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ECONOMIC AND SOCIAL CHANGES: FACTS, TRENDS, FORECAST

A peer-reviewed scientific journal that covers issues of analysis and forecast of changes in the economy and social spheres in various countries, regions, and local territories.

The main purpose of the journal is to provide the scientific community and practitioners with an opportunity to publish socio-economic research findings, review different viewpoints on the topical issues of economic and social development, and participate in the discussion of these issues. The remit of the journal comprises development strategies of the territories, regional and sectoral economy, social development, budget revenues, streamlining expenditures, innovative economy, and economic theory.

Founder: Vologda Research Center of the Russian Academy of Sciences

Federal State Budgetary Institution of Science Vologda Research Center of the Russian Academy of Sciences (VolRC 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 VolRC 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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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 – Memorandum of agreement 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 agreements are signed with Jiangxi Academy of Social Sciences (China, 2014), National Academy of Sciences SM TsSaiSI (Belarus, 2014). Protocols of intent are signed with the Academy of Social Sciences Jiangxi Mao Zhiyong (China, 2014), National Institute of Languages and Civilizations (France, Jean Verkey, 2014).

2015 – Protocol of intent is signed with the Academy of Social Sciences, Jiangxi Province (China, 2015). Cooperation agreement is signed with the Institute of Sociology of the National Academy of Sciences of Belarus (Belarus, 2015).

2016 – Cooperation agreements are signed with EHESS Ecole des Hautes Etudes en Sciences Sociales (Paris, France, 2016), Institute of Philosophy, Sociology and Law of NAS RA (Yerevan, Armenia, 2016), Yerevan Northern University (Armenia, 2016), Yerevan State University (Armenia, 2016). Protocols of intentions are signed with Academy of Social Sciences in province Jiangxi (China, 2016).

CONTENT

PUBLIC ADMINISTRATION EFFICIENCY

Editorial

Ilyin V.A., Morev M.V. Another Step toward V. Putin's "Long State" 9

THEORETICAL ISSUES

Barsukov V.N., Kalachikova O.N. The Evolution of Demographic and Social Construction of the Age of "Old Age" 34

REGIONAL ECONOMY

Ivanova M.V., Yakusheva U.E. The Formation of the Mechanism of Cooperation between Socially Responsible Business and Regional Authorities in the Arctic Zone of the Russian Federation 56

INNOVATION DEVELOPMENT

Uskov V.S. Scientific and Technological Development of the Russian Economy in the Transition to a New Technological Order 70

DEVELOPMENT OF MUNICIPAL FORMATIONS

Dvoryadkina E.B., Belousova E.A. Trends of the Development of Municipal Regions in the National Economic Space 87

Baimurzina G.R., Kabashova E.V. Features of Socio-Economic Development of Modern Single-Industry Towns in the Republic of Bashkortostan 106

ENVIRONMENTAL ECONOMICS

Lazhentsev V.N., Chuzhmarova S.I., Chuzhmarov A.I. Tax Administration in the Forest Management System and its Influence on the Budgets of Northern Territories ... 125

Potravnyi I.M., Yashalova N.N., Boroukhin D.S., Tolstoukhova M.P. The Usage of Renewable Energy Sources in the Arctic: The Role of Public-Private Partnership 144

LABOR ECONOMICS

Baranov S.V., Skuf'ina T.P., Gushchina I.A. The Impact of the Retirement Age Increase on the Economy and Attitudes of the Population of the Murmansk Oblast 160

SOCIAL DEVELOPMENT

Yarasheva A.V., Aleksandrova O.A., Medvedeva E.I., Alikperova N.V., Kroshilin S.V. Problems and Prospects of Personnel Support of the Moscow Healthcare System 174

Guzhavina T.A. Collective Actions and Social Capital: Implication of Concepts 191

Chistova E.V., Tyrsin A.N. Identification of Interconnection between Health and Employment of Retirement Age Women 204

FOREIGN EXPERIENCE

Caro-Gonzalez A., Ferreira-Lopes L. Universities in Transition: The 6i Model for Strategic Governance and Management 217

Keszthelyi K. The Features of State Regulation of Agricultural and Rural Development of Territories in Hungary 231

PUBLIC OPINION MONITORING

Public Opinion Monitoring of the State of the Russian Society 244

Manuscript Submission Guidelines 252

Subscription Information 256

Editorial

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Another Step toward V. Putin's "Long State"

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Abstract. In January of 2020, Russian President V. V. Putin delivered an annual Address to the Federal Assembly and announced a number of significant proposals in order to change the Constitution of the Russian Federation. There were broad discussions about the proposed amendments and changes of the entire Russian political system, internal and external aspects of public administration, which they entail, in the socio-political space. This article presents the author's view on this issue. The researchers analyze V. Putin's main historical steps, which have been determining the vector of the development of post-Soviet statehood over the past 20 years. The authors review the President's program articles, his public speeches, public meetings, his key decisions in foreign and domestic policy, strategic system documents, etc. The authors conclude that V. Putin has been consistently building the framework of a new Russian statehood throughout all his presidential terms. He publicly and extensively described the contours of this system in his first program article "Russia at the Turn of the Millennium" (1999). The article also includes the analysis of expert evaluations of the motives of the 2020 Presidential Address; the examination of the implementation of national projects and the National Security Strategy, for which V. Putin took personal

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responsibility in 2015; statistical data, describing the state of affairs in the areas of demography and health, science and education, economic growth and population's quality of life over the past 30 years. The results of the study allow us to say that the President's initiatives, aimed at the transformation of the country's entire political system, are largely forced. It is a necessary condition for the completion of the goal, set by him in 1999, until the end of his presidential term, limited by the current Constitution of the Russian Federation – the creation of a strong, independent social state with a stable political system, which effectively adapts to internal and external challenges.

Key words: President, Address to Federal Assembly, National Security Strategy, RF Constitution, transit of power.

On January 15, 2020, the Russian President Vladimir Putin delivered another annual Address to the Federal Assembly, which, according to most experts, immediately acquired "historical significance", which could be compared to the President's "Munich speech", delivered in February of 2007.

> "2020 federal Address of the Russian President has a historical significance, – says confidently Alexey Zolotarev, vice-chairman of regional parliament. – I will point out three such landmark messages for Russia: Putin's Munich speech on a multi-polar world in international politics, the speech on the joining of Crimea, which concerns the territorial integrity of the state, and the current message with an emphasis on domestic policy. It signaled the transition to the next political level of the country's development"[1].
>
> "The modern history of, at least, our country has begun. Or, more likely, the whole world. The text of today's Address to the Federal As-sembly of the Russian Federation will be studied and outlined by schoolchildren and students. Just like the materials of the last Congress of the CPSU"[2].

Sensational innovations of the Address were expected even before its announcement. Especially after the official announcement of the date – January 15, for the first time this early[3]. Mostly, everyone expected responses to two issues: whether the President will critically assess the progress of national projects (with all following organizational decisions), and whether he will announce any measures regarding the transit of presidential power in 2024 (in particular, whether the changes, regarding Presidential terms, etc., will be introduced in the Constitution).

However, systematic decisions, announced in the Address, turned out to be much more ambitious. We need to remind that the President's Address to the Federal Assembly included two distinct parts: social, when he proposed a number of direct measures aimed at improving the population's life quality and the development of the country's demographic potential, and political, when he introduced a number of changes in the Constitution of the Russian Federation: the priority of the Constitution of the Russian Federation over the norms of international law, the inability to have foreign citizenship for persons holding positions which are "critical for the security and sovereignty of the country", the approval of members of the Government of the Russian

[1] The Address could be called historical. *Rambler News*, January 16, 2020. Available at: https://news.rambler.ru/other/43508182/?utm_content=news_media&utm_medium=read_more&utm_source=copylinkhttps://news.rambler.ru/other/43508182-poslanie-mozhno-nazvat-istoricheskim-chto-govoryat-prikamskie-zakonodateli-o-prezidentskih-initsiativah/ (In Russian).

[2] The President's Address to the Federal Assembly 2020. What happened? *Russian News Agency*, January 16, 2020. Available at: http://новости-россии.ru-an.info/новости/послание-президента-федеральному-собранию-2020-что-же-произошло/ (In Russian).

[3] In the entire history of presidential Addresses (which began in 1994), the President addressed the Federal Assembly of the Russian Federation 26 times: 6 times in December, 5 times in February, 4 times in April, 3 times in March, May, and November, 1 time in July and, for the first time in 2020, in January.

Federation by the State Duma, the inclusion of the municipal level into the single system of public power, etc.[4].

> … Today, a number of political public associations are raising the question of adopting a new Constitution. I want to respond right away: I believe that this is not necessary. The potential of the 1993 Constitution is far from being exhausted, and I hope that the fundamental foundations of the constitutional system, human rights and freedoms will remain a solid value basis for Russian society for many decades to come[5].

Despite the fact that the President spoke only about amendments to the Main law, emphasizing that its potential is "far from being exhausted" even in modern conditions, such large-scale constitutional changes have not been made since its adoption. The Address was not only about consolidating social guarantees of the state in the country's Main law, but also about the transformation of the political system, the nationalization of elites, and the priority of Russian legislation over international law.

What caused such radical and unexpected proposals, announced in the Address by the President, who (as everyone is used to, and as he has repeatedly said it himself) always acts as carefully as possible, without haste, calculating all possible consequences of his actions?

The analysis of expert opinions allows stating a whole complex of external and internal reasons. According to some experts, the 2020 Address to the Federal Assembly was **the beginning of the transition of power**: the President initiated a comprehensive transformation of the political system to prepare it for his departure from the Presidential post in 2024[6].

> **Experts on Vladimir Putin's meeting with political scientists on February 6, 2012:**
>
> "Vladimir Putin's answers to questions about political reforms and the correction of governance mechanisms made his general approach clear. He understands the need for changes, but he is very concerned that any undue acceleration of this process may question the management of the system. Whether it is the registration of parties, the return of elected governors, the expansion of the participation of civil society in political decision-making, the selected approach is very cautious and conservative: it is like he acts according to the medical principle "do no harm".
>
> Thus, Vladimir Putin understands that "extension" is impossible without expanding public political space, but he does not trust this process very much. He constantly looks for additional "checks", built-in mechanisms that would ensure smooth, manageable changes and, in fact, guarantee that everything that was built earlier will not be questioned"[7].

Other experts say that the world economy will face **a global economic crisis** very soon (may be, this year), and, in order to be ready for it, Russia needs to develop and test a new configuration of the political system right now[8].

Some experts recall **the unsatisfactory progress of national projects** and extremely tight deadlines for their implementation, emphasizing that, if radical changes do not begin now, it will be too late[9].

Another opinion is that the President begins to assemble **the Union State** (or USSR–2), which is facilitated by the political situation in the world and, especially, in the United States[10].

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[4] Presidential Address to the Federal Assembly, January 15, 2020. T*he Russian President's official website*. Available at: http://www.kremlin.ru/events/president/news/62582 (In Russian).

[5] Same source.

[6] See: Mukhametshina E., Bocharova S., Kornya A. "The transit of power has started. Political scientists on Putin's proposal to change the Constitution". *Gazeta "Vedomosti"*, January 15, 2020. Available at: https://www.vedomosti.ru/politics/articles/2020/01/15/820659-tranzit-vlasti (In Russian).

[7] Putin V.: *The main thing is not to harm*. RIA-news, dated February 2, 2012. https://ria.ru/20120207/559346082.html (In Russian).

[8] See: Delyagin M.G. Putin is waiting for the collapse of humanity into a global depression. *Gazeta "Zavtra"*, January 19, 2020. Available at: http://zavtra.ru/blogs/putin_zhdet_sriva_chelovechestva_v_global_nuyu_depressiyu (In Russian).

[9] See: Zyuganov G. A. Bankruptcy of the government course and the policy of renewed socialism. *Gazeta "Pravda"*, January 10, 2020. Available at: https://kprf.ru/party-live/cknews/190885.html (In Russian).

[10] New state. *Gazeta "Zavtra"*, January 21, 2020. Available at: http://zavtra.ru/blogs/novoe_gosudarstvo (In Russian).

The fifth opinion: the President loses confidence in his inner circle and therefore wants to create "institutional or **constitutional guarantees" that the political system, built by him (as well as his own position in it) will continue to exist for many years, regardless of the opinions of individuals.** This is why additional centers of power (except the President of the Russian Federation) – the State Council, the Federation Council, the State Duma, and the Supreme Court – are created in the political system, or, rather, given higher powers[11].

Of course, all aforementioned opinions, most likely, were a part of motives that guided the President in his personal work on the Address (as the President's Press Secretary D. Peskov has repeatedly said). However, in our opinion, high-profile domestic political events, which took place inside the country in January of 2020, in many ways, should be considered as the part of one of Vladimir Putin's big strategic plans for creating a new (after the collapse of the USSR) Russian statehood, which he started to implement in 1999, publicly stating strategic priorities in his first program article "Russia at the Turn of the Millennium": "Russian idea", "strong state", "efficient economy"[12]. His "Munich speech" in 2007, "Valdai speech" in 2013, "Crimean spring" in 2014 are the pieces of a single puzzle called "long state"[13], just like the Address–2020. This is clearly manifested in the logic and content of President's public speeches (*Insert 1*).

Earlier, we wrote: "categories that V. Putin uses and all tasks and issues, which he sets for himself and the country, are designed to last not just for years, but for decades. It shows that Putin, first of all, is a politician who "plays a long game". He is a public official who sets goals, which are historically significant for the country, understands the need to achieve these goals, and realizes his historical responsibility to the country[15]. It needs to be reminded that, in 2000, Vladimir Putin "took" a practically ruined country, but even then, despite a wide range of acute external, internal, political, and economic crises, he never ceased to see the wide historical perspective of Russia, focusing on "rapidly occurring fundamental changes of life associated with the formation of so called postindustrial society", which he publicly announced in his first program article in 1999[16].

> In the modern world, the country's power is manifested not so much in military strength as in the ability to be a leader in the creation and application of advanced technologies, ensuring a high level of well-being of the people, in the ability to reliably protect their security and defend national interests on the international arena[14].

What place Russia should, can, and will take in a global civilization of a new formation? This question probably dictated all the actions of the President: from the "Chechen campaign" to current events. According to this logic, the President's Address to the Federal Assembly of the Russian Federation in 2020 became a consistent, regular step of a historical nature, going far beyond dissatisfaction with the implementation of national projects or the preparation of the political system for the transit in 2024.

[11] Remchukov K. Several hypotheses on what is happening in the political life of Russia. *Nezavisimaya Gazeta*, January 27, 2020. Available at: https://yandex.ru/turbo?text=http%3A%2F%2Fwww.ng.ru%2Fpolitics%2F2020-01-27%2F100_echo27012020.html (In Russian).

[12] Putin V.V. Russia at the Turn of the Millennium. *Rossiyskaya Gazeta*, December 30, 1999. (In Russian).

[13] Surkov V. Putin's long state. *Nezavisimaya Gazeta,* February 11, 2019 Available at: http://www.ng.ru/ideas/2019-02-11/5_7503_surkov.html (In Russian).

[14] Same source.

[15] Ilyin V.A. President Vladimir Putin's Third Four-Year Term: Contradictory Outcomes – an Expected Result. *Ekonomicheskie i sotsial'nye peremeny: Fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 2016, no. 2 (44), pp. 9–21. (In Russian).

[16] Putin V.V. Russia at the Turn of the Millennium. *Rossiyskaya Gazeta*, December 30, 1999. (In Russian).

Insert 1

Munich speech (February 10, 2007)

1. Incidentally, Russia – we – are constantly being taught about democracy. But for some reason those who teach us do not want to learn themselves. I consider that *the unipolar model is not only unacceptable but also impossible in today's world*. And this is not only because if there was individual leadership in today's – and precisely in today's – world, then the military, political and economic resources would not suffice. What is even more important is that the model itself is flawed because at its basis there is and can be no moral foundations for modern civilisation.

2. I am convinced that we have reached that **decisive moment** when we must seriously think about the architecture of global security. And we must proceed by **searching for a reasonable balance between the interests of all participants in the international dialogue**. Especially since the international landscape is so varied and changes so quickly – changes in light of the dynamic development in a whole number of countries and regions.

3. We very often – and personally, I very often – hear appeals by our partners, including our European partners, to the effect that Russia should play an increasingly active role in world affairs. In connection with this I would allow myself to make one small remark. It is hardly necessary to incite us to do so. **Russia is a country with a history that spans more than a thousand years and has practically always used the privilege to carry out an independent foreign policy. We are not going to change this tradition today.** At the same time, we are well aware of how the world has changed and we have a realistic sense of our own opportunities and potential. And of course we would like to interact with **responsible and independent partners** with whom we could work together in constructing a fair and democratic world order that would ensure security and prosperity **not only for a select few, but for all.**

Valdai speech (September 19, 2013)

1. Today we need **new strategies to preserve our identity** in a rapidly changing world, a world that has become more open, transparent and interdependent. This fact confronts virtually all countries and all peoples in one form or another: Russian, European, Chinese and American – the societies of virtually all countries. For us (and I am talking about Russians and Russia), questions about who we are and who we want to be are increasingly prominent in our society. **We have left behind Soviet ideology, and there will be no return**. Proponents of fundamental conservatism who idealise pre-1917 Russia seem to be similarly far from reality, as are supporters of an extreme, western-style liberalism. **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**. After 1991 there was the illusion that a new national ideology, a development ideology, would simply appear by itself.** The state, authorities, intellectual and political classes virtually rejected engaging in this work, all the more so since previous, semi-official ideology was hard to swallow. And in fact they were all simply afraid to even broach the subject. In addition, the lack of a national idea stemming from a national identity profited the quasi-colonial element of the elite – those determined to steal and remove capital, and who did not link their future to that of the country, the place where they earned their money. **Practice has shown that a new national idea does not simply appear, nor does it develop according to market rules**. A spontaneously constructed state and society does not work, and neither does mechanically copying other countries' experiences. Such primitive borrowing and **attempts to civilize Russia from abroad were not accepted by an absolute majority of our people**. This is because the desire for independence and sovereignty in spiritual, ideological and foreign policy spheres is an integral part of our national character.

3. **Russia's sovereignty, independence and territorial integrity are unconditional.** These are red lines no one is allowed to cross. For all the differences in our views, debates about identity and about our national future are impossible unless their participants are patriotic.

4. The years after 1991 are often referred to as the post-Soviet era. **We have lived through and overcome** that turbulent, dramatic period. Russia has passed through these trials and tribulations and is returning to itself, **to its own history**.

End of Insert 1

Address to the Federal Assembly (December 4, 2014)

1. We have every reason to assume that the infamous policy of containment, led in the 18th, 19th and 20th centuries, continues today. They are constantly trying to sweep us into a corner because we have an independent position, because we maintain it and because we call things like they are and do not engage in hypocrisy. **But there is a limit to everything. And with Ukraine, our western partners have crossed the line, playing the bear and acting irresponsibly and unprofessionally… Russia found itself in a position it could not retreat from.**

2. Russia's foreign policy position on this matter drew its firmness from the will of millions of our people, our national unity and the support of our country's main political and public forces. I want to thank everyone for this patriotic spirit, everyone without exception. **Now, we need to continue and maintain this kind of consolidation so as to resolve the tasks our country faces on its road ahead. Obviously, we will encounter external opposition, but this is a decision that we need to make for ourselves. Are we ready to consistently defend our national interests, or will we forever give in, retreat to who knows where?**

3. In accordance with the people's will, I submit to the Federal Assembly a request to consider a Constitutional Law on the creation of two new constituent entities within the Russian Federation: the Republic of Crimea and the city of Sevastopol.

Address to the Federal Assembly (March 1, 2018)

1. **Today, Russia ranks among the world's leading nations with a powerful foreign economic and defense potential. But we have not yet reached the required level in the context of accomplishing our highly important task and guaranteeing people's quality of life and prosperity.** But we must do this, and we will do this.

2. Everything hinges on efforts to preserve the people of Russia and to guarantee the prosperity of our citizens We must achieve a decisive breakthrough in this area. **I repeat, a solid foundation has been created for this. Therefore, we can now set and accomplish new tasks.**

3. It is high time we take a number of tough decisions that are long overdue. We need to get rid of anything that stands in the way of our development and prevents people from fully unleashing their potential. It is our obligation to focus all resources and summon all our strength and willpower in this daring effort that must yield results. Otherwise, there will be no future for us, our children or our country. **It is not a question of someone conquering or devastating our land. No, that is not the danger. The main threat and our main enemy is the fact that we are falling behind**. If we are unable to reverse this trend, we will fall even further behind… We need to master creative power and boost development so that no obstacles prevent us from moving forward with confidence and independently. **We must take ownership of our destiny.**

Address to the Federal Assembly (January 15, 2020)

1. I can assure everyone that our efforts to strengthen national security were made in a timely manner and in sufficient volume. For the first time ever – I want to emphasise this – for the first time in the history of nuclear missile weapons, including the Soviet period and modern times, we are not catching up with anyone, but, on the contrary, other leading states have yet to create the weapons that Russia already possesses.

2. Firstly, Russia can be and can remain Russia only as a sovereign state. Our nation's sovereignty must be unconditional. We have done a great deal to achieve this. We restored our state's unity. We have overcome the situation when certain powers in the government were essentially usurped by oligarch clans. Russia has returned to international politics as a country whose opinion cannot be ignored. We created powerful reserves, which multiplies our country's stability and capability to protect its citizens' social rights and the national economy from any attempts of foreign pressure. **I truly believe that it is time to introduce certain changes to our country's main law, changes that will directly guarantee the priority of the Russian Constitution in our legal framework.**

3. Our goal is **to ensure high living standards and equal opportunities for all throughout the country**. It is towards this goal that our national projects and development plans are aimed.

4. Please, do not forget what happened to our country after 1991. After the collapse of the Soviet Union, we still had the same ambitions and of course have preserved the colossal potential – the human, intellectual, resource, territorial, cultural and historical potential, and so on. But there were also threats, dangers of a magnitude no one could have imagined ever before. And that was a pity, as they should have thought about it in due time. Therefore in our further state building efforts, we are facing seemingly contradictory tasks that serve as a guideline for values and may appear incompatible at first sight. What am I referring to? **We must create a solid, reliable and invulnerable system that will be absolutely stable in terms of the external contour and will securely guarantee Russia's independence and sovereignty. At the same time, this system must be organic, flexible and capable of changing quickly in line with what is happening around us, and most importantly, in response to the development of Russian society. This system must ensure the rotation of those who are in power or occupy high positions in other areas. This renewal is indispensable for the progressive evolution of society and stable development that may not be infallible but ensures that the most important thing – Russia's interests – remains immutable**.

Let us take the liberty and assume that Russia of the future, which the President has been building for the last 20 years, largely incorporates features of post-war USSR (particularly, its international status), but it operates on a qualitatively different basis which corresponds to the new Millennium – on the developed principles of democracy, an efficient combination of a market economy and a social state, respect for sovereignty and national interests in a globalizing world.

> The most important factor of the state's competitiveness in the struggle for a place in the system of political and economic relations of the future is a protected state sovereignty, **but protected from the military and socio-economic point of view**[17].

If we think in broad "strokes", the President has always had only one opponent on his way of creating this kind of state: experts call this opponent "the collective West". Russia's foreign policy and domestic events are parts of one big game, a stake of which is "a place in the sun" in the future of world civilization. Russia's victories and defeats in this game were determined by historical tasks that the President considered a priority, and the solution of which he took, as they say, into his own hands. Thus, in the first half of the 2000s, the main task of the President was to restore the country from the ruins, left after the crisis period of the 1990s.

He spent the second half of the 2000s restoring geopolitical status of Russia, which started with the "Munich speech" in 2007. During this period, the government of Dmitry Medvedev handled the domestic development of the country, and this is where Vladimir Putin's Big Plan turned out to have vulnerabilities: "foreign partners" did not fail to take advantage of it. The liberal wing of the Medvedev's Government was not so focused on restoring Russian sovereignty and implementing national interests.

In the period of D. Medvedev's presidency (2008–2011), Russia participated in a "five-day" war with Georgia (August, 2008). As the result, our country "turned from a peacekeeper in the South Caucasus into a participant of the conflict on the side of rebellious Georgian regions"[18]. According to experts, Dmitry Medvedev actually "betrayed Libya by providing, despite interests of Russia, invaluable assistance to the United States in Libya's defeat" [19] (2011). Finally, under his rule, widespread protest movements broke out in the country, including a rally on Bolotnaya square in Moscow (December, 2011). Perhaps, the greatest historical accomplishment of Dmitry Medvedev was his refusal to run for his second presidential term and the return of "reins" into V. Putin's hands, so he could continue political course, started in 2000.

The domestic development of the country, which coincided with the global financial crisis during Dmitry Medvedev's presidential term, took a "step back", and then Vladimir Putin again turned his attention to solving internal problems. There were "May Decrees", and a "wave" of anti-corruption campaign rose. In a moment of some demoralization and disillusionment of society (due to the deterioration of life quality), Vladimir Putin put his faith in society not just to "support" it, but to consolidate it and turn it into a force that will play a major role in the country's governance in the future. All-Russia People's Front (2011) emerged, and, in 2013, the President initiated (as experts noted) "the first, after the collapse

[17] Evstaf'ev D. National modernization from above. *Zhurnal "Ekspert"*, January 27, 2020. Available at: https://expert.ru/expert/2020/05/narodnaya-modernizatsiya-sverhu/ (In Russian).

[18] 10 years later: What is important to know about the five-day war between Russia and Georgia. *Deutsche Welle, Russian Edition*. Available at: https://www.dw.com/ru/спустя-10-лет-что-важно-знать-о-пятидневной-войне-россии-и-грузии/a-44985118 (In Russian).

[19] Bol'shakov V.V. International conspiracy against Putin. Information resource WikiReading. Available at: https://history.wikireading.ru/337896 (In Russian).

of the Soviet Union, global attempt of RF authorities to form a new political ideology for Russia"[20] (V. Putin's speech at Valdai forum in 2013).

The following international events (Ukrainian conflict, conflict in Syria, sanctions, and the increase of anti-Russian attitudes in Europe) made the President come back to issues of foreign policy, and we remember the success of his actions: the American "fanned" fire in Ukraine ended with the "return of Crimea and Sevastopol to their native harbor", and Russia's participation in the Syrian campaign became a loud statement to the world that the country is ready for any international vicissitudes.

After raising the military-industrial block from scratches, the President proved that this was possible. Without observing the same efficiency in domestic socio-economic development and realizing that further economic stagnation will not allow him to achieve the goals that he set for himself in 1999, he took another historical step: **he introduced significant changes to the National Security Strategy and took personal responsibility for its implementation (2015).**

A detailed comparative analysis of the National Security Strategy–2015, approved by Vladimir Putin, and the National Security Strategy–2009, signed by Dmitry Medvedev, is given in *insert 2*. Here, we would like to emphasize that, while maintaining an unchanged list of key national security priorities, **each of them** was given a completely **new content**. The general summary of these innovations is aimed at developing the level and quality of life of **"ordinary" Russians** and ensuring the **sovereign, independent** development of the country itself – the main principles of building a future Russian statehood, which the President wrote about in 1999.

After noting in the National Security History that the implementation of its main provisions will be "governed by the President of the Russian Federation"[21], V. Putin announced to the state apparatus, liberal elites, and Russian society in general that he will now personally control the course of events in Russia's foreign and domestic policy. His further actions (in particular, his Addresses to the Federal Assembly in 2018 and 2020) are the results of this control.

Indicated constitutional restrictions of presidential terms of V. Putin (according to the current Constitution of the Russian Federation), as well as objective global trends, associated with the rapid pace of technological progress and growing requirements of society in the transition from stability to dynamic development of the level and life quality of major sections of the population, made the President declare a policy of "decisive breakthrough". Without it, it would be impossible to count on maintaining state sovereignty on the world stage or a stable socio-political situation inside the country.

It was done in the Address–2018. In March of 2018, the President began his annual address to the Federal Assembly with the thesis on "a very special landmark" nature of his speech and "the times we are living in", underlying that "the state's role and positions in the modern world are not determined only or predominantly by natural resources or production capacities; the decisive role is played by people... Therefore, everything hinges on efforts to preserve the people of Russia and to guarantee the prosperity of our citizens. We must achieve a decisive breakthrough in this area"[22].

[20] Makhmudov R. Vladimir Putin's Valdai speech: A critical analysis. Information portal http://www.12news.uz/. Available at: http://www.12news.uz/news/2013/09/30/валдайская-речь-владимира-путина-кри/ (In Russian).

[21] On the Strategy of National Security of the Russian Federation, the decree of the President of the Russian Federation no. 683, dated December 31, 2015. *Rossiyskaya Gazeta*. Available at: http://www.rg.ru/2015/12/31/nac-bezopasnost-site-dok.html (In Russian).

[22] Presidential Address to the Federal Assembly of the RF, dated March 1, 2018. *The Russian President's official website*. Available at: http://www.kremlin.ru/events/president/news/56957 (In Russian).

