, further research in the field of agent-based modeling of socio-economic development of territories can be directed at solving the problems related to the study of the interaction of agents with each other and with the environment, developing theoretical and methodological foundations for agent-based approach, analyzing software and technological implementation of agent-based models on supercomputers, and developing the algorithms for calibration and verification of agent-based models.

The author expresses his gratitude to Konstantin Anatol'yevich Gulin, Doctor of Economics, Associate Professor, ISEDT RAS Deputy Director, Head of the Department of Scientific and Technological Development and Knowledge Economy for his assistance in preparing this paper.

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Received September 13, 2016

Editor A.A. Sokolova

Make-up page T.V. Popova

Translators and Proof-readers A.A. Sokolova, A.S. Ukhanova

Passed for printing November, 28, 2016.
Date of publication November, 30, 2016.
Format 60×84 1/8. Digital recording.
Con. pr. sheets 33.8. Number of copies 500. Order No. 332.
Price is open.

The journal is registered by the Federal Service
for Supervision of Telecom and Mass Communications (Roskomnadzor).
Certificate of registration PI FS77-60248 dated December 19, 2014.

Founder: Federal State Budgetary Institution of Science Institute
of Socio-Economic Development of Territories
of Russian Academy of Science (ISEDT RAS)

Address of the Publisher and Editorial Office:
56A, Gorky St., Vologda, 160014, Russia
phone (8172) 59-78-03, fax (8172) 59-78-02, e-mail: common@vscc.ac.ru