Insert 2

Comparison of general provisions of the Russian Federation's National Security Strategy–2009 (approved by the President of the Russian Federation D. A. Medvedev) and the Russian Federation's National Security Strategy–2015 (approved by the President of the Russian Federation V.V. Putin)*

Russian Federation's National Security Strategy–2009 (approved by Russian Federation Presidential Edict no. 537 "On the Russian Federation's National Security Strategy Through 2020", dated May 12, 2009)	Russian Federation's National Security Strategy–2015 (approved by Russian Federation Presidential Edict no. 683, "On the Russian Federation's National Security Strategy", dated December 31, 2015)
21. The long-term national interests of the Russian Federation term consist of the following: developing democracy and civil society, and the enhancement of the competitiveness of the national economy; ensuring the solidity of the constitutional system, territorial integrity, and sovereignty of the Russian Federation; transforming the Russian Federation into a world power, whose activity is directed at supporting the strategic stability and mutually beneficial partner relationships within the multipolar world.	30. The long-term national strategic interests are: strengthening the country's defense, **ensuring the inviolability of the Russian Federation's constitutional order, sovereignty, independence, and national and territorial integrity;** **strengthening national accord, political and social stability,** developing democratic institutions**, and refining the mechanisms for cooperation between the state and civil society;** **raising living standards, improving the population's health, and ensuring the country's stable demographic development;** **preserving and developing culture and traditional Russian spiritual and moral values;** **increasing the competitiveness of the national economy;** consolidating the Russian Federation's status as a leading world power, whose actions are aimed at maintaining strategic stability and mutually beneficial partnerships in a polycentric world.
26. The strategic goals related to improving national defense consist of preventing global and regional wars and conflicts, and likewise of realising strategic deterrence in the interests of ensuring the country's military security.	33. The strategic national defense goals are **to create conditions for the peaceful and dynamic socioeconomic development of the Russian Federation**, and to ensure its military security.

* The key innovations of the National Security Strategy–2015 are highlighted **in bold.**

Continuation of Insert 2

35. Strategic national security objectives in the sphere of state and public security are the protection of Russia's constitutional system, of the basic rights and freedoms of the individual and the citizen, of the sovereignty, independence and territorial integrity of the Russian Federation, and likewise the preservation of civil peace, political and social stability.	42. The strategic aims of state and public security are to defend the constitutional order, the national and territorial integrity of the Russian Federation and the basic human and civil rights and freedoms, to maintain the civil peace and the political and social stability of society, and **to protect the population and the land from natural and manmade disasters.**
45. The strategic goals in terms of ensuring national security in the area of improving the quality of life of Russian citizens are the reduction of social and material inequalities within the population, the stabilization of population size in the medium term, and in the long term — the fundamental improvement of the demographic situation.	50. The strategic objectives of ensuring national security in the sphere of improving the quality of life of Russian citizens are **the development of human potential, the satisfaction of citizens' material**, **social, and spiritual needs**, and the reduction of the level of social and property inequality in the population first and foremost through increasing their income.
Economic growth. 53. Strategic national security objectives include Russia's entry, in the medium term, into the ranks of the top five countries by size of GDP, and likewise the achievement of the necessary degree of national security in the economic and technological spheres.	Economic growth. 55. The strategic objectives of ensuring national security are the development of the country's economy, the safeguarding of economic security, and the **creation of the conditions for the development of the individual, the transition of the economy to a new level of technological development**, Russia's entry into the ranks of leading countries in terms of the volume of gross domestic product, and the successful countering of the influence of internal and external threats.
66. Strategic national security goals in the sphere of science, technology and education are: developing state scientific and scientific-technical organizations, capable of providing competitive advantages for the national economy and the needs of national defense, by means of effective coordination of scientific research and the development of a national system of innovation; increasing social mobility, the population's general and professional level of education, and the professional qualities of highly qualified cadres, by means of the accessibility of competitive education.	67. The strategic aims of ensuring national security in the spheres of science, technologies, and education are: *Continuation of Insert 2* the development of a system of scientific, planning, and scientific-technological organizations that will be capable of ensuring the modernization of the national economy, the realization of the Russian Federation's competitive advantages, the country's defense, and state and public security, and also the shaping of scientific and technical groundwork for the future; the enhancement of social mobility, of the **quality** of general, vocational, and higher education, and of **its availability to all categories of citizens**, and also the development of basic scientific research

Continuation of Insert 2

71. Strategic national security goals in the area of healthcare and the health of the nation are: increasing life expectancy, reducing disability and mortality; improving disease prevention and the provision of timely, qualified primary healthcare and high-technology medical assistance; improving standards of medical assistance, and likewise of the quality, effectiveness and safety of medicines.	71. The development of health care and the strengthening of the health of the Russian Federation's population are a most important area for ensuring national security, for whose implementation a long-term state policy is being pursued in the sphere of protecting the health of citizens. The strategic aims of this policy are: to increase longevity, lower the level of disability and mortality in the population, and **increase the size of the population**; **to improve the availability and quality of medical assistance;** to improve **the vertical system for monitoring** the quality, effectiveness, and safety of medicines; **to observe citizens' rights** in the sphere of health protection and to ensure the state guarantees associated with these rights.
79. Strategic objectives ensuring national security in the cultural sphere are: broadening access of large sections of the population to the best examples of national and foreign culture and art by creating modern territorially distributed information banks; creating conditions for the stimulation of creative self-realization within the population, by improving systems of cultural enlightenment, the organization of leisure activities and mass extracurricular artistic education; assisting the development of the cultural potential of Russia's regions and supporting regional cultural initiatives.	76. The strategic aims of ensuring national security in the sphere of culture are: **the preservation and augmentation of traditional Russian spiritual and moral values as the foundation of Russian society, and the education of children and young people in a civic spirit;** **the preservation and development of the common Russian identity of the Russian Federation's peoples and of the country's unified cultural area;** **the enhancement of Russia's role in the world humanitarian and cultural area.**
85. Strategic objectives relating to ecological security and environmental management are: preserving of the environment and ensuring its protection; redressing the environmental consequences of economic activity in the context of a growing economy and global climate changes.	83. The strategic goals of environmental security and the rational environmental management are: **the preservation and restoration of natural systems and support for the quality of the environment necessary for human life and the sustained development of the economy;** **the elimination of environmental damage from business activity in conditions of growing economic activity and global climate change.**

End of Insert 2

97. The state policy of the Russian Federation in the area of national security is the result of the concerted effort of all elements of the system providing national security, with a coordinating role being played by the Security Council of the Russian Federation with respect to the realization of a range of measures of an organizational, legal-normative and informational nature.	108. The state policy of the Russian Federation in the sphere of ensuring national security shall be executed through the concerted actions of all elements of the system for ensuring it under the direction of **the president of the Russian Federation** and with the coordinating role of the Russian Federation Security Council.
112. The main indicators of the state of national security are designated in order to evaluate the level of national security and include: the level of unemployment (as a proportion of the economically active population); the decile coefficient (the correlation between the incomes of the top and bottom 10% of the population); the rate of growth of consumer prices; the level of the internal and external state debt as a percentage of GDP; the level of fiscal support for health, culture, education and science as a percentage of GDP; the level of annual renewal of armaments, military and specialist equipment; the level of supply of military and engineering-technical cadres. The list of basic indicators of national security can be made more precise in accordance with the results of monitoring of the state of national security.	115. The main indicators necessary for an evaluation of the state of national security are: **the citizens' degree of satisfaction with the protection of their constitutional rights and freedoms and personal and property interests, including against criminal infringements;** the proportion of modern models of arms and military and special equipment in the Russian Federation Armed Forces, other troops, and military formations and organs; **life expectancy;** **per capita GDP;** decile coefficient (ratio of the income of the most prosperous 10 percent of the population and the least prosperous 10 percent of the population); inflation; unemployment; proportion of expenditure in the GDP on the development of science, technology, and education; proportion of expenditure in the GDP on culture; proportion of territory of the Russian Federation not conforming to environmental standards.

Today, Rosstat data on the level of poverty for the past year are available. **The number of poor people, in comparison with the same period of the previous year, increased by 0.4% – to 14.3% of the population (21 million people).** As for child poverty, it is important to observe the process in dynamics. The surge occurred in 2015, when the number of poor juveniles increased from 20.7% to 27.4% over the year. After that, the share of poor children slightly began to decline. More than half of these children live in large families – 52.2%. **According to open data from the Russian Presidential Academy of National Economy (RANEPA), almost 80% of households below the poverty line are families with children**[23].

The government should monitor about 1.300 indicators of existing state programs and more than 500 indicators – within the framework of national and federal projects. However, in practice, federal officials do not control more than half of all these indicators, and they are not responsible for them. This diagnosis of the public administration system was made by the Accounts Chamber after an audit of the work of the federal government over the past three years. The goals of public administration at the stages of planning, monitorin %5g, control, evaluation of intermediate and final results are not achieved[25].

Nevertheless, in 2018–2019, the government of Dmitry Medvedev once again failed to fulfill its obligations, and, although the President does not explicitly say so, the resignation of the whole Cabinet of Ministers is a fact that shows so many things. Experts sum up that "it is impossible to talk about breakthrough a nd economic growth with the old Government which could not provide it"[24].

As the Accounts Chamber of the Russian Federation's reports on the interim results of the implementation of national projects (which, most likely, had a serious, maybe even decisive, impact on the text of the Address voiced by V. Putin on January 15, 2020) showed, many of the goals, tasks, parameters, recorded in passports of national projects, did not correspond, or poorly corresponded, to other legal documents, adopted in Russia, and, thus, at this stage, there is a confusion in terms, criteria, etc.

It is noteworthy that in May of 2018, the President submitted the candidacy of A. Kudrin to the State Duma for the post of the head of the Accounts Chamber of the Russian Federation – a man "who, in the first half of the 1990s, was the first deputy of A. Sobchak, and, in 1996, helped Vladimir Putin gain a foothold in Moscow"[26]. As V. Putin himself said about him: "This is my very old, good, and close companion, and I will even say that he is my friend... I understand his opinion on many issues. Moreover, he has done a lot to strengthen the country's economy. It is no accident that the International Expert Community has twice recognized him as the best finance minister in the world, and I am proud that such a person worked in my government[27].

[23] Gerasimova E. Poverty at an early age strongly affects a person. *Nezavisimaya Gazeta*, January 15, 2020. Available at: https://yandex.ru/turbo?text=http%3A%2F%2Fwww.ng.ru%2Feducation%2F2020-01-15%2F8_7768_poverty.html (In Russian).

[24] Ablaeva E., Shirshova V., et. al. Medvedev's resignation is a useful story. Especially in the light of the Address (opinion of political strategist K. Kolachev). Information portal "Real'noe vremya", January 15, 2020. Available at: https://realnoevremya.ru/articles/163206-kak-v-rossii-otreagirovali-na-otstavku-pravitelstva (In Russian).

[25] For the patient's future recovery, he must first be strangled (editorial). *Nezavisimaya Gazeta*, February 11, 2020. Available at: https://yandex.ru/turbo?text=http%3A%2F%2Fwww.ng.ru%2Feditorial%2F2020-02-11%2F2_7791_editorial.html (In Russian).

[26] Smirnov K., Bagrov A. Thirty three Putin's Bogatyrs. *Kommersant.* Vlast, 2001, no. 45, p. 12.

[27] *The transcript of the program "Conversation with Vladimir Putin. Continuation",* dated December 15, 2011. Available at: https://ru.wikisource.org/wiki/Разговор_с_Владимиром_Путиным._Продолжение_(15_декабря_2011_года) (In Russian).

It is obvious that the appointment of a "close associate and informal economic adviser"[28] to the post of the head of the Accounts Chamber was made in order to obtain objective and not embellished information about the implementation of national projects and overall economic development. As A. Kudrin concluded in December of 2019 at the Meeting on the implementation of national projects under the President of the Russian Federation, national projects "do not create the necessary critical mass of steps that would lead us to a growth trajectory"[29]. V. Putin himself disagreed with such a categorical assessment, made by the head of the Accounts Chamber, but the President called "failures in the reconfiguration of the public administration system" the main "systemic problem".

In fact, by the middle of V. Putin's last presidential term, the situation in the country did not look like a "breakthrough" (if we speak not about the historical twenty-year-old path under V. Putin's leadership, but about two last years, when the President set this task in the 2018 Address), but rather like another "stalling" of national projects and shaken trust in the authorities after the pension reform in 2018.

Moreover, Russian science turned out to be in a deplorable state, which, in the environment of "rapidly increasing speed of technological changes"[30], is undoubtedly one of the main foundations of national security and competitiveness of the state. "There was a separation of science from the real sector of the economy, which led to a break in the innovation chain: basic science – applied development – production"[31], which was the primary reason for the disappointing summary of the auditors of the Accounts Chamber of the Russian Federation: **"Russian science has not become a driver of the socio-economic development of the country"**[32].

> After the reforms, initiated in 2004, the status of Russian science was fundamentally changed. While it was previously a part of the real economy, and the Ministry of Industry and Science managed it, in 2004, science was transferred to the service sector and the management was given to the newly created Ministry of Education and Science... The emerged system of science organization corresponds to the bet on the raw material economy, which does not need the development of new technologies, and the goal of education is the training of qualified consumers.
>
> Further reforms had the same nature: the Russian Academy of Sciences was stripped of its status of the country's highest scientific organization, it was excluded from the management of science and transformed into the FSBI, losing its special organizational and legal form. In addition, scientific post-graduate school was eliminated, the new course was aimed at the reduction of the number of scientific organizations, the transfer of science to universities, which were not always able to accept this new function, etc. As the result, the segmentation of science occurred, the system of the organization of fundamental studies was destroyed[33].

This situation could not correspond to the image of Russia of the future, which was presented by V. Putin in his article in 1999, and could not correspond to all his actions to build a new Russian statehood over the past 20 years. That is why the President was simply forced to take drastic measures: this is what we saw in the Address–2020.

[28] Stanovaya T. Place in the system: Why Alexey Kudrin may again be useful to the President. *RBK*, May 4, 2018. Available at: https://www.rbc.ru/opinions/politics/04/05/2018/5aec10419a7947c3a769f795 (In Russian).

[29] National projects council: The main thing is that people feel the result. *TASS News*, December 25, 2019. Available at: https://tass.ru/nacionalnye-proekty/7425141 (In Russian).

[30] Presidential Address to the Federal Assembly of the RF, dated March 1, 2018. The Russian President's official website. Available at: http://www.kremlin.ru/events/president/news/56957 (In Russian).

[31] Gaiva E. Scientists are asked to produce an effect. *Rossiyskaya Gazeta*, February 10, 2020, no. 27. (opinion of the Deputy President of RAS, RAS Corr. member V. Ivanov).

[32] Same source.

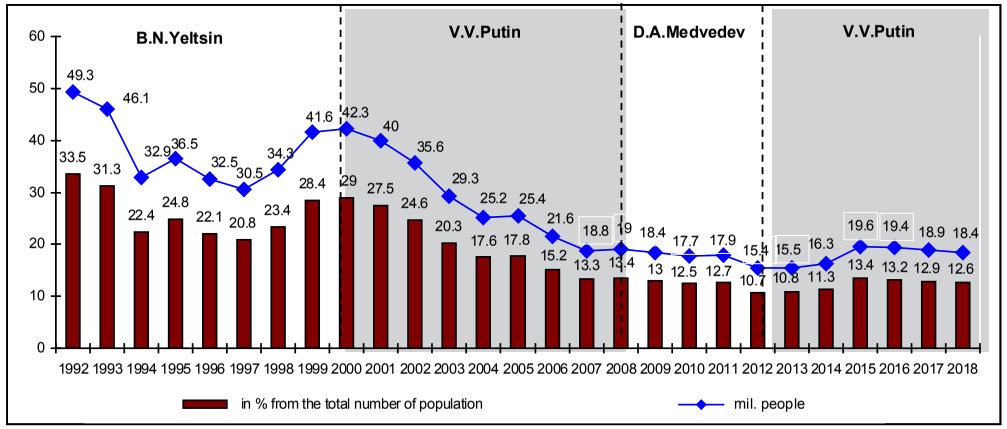
[33] Same source.

Insert 3

Key indicators reflecting the state of national security (in order of mention in the National Security Strategy–2015)

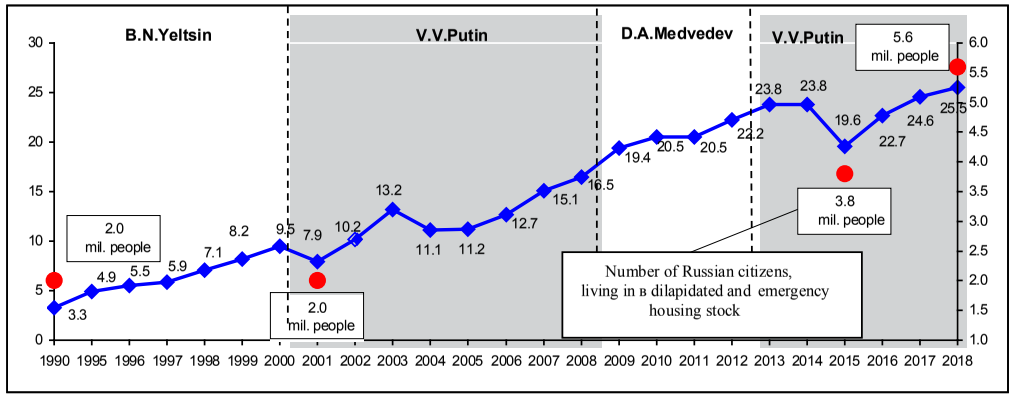
I. Strategic priority "IMPROVING THE QUALITY OF LIFE OF RUSSIAN CITIZENS"

The number of people with monetary incomes below the subsistence minimum*



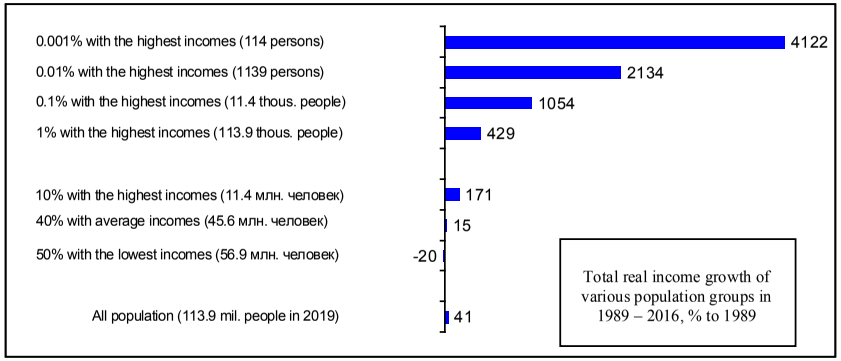
* Hereinafter, V. Putin's presidential terms are highlighted in grey. Dotted lines mark the boundaries of presidential terms: 1st, 2nd presidential terms of B. Yeltsin (1994–1999); 1st presidential term of V. Putin (2000–2004); 2nd presidential term of V. Putin (2004–2008); presidential term of D. Medvedev (2008–2012); 3rd presidential term of V. Putin (2012–2018).
Source: Federal State Statistics Service (https://www.gks.ru/storage/mediabank/urov_51g.doc)

Emergency housing stock, mil. sq. m. by the end of the year*



Source: Zhilishchnoe khozyaistvo v Rossii 2002–2019: stat. sb. Rosstat. Moscow, 2019. 78 p.

Income growth and inequality in Russia (1989-2016), in %*



*Population of the Russian Federation over 20 years old (according to data of Federal State Statistics Service. Available at: http://gks.ru/bgd/regl/b19_107/).
Distribution of pre-tax national income among adult married couples sharing income. Unit – adult (20 years and older; income of married couples is divided in half). Fractals are determined in relation to the total number of adults in the population. Adjusted estimates (using survey data, financial statements, national accounts, and welfare).
Sources: Novokmet F., Piketty T., Zucman G. From soviets to oligarchs: Inequality and property in Russia, 1905-2016. National Bureau of economic research. Cambridge: MA August, 2017, p. 78.

Number of Russians living in emergency houses, mil. people

Year	1990	2001	2015	2018
RF	2.0	2.0	3.8	5.6

Number of Russians resettled from emergency houses, thousand people*

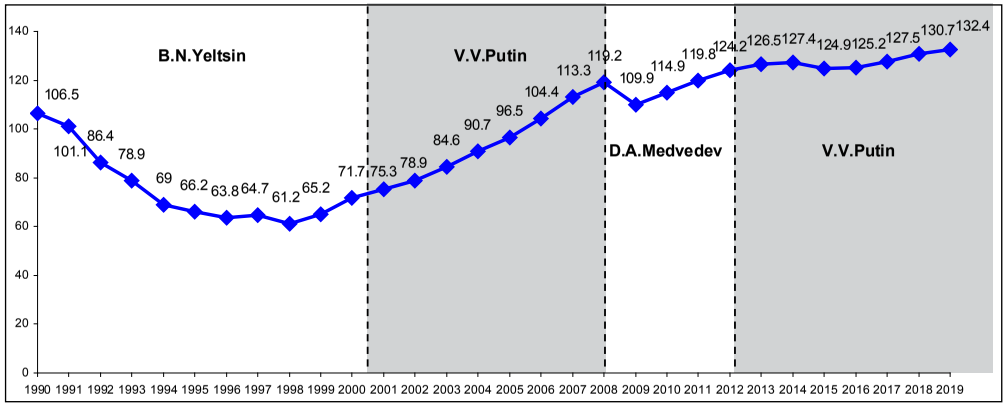
Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
RF	5.4	83.3	69.8	59.0	69.1	59.0	192.9	169.7	157.9	151.4	39.3	37.0

** In general, from 2008 to 2019, 1093780 people (1.09 mil.) were resettled from emergency houses
Sources: State Corporation – Fund for assistance to housing and communal services reforming. Rosstat; Available at: https://www.reformagkh.ru/. Federal target program "Housing" for 2002-2010.

Continuation of Insert 3

II. Strategic priority "ECONOMIC GROWTH"

GDP index, % to 1985



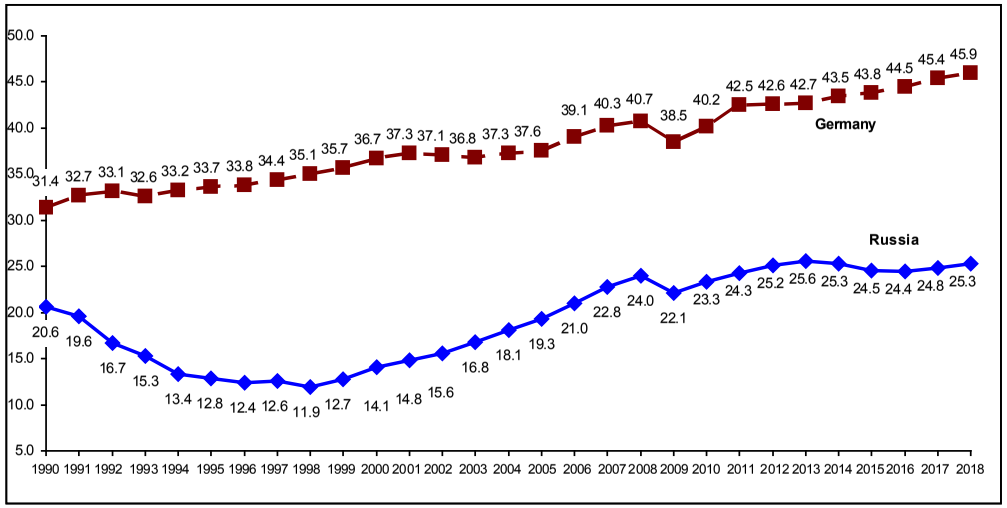
Source: Federal State Statistics Service (https://www.gks.ru)

Average annual GDP growth rate in Russia and Germany, % a year

Territory	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014	2015-2017	2018
Russia	91.1	98.9	106.8	103.9	103.0	100.0	102.5
Germany	102.7	101.6	101.0	100.5	102.2	102.1	101.5
Russia in comparison with Germany (+ / –)	-11.6	-2.7	+5.8	+3.4	+0.8	-2.1	1.0

Source: Federal State Statistics Service (https://www.gks.ru), WorldBank (https:/www.worldbank.org)

GDP per capita in 1990-2018, thous. US dollars in PPP in constant prices of 2011



Source: Federal State Statistics Service (https://www.gks.ru)

GDP per capita in Russia and Germany in 1990–2018, thous. US dollars in PPP in constant prices of 2011

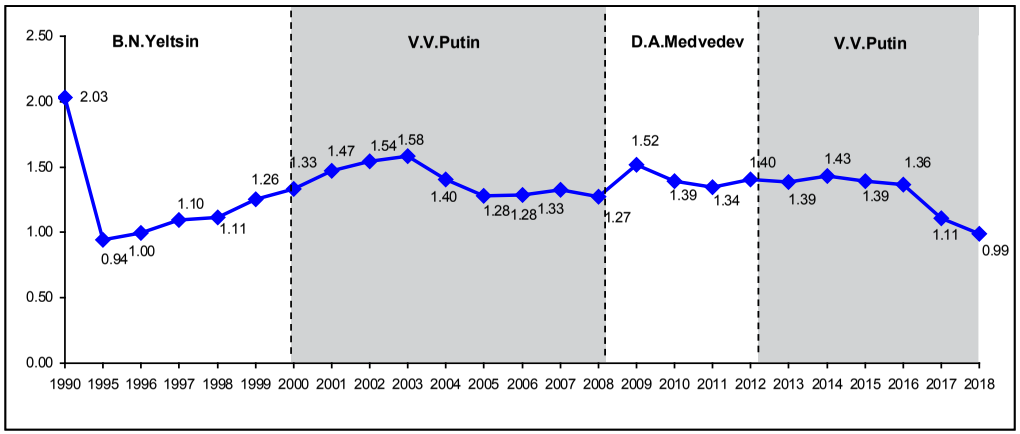
Territory	1990	1995	2000	2005	2010	2015	2018
Russia	20.6	12.8	14.1	19.3	23.3	24.5	25.3
Germany	31.4	33.7	36.7	37.6	40.2	43.8	45.9
Russia in comparison with Germany (+ / –)	-10.8	-20.9	-22.6	-18.3	-16.9	-19.3	-20.6

Source: Federal State Statistics Service (https://www.gks.ru), WorldBank (https://www.worldbank.org)

Continuation of Insert 3

III. Strategic priority "SCIENCE, TECHNOLOGY, AND EDUCATION"

Share of domestic expenditure on scientific research and development work (R&D), in % to GDP



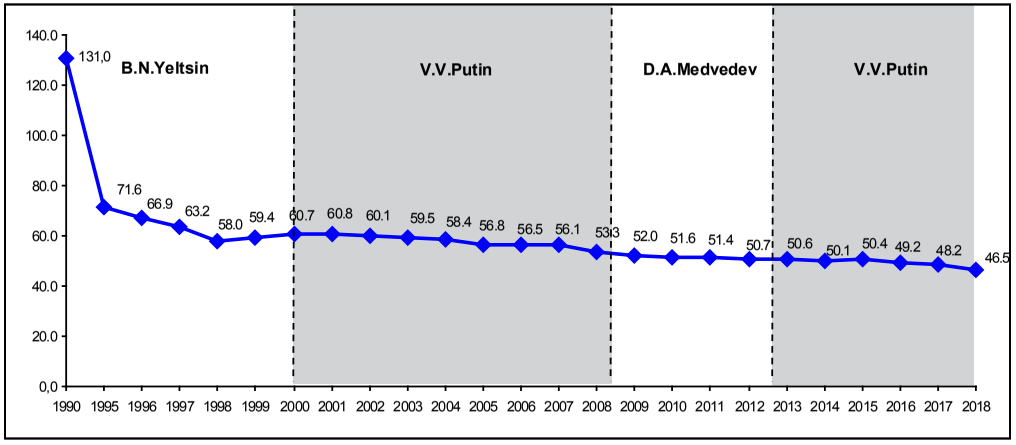
Source: database of Federal State Statistics Service (https://www.gks.ru/folder/14477)

Share of domestic expenditure on scientific research and development work (R&D), in % to GDP

Territory	1990	1995	2000	2005	2010	2015	2016
Russia	2.03	0.94	1.33	1.28	1.39	1.39	1.36
Germany	2.75	2.19	2.39	2.42	2.71	2.92	2.93
Russia in comparison with Germany (+ / –)	-0.72	-1.25	-1.06	-1.14	-1.32	-1.53	-1.57

Source: WorldBank (https://www.worldbank.org)

Number of employees engaged in research and development (per 10 thousand people)



Source: WorldBank (https://www.worldbank.org)

Number of researchers in the field of research and development (per 10 thousand people)

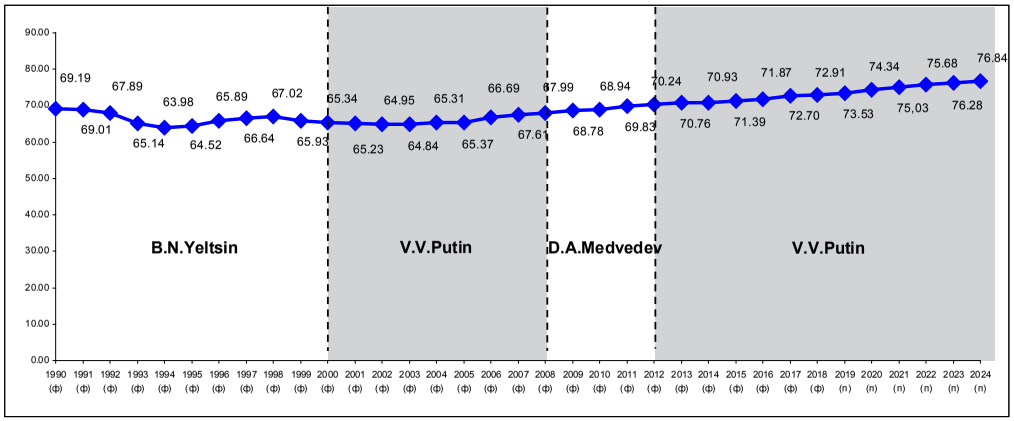
Territory	1996	1998	2000	2005	2010	2015	2016
Russia	38.0	33.4	34.6	32.3	30.9	31.2	29.8
Germany	28.3	29.2	31.6	33.3	40.5	47.5	48.8
Russia in comparison with Germany (+ / –)	+9.7	+4.2	+3.0	-1.0	-9.6	-16.3	-19.0

Source: WorldBank (https://www.worldbank.org)

End of Insert 3

IV. Strategic priority "HEALTHCARE"

Life expectancy, years*



Symbols: (ф) – actual value of the indicator; (n) – prediction. The target value of the indicator of the national project "Demography" is not included, since the national project refers to the expected length of a healthy life (67 years by 2024). The Federal State Statistics Service does not have such an indicator.

*Hereinafter, V.Putin's presidential terms are highlighted in grey. Dotted lines mark the boundaries of presidential terms: 1st, 2nd presidential terms of B. Yeltsin (1994–1999); 1st presidential term of V. Putin (2000–2004); 2nd presidential term of V. Putin (2004–2008); presidential term of D. Medvedev (2008–2012); 3rd presidential term of V. Putin (2012–2018).

Source: Federal State Statistics Service (https://www.gks.ru/storage/mediabank/urov_51g.doc).

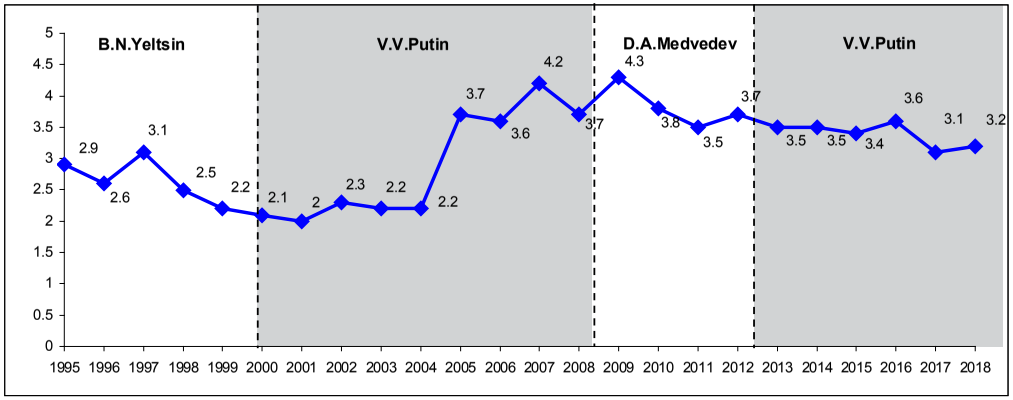
Dynamics of life expectancy in Russia and Germany, years

Territory	1990	1995	2000	2005	2010	2015	2018
Russia	69.19	64.52	65.34	65.37	68.94	71.39	72.91
Germany	75.20	76.40	77.90	78.90	80.00	80.60	81.00*
Russia in comparison with Germany (+ / –)	-6.01	-11.88	-12.56	-13.53	-11.06	-9.21	-8.09

* Data for 2017

Source: Health Nutrition and Population Statistics. The World Bank. Available at: https://databank. worldbank.org/reports.aspx?source=health-nutrition-and-population-statistics#

Healthcare expenditure, in % to GDP



* Source: Zdravookhranenie v Rossii 2001–2019: stat. sb. Rosstat. Moscow, 2019. 170 p.

Domestic public healthcare expenditure, in % to GDP

Territory	2000	2005	2010	2015	2016
Russia	2.10	3.70	3.80	3.40	3.60
Germany	7.70	7.75	9.17	9.34	9.43
Russia in comparison with Germany (+ / –)	-5.60	-4.05	-5.37	-5.94	-5.83

Sources: Federal State Statistics Service (https://www.gks.ru); WorldBank (https://www.worldbank.org)

The aforementioned course of events, the priorities, which V. Putin set for himself in various historical periods, and the problems, the country has faced throughout this path, cannot be reviewed separately from the key aspects of national security. Therefore, various indicators that show its priorities ("improving of life quality of Russian citizens", "economic growth", "science, technology, and education", "healthcare"[34]) clearly indicate the "recovery" growth in the first half of the 2000s, and the slowdown of the development rates after the global financial crisis, and the absence of any signs of a breakthrough at a time when the President made it clear that history no longer leaves Russia no time for buildup (*Insert 3*[35]).

The data, presented in *insert 3*, which cover the period from the beginning of the 1990s, clearly show the critical state of the country, when it was "embraced" by V. Putin. Despite all the difficulties that Putin had to face during his presidential terms, he managed not only to preserve Russia, but also to make it one of the centers of a multipolar world that can no longer be ignored. Only the periods, when the President, for reasons beyond his control, had to focus on foreign policy, and the implementation of domestic development goals was carried out by the government of D. Medvedev, were the periods of economic stagnation and slowed development rates that pushed Russia back, making it difficult to achieve the Great strategic goal set by the President in 1999.

In the Address–2020, the President initiated the most ambitious amendments to the Constitution in the entire period of its existence. Some of them were aimed at **the nationalization of elites** (prohibition for representatives of highest governing bodies to have non-Russian citizenship, the priority of the Constitution over the norms of international law), which, according to many experts, "offended quite a large number of quite influential persons. From Medvedev to very, very status-oriented liberals"[37], effectively canceling all the forecasts and plans of the "collective West" for a successful transit in 2024.

"In our country, the foreign policy has been determining the domestic policy for all 29 years. Russia unconditionally recognized the priority of international law over national law and carefully adjusted the second one to the first one, trying to be an obedient adept of Western democracy. However, very soon, it became obvious that the most "inviolable" international law is easily violated in relation to Russia. There are sanctions regimes, which are not defined by

> ...The discussed project of the Constitution with all amendments **cuts off liberals-marketeers from power** in the long-run.
>
> **The ruling elite was completely satisfied with the current liberal-oriented Constitution, it interpreted the laws as it wanted.** Changes were needed when the end of Putin's fourth term loomed on the horizon. The elite, apparently, wanted to get a mandate to change the Constitution in a way that would allow a new configuration of state institutions to maintain the current system of distribution of power, or simply legislate the influence of Vladimir Putin after leaving the post of the President. **However, in fact, it received a request for a new Constitution of a paternalistic, Soviet style...**[36]

[34] *On the Strategy of National Security of the Russian Federation*, the decree of the President of the Russian Federation no. 683, dated December 31, 2015. Paragraph 9. (In Russian).

[35] Whenever possible, for comparison, data on Germany (source – World Bank), as a country that, according to many experts, is the undisputed leader of the EU, especially after Brexit in the UK, is given.

[36] Who needs a new Soviet-style Constitution (editorial article). *Nezavisimaya Gazeta*, February 12, 2020. Available at: https://yandex.ru/turbo?text=http%3A%2F%2Fwww.ng.ru%2Feditorial%2F2020-02-12%2F2_7792_editorial.html (In Russian).

[37] Khazin M. Putin burns bridges. *Gazeta "Zavtra"*, January 23, 2020. Available at: http://zavtra.ru/blogs/putin_szhigaet_mosti (In Russian).

any international laws, attempts of our political isolation, and military operations without regarding the UN. Now, this Putin's historical statement sets priorities in reverse order. Boldly, and, most importantly, correctly, but a little bit late. About fifteen years! But, as they say, better late than never"[38].

Another part of constitutional changes was aimed at **improving the effectiveness of the political system** by giving greater weight to the State Duma, the State Council, and the Constitutional Court in making managerial decisions (and, in particular, in appointing members of the Cabinet of Ministers), as well as by including the municipal level in the overall structure of state administration. According to the President: "... according to our Constitution, municipalities are not directly connected with the state, and there should be **a unified system of public power, so that the upper floors of this power have responsibility for what is happening at the bottom, and those, who work in municipalities, would be connected in a certain way with the country and its interests**"[39].

Finally, the third part of the amendments was aimed directly at **society** – the fixation of the regular indexation of pensions and the norm that the minimal salary cannot be lower than the subsistence minimum in the Constitution. Of course, we can say that this norm is already enshrined in the Labor Code of the RF, and, in the Constitution, we should write not about the subsistence minimum, but about the living standards... however, at the current historical stage, this amendment should not be regarded as exhaustive; **its meaning is to provide constitutional guarantees of a stable level and quality of life for all major segments of the population**.

Thus, the President not only reformed the entire political system of the country, creating several "centers of gravity" and giving a significant role in public administration to society; not only he took a number of measures aimed at the nationalization of the elites, qualitatively limiting the authorities of the "collective West" and associated internal elites in the management of the country, but also appointed a new, significantly different in its spirit, Government, which was summoned to do what the previous Cabinet of Ministers failed to do.

> The scale of constitutional changes, introduced by always cautious and careful Vladimir Putin (let us recall his assessment of Lenin's mistakes) suggests that, **in the Address, we heard not only about a transit model, but about the task of the systemic reconstruction of Russia.** This is not a sudden or situational decision in response to unrestrained part of the elites, who considered the President a "lame duck", or a drop of authorities' ratings. It seems that the reforms are well thought, and they fit into the **historical rhythm of the country's development**, adopted by Putin. It is also a respond to the crisis of the management model, which emerged at the end of the 2010s[40].

We can probably agree with the experts, who say that the President was somewhat late with his decisions, and these changes should have been made a year, or two, ago. However, the most important thing is that he did it. A delay only complicates the tasks, which the new Government, the President, and the entire system of public administration face, but it does not make their implementation impossible.

[38] Vetrenko I. Political bullit. *Gazeta "Zavtra"*, January 24, 2020. Available at: http://zavtra.ru/blogs/vremya_prishlo (In Russian).

[39] Transcript of V. Putin's meeting with the public, February 4, 2020. *The Russian President's official website*. Available at: http://www.kremlin.ru/events/president/transcripts/62726 (In Russian).

[40] Skorobogatyi P., Obukhova E. Constitutional state turn. *Zhurnal "Expert"*, January 20, 2020. Available at: https://expert.ru/expert/2020/04/konstitutsionnyij-gospovorot/ (In Russian).

Obviously, the President considered this fact, because the proposed candidate for the position of Prime Minister and practically a new structure of the Government (which added 16 new faces and completely changed social block) largely represent a new Russian political wave – technocratic government representatives, and, according to experts, "countries resort to the technocratic method of forming management in the times of crisis"[41], when it is necessary to "show results" quickly and efficiently.

The composition of the new government, formed for Mikhail Mishustin, causes moderate optimism. First, because of its lack of outspoken liberals, who are repulsive to everyone without exception. Despite the moderate, not striking liberal Anton Siluanov, who retained the post of Finance Minister, but deprived of the vice-premiership... "The most important link of the new government will be the tandem of Mishustin and Belousov. This is an interesting **commissure of a very strong administrator and an ideologist** of transformations, currently being carried out in the economy. The question is whether these two very different specialists and persons will be able to work together"[42].

Experts believe that "the replacement of Medvedev with Mishustin is a sign. After all, this is the replacement of a person, who was incapable of doing anything, whose only advantage was an incredible loyalty, with a person who has shown the ability to solve complex issues, for example, to rapidly create a modern and effective tax service. This means that Putin suddenly needed high-qualified performers, and, if so, he expects some serious changes"[43].

Some experts, while expressing doubts about the prospects of the new Government, say that many new members of the Cabinet of Ministers do not have the experience of state governance. They have certainly proven themselves in managing regions, individual services, departments... but now they will have to solve completely different issues and deal with completely different resources. Therefore, "the Government will really be technocratic, but in a narrow bureaucratic sense, in the logic of "small affairs" ... this is the limit of tasks – these appointments do not imply any structural reforms"[44].

The new Cabinet of Ministers will continue the socio-economic policy of the government of Dmitry Medvedev. As the head of the Bank of Russia, madam Nabiullina is a guarantee of this. The responsibility is also on Finance Minister Anton Siluanov and Deputy Prime Minister Tatyana Golikova, who will continue the work in the government[45].

However, it is important to state something else: the majority of experts agree that "the Russian government has never been so non-political as it is today"[46] and that "the new

[41] Ivanov A. Cabinet of Ministers–2020: Moderate optimism. *Gazeta "Zavtra"*. January 22, 2020. Available at: http://zavtra.ru/events/kabmin-2020_umerennij_optimizm (In Russian).

[42] Same source.

[43] Delyagin M.G. Putin is waiting for the collapse of humanity into a global depression. *Gazeta "Zavtra"*, January 19, 2020. Available at: http://zavtra.ru/blogs/putin_zhdet_sriva_chelovechestva_v_global_nuyu_depressiyu (In Russian).

[44] Stanovaya T. Versatility and youth. What to expect from a renewed government. Carnegie Moscow Center, January 22, 2020. Available at: https://carnegie.ru/commentary/80860 (In Russian).

[45] Delyagin M.G. Without illusions. *Official website of Isborskij Klub*, January 30, 2020. Available at: https://izborsk-club.ru/18710 (In Russian).

[46] Stanovaya T. Versatility and youth. What to expect from a renewed government. Carnegie Moscow Center, January 22, 2020. Available at: https://carnegie.ru/commentary/80860 (In Russian).

Cabinet of Ministers is purely technocratic"[47]. **This fact indicates the President's determination to finally move the implementation of his promises and give a new pulse to the domestic development of the country.**

The situation that causes the forced nature of cardinal decisions, announced by the President in the Address–2020, is also largely related to the state of society. **Over the last 25 years, Russian society has never been so "charged" (and constructively "charged") with radical changes in the system of state management, which also determines the solution of socio-economic issues.** "After going through the crucible of the wild capitalism of the 1990s, which burned the illusion of holiness of entirely market relations, after getting the experience of state capitalism of the 2000s, the public mind has acquired a clear perception of reality and the ability to adequately assess propositions of different political forces on the further development of the country"[48].

We can confidently state that the vast majority of our people remained committed to the main **value of the previous socialist period of development – the idea of social justice,** understanding it as equal ownership of public wealth and equal access to the goods produced, regardless of the social status of a citizen and his material well-being. At the same time, it is equally certain that these people, not willing to give up their newfound personal freedom, **suffered** a certain balance between personal and public. The President also **legislates visibly designated constants of people's soul**[49].

It is not a coincidence that, in his Address, the President referred to this topic twice, starting his speech with the phrase that "our society is clearly calling for change. People want development, and they strive to move forward in their careers and knowledge, in achieving prosperity, and they are ready to assume responsibility for specific work. Quite often, they have better knowledge of what, how and when should be changed where they live and work, that is, in cities, districts, villages and all across the nation" and, at the end, summing up that "Russian society becomes more mature, responsible, and demanding".

In other words, by introducing the amendments to the Constitution, the President reacted to deep domestic processes and expectations of people, which have been intensively developing in our society over the past five years, at the highest level of governance.

According to the results of a poll, conducted by VCIOM on January 24, 2020, Russians optimistically reacted to the new page of history started by the President on January 15: 79% of people considered the changes to the Constitution, proposed by V. Putin, important. 60–90% of people supported proposed changes[50].

P. Krasheninnikov (co-chairman of the working group on preparing proposals for amendments to the Constitution of the Russian Federation. The composition of this group, in his words, "perfectly represents the structure of Russian society") noted that "the President's proposals, aimed at strengthening the country's sovereignty and fixing the social orientation of the state, are most supported"[51].

[47] Stanovaya T. Versatility and youth. What to expect from a renewed government. Carnegie Moscow Center, January 22, 2020. Available at: https://carnegie.ru/commentary/80860 (In Russian).

[48] Noskovich O. Russia returns to the Red project. *Nezavisimaya Gazeta*, February 11, 2020. Available at: http://www.ng.ru/kartblansh/2020-02-11/3_7791_kartblansh.html (In Russian).

[49] Same source.

[50] Amendments to the Constitution: Meaning and Relation. *VCIOM press-issue*, no. 4160, February 3, 2020. Available at: https://wciom.ru/index.php?id=236&uid=10146 (In Russian).

[51] V. Putin's meeting with the working group on drafting proposals for amendments to the Constitution, February 13, 2020. *The Russian President's official website*. Available at: http://www.kremlin.ru/events/president/news/62776 (In Russian).

Thus, the decisions, made by the President at the beginning of 2020, are not exactly the results of his dissatisfaction with the progress of national projects, but a manifestation of his political will – a will of a person who has taken personal responsibility for Russia's national security, and a will of a person who systematically achieves his goal of building the new, "post-Soviet" statehood, the understanding of which he publicly outlined 20 years ago.

> Putin's Address provokes optimism. Not a superficial, mood-based, easily exhaled optimism, but a growing confidence that we are inside some important process of formation. This "inside" feeling is still difficult to get used to. It is still easier for us to complain about the lack of ideology of our existence. However, an honest observer should admit that **Putin, declaring a facade of non-ideologism, works hard in the field of deep ideology for deep people. He methodically, very carefully, seeks new approaches to Russian ideology.** And there is a growing confidence that he will not leave behind a country without ideology[52].

It is difficult to disagree with the opinion of experts that "the changes, proposed by the President in the Address, only narrowly concern current political figures. They not only lay down the format of the presidential transfer-2024 and the roles of participants in the transit race, but also set the framework for the political and managerial system for many years to come. **Vladimir Putin wants to go down in history as the architect of the new Russia"[53] ...And not only as the architect, who designs and controls the process of building of the new Russian state, but also as a builder, who took an active part in this process. On this path, the President faces many external and internal barriers, but, looking back at 20 years of his presidency, it should be noted that there is a progress, and the general nature of this progress allows stating that V. Putin fulfills his historical mission with a firm hand.**

* * *

In conclusion, we would like to quote one of Vladimir Putin's speeches to the political public in February of 2012.

Shortly before the presidential elections on March 4, Vladimir Putin (while serving as the Prime Minister) decided to meet political scientists to discuss the course of the election campaign, current political processes, and his article "Democracy and the Quality of Government"[54], in which the future President discussed the threats and prospects for the development of democracy in Russia and in the world, the problems of local self-government, the judicial system, etc.

The event was held in Moscow, in Novo-Ogaryovo. For four hours, a number of renowned experts[55] discussed such hot topics as opposition protests, the return of direct gubernatorial elections, the presidential race, etc. However, despite a significant number of specific issues and problems that were discussed, the key point was that, at this meeting, Vladimir Putin fully revealed his inner scale as a statesman and historical figure who takes responsibility for the fate of Russia. In his

[52] Fateev E. Address about value added. *Gazeta "Zavtra"*, January 21, 2020. Available at: http://zavtra.ru/blogs/o_dobavlennoj_stoimosti (In Russian).

[53] Skorobogatyi P., Obukhova E. Constitutional state turn. *Zhurnal "Expert"*, January 20, 2020. Available at: https://expert.ru/expert/2020/04/konstitutsionnyij-gospovorot/ (In Russian).

[54] Putin V.V. "Democracy and the Quality of Government". *Gazeta "Kommersant"*, February 6, 2012, no. 20. Available at: https://www.kommersant.ru/doc/1866753 (In Russian).

[55] The meeting was attended by: general director of the Agency for political and economic communications D. Orlov, historian, political scientist N. Narochnitskaya, the head of the National Energy Security Fund K. Simonov, the presedent of the fund "The Center for Strategic Research" M. Dmitriev, the president of the Institute of National Strategy M. Remizov and the president of the fund "St. Petersburg politics" M. Vinogradov, editor-in-chief of the journal "Russia in global affairs" F. Luk'yanov, the president of the "Foundation for Effective Politics" G. Pavlovskii, et al.

responses, he described in details the strategy and goal that he set for himself in 1999, which he has been gradually moving toward over the years, and which he plans to further implement during his third presidential term:

"During my first and second Presidential terms, I have always thought about how we can make Russia's fate independent of one, two, or three people, so that we can create a system, where we can clearly and surely guarantee our sovereignty, and, at the same time, a system, which would respond to all demands of the time, be alive, and develop. It has always been the most important task, but you were right when you mentioned the conditions, under which I had to start working. **At the first stage, it was necessary to simply save the country, which was clearly falling apart,** and it was necessary to restore the economy and social sphere in an elementary way. I should not, probably, mention now that not only pensioners had not received their pensions for months, the economy had not paid, and the army had not paid for months. It was the state of the social sphere! We had to stay alive at that time. We had to do the most basic things.

Now (and I mentioned this in an article, by the way), I believe that we are just finishing the stage of this post-Soviet period – the first stage of the post-Soviet period, and we can really start moving forward now. We have not had a basis until now. I often hear discussions of my articles (I am, by the way, very happy that it is discussed by those who support what is written, and those who criticize), **I often hear the same argument from critics: why did not you do it before? It was either impossible to do this before, because there were no resources, no conditions, or these problems were not priorities. They were not as important as the problems we had to pay attention to first,** because life constantly moves forward, the situation always changes.

However, I want to say something in this regard: we have been quite efficient so far, and it gives me the right to say that we will continue to act with the same efficiency. **Therefore, the most important task here is (by the way, I also wrote it in my article) to logically conclude this main task: to create such a state body (I will repeat this not literally, but close to the text), such an economic system, such a social system that everything mentioned would be an alive, powerful, healthy organism that guarantees our sovereignty. At the same time, it should be alive, responsive to challenges of its time, changing, and, on this basis, it should guarantee long-term living standard of Russian citizens. It is, in fact, the most important task"**[56].

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The Evolution of Demographic and Social Construction of the Age of "Old Age"

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Abstract. In the 21st century, global demographic system is in the transition from the stage of demographic dividend implementation to population ageing. A global trend of the age structure transformation is a new, by the history's standards, phenomenon. Reasons and mechanisms of its emergence are revealed and empirically confirmed. However, the issue of the population ageing's consequences, which do not have universal mechanisms of formation and differ according to a territorial basis, remains relevant. The reason of differences is not only about socio-economic parameters of countries, which determine the potential to overcome the consequences of demographic ageing, but also about the lack of a common understanding of the "old age" and the correlation between the demographic basis of its construction and the social perception of this category. Population ageing and ageing society are manifestations of the age structure transformation, which have common reasons of emergence, but they are conceptually different in defining the age of the "old age". Thus, the purpose of this work is to identify and systematize

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the evolutionary features of demographic and social construction of the age of the "old age". The article consists of two main parts: the analysis of existing approaches to constructing the age of the population's demographic "old age" and features of the transformation of public perception of elderly population in different historical epochs (social construction of the studied category). The main conclusion of the study is that within global, irreversible (with a narrowed reproduction) ageing of the population and demographic beta-convergence, the construction of the age of the "old age" gradually moves into the social area. Societies restructure the concept of the old age not only through the prism of increasing life expectancy (including healthy), but also through awareness of the increasing role of the older generation in maintaining sustainable rates of the socio-economic development. On this background, the main task of "ageing" states is to overcome the persistent (albeit on a less significant scale) manifestations of age discrimination against older citizens.

Key words: age of "old age", population ageing, older generation, social construction.

Introduction

Global population ageing is one of the main trends of modern times. Increase of the share and the number of senior population significantly impacts socio-economic development of "ageing" states. Considering the inevitability of demographic ageing within narrowed reproduction of the population, it is important to note that one of the main instruments of overcoming its consequences is the efficient implementation of the resource potential of senior population. However, our earlier research on the spread of age discrimination against older people (according to sociological data, in more than 50 countries) allowed concluding that the prevalence of such discriminatory practices takes place in many regions of the planet [1]. Stereotyping of older population, which is one of the main factors of inclusion of this socio-demographic group, has a basis in the form of a social construct of the age of "old age", parameters of which were studied by representatives of various scientific fields, but, due to the versatility of the research object, the information about it is not systematized in a single approach. In this case, the stumbling block is the subjective component of the "old age" phenomenon, which is reflected in three projections: population (a set of representatives of Homo Sapiens species with accompanying demographic characteristics), social (a set of society's representatives with their characteristic values and norms), and individual (psychological self-perception of certain individuals). Thus, the age of "old age" is defined as a complex versatile construct, the perception of which is highly likely to be subjective (on the level of individual territories, communities, individuals). Despite the complexity of the studied object, the global nature of demographic ageing and its consequences actualize the conducting of studies which are aimed at the generalization of interrelations between two different, but closely overlapping phenomena: population ageing and society ageing. The relevance of the study is also confirmed by the need to change the existing socio-cultural "old age" paradigm. This need is caused by new demographic conditions, where the role of older people will be much more important than in previous eras.

The purpose of this work is the identification and systematization of evolutionary features of demographic and social construction of the age of "old age". The article consists of two main parts: a critical analysis of methodological problems of determining the population's

"old age" and a brief summary of the transformation of its social perception within demographic changes. The informational basis of the research is the results of scientific studies on historical demography, anthropology, archaeology, ethnography, sociology, social gerontology, physiology, and statistical data on the population's age structure.

Methodological problems of determining age criteria for demographic old age of the population

One of the main issues of the study of problems, related to the population ageing, is the determination of age boundaries for "old age". It is obvious that ideas on this problem may significantly differ due to its conditional nature. The concepts which define three types of human age – biological, social, psychological – and create a single "triad" in the construction of the periodization of a person's life are the most generally accepted concepts in the scientific literature. However, it should be noted that, while studying the evolution of public perception of senior people in the context of population ageing, there is a need to use another measure of "old age" – demographic. In the 21st century, the process of demographic ageing has become global: in all regions of the world, there is an increase of the share and number of older population. However, despite the universal trend, we can still observe and record differences in the course of this process on certain territories, manifested in different intensity of the increase of the share of older people among population [2]. The existing differentiation does not contradict the basic postulates of the theory of demographic transition, and it is largely a reflection of differences in the completion of its phases. Without denying the fact that there are common trends, we should also pay attention to the fact that the variety of demographic development models in the world today is even greater than, for example, in the middle of the 20th century. It has intensified the scientific debate about the patterns and features of regional demographic development [3; 4]. If we narrow down the subject of the discussion to the phenomenon of population ageing, then a question arises: how much do existing approaches to measuring and comparing the levels of demographic old age correspond to modern realities?

Before proceeding directly to the subject of our study, we need to draw terminological boundaries between the concepts of "demographic old age" and "demographic ageing", which are often used as synonyms. "Old age" is a static concept, and "ageing" is a dynamic one. Studies, based on the comparison of separate territories (countries, regions), are aimed at assessing "young age" or "old age" according to selected classification criteria. The characteristic of "ageing" is given according to the analysis of changes of the population structure on territories (countries, regions) in different periods. At the same time, the measure of "old age" is determined by some conditional age limit. There are many age classifications, and each of them highlights different periods and boundaries of stages of human life, including old age (*Tab. 1*).

Approaches, given in the table, are only a small part of all approaches toward the classification of a person's life. We have used the most known classifications, the analysis of the evolution of which allows us to draw an important conclusion: despite the increase of population's life expectancy, the age of old age, throughout the history of mankind, was determined somewhere around 60 years.

Discoveries of Ch. Darwin and A.R. Wallace became catalysts for the development of many areas of anthropology in the late 19th–the early 20th century, including the periodization of a person's age, and the limits of a life's duration. Physiologists and anthropologists (for example, M. Rubner, P. Flourens, L. Aschoff, and I.

Table 1. Boundaries of the age of "old age" in different classifications

Classification	Boundaries of the age of "old age"	Beginning of old age
Ancient Chinese classification (BC)	50–60 years – the last period of creative life 60–70 years – desired age After 70 years – old age	60 years
Pythagoras' classification (BC)	60–80 years – old and fading man	60 years
Hippocrates' classification (BC)	56–63 years – the ninth period 63–70 – the tenth period	Не определено
Classification of French physiologists (beginning of the 19th century)	After 55–60 years – the period of old age	55-60 years
Flourens' classification (mid-19th century)	70–85 years – first period of old age After 85 years – second period of old age	70 years
Rubner's classification (end of the 19th century)	50-70 years – old age After 70 years – venerable old age	50 years
Aschoff's classification (early 20th century)	45–65 years – the beginning of old age 65–85 years – senile age After 85 years – venerable old age	45 years
Classification of English physiologists (early 20th century)	After 50 years – the period of old age	50 years
Classification of German physiologists (early 20th century)	After 60 years – the period of old age	60 years
Frankel's classification (mid-20th century)	After 60 years – the period of old age	60 years
The Great Soviet Encyclopedia (1960)	65–75 years – beginning of old age	65 years
All-union Congress in Gerontology (1963)	60–74 years – old age 75-90 years – senile age 91 and older – long-livers	60 years
WHO classification (second half of the 20th century)	51–60 years – ageing man; 61–75 years – elderly person; 76–90 years – old man; 90–100 years – very old man; After 101 years – man in deep old age	50 years
Peter Laslett's concept of the "third" age (second half of the 20th century)	60–65 years – The Young Old 65 years and older – The Old Old	60 years
WHO classification (21st century)	60–75 years – old age; 75–90 years – senile age; After 90 years – long-livers.	60 years
Source: own compilation.		

Schwidetzky), based on the results of their research, tried to determine the natural limit of a human life (age periodization was carried out on the basis of it), while statisticians and demographers focused on calculating population's modal ("normal") life expectancy (Lexis, Meiner, and Freudenberg's methods). Different scientists set different tasks and used different methodological tools. Moreover, in the first case, the subject of the study was an individual, and in the second – the population as a whole.

The question, related to the process of the population's age structure transformation, has been studied quite widely. The theoretical and methodological basis was formed during the 20th and 21st centuries. One of the first researchers to propose a classification of types of age structure was the Swedish demographer A. G. Sundberg (1894). He introduced into scientific use the concept of progressive, stationary, and regressive types of age structure. With a progressive age structure – the population grows, with a stationary one – its number does not change, and with a regressive one – the number decreases. The difference is in the proportion of children, aged 0–14, and "old people", aged 50 and above. In Sundberg's

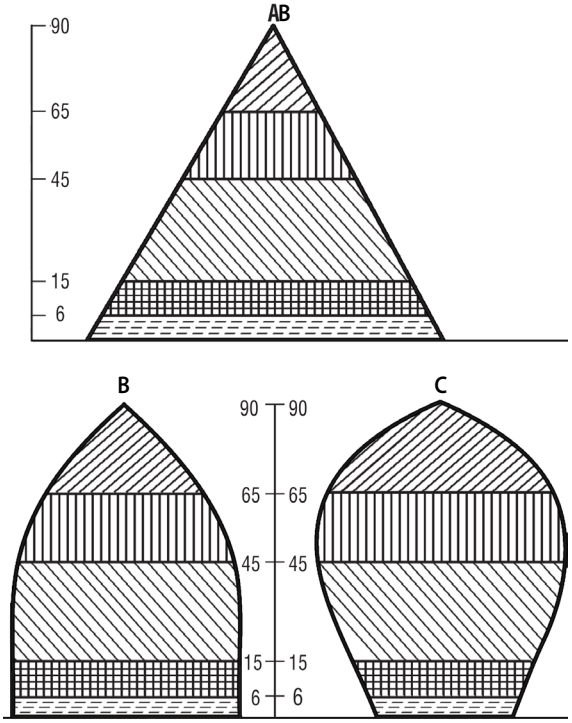
progressive age structure, the proportion of children is 40%, and the proportion of old people is 10%, in the stationary age structure – 27% and 23%, respectively, and in the regressive age structure – 20% and 30%. Due to the fact that the regressive type of age structure practically did not appear in Sundberg's times (with the exception of some France's provinces), he formulated so-called "Law of the age structure equilibrium", the main postulate of which is that the share of able-bodied population (15–49 years) remains unchanged within 49–50% range[1]. However, if we apply this age classification, for example, to the population of modern France, we can state that the range of values of the share of population, aged from 15 to 49, in 1950–2015 varied from 44 to 50.5%[2]. In practice, Sundberg's law is not confirmed, but his approach became the basis for the study of age profiles in demography.

In the 1930s, the German statistician F. Burgderfer developed the concept of types of population's age structures, formulated by Sundberg [5]. The progressive age structure (young population) corresponds to the correct pyramid. A diagram, depicting a stationary structure, resembles a "bell". The regressive age structure corresponds to a figure called the "urn" (*Fig. 1*).

However, if the regressive type was considered a theoretically possible in times of F. Burgderfer, then, according to 2015 data, the entire spectrum of selected types of age structures is reflected in practice (*Fig. 2*).

Burgderfer and his compatriot V. Mayer believed that the thesis about the interconnection between demographic ageing and depopulation is erroneous, and it is not confirmed empirically. Their opinion was quite reasonable, given the fact that, in the first half

Figure 1. Types of age structures (according to F. Burgderfer): A – young (growing) population; B – aged (stationary) population; C – very old (decreasing) population



Source: Medkov V.M. Demografiya: ucheb. posobie dlya vuzov. R/nD: Feniks, 2002. 448 p.

of the 20th century, the process of the increase of the share and number of older people happened simultaneously with the growth of the entire population. However, the current situation shows the opposite. In particular, over the past ten years (2005–2015), the population of Japan (the country with the highest share of old people above 60 years old) decreased by 1%, and, according to the average version of the UN forecast, it will have decreased by almost 20% by 2050[3].

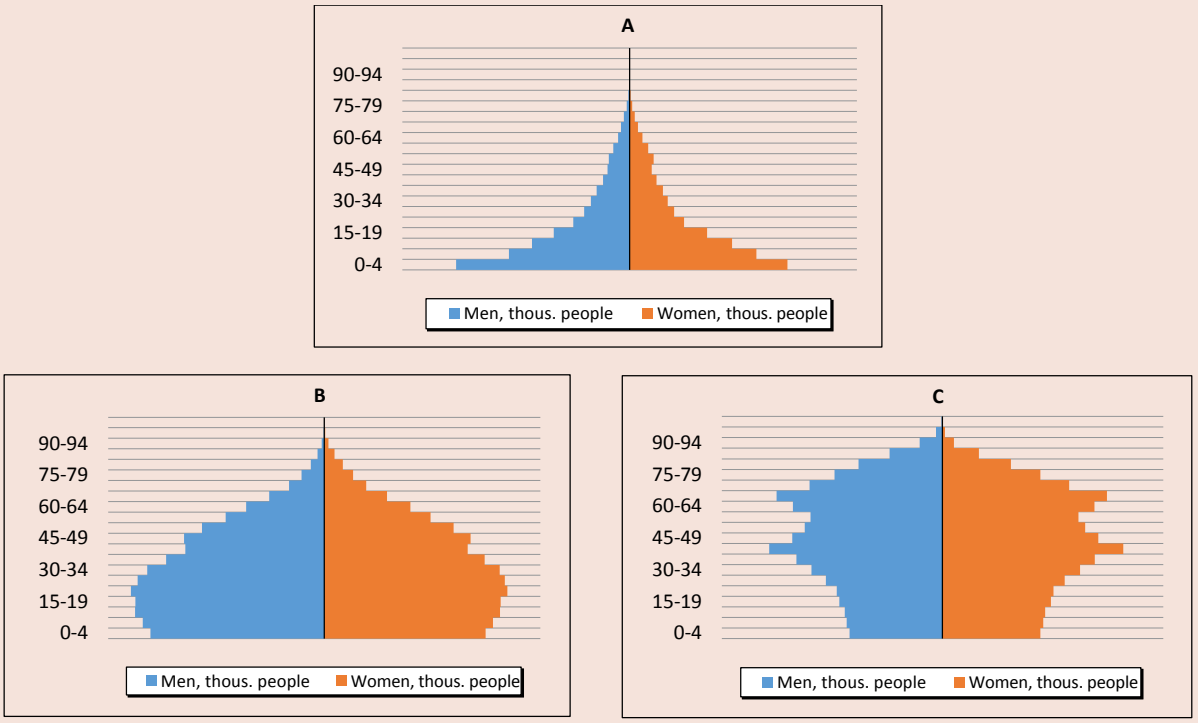
It should be noted that, until the middle of the 20th century, the phenomenon of population ageing received very little

[1] Medkov V.M. Demografiya: ucheb. posobie dlya vuzov. R/nD: Feniks, 2002. 448 p.

[2] World Population Prospects: the 2015 revision. Available at: http://esa.un.org/unpd/wpp/

[3] World Population Prospects: the 2015 revision. Available at: http://esa.un.org/unpd/wpp/

Figure 2. Age structures of the population in some countries of the world in 2015:
A – Niger; B – Colombia; C – Japan



Source: own compilation according to data of World Population Prospects: the 2015 revision. Available at: http://esa.un.org/unpd/wpp/

attention from the scientific community, since the share and number of older people had not shown significant growth rates for a long time. At the same time, within the actively developing theory of demographic transition, some forecasts and assumptions about the potential growth of the problem in the near future were made [6]. In the 50s and the 60s, the problem of population ageing became clear. It stimulated the research, purpose and objectives of which were the definition of fundamental methodological principles of evaluating demographic ageing territories. During this period of time, a number of theoretical and practical works were published, the totality of which could be called a classic stage in the development of ideas about the phenomenon of population ageing: the UN Report "The Ageing of Populations and its Economic and Social Implications" (1956), E. Rosset's fundamental works (1959), J. Beaujeu-Garnier (1965), A. Sauvy (1966), etc. UN experts were among the first researchers who attempted to classify countries by the level of demographic "old age", and the main criterion was determined by the share of the population above 65 years old. Three levels, characterizing the population's age structure, were proposed [7]:

1) with 4% of people over 65 years old – the young population;
2) 4–7% – mature population;
3) more than 7% – old population.

Let us emphasize that this classification is currently used by many experts for analyzing trends in the process of demographic ageing. However, in the late 50s, it was fairly

Table 2. Beaujeu-Garnier–Rosset's scale of demographic old age

Stage	Share of people, aged 60 and above, %	Stage of ageing and the level of population's old age
1	<8	Demographic youth
2	8–10	The first threshold of old age
3	10–12	Actual threshold of old age
4	12 and above	Demographic old age
	12–14	Initial level of demographic old age
	14–16	Average level of demographic old age
	16–18	High level of demographic old age
	18 and above	Very high level of demographic old age

criticized by some scientists: in particular, by the Polish demographer E. Rosset. He considered the UN classification too narrow, which did not reflect the entire global scale of the population ageing phenomenon [5]. After carrying out a conceptual analysis of existing approaches to determining the age of old age, Rosset formed his own scale of demographic old age, which included four levels. As a classification criterion, he used the age of 60 years and older. Later, when he came to a consensus with the French scientist J. Beaujeu-Garnier (initially E. Rosset criticized her approach to highlighting the boundaries of demographic old age), the scale was expanded (*Tab. 2*).

Thus, the Sundberg's concept acquired a slightly different format: the progressive, stationary, and regressive population was replaced by the young, mature, and old population. In this case, it is rather a question of terminology, since the diversity of types of age structures has not been questioned. However, the main methodological difference between new approaches was the departure from two criteria in the measurement of the demographic old age (previously, the share of children and the share of old people were used for characterizing the type of the population's age structure). The level of old age of the population was measured using only the indicator of the share of the population above 60/65 years old. According to scientists themselves, it allowed introducing stricter methodological boundaries in the study of demographic ageing [5].

Later, Alfred Sauvy in his book "Théorie générale de la population: La vie des populations" (1966) presented some kind of a resume in relation to approaches toward the study of the demographic ageing process. At the same time, the French scientist did not focus on defining the boundaries of old age. The center of his attention was the practical result of assessing possible consequences of population ageing and indicators that allow their measurement and forecast [8]. In the classic projection of assessing the effects of the studied phenomenon, such indicators included the average age of the population, the number of old people per 1000 able-bodied population (most often – from 14 to 59/64 years old), the old age index (the number of elderly people per 100 children, aged 0–14). The important methodological point is the shift of the two-criteria principle from measuring the level of population's old age to measuring the consequences of this phenomenon.

In later periods, a number of scientists [9–12] repeatedly attempted to create new typologies and classifications for measuring levels of demo-graphic old age and consequences of population ageing, which, however, were based on previously established classic principles. In the 21st century, when the phenomenon of population ageing became global, the main question, which started the scientific

discussion on the definition of "old age" in the 50s and 60s, has become even more relevant: how do established methodological boundaries correspond to modern realities? For clarity, let us compare the distribution of countries in the UN and Beaujeu-Garnier–Rosset's classifications in 1950 and 2015 (*Tab. 3 and 4*).

The data show that the share of countries, which could be called demographically old, became several times higher in 1950–2015: from 23.5% to 44% according to the UN methodology, and from 12% to 39% according to the Beaujeu-Garnier–Rosset's scale. This trend once again confirms the fact of the sufficient intensity of the process of global demographic ageing. However, the presence of countries in the "buffer" zone between "young" and "old" territories has significantly decreased. In fact, in the 50s, three conventional levels of old age were distributed in the descending order from "young" to "old". However, at the moment, both classifications allow speaking about the existence of two poles: the first one includes primarily "young" territories, and the second one – "old" territories. There is a contradiction: on the one hand, it is difficult to deny the global nature of demographic ageing, and, on the other hand, these data do not indicate the decrease of differentiation between countries, but the distance between two opposite groups.

Thus, the departure from two-criteria (which should have created a stricter methodological framework and reduced the impact on the final indicator of the share and the number of children) did not justify itself. In both classifications, there was a narrowing of the "buffer" zone between "young" and "old" countries due to increasing differentiation between them in terms of fertility. The "bottom-up ageing" format, which happens due to the reduction of the birth rate and, consequently, the proportion of children in the population, has severely deformed the structure of the world's countries in terms of demographic old age. Comparison of territories with each other

Table 3. Distribution of countries by demographic old age in 1950 and 2015 (UN classification), %

Level of old age	Share of countries, %	
	1950	2015
Young population (share of people, aged 65 and above, is less than 4%)	47.5	31.5
Mature population (share of people, aged 65 and above, is from 4 to 7%)	29	24.5
Mature population (share of people, aged 65 and above, exceeds 7%)	23.5	44
Source: own compilation according to data of World Population Prospects: the 2015 revision. Available at: http://esa.un.org/unpd/wpp/		

Table 4. Distribution of countries by demographic old age in 1950 and 2015 (Beaujeu-Garnier–Rosset's classification), %

Stage	Share of people, aged 60 and above, %	Distribution of countries, %	
		1950	2015
1	Demographic youth (<8)	66	43.5
2	The first threshold of old age (8–10)	9.5	10
3	Actual threshold of old age (10–12)	12	7.5
4	Demographic old age (12 and above)	12	39
	Initial level of demographic old age (12–14)	6	4.5
	Average level of demographic old age (14–16)	5.5	5
	High level of demographic old age (16–18)	1	2
	Very high level of demographic old age (18 and above)	0	27.5
Source: own compilation according to data of World Population Prospects: the 2015 revision. Available at: http://esa.un.org/unpd/wpp/			

has become much more complicated. This difficulty has made it more relevant to search for other criteria of demographic old age, less dependent on birth rates.

In 1975, Norman Ryder proposed a new measure of the population's old age: it reflects not the number of years passed since birth, but the number of years of living in older ages [13]. As a criterion for measuring the level of demographic old age, he chose the indicator of the population share with a life expectancy of less than 10 years. This methodological principle was later used as the basis for the concept of prospective age, actively developed by W. Sanderson and S. Shcherbov [14–17]. Their proposed criterion for determining the level of old age of the population is the share of population with a life expectancy of 15 years or less. Researchers set the task of determining the objective boundaries of old age from the perspective of the "ageing from above" model on the basis of the indisputable fact that a conditionally modern 70-year-old individual has fundamentally different biological and social characteristics than his peers a few decades ago did. The main difference between this approach and the traditional one is a seemingly paradoxical statement: the increase of life expectancy at older ages leads to the rejuvenation of the population, not the ageing. In many developed countries, where the demographic transition began much earlier, the median population's age, calculated using the prospective method, tended to decrease since the middle of the 20th century, while the indicator in the traditional projection continued to grow [18]. As a confirmation, let us overview the indicators of demographic old age, calculated using different methods for the population of Russia, Sweden, and Denmark (*Tab. 5*).

The data show diverged nature of demographic ageing in classic and prospective projections: the share of population above 60 and 65 years old grows, whereas the share of the population with a LE of 15 years and less reduces. Moreover, Denmark, which is at the top of a rating in terms of demographic old age in traditional measurement, has a smaller share of older people than Russia, based on calculations of the prospective indicator. It is also obvious that countries are less differentiated by the level of demographic old age.

An important point is also the fact that the shift in the boundaries of old age in the prospective concept generally corresponds to the trends of the social age shifting, which has more formal boundaries (for example, the

Table 5. Share of older population of some countries in different classifications (1990–2015)

Country	Year	Share of population above 60 years, %	Share of population above 65 years, %	Share of population with LE from 15 years and less, %
Russia	1990	15.9	10	11.4
	2015	19.8	13.2	11.1
	+/-	+3.9	+3.2	-0.3
Sweden	1990	22.7	17.8	14
	2015	25.2	19.6	11.6
	+/-	+2.5	+1.8	-2.4
Denmark	1990	20.3	15.6	13.6
	2015	24.7	19	10.7
	+/-	+4.4	+3.4	-2.9

Source: own compilation according to data of Federal State Statistics Service of the Russian Federation. Available at: http://www.gks.ru; official website of statistics in Sweden. Available at: https://www.scb.se/en/; official website of statistics in Denmark. Available at: https://www.dst.dk/en

retirement age). Consequently, increased life expectancy at older ages expands the definition of productive population, which may be a reason for the retirement age increase. However, there is one flaw: the concept of prospective ageing does not take into account the growth rate of healthy life expectancy (HLE) and other characteristics that reflect, for example, the institutional features of the population's employment in older ages. In the classic measurement of demographic old age, these elements are also not provided, while the setting of the age of old age at the level of 60/65 years allows bringing closer the ratio of biological and social (in this case, we mean the retirement age) ages from an applied point of view. Let us overview the Russia as the example.

If we rely on calculations in the projection of prospective ageing, age limits in the country would be 62 years for men and 69 years for women in 2015. At the same time, determined retirement age limits were 60 years for men and 55 years for women then. Therefore, if we calculate the demographic workload in the projection of prospective ageing, millions of men, aged 60–62, and women, aged 55–69, will formally belong to the productive part of the population, although the vast majority of them have already retired. The example of Russia may not be the most significant, but we should note that the prospective age of old age in Sweden and Denmark, which had been already overviewed, also significantly exceeds the standard retirement age (by 4 and 5 years, respectively).

Let us go back to the HLE indicator in three overviewed countries. Dynamics of this indicator is probably one of the most significant critical arguments against the concept of prospective ageing. Thus, between 1990 and 2015, the age of "old age" in Russia, Denmark, and Sweden increased by 2; 4.5 and 3.5 years, respectively, while the HLE indicator of the population, aged 65, increased by 1 year in the Russian Federation and by 2 years in the Scandinavian countries. Objectively, the situation in all countries, without exceptions, develops in such a way that the growth rate of the HLE indicator is significantly slower than the growth of average life expectancy. The question appears: how objective are the boundaries of age in the concept of prospective ageing? We believe that the usage of the criterion of the share of the population with LE of 15 years and less in the measurement of demographic ageing slightly distorts the idea of old age, because it ignores the real achievements in extending healthy life in older ages.

The analysis allows us to conclude that existing approaches to measuring the level of demographic old age have a number of shortcomings. Thus, the measurement with traditional methods, which apply indicators of the share of population older than 60/65 years, is somewhat outdated, while the measurement with the prospective method, in our opinion, might overestimate real boundaries of population's old age. Also, the issue of the representativeness of the comparison of demographic old age levels in certain regions of the world remains unresolved.

If we overview population ageing as a dynamic process, then the transformation of age structure reflects the movement of population from one phase of demographic transition to another. However, if we overview demographic old age in static, it is a set of completely different types of age structures, which are difficult to compare with each other due to the different influence of individual factors on its change. Thus, in fact, the need for the global measurement of demographic old age loses its relevance from the point of view of traditional methods and the prospective ageing concept.

It worth mentioning that we do not pursue the aim of a complete denial of existing methods of the demographic old age measuring. The problem lies solely in the methodological validity of applying common criteria of its "age" to countries at different stages of demographic transition. The main drawback of these methods is that the determination of the population ageing extent through the prism of the age of demographic old age (in fact, the population level) does not answer the important question: how does society grow old? Countries with similar indicators of demographic old age may differ significantly in socio-demographic characteristics of older generation. Demographic construction of the age of "old age" is based on the usage of methods which allow assessing the factors and consequences of increasing the share and number of older people in the population, but they do not allow determining the parameters of changes of the older people's position in the social structure. In this regard, the study of the evolution of the "old age" social construction (a process that occurs simultaneously with demographic changes) is a necessary condition for a complete understanding of the nature of the "silent revolution".

Main milestones of the evolution of the public perception of old age: from geronticide to a society "for all ages"

In all discussions on consequences of demographic ageing, the attention is usually focused on the economic component (the deficit of pension systems, the reduction of supply on labor market, etc.). At the same time, the transformation of the population's age structure leads to the change of social space where the older generation becomes more and more important. It poses the question: what will happen after these changes, and is society ready for it? The answer to this question lies in the public perception of the inevitable change of the socio-cultural paradigm of "old age", where the resource potential of older generation is considered to be one of the main factors of sustainable socio-economic development. It is important to understand that the process of social "restructuring" of old age began in ancient times, when the population's age structure, the place and the role of an old person were completely different. The attitude toward older people and demographic transformations has an evolutionary nature, which implies the presence of certain factors that influence its change. In this part of the paper, we attempted to build a chronological sequence of changes of the public perception of older generation on the context of changes of the population's age structure. The study was conducted by a step-by-step review of five historical epochs (primitive society, ancient era, Middle Ages, modern and contemporary history). The overview of the demography of old population and the social status of this socio-demographic group was given for each period.

Primitive society. E. Rosset in his fundamental work "Proces starzenia sie ludnosci" called ancient society "the society without old people" [5; 19]. It is worth mentioning that his statement is confirmed by the data of archaeological excavations – the only source of information about the population of that time. In the middle of the 20th century, the French researcher Henri Valois publically presented the data on the study of 186 human remains from the late Paleolithic (40–13 thousand years BC) and Mesolithic (13–4 thousand years BC) eras, according to which, on average, only 2–2.5% of the population lived to the age of 50–60 years [20]. An outstanding domestic demographer B. Ts. Urlanis in his work [21] refers to the data on excavations in North America, where only four out of 1132 found skeletons of a pre-agricultural tribe were 55 years old or older.

Hungarian scientists Acsádi J. and Y. Nemeskeri calculated the survival coefficient for the Paleolithic population aged 40–44 years: it was 0.01. In general, the peaks of mortality were observed in the ages from 0 to 5 and from 20 to 30 years old [22]. According to B. Ts. Urlanis [21], the main cause of adult mortality in ancient times was violent death (death in skirmishes with animals, ritual killings, battle for prey, etc.).

If we speak about older people, then, according to E. Rosset [19] and L. Krzywicki [23], in primitive society, the deliberate killing of old persons was common. The reason, most likely, was the limited resources for living and the decline of their bodies' physiological properties, which led to the loss of ability to perform useful functions for the community. A middle aged person was an important part of the social structure, because he had an experience and skills to gather useful resources, but when a person became old, all these skills got devaluated. At the same time, L. Krzywicki, on the basis of studies on the age structure of the remains and behavioral characteristics of the tribes of New Zealand and New Guinea, put forward a hypothesis that this situation significantly improved, when ancient people learned how to make a fire [23]. If we turn to a well-known classification of L. Morgan [24], we can assume that the social significance of older generation has changed fundamentally with the transition of mankind to the middle stage of savagery. In tribes, old men, along with women, were given an important function – the keeping of fire. In fact, it could be called the first of the most significant stages of the evolution of attitudes toward older people, characterized by the awareness of the usefulness of functions, performed by older generation.

Ancient era. The early historical era provides much more information about the age structure, place, and role of older people in society. J. Angel in his work [25] compared archaeological data on Greeks' remains, which belonged to times between the Neolithic period and the Roman Empire. According to it, average mortality age increased by almost 7 years during this period (31.8 and 38.5 years, respectively). For comparison, Ya. Shiladi, who conducted a study of tombstones in 48 cities and districts of the Roman Empire, determined that the average age of the dead in the ancient era was 32.2 years [19]. C. Pearson, who studied tablets attached to mummies in Ancient Egypt [26], and W. Macdonel, who studied tombstones in the Western part of the Roman Empire from the first century BC to the first century AD [27], estimated the average population's life length in the ancient world at 22 years. American researchers L. Dublin, A. Lotka, and M. Spiegelman assumed that this number was between 20 and 30 years [28]. The difference of these estimates could be explained by differences of methods applied.

However, what is important for us is not the order of numbers, but the fact that the population's life expectancy, in comparison with prehistoric times, increased in this era. J. Angel called the improvement of sanitary conditions and the elimination of certain types of external causes of death main reasons of such changes [25]. Of course, the increase of life expectancy and its quality had a positive impact on society's attitude to older generations.

The collapse of tribal relations significantly changed the position of older people in the structure of society. It is safe to say that the social structure of ancient states was based on family and clan principles. The famous ancient Greek historian and geographer Strabo noted that "... the most famous, oldest, and experienced people are trusted" [29]. The highest authorities in Ancient Greece ("Gerousia") and the Roman Empire ("Senate") were councils of elders. The

etymology of these words shows that they are derived from the word "old man" [30]. In our times, the system of state administration of ancient states was called "gerontocracy", i.e. "the power of old".

At the same time, in the literature of ancient world, there was the information which could be used for assessing the public perception of older people and their way of living. The Roman philosopher Cicero was one of the first to present a philosophical understanding of old age in the dialogue "Cato the Elder on Old Age", written by him in 44 BC [31]. In this work, he identified four main reasons that form a negative image of older people. His thoughts remain relevant in the XXI century:

- old age hinders activity;
- old age weakens a body;
- old age deprives all pleasures;
- old age brings us closer to death.

Cicero does not deny the existence of these phenomena, but pays great attention to the philosophical attitude of an individual to older age. In his opinion, foresight, accumulated experience, and persistent character make old age the most useful age for a wise person. Cicero gives many examples of active political and military activity of his elderly contemporaries, thus refuting the statement that age hinders social activity. Common sense, memory training, and reflection compensate for fading physical strength, and the rashness of youth is replaced by foresight. As for the last reason mentioned by the philosopher, in his opinion, every person is at the same distance from death.

Later, Cicero's reflections on old age were supported by his compatriot Lucius Annaeus Seneca. In the 12th chapter of "Moral Letters to Lucilius" [32], he calls for considering old age an unavoidable part of a person's life path, filled with its own advantages that are natural for this age. Following Cicero, Seneca writes that "all pleasures ... replace the lack of need for them", but, at the same time, old age "...is full of pleasures, if you know how to use them".

It is important to note that historical sources indicate the preservation of the ancient tradition of killing the elderly in the ancient era. Strabo gives several examples that date back to the 4th century BC [29]. On the Island of Keos (Polis Yulida), there was a custom that ordered all old people over 60 years to drink hemlock (poisonous extract). This was justified by the lack of food, and the "law" itself sounded like this: "The one who does not live well, should not live bad". In the Sogdian and Bactrian tribes (the modern territory of Uzbekistan and Tajikistan), old people were fed alive to dogs, but this custom, according to Strabo, was eliminated by Alexander the Great. In the Scythian-Sarmatian tribes of the Aral-Caspian region, there was a practice of eating older men over 70 years of age and their starvation. M.I. Kulisher, referring to the protestant pastor and ethnographer Matthäus Prätorius [33], notes that gerontocide ("killing of old people") was practiced by Prussian Lithuanians and ancient Prussians.

Thus, despite some old people's social status changes, the problem of geronticide in the ancient world remained relevant. Due to the lack of available information, we cannot define the scale of this phenomenon, but the fact of its existence is difficult to deny. Moreover, given examples show that the practice of killing older people was not attached to a particular culture. As before, in each case, a single direct or indirect cause can be seen: the lack of resources. Therefore, we can assume that gerontocide was one of the first and most radical manifestations of age discrimination, which primarily applied to older people, whose physical and moral condition, according to their contemporaries, did not allow them to be classified as a

"useful", productive part of society.

The Middle Ages. This period of human history provides scientists with an extremely small number of materials on population statistics and historical demography. One of the most significant works on medieval demography belongs to J. Russel [34]. The scientist calculated 11 mortality tables for the population of England for the period from 1276 to 1450, according to which the average life expectancy at birth was about 26–28 years in this era. It is worth mentioning that the value of the indicator varied greatly (from 17 to 35 years), which was caused by the plague epidemic, which reached its peak in the second half of the 14th century. This factor became the main barrier to the growth of life expectancy in the medieval era. One of the confirmations of the hypothesis on the decrease of the average life expectancy in reviewed historical periods is the study of V. Valaoras: according to his data, the value of the indicator for the population of Greece in the era of antiquity and in the Middle Ages was the same – 22 years [35].

The most detailed information about the age structure of the population in the Middle Ages is presented in the work of J. Acsádi and Y. Nemeskeri [22]. According to their research, conducted in Yugoslavia (10–11th centuries), Sweden, and Germany (12–14th centuries) in the studied period in Europe, averagely 6% of the population lived to the age of 60 years. E. Rosset in his research [5; 19] refers to the work of Pope Innocent III (1161–1216) "On the predictable world and human poverty", who characterized the demographic situation of his era with the following words: "Few people lived to forty years, and sixty-year-olds were rare cases". On the basis of this information, we can assume that, in the Middle Ages, the evolution of life expectancy and, consequently, the growth of the number of elderly people slowed down, which happened primarily due to the large number of wars, unsatisfactory sanitary and economic conditions.

Let us now discuss the public perception of older people in the studied historical period. Famous historian and sociologist Ph. Ariès provides important information about the image of the older generation in the eyes of medieval society [36]. The iconographic tradition of France in the 14–18th centuries shows that each specific age was assigned a certain social function. In case of an elderly person (the house-sitting age), it was an untidy, old-fashioned, bearded scientist (or a representative of a different cohort related to mental work). Thus, in the Middle Ages, knowledge and related functions were associated with old age. This fact allows us to assume that representatives of the older generation get a specific niche in the social structure. At the same time, Ph. Ariès notes that, in medieval France, older people did not enjoy public respect [36]. Old age was defined as the age of renunciation, the age of reading books and praying. In the 16–17th centuries, the image of a full-fledged man was formed: it was a young military man in an officer's belt at the top of a social pyramid. Without doubt, the example of France does not make it possible to extrapolate the results to all regions of the world, but, in our opinion, this information allows us to indirectly characterize the situation in the countries of continental Europe: they have historically been the "vanguard" of social transformations.

The cases of geronticide, which were typical for that time, need to be mentioned too. One of the most important historical facts is the Commission of Pope Alexander IV, dated the 13th century, according to which the famous medieval theologian Saint Albert the Great had to go to Poland to eliminate the barbaric custom of killing old people, which existed there [33]. A. A. Kotlyarevskii thoroughly

reviewed the Wends' (collective designation of Slavic tribes that inhabited Europe) traditions of killing elderly people. The author gives an example that dates back to 1220, when the elder Levin von Schuleberg forcibly took an old man, who was sentenced to death, from a group of Wends. After this incident, the rescued old man lived for about 20 years [37]. The last mention of this Wends' custom is from the 17th century. The Church Minister Hildebrand wrote: "In former times, children killed their decrepit parents, who were unable to earn money, saying that God is not pleased with people who do not work" [33]. In our opinion, this quote is another confirmation of the fact that, in a relatively stable demographic situation, the economic context largely deter-mined the attitude toward older people in ancient and medieval times. However, it should also be noted that this custom was questioned and regarded as an inhumane relic of the past in relatively developed countries.

Modern Age. This historical era is associated with the birth of the demography science. The first two known mortality tables were constructed in the second half of the 17th century: J. Graunt's table was for the population of London (the 1660s) and E. Halley's table was for the population of Wroclaw (1687–1691). However, estimates of average life expectancy varied significantly: the number was around 18 years in the first case [38] and 30 years in the second one [39]. According to E. Halley's calculations, 24.2% of the population lived to the age of 60 (in the Middle Ages, this number was around 6%). In France, The Netherlands, and Sweden of the 18th century, the share of those who lived to 60 years increased to 30% [5]. In the 19th century, the share of those who could live to old age ranged from 35 to 46% in developed countries, while the number was about 25% in the European part of Russia: according to E. Halley's calculations, it was similar to the indicators of Poland of the 17th century. S.A. Novosel'skii in his work "Mortality and life expectancy in Russia" (1916) characterized the age structure of the Russian Empire as "typical for agricultural countries which are underdeveloped in sanitary, cultural, and economic terms" [40]. At the turn of the 19th and 20th centuries, about 29% of the inhabitants of the European part of Russia lived to 60 years, while this number exceeded 50% in Sweden and Denmark [41]. The revealed differentiation is important for comparing the demographic development of countries, but the most important thing needs to be mentioned: in all reviewed countries, there was the decrease of mortality (to varying degrees) in all ages, including older ages. At the beginning of the 20th century, in several European countries, the share of the population, aged over 60 years, exceeded 10% (France, Sweden, Ireland). As for the change of average life expectancy, it is estimated[4] that it averagely increased by almost 10 years in developed countries between 1840 and 1900 (from 41 to 50.5, respectively).

The public perception of older people has also been changing. The image of a respected elder gradually changed to "a man of age" and "a well preserved woman or a man" in developed countries [36]. In this regard, the change of the perception of the age of old age becomes decisive, which is some kind of a social phenomenon. Social phenomena are structures created by man in the course of historical development [42]. The construction of old age in Modern Age takes place in the context of the awareness of demographic (increase of life expectancy and transformation of the age structure), economic (industrial revolution), and cultural changes.

Despite significant changes in the

[4] Demographic Yearbook. 1953. Available at: https://unstats.un.org/unsd/demographic/products/dyb/dybsets/1953%20DYB.pdf

perception of the older population, references to gerontocide are found even in the 19th century. Thus, the famous traveler D.N. Bukharov described the custom of Lapp (Sami) nomads: a sick or elderly person was left to his fate, if he could not continue the journey with the rest. They built a small hut for him, left some water and provisions, and then left him [43]. An article by P. Litvinova in the journal "Kievskaya starina" (1885), called "How old people were put on the lubok in the old days", is of particular interest [44]. The author gives data from interviews with residents of one of the villages of Little Russia, confirming the fact of elderly people murders. The story of a local resident directly traces the nature of the attitude toward elderly people in those days: an old person was significant and respected only if he had useful skills for his social group.

It is also important to mention that, at the end of the historical era, regular population censuses, which gave a more realistic idea about the age structure, began in several developed countries (for example, Sweden, England, Germany). In the second half of the 19th century, the first Chancellor of Germany Otto von Bismarck implemented the first model of the social service and insurance system (including pension), which marked the beginning of the "welfare states" era. One of the main reasons for these changes was the awareness of the fact that the older population grows in a number of European countries. It those years, the phenomenon, which became global and radically changed the society's perception of the older generation and the "age of old age" by the 1920s, began – population ageing.

Contemporary Age. The contemporary era is associated with demographic transformations. In 1909, the French demographer A. Landry drew attention to the existence of certain patterns in the demographic development of Western countries and to the transition to a "new demographic regime" [45]. A significant event was the publication of his book "La Révolution Démographique" (1934 [46]), which gave the eponymous name to the change of birth and death trends in developed countries in the first half of the 20th century. The decrease of the number of births and the increase of life expectancy caused a significant transformation of the population's age structure. Its main feature was an unprecedented increase of the share and the number of the elderly population (*Tab. 6*). According to 2015 data, the share of the population, aged over 60, is, averagely, 24% in developed countries (in the world – 12%).

Changes of the demographic situation led to a revision of state policy toward older citizens. The problem of population ageing required solution of two interrelated tasks: the maintenance of the economic growth and the provision of decent living conditions for the older generation. At the beginning of the 20th century, most of the developed countries of the world set a course for the introduction of national social programs. For a long time (more precisely, until the 70s–80s), the pension systems in developed countries were based on so-called principle of generational solidarity ("pay-as-you-go" model of the conditional-funded pension system) and functioned by redistributing funds between generations, or rather transferring part of incomes of working population in favor of disabled citizens. However, when the demographic dividend was exhausted, and many developed countries entered the third phase of the demographic transition, the pension load on able-bodied population began to significantly increase, which made the issue of the fairness of public finances redistribution relevant. The socio-demographic group of older people, previously considered to be only an unproductive part of

Table 6. Change of the share of older people in the total population of developed countries

Share of people aged 60 and above, %	Country, year			
	France	Sweden	Great Britain	Germany
8	1788	1860	1910	1911
10	1850	1882	1925	1925
12	1870	1912	1931	1937
14	1931	1948	1938	1950
15	1939	1950	1940	1954
16	1947	1956	1952	1960
17	1961	1959	1961	1962
Source: Sauvy A. La vie des populations. Translation from French by F.R. Okuneva. Moscow: Progress, 1977. 520 p.				

the population, is labelled as "burden" for the state and its budget. We need to point out that many countries responded to this challenge by switching to a funded pension system, which increases the individual responsibility of a citizen for pension savings.

Another important consequence of demographic ageing is the transformation of the labor market and the reduction of supply on it. In the second half of the 20th century, employers in developed and developing countries used a system that could be called "last in, first out" for older people [47]. It means that people, approaching retirement age, became the first candidates for dismissal and the last in the process of applying for a job. In the 70s, developed countries actively introduced the practice of early retirement, due to the employment crisis that arose in those years, and developed special programs for "exempt employment" (England) or pre-retirement payments (Germany) [47]. However, despite the context, this system is discriminatory by definition. It is economically justified only within the "demographic window": if the ratio of the share of dependents and the share of working population tends to a minimum.

At the turn of the 20–21st centuries, the problem of supply surpluses on the labor market was replaced by its deficit in many developed countries. Due to the irreversibility of global demographic ageing, the problem of implementing the second demographic dividend [48] has become relevant. It was based on the resource potential of the older generation. In other words, on the stimulation of the employment of older people and the implementation of a policy of extending the period of labor activity of citizens after reaching retirement age. Global community responded by adopting normative documents that regulate the work of older people too: the Vienna International Plan of Action on Ageing (1982), Proclamation on Ageing (1992), and the Madrid International Plan of Action on Ageing (2002). States and employers are encouraged to create favorable conditions and to employ the "third age" population. The attitude to older people in society is built through the awareness of the need for effective implementation of their resource potential.

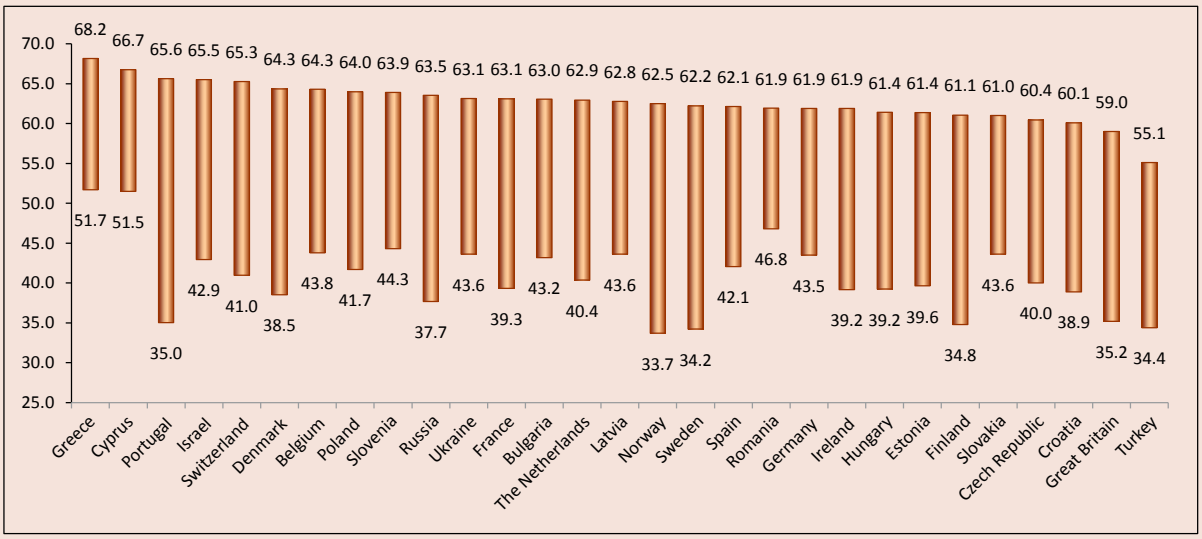
There is no place for gerontocide in the modern world, but the scornful attitude toward elderly people still exists in a different form, which is called "ageism" in science. The term was coined by the American scientist R. Butler [49], and it means age discrimination, similarly to Nazism and sexism. Butler reviewed it as a combination of three interrelated aspects, such as the negative stereotyping of older people, discriminatory manifestations in people's interpersonal interaction, and discrimination on the institutional level (in particular, on labor market) [50].

It is possible to assume that age discrimination against older people is a factor which reduces their living quality. To confirm this hypothesis, we attempted to compare the results of the sixth wave of The World Values Survey's sociological research[5] (a set of questions aimed at identifying age discrimination) with the data of the global rating of older people's living quality (Global AgeWatch Index, 2015), calculated using the methodology of the international non-governmental organization HelpAge International. The calculations showed a strong positive correlation (r=0.71), i.e. the lower the level of discriminatory attitudes toward older people, the higher their living quality is. The elimination of ageism, which is as much of a social vestige as gerontocide, has become an integral part of the transition to a new socio-cultural paradigm of "old age" and the policy of effective implementation of the older generation's resource potential.

Sociological surveys are among the most important tools for obtaining information about limits of the age of "old age" from the position of a society itself. In 2008, participants of the European Sociological Survey (ESS) were asked to answer two questions: 1) "At what age does youth end?" and 2) "At what age does old age begin?". *Figure 3* shows data for some countries (the number at the bottom of the column is the end of youth, at the top – the beginning of old age).

According to the aforementioned data, we may conclude that these countries differ most significantly in terms of the end of the youth period (which affects the duration of "maturity"), while the age of "old age", without considering extreme points, varies from 60 to 65 years. In general, it confirms the relevance of using similar criteria for determining demographic old age and approximate compliance with the retirement age, which is one of the formalized versions of the social

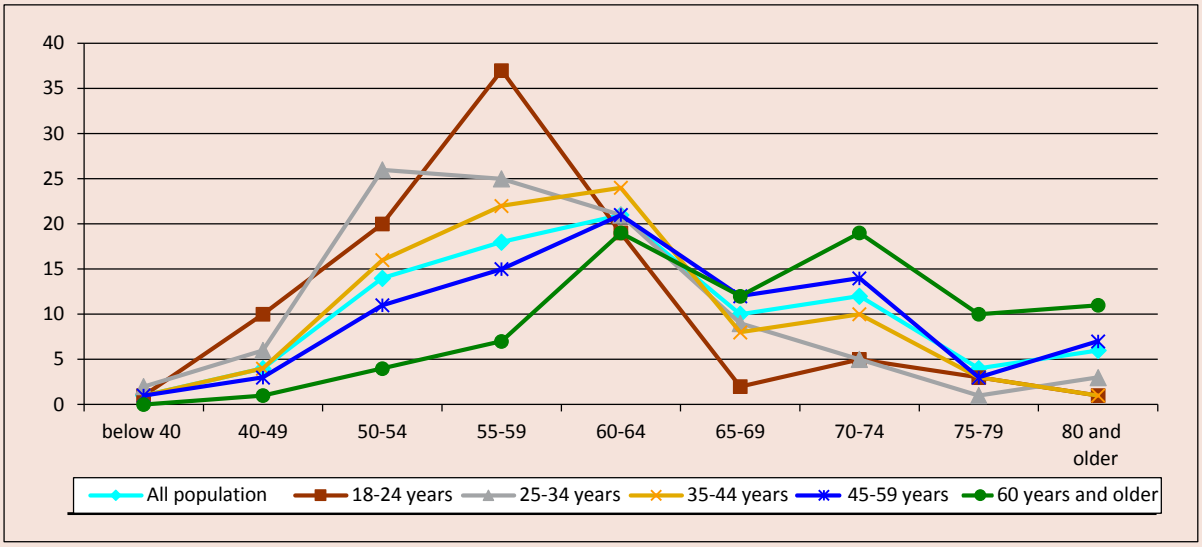
Figure 3. Distribution of answers to questions "At what age does youth end?" and "At what age does old age begin?", 2008, years



Source: ESS4 2008. Available at: https://www.europeansocialsurvey.org/data/download.html?r=4

[5] Standardized surveys were conducted in 56 countries in 2010–2014, with a total sample of over 90.000 people.

Figure 4. Distribution of answers to the question "In Your opinion, at what age does old age begin?", 2018



Source: Demoscope Weekly. Available at: http://www.demoscope.ru/weekly/2018/0787/opros01.php

age. It might be assumed that the age of "old age" largely corresponds to the legally fixed retirement age in the society's understanding. In other words, not only demographic factors cause social changes, but it also might happen vice versa: the age of "incapacity" becomes a product of social construction in the public consciousness.

Interesting information was obtained by VCIOM, which conducted a similar version of the survey in Russia (*Fig. 4*).

In this case, the important thing is not only what age Russians relate old age to, but also differences of old age perceptions in different age groups. Thus, based on these data, we may assume that, according to members of younger groups, the age of "old age" comes much earlier in comparison with the older generation's point of view. Thus, we may assume that, with population ageing and increasing number of older people, the age of "old age" is constructed not only through awareness of the fact of growing life expectancy, but also through the change of the balance of representation of different socio-demographic groups in the population. This is indirectly confirmed by the earlier data: according to it, the level of tolerance toward older people is higher in countries where the largest presence of these groups in the overall structure is recorded [1].

It is obvious that demographic changes are the root cause of the population (Homo Sapiens population) and society ageing. However, in the current conditions of globality and irreversibility of population ageing, cause-and-effect connections are not so clear. Ageing society, adapting to new demographic parameters, "restructures" the concept of the age of "old age", which is largely determined by social constructs (like the retirement age). The population and society ageing is an absolutely natural process which might only be accelerated or slowed down, but it could hardly be prevented. Coming back to methodological reflections concerning the relevance of approaches to determining the age of "old age", we face the question: is there a place and need for this term in ageing society?

Conclusions

While the ancient society could be confidently called the "society without old people", the current demographic situation is the opposite. Based on the available information, we assume that fundamental changes in the position of the older generation were influenced by revolutionary civilizational breakthroughs (fire, industrial revolution, etc.) and qualitative changes of the demographic system.

In particular, the rise of social states in developed countries occurred at the stage of the implementation of demographic dividends, when the share of dependent groups in the population reached a historical minimum: it allowed creating a foundation for the development of protectionist social security systems for older citizens. Thus, it becomes obvious that the construction of the age of "old age" in its original manifestation primarily had a demographic context with distinct economic factors.

In the context of global, irreversible (with maintaining a narrowed reproduction) population ageing and demographic beta-convergence (developing countries "age" significantly faster than developed countries) [51], the construction of the age of "old age" is gradually moving into the social area. Societies restructure the concept of old age through the prism of increasing life expectancy (including healthy life) and the awareness of the growing role of the older generation in maintaining sustainable rates of the socio-economic development.

Changes in public opinion about old people in different historical periods were determined by the perception of the demographic structure and current socio-economic conditions. In each of studied eras, the attitude toward older people had its own features: elderly people's functions and social appearance changed too. The analysis shows that systemic gerontocide took place throughout the history of mankind up to the 19th century. It is obvious that main factors, which determined the existence of this phenomenon, were the elementary lack of resources and, according to the rest of society, the loss of useful skills by the older generation. The gradual transition from the contempt toward elderly people to the disappearance of the "old age" concept, at least in the sense of degradation, could be seen as a reaction of society to life expectancy changes. At the same time, the social construction of an old person's image in the context of demographic ageing is carried out by evaluating the usefulness of skills of the older generation, just like in previous historical eras. The main difference is that the primary social function of an elderly person in the past was the "transmission" of life experience. Today, while the share of older people in most developed and developing countries is the only one increasing, this socio-demographic group is responsible for maintaining state's sustainable socio-economic development. In this regard, the primary objective is to create favorable conditions for increasing the involvement of the older generation in socially useful activities. It might significantly simplify the transition to the new society. The effectiveness of the solution depends not only on elderly people themselves, but also on the state's policy and the willingness of society to accept these inevitable changes.

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The Formation of the Mechanism of Cooperation between Socially Responsible Business and Regional Authorities in the Arctic Zone of the Russian Federation

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Abstract. In the current development conditions, the issue of distributing social functions between the state and a business is the most relevant. There are several institutions through which the state transfers social functions to organizations: social entrepreneurship, nonprofit organizations, and corporate social responsibility. These processes are the most important for the RF Arctic zone, which is resource oriented, and it is characterized by a special vulnerability to technogenic, biogenic, and socio-cultural threats. Mining companies adopt a voluntary social responsibility policy more often than companies from other industries. The results of the analysis of conducted studies show that a little attention is paid to issues of cooperation between socially responsible companies and regional authorities. This work is devoted to studying processes of the formation of mechanisms defining cooperation between socially responsible

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companies and regional authorities of the RF Arctic zone. Primary and secondary sources of information served as the informational basis. To collect primary data, we used in-depth unstructured interviews. Secondary data sources were official data from government and companies' websites, legal acts, and internal documentation of companies (annual reports, ordinances, regulations, policies, and reports on sustainable development). Content analysis of strategies, synthesis, and structural approach were used as methods of data interpretation. Access to company's internal documentation and the lack of updates on government and companies' official websites were restrictions of the research. Despite the existing bottlenecks in the research, the results are interesting for the further study of the mechanism of influence of business' social responsibility on the territories' socio-economic development and actualization of strategies for the Arctic regions' development.

Key words: socio-economic policy, corporate social responsibility, RF Arctic zone, mechanism of influence.

Introduction

Modern trends of the implementation of regional socio-economic policy in Russia are characterized by the diversification of social responsibility and the formation of common joint responsibility of the state and business. Denationalization of social responsibility occurs through the development of social entrepreneurship, attraction and support of socially oriented nonprofit organizations, and promotion of the development of corporate social responsibility. The development of social responsibility institutions is aimed, on the one hand, at reducing the financial burden of regional budgets, and, on the other hand, at improving the quality of social services provided. Thus, according to the authors' definition [1], social responsibility could be understood as the activity of a law-abiding company in relation to citizens of any territorial unit, aimed at providing social benefits for citizens and leading to improvement of the quality of life, preservation of biodiversity, reduction of the negative impact and comprehensive develop-ment of a given territorial unit. This is especially relevant for the Arctic regions due to their higher sensitivity toward any optimization reforms, aimed at reduction of state social costs: especially concerning life support systems.

Thus, the study of the formation of the mechanism of cooperation of companies and regional authorities' social responsibility in the RF Arctic zone will reveal the features of formal and informal interconnections between the region and business.

The methodology of the research is based on the systematic interdisciplinary approach. Theoretical constructions are based on the results of expert evaluation of domestic and foreign legislative acts, other legal documents, which directly or indirectly regulate corporate social responsibility (CSR), and on the results of interviewing selected focus groups[1].

On the basis of the content analysis of the strategy of the socio-economic development of the Arctic regions, the main characteristics of CSR and features of the entire communication process were identified (criteria analysis was the frequency of references of words "corporate

[1] The empirical research was conducted within the framework of the qualitative paradigm. In order to study the implicit elements of the mechanism of implementing corporate social responsibility of large companies, focus groups were held, the object of which were representatives of various social groups who were more or less aware of the organizational processes in the field of CSR: representatives of the district administration (8 people); employees of oil and gas companies (8 people), students who had internships in an oil and gas company (10 people).

social responsibility", "public-private partnership", "social project" in relation to the business, "private investments" – in relation to social projects, and the semantic analysis of mentions of oil-gas companies and their social role in the regional development).

Theoretical basis of the research is complied from works of researchers of 20th century, who described the idea of transferring some social functions to business. Thus, H. Bowen said that business should be responsible for existing social problems in the region and take part in their solution. Social responsibility was reviewed as the possible way of business development, not the only correct one. H. Bowen is called the "father of Corporate Social Responsibility [2, 3]. The similar idea was supported by W. Frederick: resources of companies should be used not only for achieving business' aims, nut also for creating "universal socio-economic good" [4, 5].

S. Seti, S. Vartrik and F. Cochran, E. Freeman, L. Carroll more clearly formulated the role of socio-responsible business, which consists of carrying out social events that help solve social problems in the regions of presence [6, 7, 9, 10, 11].

Works of researchers of 21st century include modern practices of socially responsible companies. D. Rondinelli and M. Berry analyzed different events which affect the development of the region and selected 20 types of events, such as the development of own stricter standards, the provision of financial support for environmental activities, the participation in the creation of protected areas, the implementation of clean production practices, waste recycling, etc. [12]. L. Shen, K. Muduli, and A. Brave reviewed the impact of business' social responsibility on the region by grouping them in three types: economic, social, and ecological [13]. Special attention is paid to the relationship between companies, which produce natural resources, and local population, because these companies' activities directly and indirectly affect the quality of life and the development of the region. The activity of companies which produce, for example, oil leads to a failure of the ecosystem. If the company's activities were or are carried out within accepted standards, the ecosystem recovers after some time, and environmental damage to local residents does not lead to a significant deterioration of the life quality. Thus, companies may use social programs to get compensation for damage caused [14].

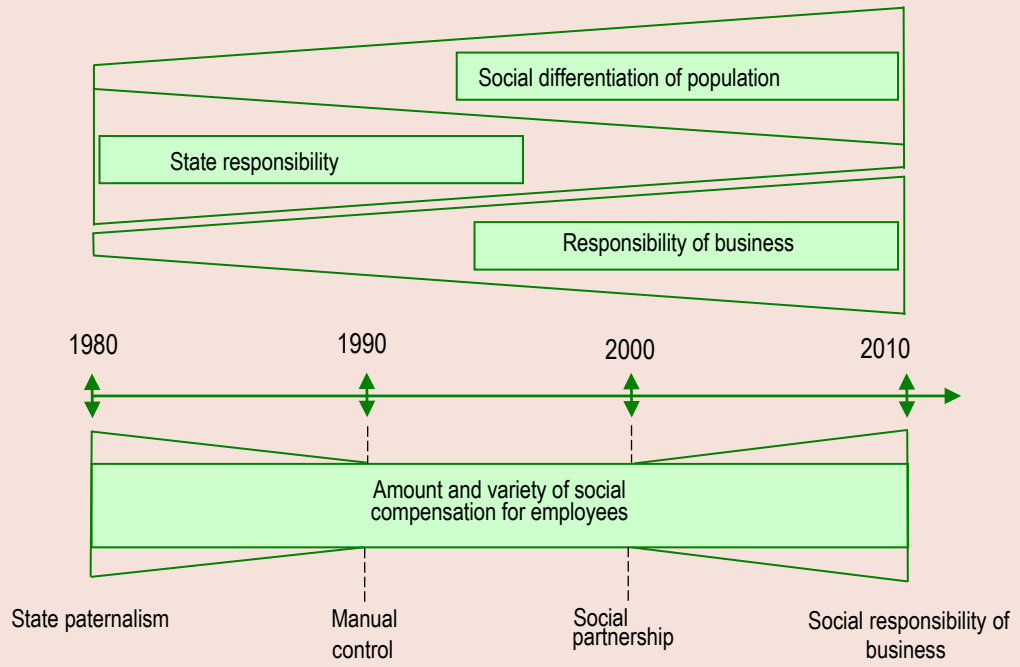
A.M. Fadeev, A.E. Cherepovitsyn, F.M. Larichkin said that state and northern regions need to build the policy of cooperation with countries which would bring them to the solution of existing socio-economic problems: to implementation of hydrocarbon resources' social value. At the same time, the main problem is considered to be the need to achieve certain production indicators, which leads to the non-use of all potential social value [15]. A.N. Pilyasov and N.Yu. Zamyatina, who also studied social development of the Arctic zone, argued that socio-economic development should be considered according to the "lower level" and local communities' needs [16]. Partnership with business, a common form of which is public-private partnership in the social sphere, gains significant weight [17]. R.N. Pavlov considered the essence and role of social entrepreneurship in the state as one of the possible forms of transition from the "kingdom of necessity" to the "kingdom of freedom". E.V. Popov, A.Yu. Veretennikova, I.V. Naumov, K.M. Kozinskaya revealed factors, which affect increase of the level of socially oriented business: growth of social autonomy and gender equality [18, p. 249; 19]. At the same time, increase of the number of socially oriented

goals and the number of participants in social organizations does not affect the companies' development. The results obtained prove that the popularization of socially oriented business is possible through the development of the principles of democracy. The authors review the issues of social entrepreneurship, which is different from the business' social responsibility due to the fact that business initially has commercial goals and uses the resulting profit to solve problems in the sector of healthcare, culture and sports, and social entrepreneurship is focused on obtaining a social effect and functioning in the social sphere. J. Moon and D. Vogel suggested that the relationship between the state and a socially responsible business may be reviewed using two approaches: a socially responsible business and the government are mutually exclusive in solving social issues, or it is a relationship between a market participant and the government [20]. D.S. Dubovets, on the basis of the analysis of a payer of social compensations to personnel, examined the evolution of social responsibility in Russia, proving that the country uses an approach of mutual exclusion of business and government while performing a social function (*Fig. 1*) [21].

The main negative effect of shifting social responsibilities from the state to the shoulders of companies is the increase of social differentiation of the population [21]. However, many factors influence the differentiation of the population's income, and the very existence of the pheno-menon does not depend on the performer of social functions.

Therefore, researchers paid attention to different aspects of the interaction of the region and a socially responsible business, such as the analysis of theoretical approaches to the role of business, cooperation effects, and industrial specifics of socially responsible business.

Figure 1. Social responsibility of business and state



Source: Dubovets D.S. The role of social and labor relations in the socio-economic system. *Man and Labor*, 2010, no. 9.

However, the question of the examination of the mechanism of the effect of social responsibility on the region's development remains unsolved in the works of Russian and foreign scientists, and it requires further study.

Results of the research

In this paper, the "mechanism of the influence of corporate social responsibility" is understood as the system of links, elements which cooperate with each other and set each other in motion. To describe the mechanism, the existing elements, forms of influence, their order and method of interaction are given below.

The modern mechanism of interaction between socially responsible oil-gas companies and regional authorities, which affects the development of the Arctic zone of the Russian Federation, is based on companies' common policy and goals of the region. Goals of the region are usually presented in the strategies and programs of the socio-economic development. They represent the interests of society, and policies of companies in the region are reflected in the following documents: ethical or social code; the sustainability report, report on social development or the report on corporate social responsibility; annual report; ordinance; other reports, regulations, codes.

The study of the formation of the interaction mechanism was carried out on the example of the Nenets Autonomous Okrug (NAO), because it is one of the territories where large oil-gas companies have significant experience of implementing CSR. According to the Consolidated state register of subsoil sites and licenses, from 1993–2018, the license to extract hydrocarbon resources on the territory of the NAO was received by 72 companies, 20 of which follow the policy of social responsibility [22]. Most of companies belong to the holdings of the "LUKOIL", "Rosneft", and "Gazprom" group of companies.

It was revealed that the mechanism is formed within the interaction of formal institutions, fixed in the form of legislative, regulatory and legal acts, standards, and informal ones, which represent stereotypes of thinking, habits, norms of behavior, and "contractual capacity" that develop over time and depend on mental characteristics of the society. Let us consider four main forms of interaction between companies and the region within the formation of a mechanism:

– cooperation that occurs within the framework of legislation;

– usage of recommendations or standards for maintaining corporate social responsibility;

– cooperation in the process of obtaining a license for the extraction of hydrocarbon resources;

– interest of public authorities and companies.

1. Interaction that occurs within the framework of legislation. As a result of the examination of the normative field of social responsibility of oil-gas business in the Arctic, three types of legal acts were identified:

Legal acts, regulating the specifics of a company's activity. Primary ones are the RF Law "On Subsoil"[2], the Federal Law "On Production Sharing Agreements"[3]; Nenets Autonomous Law "On the Amendments to the NAO Law "On Subsoils Usage"[4]. These legal acts reflect actions that companies are required to perform and that cannot be attributed to corporate social responsibility. Their examination helps to avoid situations, when the company issues obligations, established by law, for social responsibility.

[2] On Subsoil: Law of the Russian Federation no. 2395-1, dated February 21, 1992 (ed. on 30.09.2017). SPS KonsultantPlyus.

[3] On Production Sharing Agreements: Federal Law no. 225-FZ, dated December 30, 1995. SPS KonsultantPlyus.

[4] On the amendments to the NAO law "On Subsoils Usage": Law of Nenets Autonomous Okrug no. 357-OZ, dated December 22, 2017. SPS KonsultantPlyus.

Legal acts, which regulate charitable and voluntary activities. The primary ones are: The Universal Declaration on Volunteering[5], Federal Law "On Charitable Activities and Charitable Organizations[6], Federal Law "On Gratuitous Aid (Assistance) of the Russian Federation and Amendments and Additions to Certain Legislative Acts of the Russian Federation on Taxes and Establishing Benefits on Payments to State Extrabudgetary Funds in Connection with Implementation of Gratuitous Aid (Assistance) of the Russian Federation"[7], Nenets Autonomous Okrug Law "On Contracts and Agreements of the Nenets Autonomous District"[8]. Despite the fact that corporate social responsibility implies voluntary actions, the organization of these actions falls under legislative regulation, which, in turn, reflects the main ways of implementing social activity and the main principles of legal regulation of the social sphere.

Normative acts regulating the activities of the government and other state bodies. The primary one are Resolution "Recommendations on Support for Volunteering"[9], the RF President Decree "On National Goals and Strategic Objectives of the Russian Federation through to 2024", "On Privileges for Payment of Electric Energy (Capacity) on the territory of the Nenets Autonomous Okrug"[10], "On the Establishment of the Lowered Tax Rate on Profit of Organizations for Certain Categories of Taxpayers"[11]. This group of documents shows the interest of the region in the business development.

As the result of the analysis of global, federal, and local normative-legal acts (43 documents were analyzed), which have a direct and indirect influence on the formation of the mechanism of cooperation of corporate social responsibility, possible ways of implementing companies' social policies and companies' public instruments of motivation were identified for the participation in the development of the region – a territory of presence. Thus, the implementation of the company's social policy is possible through charity, financing of nonprofit organizations, through public-private partnerships, the conclusion of concession agreements, and financing of socially oriented enterprises. The company may independently participate in social activities and in the organization and financing of other legal entities, activities of which are of a social nature. The analysis showed that the regulation of companies' social activity is aimed at preventing violations of citizens' rights and freedoms or protecting the interests of parties of an agreement.

State methods of motivating companies to participate in the development of the region and to conduct social events include: the creation of legal acts that allow securing rights and regulating emerging contradictions; co-financing of joint projects, the participation in the registered capital of companies; the creation

[5] The Universal Declaration on Volunteering, adopted at the 16th World Conference of International Association for Volunteer Effort in Amsterdam, January of 2001.

[6] On Charitable Activities and Charitable Organizations: Federal Law no. 135-FZ, dated August 11, 1995. SPS Konsul'tantPlyus.

[7] On Gratuitous Aid (Assistance) of the Russian Federation and Amendments and Additions to Certain Legislative Acts of the Russian Federation on Taxes and Establishing Benefits on Payments to State Extrabudgetary Funds in Connection with Implementation of Gratuitous Aid (Assistance) of the Russian Federation: Federal Law no. 95-FZ, dated May 4, 1999. SPS Konsul'tantPlyus.

[8] On Contracts and Agreements of the Nenets Autonomous District: Law of Nenets Autonomous Okrug no. 38-OZ, dated June 28, 2010. SPS Konsul'tantPlyus.

[9] Recommendations on Support for Volunteering: A/RES/56/38 Resolution, adopted by United Nations on January 10, 2002.

[10] On Privileges for Payment of Electric Energy (Capacity) on the territory of the Nenets Autonomous Okrug: Law of Nenets Autonomous Okrug no. 368-OZ, dated February 8, 2018. SPS Konsul'tantPlyus.

[11] On the Establishment of the Lowered Tax Rate on Profit of Organizations for Certain Categories of Taxpayers: Law of Nenets Autonomous Okrug no. 88-OZ, dated October 8, 2013.

of necessary infrastructure for the production of hydrocarbon raw materials; the usage of financial levers, such as taxation or payment exemptions, allowing companies to reduce the costs of hydrocarbon production; the regulation of prices using the mechanism of customs duties (import substitution).

At the same time, the imperfection of the regulatory system may lead to conflicts of interest and limit companies' rights to operate. In particular, public authorities should ensure the right of small indigenous peoples to conduct traditional economic activities in places of traditional residence. It leads to restrictions for oil-gas companies to operate in areas that belong to places of traditional residence. In Nenets Autonomous Okrug, such places include Zapolyarny municipal district (except for the urban work settlement Iskateley). A conflict of interests emerges: on the one hand, there is a goal "to get economic benefits", and, on the other hand, there is a need "to preserve cultural heritage".

Normative acts pay attention to the issue of the state support for hydrocarbon companies' activities, but these companies' voluntary participation in the development of the region through carrying out of social events is rarely mentioned. At the same time, a large block of normative acts is aimed at the legislative consolidation of labor rights, the regulation of safety issues, the development of the social sphere, and the introduction of innovations in all spheres of society' life.

2. Recommendations or standards for corporate social responsibility. Another form of the interaction between the society and hydrocarbon companies is the usage of voluntary standards and recommendations for corporate social responsibility and standards for reporting on the company's sustainable development. Incentives to comply with the standards are the existing industry traditions, public pressure, or the requirement of partners or suppliers [23]. For example, the Code of Business Ethics of PJSC "LUKOIL Oil Company" includes the statement that the company expects suppliers to approve the principles of the Code and to follow the standards of ethical business maintenance, while the Social Code of PJSC "LUKOIL" specifies the criteria for selecting suppliers[12].

As the result of our expert evaluation of more than 20 standards and recommendations for conducting social activities, all of them were grouped into the following categories:

- by the sphere of application: standards that focus on regulating environmental, labor protection, or economic issues;
- by coverage level: international or federal;
- by the stage of regulation: standards that focus on the process and provide guidance for action; standards that help generate reports, results, and evaluate the presented indicators.

It was revealed that most of the standards are aimed at regulating social and environmental aspects of company's activities. At the same time, all standards aim to help a company build a policy that would contribute to the achievement of sustainable development goals. Just a few guidelines focus on the sustainable development reporting process. Thus, through the usage of standards, the state can participate in the regulation of social business practices through associations, unions and other alliances.

3. Cooperation in the process of obtaining a license for the extraction of hydrocarbon

[12] The Code of Business Ethics of PJSC "LUKOIL Oil Company". Available at: http://www.lukoil.ru/FileSystem/9/312213.pdf (accessed: 12.05.2019); the Social Code of PJSC "LUKOIL", adopted at the meeting of the Board of Directors of PJSC "LUKOIL", dated October 24, 2017, №16. Available at: http://lukoil.ru/FileSystem/9/166582.pdf (accessed: 12.05.2019).

resources. On the basis of interviews, established practices of cooperation between licensing entities were identified. The license for the extraction of minerals is issued on a competitive or auction basis, and it consists of the following steps: announcement of a competition with its placement on the government's official website; collection of applications with necessary documents; carrying out of an auction; making a decision by a competition's commission. Respondents noted that, in addition to obtaining a license for mining, companies draw up a technical project and sign an agreement, which, in particular, includes work on the territorial arrangement of the production site and measures for the elimination of the environmental damage. In addition to mandatory paragraphs, the agreement may contain additional clauses, such as the social role of a business in a resource extraction region. Applications with the highest number of socio-economic effects for the region have the best chance of approval. The examination of technical assignments allowed us to conclude that companies write down measures for the rational usage and the protection of the environment, the increase of a well's oil recovery.

4. Interest of public authorities and companies. The President of the Russian Federation urged companies to use the corporate social responsibility policy at the 13th Congress of the Russian Union of Industrialists and Entrepreneurs in 2003[13]. He noted that "social responsibility of entrepreneurs is absolutely necessary component of the participation in the production process"[14].

The analysis showed that the interest of public authorities in the development of corporate social responsibility is expressed by oral messages and by mentioning the role of companies in the development strategies.

- **On the federal level:**

1. Russia's Energy Strategy for the Period up to 2030[15]. It proclaims the usage of innovations by companies, R&D stimulation, ecological safety, and the transition to new structure of fuel and energy complex the priorities of the development. The document outlines the need for companies to present indicators of the sustainable development and to implement standards of corporate social responsibility. The general measures of state support for corporations, in particular, for the development of the social sphere by companies, are wrote down; measures for the creation of conditions for the implementation of social programs in the field of the personnel development are also noted. The financial participation of the state in the formation of the necessary infrastructure is indicated. The Arctic is singled out as one of the regions of the development of the fuel and energy complex.

2. The Development Strategy of the Arctic Zone of the Russian Federation and National Security for the Period Up to 2020[16]. It lists the problems of the Arctic development and the goals of its further development. The emphasis is put on the provision of the state support for oil and gas companies. The need to attract extra-budgetary sources of funding and the development of public-private partnerships is mentioned in the Strategy.

[13] Official website of the President of Russia. Available at: http://kremlin.ru (accessed: 29.04.2019).

[14] Official website of All-Russian quality organization for social responsibility matters. Available at: http://www.ksovok.com] (accessed: 29.04.2019).

[15] Russia's Energy Strategy for the Period up to 2030: adopted by the decree of the RF Government no. 1715-p, dated November 13, 2009.

[16] The Development Strategy of the Arctic Zone of the Russian Federation and National Security for the Period Up to 2020: adopted by the decree of the President of Russia no. Pr-232, dated February 8, 2013.

3. The state program "The Strategy for the Development of the Arctic Zone of the Russian Federation and National Security up to 2020"[17]. Subprogram 3 identifies issues of the development of the oil and gas sector in the Arctic with a focus on the usage of innovations. It also emphasizes the need for cooperation between the state and business. While describing the participation of public authorities in the implementation of the program, the need to maintain a balance of interests of the state, business, and society is mentioned. Within the selected areas of the Arctic development, companies may conduct social events for the development of science, innovation, and environmental protection. The state's interest in the participation of companies in the implementation of planned activities is confirmed by the presence of extra-budgetary sources of funding.

4. The Strategy of Spatial Development of the Russian Federation until 2025[18]. It determines the planning of the territory's development and analyzes existing problems. The strategy mentions the regions included in the Arctic zone of the Russian Federation as mineral resource centers, which indicates their resource orientation. The strategy, on the one hand, puts forward the need to move away from single-profiled entities, and, on the other hand, the development of mineral resource centers is considered to be one of the tools for implementing the goals of the strategy. This creates a contradiction and questions the implementation of set goals.

- **On the regional level:**

1. The Strategy of Socio-Economic Develop-ment of Nenets Autonomous Okrug until 2030[19]. Content analysis showed that "corporate social responsibility" and "social projects", in relation to business, were not mentioned in the strategy at all. It recognizes the important role of oil and gas resources in the economic development of the region. While describing the development of NAO, almost every section examines the effects of the activities of oil and gas companies, primarily expressed in the form of investments, budget revenues, and job creation. Develop-ment planning focuses on solving existing problems, such as unemployment, by reori-enting personnel to the basic sector. The text of the document highlights the needs for economic diversification, which there are no detailed projects. The region regards extensive economic development as the basic direction of the development. The strategy mentions one of the mechanisms of interaction with companies – the usage of PPP (mentioned 10 times, including 4 mentions in relation to mining companies), but without identifying the main participants of the oil and gas business.

For companies, the interest in the imple-mentation of the corporate social responsibility policy might be expressed in the following benefits:

– through awards and certificates for public recognition;

– for membership in a club that promotes social responsibility ideas, to get contacts, for conclusion of agreements, for promoting business, to get investment, etc..

[17] The state program "The Strategy for the Development of the Arctic Zone of the Russian Federation and National Security up to 2020": adopted by the decree of the RF Government no. 366, dated April 21, 2014.

[18] On the approval of "The Strategy of Socio-Economic Development of Nenets Autonomous Okrug until 2030": the decree of the RF Government no. 207-p, dated February 13, 2019.

[19] The Strategy of Socio-Economic Development of Nenets Autonomous Okrug until 2030: adopted by the decree of the Meetings of deputies of Nenets Autonomous Okrug no. 134-sd, dated June 22, 2010.

World clubs are the following ones: Business for Social Responsibility[20], The Conference Board[21], CSR Europe[22], The European Bank for Reconstruction and Development[23]. The following associations are popular in the Russian Federation:

– Russian Managers Association[24];

– The Russian Union of Industrialists and Entrepreneurs, Committee on Social and Demographic Policy[25];

– The Chamber of Commerce and Industry of the Russian Federation, which publishes "Register of reliable suppliers" and "Register of socially responsible organizations in Russia"[26].

While planning business development, companies focus on economic (tax revenues) and social (creation of jobs) effects for the region. At the same time, the region is ready to participate in the creation of economic infrastructure for the development of new fields. However, the issue of using infrastructure after the development of oil and gas complex remains unresolved: will citizens and other companies be able to access it? Existing strategies for the development of the Arctic regions should be updated with the emphasis on the significant role of a socially responsible business in regulating social problems due to the willingness and interest of business to participate in their solution.

The results of the study of formation processes of the mechanism of oil and gas companies' corporate social responsibility influence on the regional development of the RF Arctic zone allowed developing a formalized scheme, which shows the cumulative cooperation of CSR formal and informal institutions (*Fig. 2*).

The policy of the region and companies in the field of solving social problems is reflected in the goals, for which both parties cooperate in four examined forms. In addition to the presented forms of cooperation between the region and companies, the mechanism is based on the effects obtained from the cooperation and adjustment of goals. The mechanism of influence triggers a socio-dynamic multiplier, the effect of which is manifested in the economic, social, and environmental effects on the meso- and micro-levels of the corresponding territory.

A. On the meso-level:

1. Economic effects are connected, first of all, with the expansion of the financial basis of regio-nal and local budgets – territories of presence. The provision of the social stability of a territory, population's employment, and the creation of new jobs. Improvement of the region's image to show that it is a great place for work and life.

2. Social effects are manifested in the improvement of the local society's life quality, in the growth of its well-being (increase of material, financial, social, and spiritual benefits) (*Tab. 1*).

3. Environmental effects are primarily related to maintaining biodiversity and minimizing anthropogenic impact on the environment.

As examples of social effects on the meso-level, we can review the initiatives implemented in Nenets Autonomous Okrug by the "LUKOIL" Group of Companies, OOO "SK Rusv'etpetro", and JSC "Total".

[20] Official website Business for Social Responsibility. Available at: https://www.bsr.org (accessed: 04.05.2019).

[21] Official website The Conference Board. Available at:https://www.conference-board.org (accessed: 04.05.2019).

[22] Official website CSR Europe.Available at:https://www.csreurope.org (accessed: 04.05.2019).

[23] Official website European Investment Bank .Available at: https://www.eib.org/en/index.htm (accessed: 04.05.2019).

[24] Official website Russian Managers Association. Available at: https://amr.ru (accessed: 08.05.2019).

[25] Official website of The Russian Union of Industrialists and Entrepreneurs. Available at: http://www.rspp.ru (accessed: 08.05.2019).

[26] Official website of The Chamber of Commerce and Industry of the Russian Federation. Available at: https://tpprf.ru (accessed: 08.05.2019).

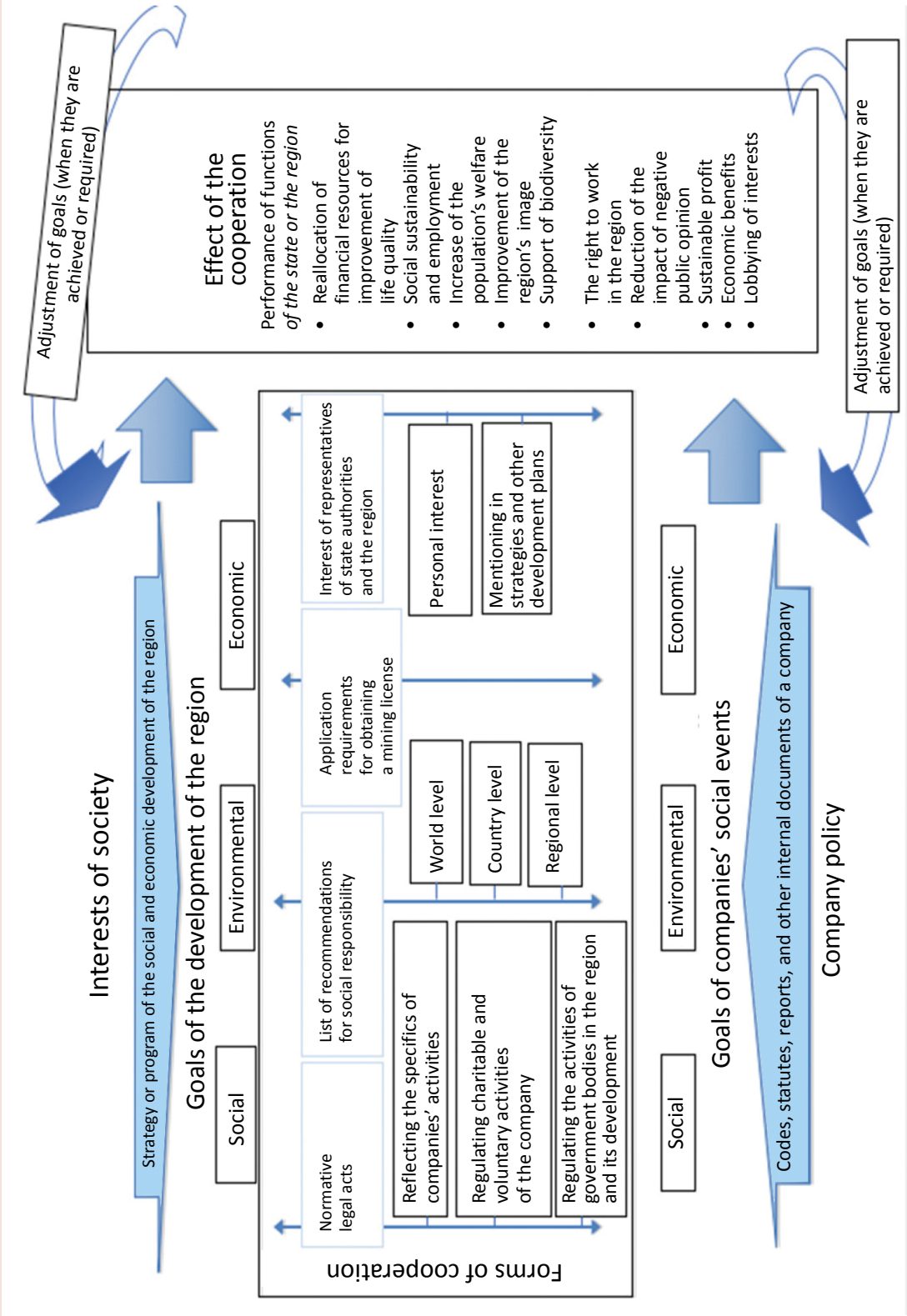


Figure 2. Mechanism of interaction between socially responsible big business and regional authorities of the Arctic zone of the Russian Federation

Table 1. Examples of social activity of oil and gas companies in Nenets Autonomous Okrug

Company	Year of implementation	Event	Amount	Result/ effect
"LUKOIL" Group of Companies	Since 2005 to present moment	Competition of social and cultural projects on the territory of presence	~42 million rubles	About 200 projects were supported
	Since 2015 to 2018	Support for reindeer herding agricultural cooperatives "Kharp", "Erv" and "Izhemskii olenevod i Ko"	~120 million rubles	Carrying out of an annual holiday, delivery of necessary medications
	2017	Study of the impact of the company's activities on the environment, together with ROO "Sovet po morskim mlekopitayushchim"	~50 billion rubles	Carrying out of a conference, addition to the Knowledge Bank
	2017	Restoration of fish resources, preservation of biodiversity.	280.2 million rubles	Preservation of the existing ecosystem in places of presence
JSC "Total"	2009	Financing the construction of social infrastructure facilities	-	School no. 2 was built in the locality of Iskateley
OOO "SK Rusv'etpetro"	2016	Financing the resettlement of dilapidated housing	20 million rubles	People, who lived in dilapidated houses that were not suitable for living, received new apartments

Sources: official website of "LUKOIL" oil company. Available at: http://www.lukoil.ru/; official website of OOO "SK Rusv'etpetro". Available at: https://www.rvpetro.ru; official website of the Government of Nenets Autonomous Okrug. Available at:http://adm-nao.ru (accessed: 30.09.2019).

Б. On the micro-level:

1. *Additional economic benefits* of a company: developing the potential of the workforce, entering new markets, and improving relations with local community.

2. *Sustainable profits in the future:* by investing some money in social and philanthropic programs, corporations reduce their current profits, but, in the long run, create a favorable social environment.

3. *Economic benefits* in the form of tax preferences (*Tab. 2*).

4. *Lobbying of interests* is aimed at creating a positive image of a company. It can reduce the citizens' degree of distrust, who later perceive a company as active participant in the regional development[27].

5. Reduction of the impact of negative public opinion.

The mechanism of cooperation between socially responsible business and regional authorities was examined on the example of Nenets Autonomous Okrug. However, due to the similarity of the specifics of the development of the Arctic regions and their dependence on the extractive industry, the results may be extrapolated to all territories of the Arctic zone of the Russian Federation.

Conclusions

The study examined the mechanism of influence of socially responsible business on the socio-economic development of the regions of the RF Arctic zone on the example of oil and gas companies in Nenets Autonomous Okrug. The existing mechanism is based on formal and informal institutions. Formal ones include the current legal framework, while informal ones include customs of business intercourse, practices, and the "contractual capacity" of the process' participants.

The positive effects, acquired after the cooperation, are among main factors, which motivate the region to provide access to territories with mineral resources and to issue a license for the extraction of these minerals. Social programs are also the mechanism of

[27] Lobbying refers to the process of defending one's interests in ways defined by law (consultations, expert advice, public hearings, etc.). Articles 30–45 of the Constitution of the Russian Federation. SPS Konsul'tantPlyus.

Table 2. Economic benefits received by oil and gas companies

Benefit	Characteristic
0% tax on mining	In case of regulatory losses or associated gas production and other cases of article 342 of the Tax Code of the Russian Federation.
Reduction of the amount of mineral extraction tax	Reduction of the amount of deductions for processing gas condensate.
13.5 % income tax	Reduction of the tax rate to the regional budget.
VAT exemption	Transfer of goods and property rights for charitable activities, implementation of medical and educational services.
Reducing of the income tax	Expenses for the production and distribution of social advertising are taken into account; concessions for participants in regional investment projects (rate reduction to 0%).
Sources: Tax Code of the Russian Federation, On the Establishment of the Lowered Tax Rate on Profit of Organizations for Certain Categories of Taxpayers: Law of Nenets Autonomous Okrug no. 88-OZ, dated October 8, 2013.	

relocating resources by municipal and regional authorities in order to address social and environmental issues. For a company, positive effects serve as incentives to participate in the development of the region. They also form a strategy of the further development in a selected region. Thus, companies and the region are responsible for addressing social problems existing in the region. The normative and legal framework sufficiently regulates corporate social responsibility and reveals primary means of implementing social activities.

The further study of the formation of the mechanism of business' social responsibility influence on the socio-economic development of the Arctic regions of the Russian Federation will show the features of the existing social relations between the region and business. It will also reveal the potential of the regional market of social services, especially – in remote areas.

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Scientific and Technological Development of the Russian Economy in the Transition to a New Technological Order*

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Abstract. In modern developed countries, an active search for new sources of growth has begun. One of them is the scientific and technological potential (STP), implemented through new informational, digital, and industrial technologies. Its development leads to the formation of a new technological structure and the acceleration of labor productivity growth. STP accounts for up to 90% of the total contribution of all factors to the growth of these countries' gross domestic product. The formation of a new order is a modern global trend, which is important to follow in order to maintain the economy's competitiveness. The orientation of the Russian economy toward the export of energy resources poses threats to the economic and technological security of the national economy. Thus, within fundamental technological and structural changes of the world economic system, the task of Russia's transition to a new technological order becomes particularly relevant. Important areas of its solution are the creation of qualitatively new production relations, a favorable regulatory environment and its alignment with the requirements of the new technological order, the formation of appropriate informational and material equipment for the implementation of new technologies and activities. The purpose of this article is to analyze the scientific and technological development of the Russian Federation in the process of transition to the new technological order. The article summarizes the theoretical foundations of the essence of technological changes in the economy in the process of the transition to the new technological order; it studies domestic and foreign experience of implementing national plans and strategies in the sphere of scientific, technical, and

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innovative development; it analyzes the status and trends of the scientific and technological development of the Russian Federation according to key indicators of a new technological revolution; it reveals issues of the economic development in the process of the transition to the new technological order; it develops a set of measures for the activization of processes of the scientific and technological development of the Russian Federation in a new environment.

Key words: scientific and technological development, new technological way of living, problems, state, trends, development areas.

Introduction

The country's position on the world market and the national economy growth is determined by its competitiveness, the increase of which is achieved through the success and speed of progress in the socio-economic system of the state and its regions on the path of scientific and technological development.

Over the last one hundred years, this country has been experiencing evolutionary and revolutionary change of development targets of the national economy and its constituent subsystems. For example, since the 1990s, the transition to the market economy, overcoming the structural crisis effects and combating the global financial crisis were considered the targets of economic development. In the last decade, the issue of overcoming country's commodity dependence, ensuring high rates of economic growth on this basis, and the country's becoming one of the world leaders was brought to the forefront. The solution of this problem partly depends on the creation of conditions for innovative development of the economic system, the formation of organizational-economic structure appropriate for the knowledge economy (innovation economy, cognitive economy, knowledge-based economy, innovative model of development).

In this regard, the problem of ensuring the long-term scientific and technological development of the economy is in the center of researchers, the executive bodies of the state authority, and public organizations' attention [1, 2]. However, it is early to speak about a significant progress in this area. The problem remains unresolved and, therefore, relevant, which is evidenced by the fact that Russia is far behind the innovative leaders (Switzerland, UK, and Sweden) in all key indicators in the international rankings from the point of view of the resource potential of science (intellectual capacity, infrastructure, financing, regulation)

Table 1. The Russian Federation rating according to basic indicators of the Global innovation index

Indicator	Rating position		
	2013	2016	2017
The Global innovation index	**62**	**43**	**46**
Institutions	87	73	73
Human capital and science	33	23	23
Infrastructure	49	60	62
IT	28	35	36
The development of the internal market	74	63	60
Business development	52	37	33
The development of technology and the knowledge economy	48	40	45
The development of creative activities	101	66	62
Source: Global Innovation Index: official website. Available at: https://www.globalinnovationindex.org/			

and the relevance of scientific results. Thus, by the end of 2017, Russia has been ranked 46th in the Global innovation index; 45th in terms of technology development; 36th by information and communication technologies; 62nd in creative activities (*Tab. 1*).

Russia's substantial lag in the innovation development is the result of its economy orientation toward the export of raw resources. The presence of rich natural resources forms so-called "resource curse" syndrome which does not allow the national economy to develop its high-tech sector [3], and considerable differentiation of the country's territories is not conducive to the formation of regional innovation systems and, consequently, of the state as a whole. This, in turn, hinders the transition of the economy to the innovative path, and it does not ensure high growth rates and national competitiveness.

However, the technological development becomes the determining factor of economic leadership. The growth of technology-based competition requires the formation of advanced technological structures of the economy to be set as the major priority of the country. One of the main tasks of the Russian state is the transition to a new technological order. Therefore, it is necessary to determine the priority directions of science and technology development, to form an effective infrastructure provision, to encourage businesses to the creation and implementation of new technologies. The solution of this problem will allow Russia not only to participate in shaping the markets of the future, but also to take a worthy place in the global technological chains.

In this context, the aim of the research is the analysis of scientific and technological development of Russia in the conditions of transition to the new technological order.

To achieve this aim the following tasks should be resolved:

1) the study of the essence of technological change of the economy in the transition to a new technological order;

2) the synthesis of domestic and foreign experience of national plans and strategies realization in the field of scientific-technological and innovation development;

3) the analysis of the state and the definition of trends of scientific and technological development of the Russian Federation according to the key indicators and the reveal of the problems hindering the transition of the economy to the new technological order;

4) the substantiation of a complex of measures for enhancing the processes of scientific and technological development of the Russian Federation.

Theoretical aspects of the research

Domestic and foreign scientists have been concerned with the problem of the economic growth for decades. Currently, the level of the technological development has priority among the main factors of the economic growth [4]. This is evidenced by the fact that countries with high technological level are among world leaders. As a rule, these are industrialized countries which have reached a high level of technical and technological development and qualification of labor resources [5]. In other words, the high-tech industry provides a higher growth rate of the economy as a whole. This thesis is fundamental in the theory of stages of economic growth by Walt Rostow [6], the theory of a single industrial society by Raymond Aron [7] and the new industrial society by John Galbraith [8], the theory of postindustrial society by Daniel Bell [9], and others [10–14]. The thesis is practically confirmed by the USA which are very actively engaged in the process of re-industrialization, i.e. they

"return" manufacturing enterprises from the developing countries. Moreover, this return is largely associated with greater labor-saving generated by intensive automation of modern industrial production and the usage of robotics in the developed countries [15].

An integral part of the theoretical platform of the study of industrialization and new industrialization is the theory of long-term economic development explaining the regularities in technology dynamics. The main idea of the theory is the "technological order", the phenomenon studied in the works of many Russian and foreign economists (among them are D. Ricardo, K. Marx, Th. Schumpeter, D.S. L'vov, S.Yu. Glazyev, Yu.V. Yakovets, A.A. Sytnik, etc.).

The founder of the modern view of technological order is N.D. Kondrat'ev. According to him, the main cause of cyclicity is the need to update basic production assets. He assigned the scientific and technological innovations a major part in the development of civilization [16]. He believed that, before the upward wave of a long cycle, there is a serious transformation in various spheres of life that relate to the changes in science and technology.

In the Russian economic science, the model of technological order has become a major analytical tool for the analysis of technological revolutions [17, 18, 19]. Technological order is understood as a "large complex of technology conjugate industries" regularly replaced by another complex which is more modern in composition of the used technology.

Leading domestic scientists [20] define technological order as a certain combination of technologically interrelated industries that are close in terms of the quality technology, resources and products. Most Russian scientists, who carried out their researches in the 1990s–early 2000s, have a similar point of view.

The analysis of domestic and foreign literature on studied issues enabled us to identify three main approaches to the essence of the category of the "technological order". Technical and technological approach is followed by S. Glazyev, Yu.V. Yakovets, R.M. Nizhegorodtsev, T.P. Nikolaeva, J. Dosi, etc.

Table 2. Main research directions of the essence of "technological order" category [21–25]

Name of the approach	Representatives	Definition
Technical and technological	S.Yu. Glazyev, Yu.V. Yakovets, R.M. Nizhegorodtsev, T.P. Nikolaeva, J. Dosi	1. A set of technologically conjugate industries, preserving the integrity in the process of its development, "a certain set of units close in terms of quality characteristics of resources technology and products". 2. Techno-economic paradigm – a set of technologically conjugate "clusters of technologies" based on radical innovation.
Evolutionary	V.I. Maevsky, V.V. Ivanov, R.I. Tsvylev	1. A combination of evolutionary developing technological trends. 2. Technological order allows to study the regularities of economic and technological development in the form of structural changes, economy development is considered in terms of its advanced informatization and distribution of material processes in the economy.
Institutional	K. Perez, V.V. Kiseleva, A.G. Fonotov, O.S. Sukharev, B. Karlsson, R. Stankevich	1. Techno-economic paradigm is a complex of industrial sectors, the appropriate institutional structure, infrastructure, financial structure, and socio-economic climate and a specific system of relations between labor and capital formed on the basis of the embedded in the phase of depression of the beam of the base technological innovation and mediating the development of a new technological style. 2. Technological system is a network of agents interacting in a specific economic (e.g., industry) sphere, with appropriate institutional infrastructure and involved in the development, diffusion and use of new technologies, the emphasis is on radical innovation, i.e. on new technologies leading to the displacement of obsolete ones.

Evolutionary approach to the technological order is defended by V.I. Maevskiy, V.V. Ivanov, R.I. Tsvylev, etc. Institutional approach is advocated by K. Perez, B. Carlsson, R. Stankievich, N.I. Ivanova, V.V. Kiselev, O.S. Sukharev, A.G. Fonotov, etc. (*Tab. 2*).

Critically approaching the definitions of "techno-economic paradigm" and "technological order" ("technological system"), we may conclude that these concepts are very similar. The fundamental difference is that foreign researchers adhere to the institutional approach and take into account the dynamics of technological and economic development while interpreting the first term. In the works of domestic scientists, the attention is mainly concentrated on the technical and technological side, and changes are ignored.

Global trends currently indicate a transition to the new, sixth technological order, the main trends of which are [26]: the transition to customized production, the growth of engineering companies large-scale use of additive technologies, 3D printers; simulation; the erase of geographical barriers and the disappearance of intermediaries.

The study of theoretical and methodological approaches and the best foreign experience allows concluding that information technologies and digital transformation are the main drivers of the technological change, which ensure competitiveness at the level of individual enterprises and at the level of countries and supranational unions, leading to a restructuring of all economic and production processes, radical productivity improvement, the increase of quality and the reduction of the cost of goods and services [27]. The most important rapidly developing technologies are robotics, 3D printing, artificial intelligence, Internet of things and connection of objects to the Internet, computer-aided design, new sensors, the usage of intelligent networks in energy, the creation of materials with desired properties. In general, these technologies allow creating and using cyber-physical systems in industry, i.e. programs controlled production using sophisticated sensors where there is no need for people to participate. This is manifested in the total automation of technological and business processes, the maximum horizontal and vertical information integration [28, 29, 30].

These trends reduce the material consumption, increase the productivity and the "intellect" share in the cost, and the geographic availability of goods, which is highly relevant for Russia.

Materials and methods of the research

The author of the research used a set of methodological approaches providing the necessary complexity of assessing the possibility of strengthening the role of the new industrial revolution in the development of production, improving the efficiency and competitiveness of the Russian economy in conditions of transition to the new technological order.

The assessment of the level of the scientific and technological development of the industrial sector of the Russian Federation and the degree of its readiness for the development in the transition to a new technological order was based on the amount of statistical information, covering, firstly, the indicators of innovative development of the economy, and, secondly, the indicators characterizing the socio-economic potential of the Russian Federation, the performance of economic and social policies; thirdly, the performance of the real sector of the Russian economy and the market of information and communication technologies. Methods of the analysis are comparative analysis, methods of cognition, content analysis, methods of dialectical logic, method of synthesis of the theory basis, and empirical experience.

Scientific novelty of the research is the development of methodical approaches to the definition of innovative transformations of scientific-technological sector of Russia in the context of transition to the new technological order and development of the economy focusing on the implementation in the production of digital technology making up the technological basis for the economic growth of the Russian economy.

Main results of the research

Low growth rates of the Russian economy allow asserting that possibilities of the economic growth at the cost of resource factors are largely exhausted. Russia faces the challenge of achieving qualitative growth which can only be ensured on the basis of the scientific and technological development, i.e. the transition to the new technological order.

These tasks are also caused by global "big challenges" faced by all countries of the world. These challenges include the exhaustion of potential for further productivity growth in most developed countries: since 2011, the value of this index has not exceeded 1% per year [31].

Industrialized countries (USA, Germany, UK, Japan, China, South Korea, etc.) responded to this challenge with the scientific-technological and innovation policy aimed at the development stimulation and the introduction of advanced technologies providing high performance and, as a consequence, the technological and economic growth. At the same time, the emphasis is on the development of the industrial sector.

This is reflected in the implementation of various strategies, countries' plans and programs that stimulate building up of the scientific-technological and industrial potential, the improvement of innovation systems, the update of technical base of the industry (*Tab. 3*).

Table 3. National plans and strategies in the sphere of scientific and technical and innovation development, adopted in some developed and rapidly developing countries

Country	Document	Period
France	The national research plan	2013–2018
	The plan for industry restoration	Since 2013
	Innovation–2030	2013–2030
	National strategy for higher education	2014–2018
Germany	Industry 4.0	2011–2020
	Enhanced strategy for the development of high technology	in development
Italy	Industry 2015	2006–2025
	The Destiny of Italy	Since 2013
Japan	A comprehensive strategy of science, technology and innovation	2013–2030
UK	The strategy of innovative development and research	Since 2011
	Industrial development strategy	Since 2012
USA	The strategy of innovative development	Since 2009
EU	European innovative initiatives	2012
	For the European industrial Renaissance	2014
	European framework program for research and innovation "Horizon 2020"	2014–2020
India	A decade of innovation	2010–2020
China	Medium and long-term National plan for the development of science and technology	2006–2020
	13th five-year plan for the development of science and technology	2016–2020

Sources: OECD Science, Technology and Industry Outlook 2014. OECD, 2014. 480 p. Available at: http://www.keepeek.com/Digital-Asset-Management/oecd/science-and-technology/oecd-science-technology-and-industry-outlook-2014_sti_outlook-2014-en#page114; OECD Science, Technology and Industry Outlook 2016. OECD, 2016. 196 p. Available at: https://read.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-innovation-outlook-2016_sti_in_outlook-2016-en#page1

The possible prospects of the new technologies usage are also actively discussed Russia. In 2016, the Strategy of Scientific and Technological Development of the Russian Federation until 2035 was adopted [36], which codified the following priority development directions of national science, technology and innovation:

1. Conducting research, promoting the provision of the country with technologies of the new industrial revolution.

2. Creating an interactive environment of intellectual digital production. The development of "green" energy.

3. Maintaining the society's resource balance in conditions of limited natural resources for industry.

4. Developing the country's food security.

5. Adapting the state to the risks associated with future demographic changes and the complexity of socio-technological systems.

In 2017, the program "Digital economy" was adopted (now, it is the national program "Digital Economy of the Russian Federation"). Programs of the regional level are also being developed. Such documents usually include aims and a work plan for the modernization of existing production facilities based on new digital technologies including the creation and the development of enterprises in IT sector, the creation of relevant infrastructure, and legal framework in the country.

In addition to the state program of 2017, Russia adopted a number of strategic documents which significantly influence the application of digital technologies in the domestic economy. They were founded in 1996 after the adoption of the Recommendation legislative act "On Protection of High Technologies", which was aimed at the creation of conditions for the development of information technologies (*Fig. 1*).

Thus, by adapting to "big challenges" and main trends of the global economy, the Russian Federation sets the task of the transition to the new technological order, the core of which includes the computerization and digitalization of economic processes in all spheres of economic activity.

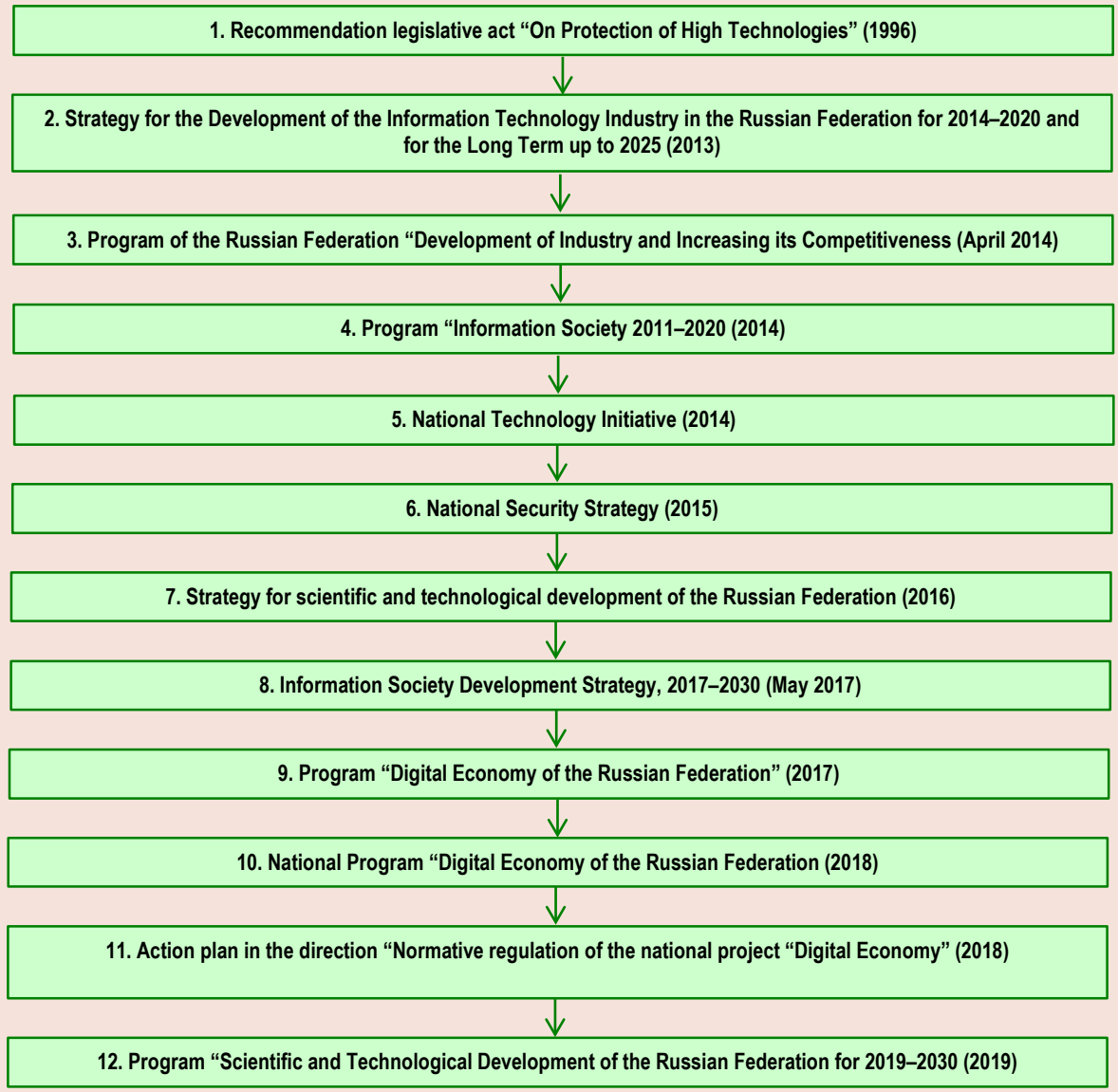
However, a major obstacle in resolving this problem is the low share of domestic expenditure on information and communication technologies in the gross domestic product of the country (*Tab. 4*). Our analysis showed that, over the period from 2010 to 2017, this figure did not change significantly.

For this period, enterprises' expenditures on information and communication technologies have increased more than 6 times: from 160 up to 1012 billion rubles, respectively. However, their share in GDP decreased.

Currently, there is no detailed information on the annual dynamics of the enterprises' expenditures on information and communication technologies in GDP in foreign countries in the statistics. However, the study of publications on the subject leads to the conclusion that, in developed countries, particularly in Germany, the value of this indicator in GDP ranged from 3 to 4% in recent years (i.e. four times higher than in Russia).

As we already mentioned, the main reason for the deployment of the new industrial and technology policy in advanced countries was the need to overcome the slowdown of productivity growth. Between 2000 and 2015, the sustainable growth of this indicator was preserved in these countries (*Fig. 2*). In relation to Russia, we can say that it still lags behind leading countries: its index is 2–2.5 times lower than in Germany, France, and the United States. As the presented data shows, Russia has not even reached the level of productivity, which was in developed countries 10–20 years ago.

Fig. 1. Legal framework regulating the development of high-tech industries based on the development of information technologies



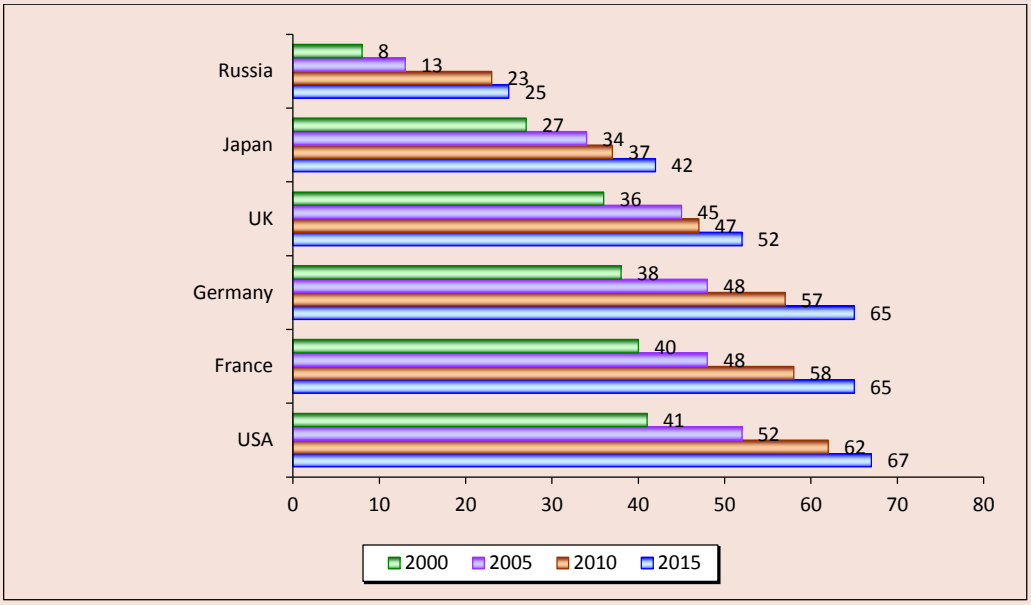
Source: own compilation.

Table 4. The expenditure on information and communication technologies in GDP for the period from 2010 to 2017

Figure	2010	2012	2014	2015	2016	2017	2010–2017, %
Expenditure on IT, billion rubles	516	843	1175	1153	1249	1012	196.1
GDP, billion rubles	46309	68164	79199	83387	86010	92000	198.7
Expenditure on IT in GDP, %	1.11	1.24	1.48	1.38	1.45	1.10	-0.01

Source: Regiony Rossii. Sotsial'no-ekonomicheskie pokazateli, 2003–2018 gg. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1138623506156 (In Russian).

Figure 2. Labor productivity countrywise (per one employed person, USA dollars)



Source: *Novaya tekhnologicheskaya revolyutsiya: vyzovy i vozmozhnosti dlya Rossii: ekspertno-analiticheskiy doklad*. Moscow, 2017. 136 p. (In Russian).

Thus, Russia faces the challenge of ensuring sustainable growth of labor productivity for the full potential realization of the national economy. It requires technological modernization of production including commissioning of new equipment, upgrading of basic production assets, primarily equipment, complex automation of production, etc. In the opinion of the absolute majority of Russian industrial companies' CEOs (84%), the internal key condition for productivity growth is the increase of the technical level of production1.

Technological upgrade should be reflected in the growth of investment in fixed capital, which is hardly seen in Russia today: according to Rosstat, the degree of fixed assets depreciation in the manufacturing industry has been increasing steadily since 2005 (47.1%) till 2018 (50.6%). Similar dynamics is also traced in the mining industry and in enterprises for the distribution of electricity, gas, and water (*Fig. 3*).

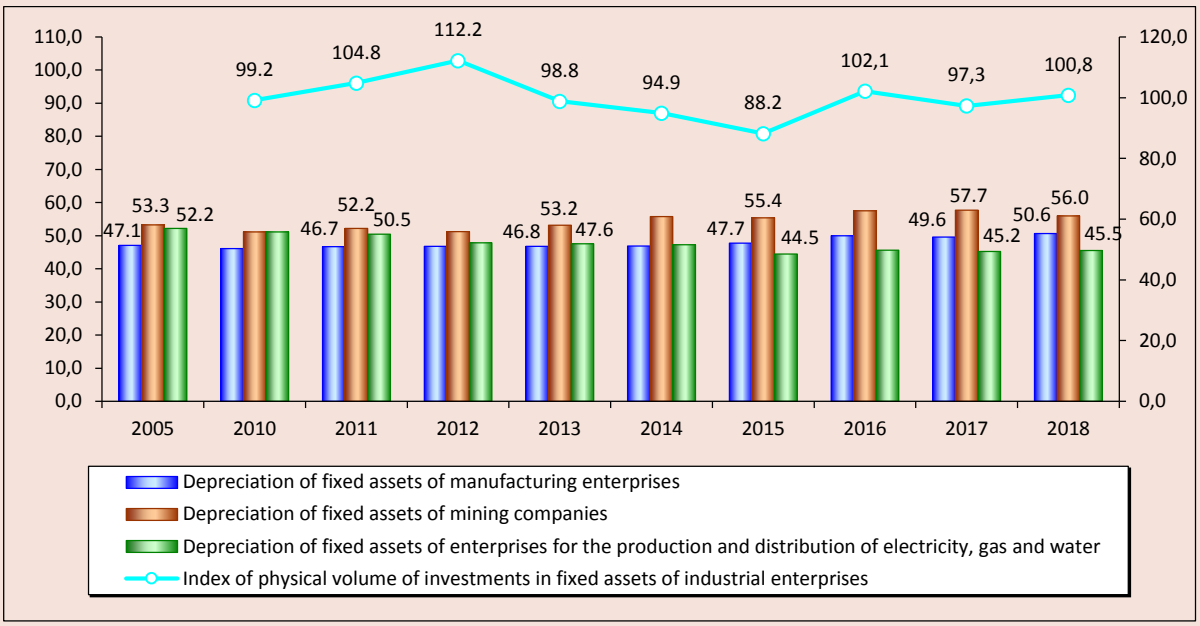
The analysis of the dynamics of the index of physical volume of investments in fixed assets suggests that, despite the increasing degree of fixed assets depreciation, the volume of investment in Russian industry, especially in high-tech industry, does not grow substantially.

Russia lags behind in other key indicators of the technological development too.

First, the level of innovation activity of industrial organizations remains very low (about 10%). In recent decades, the share of innovative products in total volume of shipped goods on a national scale did not exceed 10%. Industrial enterprises' expenditures on R&D are very low: in 2015, only 0.3% of GDP according to the OECD. For comparison, the similar indicator was 1.54% of China's GDP, 1.79% of the United States' GDP, 2.72% in Japan's GDP (*Fig. 4*).

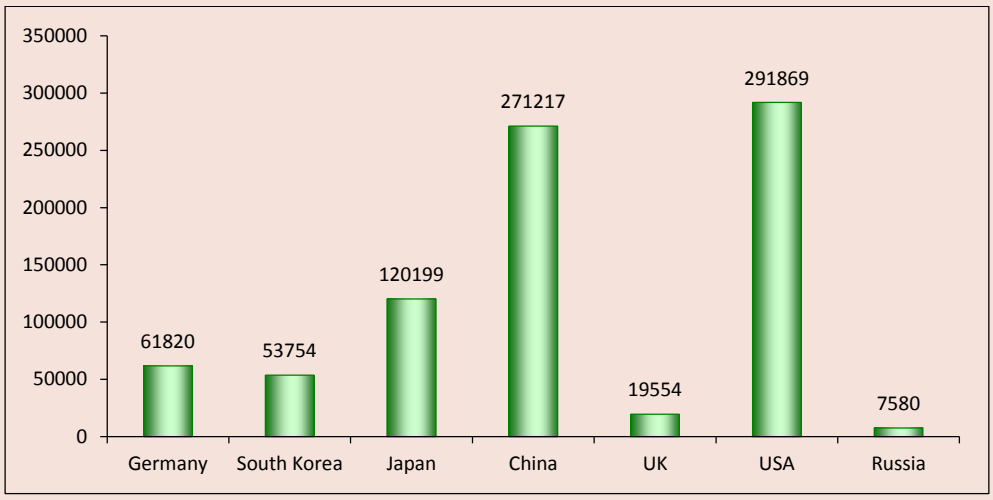
[1] Labor productivity. Results of a survey of 500 managers of industrial enterprises. The Ministry of Industry and Trade of Russia, the Center for Strategic Development Foundation, the Center for Monitoring Industry Development, the Agency for Technological Development. 2017.

Fig. 3. The degree of industrial enterprises' fixed assets depreciation and the index of physical volume of investments in fixed assets of industrial enterprises of the Russian Federation



Sources: Effektivnost' ekonomiki Rossii. Available at: https://www.gks.ru/folder/11186; Tehnologicheskoe razvitie otrasley ekonomiki. Available at: https://www.gks.ru/folder/11189 (In Russian).

Figure 4. R&D expenditures of industrial enterprises in 2015, mil. USA dollars (in permanent prices)

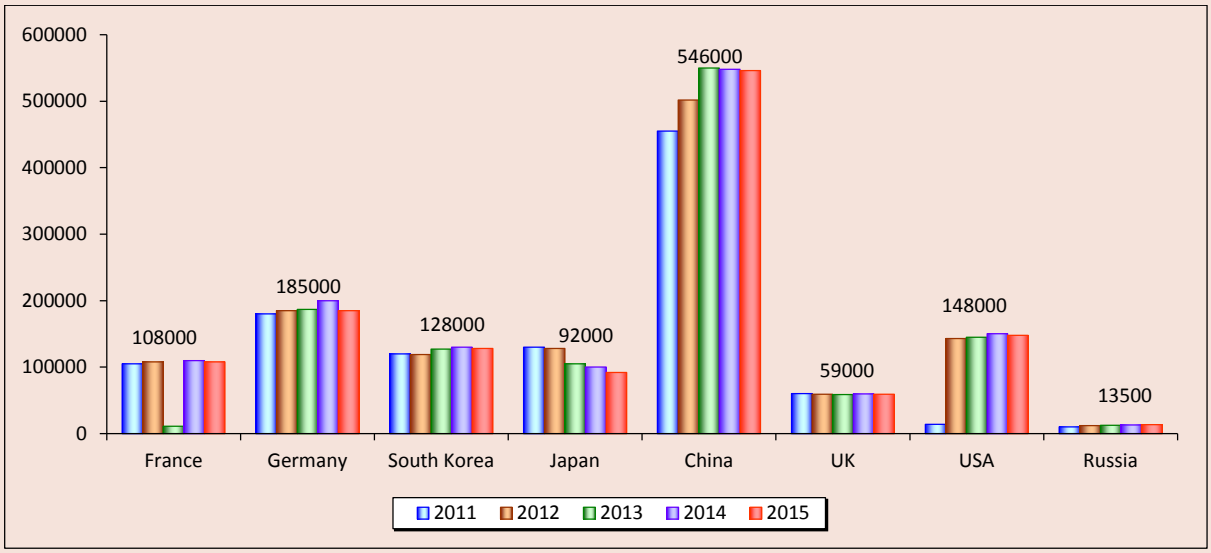


Source: *The Global Competitiveness Report 2017–2018*. Geneva: World Economic Forum. 2017. P. 249.

Second, the level of products diversification is being reduced, resulting in the displacement of the Russian export structure toward the products of low complexity (about 80% in the export structure) with a simultaneously low level of manufacturing industry export (*Fig. 5*).

Third, there is a lag in creating new industries and markets of the unfolding technological revolution. Despite the gradual recovery of the economy, the share of high-tech and knowledge-intensive industries' production in Russia's GDP remains low (*Tab. 5*).

Figure 5. The volume of high-tech export by individual countries, mil. USA dollars



Source: based on the data from the World Bank. Available at: https://data.worldbank.org/indicator/TX.VAL.TECH.MF.ZS

Table 5. Dynamics of knowledge-intensive industries' contribution to GDP

Indicator	The value by years						
	2010	2011	2012	2013	2014	2016	2016 to 2010, %
The volume of GDP, billion rubles	39763.2	41457.8	42869.6	43444.4	43722.7	43855.4	110.3
The share of high-tech industries products in GDP, %	22.8	21.9	22.1	23.1	23.5	23.7	0.9
The volume of high-tech products in in constant prices, billion rubles	9066	9079	9474.2	10036	10275	10316	113.8
The growth of high-tech products in GDP relatively to 2010, %	–	0.14	4.50	10.70	13.34	13.52	13.4*
Source: Federal State Statistics Service. Available at: http://www.gks.ru/ * 2016 to 2011.							

All these facts suggest that Russian economy is characterized by innovative stagnation, there is no mass redistribution of resources in favor of progressive technological orders, and the strong technological inferiority has developed in the industrial sector.

At the same time, judging by the dynamics of growth rates of GDP physical volume, return on assets, return on sales, and specific values of the volume of innovative goods, works, services, prevailing in the Russian industry, the technological orders III and IV reached the limits of economic growth (*Tab. 6*).

Fourth, the gap between Russia and leading countries in some of registered patents in areas such as robotics, new materials, additive technology, industrial Internet of things, etc., is measured by the times. According the All-Russian Scientific Research Institute of Aviation Materials, Russia's share in the global additive manufacturing market amounted to almost 1.7% in 2016 [31].

Fifth, an extremely low level of R&D funding: approximately 1.10% of GDP is allocated on research and development nationwide, while in countries, which are

Table 6. Dynamics of GDP rates, the profitability of organizations in the Russian Federation for the 2000–2016 period

Indicator	2000	2005	2010	2012	2014	2015	2016
Index of GRP, growth rate, %	10.6	7.6	4.6	3.1	1.3	-0.6	0.8
Return on assets, %	7.6	8.8	6.7	6.1	2.5	3.9	4.9
Return of sales, %	18.9	13.5	10	8.6	7.3	8.1	8.7
The volume of innovative goods, works and services, %	4.4	5.0	4.8	8	8.7	7.9	8.4
Source: Rossiya v tsifrakh. 2017: krat. stat. sb. *Rosstat*, M., 2017, 511 p. (In Russian).							

technological leaders, the figure is 3–4% of their GDP [28, 31].

Sixth, the rates of the economy digitalization and platforming remain low. According to the study [31], the Russian Federation takes is placed 41st according to its readiness for the digital economy (ten leading countries are Singapore, Finland, Sweden, Norway, United States of America, the Netherlands, Switzerland, UK, Luxembourg, and Japan). Russia is 38th in the rating of economic and innovation results of digital technologies usage, which is significantly lower than Finland, Switzerland, Sweden, Israel, Singapore, Netherlands, USA, Norway, Luxembourg, Germany, etc. Such position of Russia is the result of low elaboration of the regulatory framework and the lack of favorable conditions for the application of digital technology and innovation in businesses. It should be noted that, in 2016, the International Digital Economy and Society Index (I-DESI) was 0.47 for Russia. For comparison, the EU average value of this indicator was 0.54; the leaders in terms of digitization are Denmark (0.67), Finland (0.66), Sweden (0.65), and the Netherlands (0.64) [31].

The result of Russia's noticeable lag, according to key indicators of technological development, is a very low percentage of high-tech products and products with high value added in exports.

Thus, our analysis allows drawing a conclusion on the low level of scientific and technological development in Russia which prevents the country from the solution of the issue of improving the productivity and including the country into global trends. In this context, it seems that the state policy in scientific, technological, and industrial spheres requires significant adjustments.

Suggestions and conclusions

One of possible solutions of abovementioned problems and the response to challenges, currently facing the Russian economy in conditions of transition to the new technological order, is primarily the promotion of scientific and technological development of the industrial sector.

The formation of the new technological order is based on the social system processes including innovation, intensive investment in information, digital technologies. Knowledge economy is characterized by close links between science and technology, the high importance of innovation for economic growth and competitiveness, and the importance of education, lifelong learning, increasing investment in intangible assets: R&D, software, education. Therefore, the successful development of knowledge economy and active growth of innovative industries are closely interconnected. From this perspective, we should emphasize the special importance of creating effective institutions for scientific and technological development [5, 14]. In order to complete set goals, appropriate activities are required. First, it refers to the creation of

enabling legal and regulatory environment and bringing it in line with the requirements of the digital economy as the new way of life and qualitatively new production relations. Second, the appropriate information, material, and technical equipment is necessary for the implementation of new technologies and activities. Third, it is important to make changes in the system of specialists training and retraining including advanced training in new specialties. In addition, the appropriate mechanisms for the support of domestic companies, which are the most advanced in terms of new technologies, should be developed [37].

It should be remembered that the regulation of the economy in the period of the new order formation requires a careful approach from the state apparatus. The emergence of the new type of economics is impossible without innovation, and the large-scale marketing is impossible without constant race for increasing products' competitiveness.

The nature and methods of state regulation should be associated with the policy in the investment sector, funding of basic sciences, and risky projects.

For scientific and technological development of the industrial sector, a state policy of re-industrialization in the context of globalization and structural transformation of the national economy should be formed, and its effective implementation should be started. The creation of high-tech industries and innovative enterprises will improve the competitiveness of industries, their innovation potential [17; 24], and the socio-economic development of Russia and its regions [31; 34].

Industrial policy of the state should be aimed at encouraging technological modernization of industrial enterprises; the modernization of main production funds; the creation of conditions for realization of results of intellectual activities in industrial production; the expansion of innovative production; the development of production and innovative capacities of enterprises.

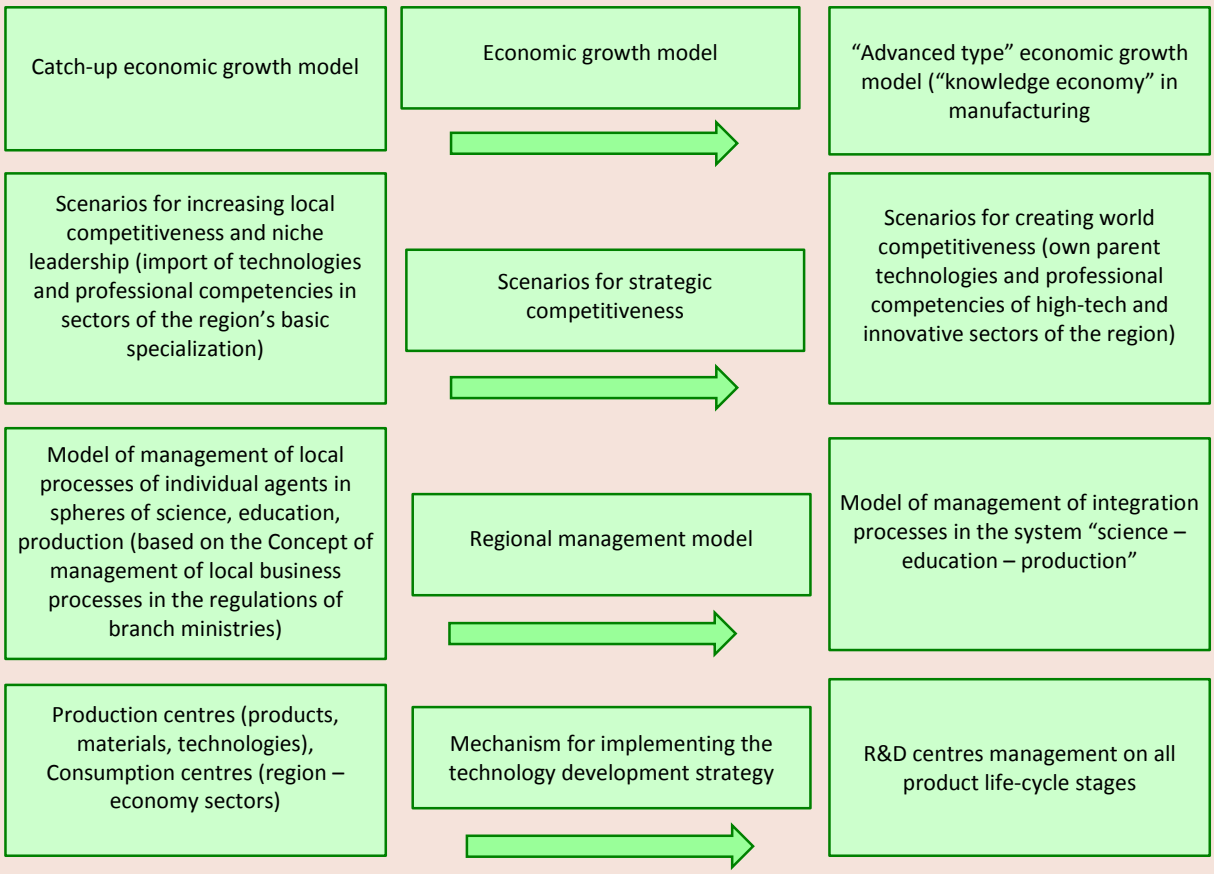
For the formation and implementation of state policy in the field of scientific and technological development, various methods and approaches may be used (*Tab. 7*).

The change of management formats of scientific and technological development in the transition to the new technological order should be based on the conceptual framework of the change of economic growth pattern, scenarios for the formation of technological leadership, the management model of the processes of scientific and technical changes, methods of implementation of technological development strategies (*Fig. 6*).

Table 7. Methods of implementation of the mechanism of state scientific and technological development in the transition to the new technological order [38]

Direct methods	Indirect methods
R&D financing from federal and regional budgets	Tax credits and benefits
Control of technology and innovation procurement abroad	Stimulation of businesses through changes of price and customs policy
Insurance against innovation-related risks	Accelerated depreciation
Subsidizing scientific and technical developments	Foundation of innovative scientific and technological centers in leading universities of the country
Subsidized financing of individual innovation projects and the allocation of funds for creating platforms for their interaction	Improvement of legislation in matters of patent law, intellectual property
Partial government guarantees the attraction of funds of different types of investors to the project: banks, investment companies, etc.	Creation of legal mechanism of purchase or entry into the capital of small innovative companies of large business
Institute of Special Investment Contracts.	

Fig. 6. Conceptual basis of changing management formats of the scientific-technological and innovative development



Sources: own compilation on the basis of: Korovin G., Chenchevich S., Krokhina E.O. On the role of regional institutions of innovative development. *Problemy teorii i praktiki upravleniya=Management Theory and Practice*, 2018, no. 12, p. 84. (In Russian); Lenchuk E.B., Vlaskin, G.A. The emergence of digital economy in Russia: Problems, risks, prospects. *Vestnik Instituta ekonomiki Rossiyskoy akademii nauk=Bulletin of the Institute of Economics of the Russian Academy of Sciences*, 2018, no. 5, p. 9.

The mechanisms of management of the system of scientific and technological transformation should be aimed, on the one hand, at the reduction of terms for the development and commercialization of breakthrough techno-logical solutions, ensuring the region's strategic positioning, and, on the other hand, at the readjustment of the mechanisms of interaction of all subjects of integration processes of the system "science – education – production" in order to ensure the uniform distribution of innovative technological solutions.

This approach, in turn, allows determining the basic parameters of international positioning of the technological development for innovation-technological and market capabilities based on technological development strategies, formed on the basis of the ratio of knowledge sources (technologies/professional skills):

– global technological competitiveness (new sectors of the economy in the regions: high-tech; "knowledge economy" sector);

– local technological competitiveness (basic sectors of the economy: resource, infrastructure);

– niche leadership in new sectors of the regional economy and the core sectors of the economy.

In our opinion, in order to accelerate technological transformation, large, medium, and small businesses should be supported only on the condition of the compliance of innovative technological solutions with the following requirements:

– a new quality of the region's economic growth (new product markets and labor markets; the share of production with high value added; intellectual capacity; new professional competences);

– a new quality of life of the population (accessibility; efficiency; health safety);

– a new quality of consumption (energy efficiency; cost effectiveness; productivity; performance).

The institutional support for changing management formats may be provided by the "institutions of professional customers" for innovative technological solutions (ITS) necessary for the transition to the technology of the VI technological order. In our opinion, to perform the functions of "professional customers" for ITS, formats of regional technological platforms, combining the interaction of actors of the integration system "science–education–production", may be used.

Conclusions

Thus, the implementation of the course of scientific and technological development of economy in conditions of transition to the new order includes the establishment of economic and scientific-technical development priorities, increased R&D funding, investments in industrial-technological complexes of the new order, the formation of an appropriate institutional environment. The taken decisions, including growth and development priorities, should be connected, first, with objects of innovation transformation, second, with preferences of main economic agents, and, third, with external and internal conditions, factors, and the dynamics of change within the country.

In this regard, the selection of priority directions of forces and means expenditures should be preceded by a systematic analysis of the socio-economic system potential in the context of its all subsystems, taking into account the history, experience, state of technology, resource base, and intellectual capacity.

High-tech industries' development in the framework of the new order formation implies a broader and deeper analysis of national economy sectors. The pace of the country's development in this direction is related to extensive growth of electronic market segments. Relatively modest advantages in most areas of modern scientific progress cast doubt on the ability to radically change the balance of power in the global scientific and technological arena and to develop high growth rates of competitive industries on the basis of digital technologies. The application of systemic principles for justifying the strategic priorities and methods of influence involves co-measurement of the targets of digital technology, at the expense of certain sources, with the available intellectual and technological potential of the economy.

To ensure the growth of high-tech industries in the digital transformation of the country's industrial sector, a systemic paradigm for the economy and society is required. It serves as the only adequate methodological basis of the innovative-technological development of the socio-economic system and its components during radical changes.

The results of the research might be used for analytical and predictive studies of regional and national macro-systems' dynamics, for making recommendations on the creation of prerequisites for boosting economic growth in the transition to the new technological order. It will allow improving the quality of implemented economic policy.

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Trends of the Development of Municipal Regions in the National Economic Space

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Abstract. Concentration of population and economic activity in large and largest urban agglomerations, together with the transformation of the system of strategic planning in Russia, cause great challenges for less populated municipal entities, situated in less urbanized territories, the main of which is the municipal district. On the one hand, local self-government bodies of municipal districts are forced to work in conditions of a shrinking resource base. On the other hand, to ensure the implementation of strategic planning documents on federal and regional levels, including ones related to spatial development. In this context, a scientifically justified assessment of the economic and spatial development of municipal districts is important. It may serve as the basis for making decisions on the usage of strategic and tactical tools for managing the territory of a municipal entity. The purpose of the study is to determine development trends of municipal districts as a specific object in the economic space of the region. The methodological basis of the article is based on concepts of the economic space. The assessment of the

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economic and spatial development was based on groups of indicators that reflect three parameters of the economic space: intensity, the development of the physical basis, and connectivity. On the basis of the results of calculating the presence indices and analyzing time series, a generalized score of the economic and spatial development of municipal districts is given. According to it, the types of trends, depending on the impact of the economic space of the region (constructive or destructive), are identified. Approbation of the methodology on the example of municipal districts of the Chelyabinsk Oblast showed that urban areas have a significant impact on the economic space of the region in the field of agricultural production, despite the industrial specialization of the region; it confirmed the trend of movement of labor and capital into urban districts; allowed stating negative dynamics of the development of physical basis of the economic space and the unsatisfactory situation in terms of the connectivity of the economic space. The analysis made it possible to formulate four directions of the economic and spatial development of municipal districts. It may become the basis of tactical and strategic tools for regional and municipal management.

Key words: economic space, region, municipal region, municipal economy, rural territories.

Introduction

A trend of growing imbalances in the regions' economic space is evident at the present stage of the Russian economy development, which is associated with the concentration of population and economic activities in large metropolitan areas and limited development of municipalities, located outside them, i.e. municipal districts. The perspective development of municipal districts is largely associated with poorly urbanized areas, as rural settlements, formed on the basis of villages, dominate in their composition (92%[1]). The economic development of such areas is characterized by a number of problems including low level of incomes and living environment, poorly developed labor market, a lack of investment in engineering and social infrastructure. The observed outflow of the population and business aggravate them even more. In general, it could be noted that the outflow of population from sparsely populated rural municipalities is a global trend [1–6]. Spatial conditionality of difficulties of local self-government implementation on the territories of municipal districts is not discussed: settlements' dispersion and their poor transport accessibility make it difficult to provide the population with municipal services and the access to infrastructure, education.

In addition, the transformation of normative conditions of spatial development in the country necessitates the adaptation of municipalities to the emerging system of strategic planning. The adoption of a significant document in the field of national spatial development at the beginning of this year, the Strategy of Spatial Development of the Russian Federation until 2025, aggravates the number of issues associated with scientific and methodological support of the strategy implementation, including the development of strategic and tactical tools for regions and municipalities. First, regions' executive authorities and local governments are directly recommended to follow the provisions of the Strategy when developing and implementing the sectoral strategic planning documents, government programs, and other programmatic and planning documents, while making

[1] Formirovanie mestnogo samoupravleniya v Rossiiskoi Federatsii na 1 yanvarya 2018: byulleten'. Federal State Statistics Service. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1244553308453

decisions aimed at ensuring the sustainability of the settlement system, and in order to remove infrastructural constraints in the territories' socio-economic development which will require skilled analysis and adaptation of the Strategy's provisions to specific economic and spatial conditions in the future. Second, the problems, identified in the Strategy as starting points, are directly related to the municipal district as a municipal formation localized in the economic space of the region (including the growing demographic burden on the working population, significant intraregional differences in terms of socio-economic development, low level of entrepreneurial activity outside major urban agglomerations). Third, the problem of evaluation (qualitative, quantitative) of economic and spatial development on national, regional and municipal levels is not fully resolved.

It should be noted that most researchers turn to the study of socio-economic development of municipal areas outside the spatial context. In our opinion, the development of municipal districts as specific areas of the local government in conjunction with the processes of the transformation of the region's economic space is not sufficiently studied. Accordingly, the purpose of this research is to examine the economic-spatial development of municipal districts as a specific object in the economic space of the region.

Research methodology

Let us briefly introduce the main provisions of the applied methodology (detailed methodology of the research is described in the paper [7]). Generalization of theoretical researches on the nature of economic space (A.G. Granberg[2], P.A. Minakir [8, p. 43–45; 9, c. 124; 10, p. 18], T.G. Nefedova [11], A.I. Treivish [12] and other researchers) leads to the conclusion that the transformation of the economic space (ES) could be characterized through the change of three parameters: ES saturation with economic agents' activities, development of ES physical basis and ES coherence. With the aim to characterize these parameters, we analyzed the array of available official statistics generated by the Russian Federal State Statistics Service and selected the indicators *(Tab. 1)* that meet several criteria:

– reflecting the development of municipal districts as a specific object in the region's economic space;

– reflecting the development of the municipal district as a space of the municipal economy functioning and areas of rural settlements concentration;

– allowing drawing conclusions about the trends contributing to the development of the region's ES (structural trends) and the trends leading to its destruction (destructive trends).

Regarding the last criterion, the following statement should be explained. Sharing the opinion of the Russian researcher V.N. Lazhentsev that spatial development is "concerted progressive changes in the development and reproduction of natural resources, location and internal content of production forces, the resettlement of the population and improvement of living environment" [13, p. 97], we may conclude that the development of the economic space goes through: appearance of new settlements; growth of economic activity; growth of economically significant result (product/income); infrastructure development.

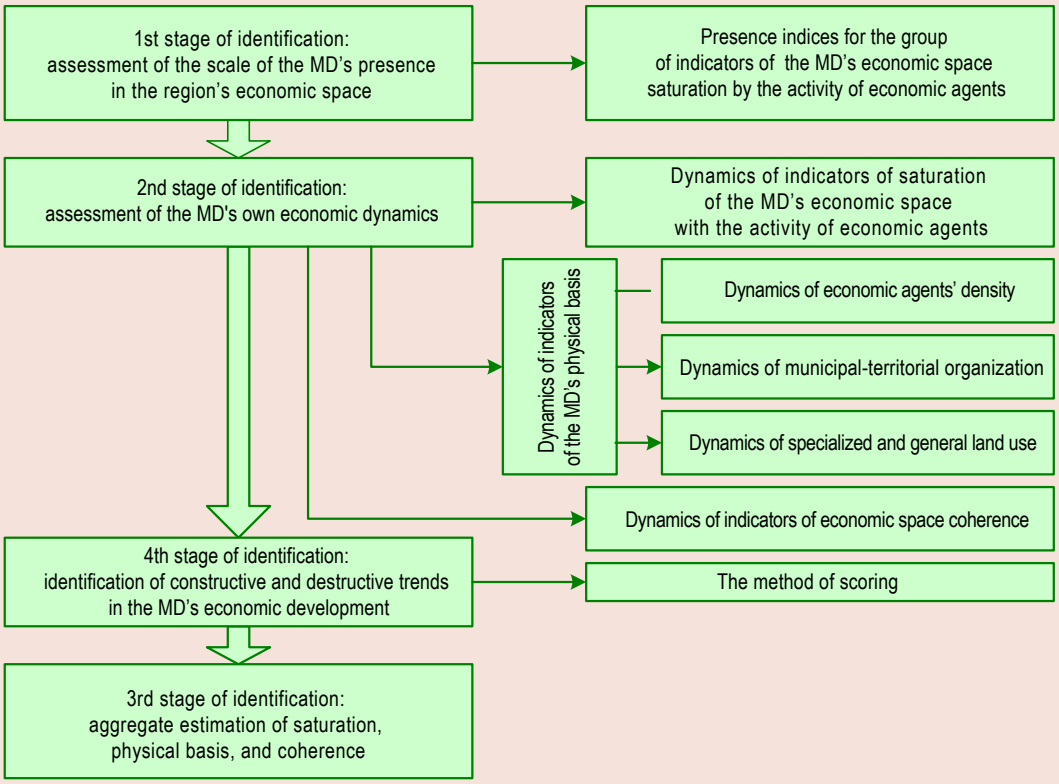
The reverse process, the destruction of economic space, is characterized by disappearance of settlements, decline of economic activity, decline of economically significant result, infrastructure degradation.

[2] Granberg A.G. Osnovy regional'noy ekonomiki: uchebnik. *Moscow*, 2000. P. 25.

Table 1. Composition of methodology indicators groups

Group of indicators	Indicators of saturation of the municipal district's economic space with economic agents' activities	Indicators of spatial frame (physical basis) of economic space	Indicators of economic space coherence
Group contents	– agricultural production as a measure of production and production activity results; – investments in fixed capital (carried out by organizations located on the territory of the municipal district (without small business entities) as an indicator of distribution (cash in fixed capital formation); – retail trade turnover as an indicator of consumption.	– the number of settlements and municipalities (municipal districts, rural and urban settlements); – population density; – sown area of agricultural crops in farms of all categories; – area of perennial plantations; – area of land plots provided for housing construction, individual housing construction and integrated development for housing per 10 thousand population.	– the proportion of the population living in settlements not having regular bus service and (or) railway communication with the administrative center of the municipal district in the total population of the municipal district; – the share of the length of public roads of local importance not meeting regulatory requirements, in total length of public roads of local importance; – the number of villages served by the post connection; – the number rural settlements equipped with a telephone line.
Analytical value	reflect the reproduction process in the territory	characterize the changes in the development of ES within the municipal district (the ability to draw conclusions about the physical compression or expansion of ES)	characterize the intensity of economic linkages within the municipal district determined by the development of transport, roads and communication lines supporting the interaction of economic agents, as well as its integration in the region's ES

Figure 1. The algorithm of methodical approach to the identification of trends (constructive and destructive) of economic development of municipal districts in the region's economic space



The algorithm of methodical approach to the identification of trends of the economic development of municipal districts (MD) in the region's economic space are shown in *Figure 1*.

Municipal districts are a part of the region's ES, a type of spatial economic entities at the regional level, therefore, the methodology includes evaluating of the municipal districts' autonomous economic development, on the one hand, and the scale of the municipal districts' influence on the region's ES through the calculation of indices of presence, on the other hand.

To test the methodology, municipal districts (MD) of the Chelyabinsk Oblast were selected. The choice was caused by several factors.

The earlier research concerned MD of the Sverdlovsk Oblast. The Sverdlovsk and Chelyabinsk oblasts are characterized by the similar structure of the economy, as they are the regions of traditionally-industrial classical type [14, p. 19] and are recognized as the leading industrial regions of the country [15]. The regions are characterized by almost the same level of state of the environment (according to the Russian public organization "Zeleniy patrul")[3] that significantly affects the municipal districts' development. However, in regard to the regions' municipal organization, the ratio of municipal and urban districts, they are significantly different, and it is interesting, because it allows comparing the magnitude of the municipal districts' presence in region's ES in terms of advantage in numbers of different types of municipalities. In the Sverdlovsk Oblast, there are 5 municipal districts and 68 urban districts, and, in the Chelyabinsk Oblast, there are 27 municipal districts and 16 urban districts[4].

The analysis of statistical indicators and indices of presence, based on them, is limited to the period of 2011–2017. The selection of the period is caused by the fact that 2011 is the first year of implementation of the Conception of Sustainable Development of Rural Territories for the period up to 2020[5], namely, rural territories dominate in the municipal districts' ES.

Results of the research

1st stage. Evaluation of the municipal districts' presence in the region's economic space. The indices of presence, as the ratio between the municipal district's share in the region according to the analyzed indicator and its share in the total population of the region, are calculated according to indicators of the group of ES saturation with economic agents' activities[6]. The basis of the index of presence is the indicator of population. Dynamics of the share of population in the MD of the Chelyabinsk Oblast is presented in *Table 2*.

The presence of municipal districts in terms of the population size in the economic space of the Chelyabinsk Oblast is more than 11.5 times greater than the presence of municipal districts of the Sverdlovsk Oblast, but they also continue to decrease: in the 2011–2017 period, the share

[3] Final environmental rating of the entities of the Russian Federation for the year of 2017. Available at: http://green patrol.ru/ru/stranica-dlya-obshchego-reytinga/ekologicheskiy-reyting-subektov-rf?tid=338.

[4] *Formirovanie mestnogo samoupravleniya v Rossiiskoi Federatsii na 1 yanvarya 2017: byulleten'*. Federal State Statistics Service. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1244553308453.

[5] Conception of Sustainable Development of Rural Territories for the period up to 2020, approved by the RF Government decree no. 2136-R, dated November 30, 2010.

[6] Index of presence as an indicator balanced by population allows to make a conclusion about how proportional the participation of municipal districts in the region's reproduction process by the number of economic agents is. An index value less than unit indicates advantage of other territories, equal to unit indicates a proportional distribution of the indicator by the population, more than unit means active participation of municipal districts in the formation of the regional indicator.

Table 2. The share of the municipal districts' population in the total population of the Chelyabinsk Oblast at year-end, %

Municipal district	2011	2012	2013	2014	2015	2016	2017
Agapovskiy MD	0.99	0.99	0.97	0.95	0.95	0.95	0.95
Argayashskiy MD	1.18	1.17	1.17	1.16	1.17	1.18	0.17
Ashinskiy MD	1.84	1.81	1.77	1.75	1.73	1.71	0.69
Bredinskiy MD	0.80	0.78	0.76	0.75	0.74	0.73	0.73
Varnenskiy MD	0.77	0.76	0.74	0.73	0.72	0.72	0.72
Verkhneuralskiy MD	1.03	1.02	1.01	1.00	0.99	0.99	0.98
Yemanzhelinskiy MD	1.53	1.52	1.50	1.49	1.46	1.44	1.42
Etkul'skiy MD	0.88	0.88	0.88	0.88	0.88	0.87	0.86
Kartalinskiy MD	1.40	1.39	1.38	1.36	1.35	1.34	1.33
Kaslinskiy MD	0.98	0.98	0.97	0.96	0.94	0.93	0.91
Katav-Ivanovskiy MD	0.94	0.92	0.91	0.89	0.88	0.86	0.85
Kizil'skiy MD	0.73	0.72	0.70	0.68	0.67	0.65	0.64
Korkinskiy MD	1.83	1.82	1.78	1.74	1.73	1.71	1.71
Krasnoarmeyskiy MD	1.22	1.24	1.23	1.20	1.21	1.21	1.20
Kunashakskiy MD	0.86	0.86	0.86	0.86	0.85	0.84	0.83
Kusinskiy MD	0.83	0.82	0.81	0.80	0.79	0.78	0.77
Nagaybakskiy MD	0.59	0.57	0.56	0.55	0.54	0.54	0.53
Nyazepetrovskiy MD	0.51	0.50	0.50	0.49	0.48	0.48	0.47
Octyabr'skiy MD	0.60	0.59	0.58	0.57	0.57	0.57	0.56
Plastovskiy MD	0.74	0.74	0.73	0.74	0.74	0.74	0.73
Satkinskiy MD	2.45	2.42	2.39	2.36	2.33	2.31	2.29
Sosnovskiy MD	1.79	1.82	1.84	1.88	1.93	2.00	2.05
Troitskiy MD	0.80	0.79	0.77	0.75	0.74	0.73	0.73
Uvel'skiy MD	0.91	0.90	0.89	0.89	0.90	0.91	0.91
Uyskiy MD	0.74	0.72	0.70	0.69	0.68	0.67	0.66
Chebarkul'skiy MD	0.85	0.86	0.86	0.85	0.85	0.85	0.85
Chesmenskiy MD	0.57	0.57	0.56	0.55	0.54	0.54	0.53
Total	*28.38*	*28.13*	*27.82*	*27.52*	*27.37*	*27.25*	*27.09*

Calculated according to: the Database of municipalities. Federal State Statistics Service. Available at: http://www.gks.ru/dbscripts/munst/munst65/ DBInet.cgi; Regions of Russia. Socio-economic indicators. Federal State Statistics Service. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ ru/statistics/publications/catalog/doc_1138623506156.

of municipal districts in the total population of the region fell down from 28.38 to 27.09%. The decrease of negative values of the growth rate is the same as in the Sverdlovsk Oblast: at the beginning of the period, it ranged from 0.8 to 1.1%, by the end of the period, the rate of decline of the share of municipal districts in the total population of the region was 0.6%.

In the Chelyabinsk Oblast, as well as in the Sverdlovsk Oblast, the scale of presence by the population and the population were growing throughout the period under review only in one municipal district – the Sosnovsky. Two more districts managed to maintain the share of the region's population: in the Uvelskiy municipal district, population increased by the end of the period, and, in the Chebarkul'skiy municipal district, it remained almost the same as in 2011.

The calculated indices of the presence of municipal districts in terms of "agricultural products (farms of all categories)" for the Chelyabinsk region are presented in *Table 3*.

Although the population of municipal districts of the Chelyabinsk Oblast is 9.5 times, and the share of the municipal districts'

Table 3. Indices of presence of the municipal districts in the economic space of the Chelyabinsk Oblast in terms of agricultural products

Municipal district	2011	2012	2013	2014	2015	2016	2017
Agapovskiy MD	7.61	7.45	6.51	6.83	6.91	6.74	6.50
Argayashskiy MD	5.62	6.02	6.17	6.25	5.33	5.12	5.20
Ashinskiy MD	0.46	0.42	0.49	0.42	0.39	0.36	0.31
Bredinskiy MD	5.42	4.70	4.54	4.32	5.09	4.97	5.31
Varnenskiy MD	4.67	4.26	3.66	3.90	4.02	3.90	4.19
Verkhneuralskiy MD	4.50	3.73	3.74	3.19	3.24	3.04	2.92
Yemanzhelinskiy MD	2.67	4.56	4.75	5.02	4.37	3.99	2.74
Etkul'skiy MD	2.81	2.72	2.93	2.64	2.63	2.39	2.23
Kartalinskiy MD	1.77	1.67	1.50	1.45	1.70	1.70	1.77
Kaslinskiy MD	1.88	1.50	1.49	1.30	1.06	1.05	1.11
Katav-Ivanovskiy MD	0.80	0.72	0.82	0.69	0.65	0.59	0.53
Kizil'skiy MD	5.83	5.57	4.91	4.39	5.04	5.20	5.21
Korkinskiy MD	0.27	0.23	0.24	0.24	0.22	0.21	0.20
Krasnoarmeyskiy MD	4.02	4.51	4.47	5.02	4.23	4.33	4.38
Kunashakskiy MD	2.68	2.39	2.74	4.36	5.16	5.16	5.27
Kusinskiy MD	1.09	1.02	1.18	0.95	0.86	0.79	0.69
Nagaybakskiy MD	5.12	7.03	9.32	10.46	10.06	10.82	10.99
Nyazepetrovskiy MD	1.53	1.42	1.51	1.28	1.21	1.11	1.05
Octyabr'skiy MD	5.64	4.31	5.11	4.62	4.79	5.36	5.18
Plastovskiy MD	2.15	1.83	1.82	1.58	1.58	1.54	1.42
Satkinskiy MD	0.41	0.38	0.37	0.35	0.31	0.30	0.26
Sosnovskiy MD	4.49	4.90	4.56	4.53	4.41	4.40	4.13
Troitskiy MD	5.05	4.37	4.73	4.24	4.46	4.90	5.35
Uvel'skiy MD	2.96	2.56	2.87	4.11	6.81	8.41	9.50
Uyskiy MD	3.21	3.29	3.08	3.01	2.99	2.97	3.39
Chebarkul'skiy MD	6.96	7.87	7.40	7.96	7.19	6.92	7.11
Chesmenskiy MD	6.18	5.06	4.85	4.38	4.33	4.11	4.49
Total index	*3.12*	*3.15*	*3.16*	*3.23*	*3.25*	*3.28*	*3.27*

Calculated according to: the Database of municipalities. Federal State Statistics Service. Available at: http://www.gks.ru/dbscripts/munst/munst65/ DBInet.cgi; Regions of Russia. Socio-economic indicators. Federal State Statistics Service. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ ru/statistics/publications/catalog/doc_1138623506156.

population in the regional population is 11.5 times greater than in the Sverdlovsk Oblast, the index of the presence of municipal districts of the Chelyabinsk Oblast is lower than in the Sverdlovsk one (3.27 vs 4.72), and, in the studied period, it increased by only 5%. Thus, the regional agricultural production and the municipal districts' share in it were growing more rapidly in the Sverdlovsk Oblast than in the Chelyabinsk Oblast.

Individual indices of presence in terms of agricultural production of most districts are higher than unit for the whole period. Only four districts have an index less than one – Ashinskiy, Katav-Ivanovskiy, Korkinskiy, Kusinskiy (by the end of the period), Satkinskiy; their share of regional agricultural production is lower than the share in the region's population.

Impressive dynamics of the Nagaybakskiy municipal district's index draws attention. The presence of this district increased more than twice – from 5.12 to 10.99, the dynamics were very positive and reinforced by the growth of agricultural production. These dynamics is associated with the appearance of a poultry complex in the district. Active construction of main production facilities of the Nagaybakskiy poultry complex started in early summer of

Table 4. Indices of presence of municipal districts in the economic space of the Chelyabinsk Oblast in terms of investment in fixed capital

Municipal district	2011	2012	2013	2014	2015	2016	2017
Agapovskiy	0.07	0.38	0.20	0.04	0.08	0.07	0.12
Argayashskiy	0.44	0.55	0.36	0.09	0.05	0.12	0.07
Ashinskiy	0.31	0.68	1.23	0.69	0.21	0.25	0.34
Bredinskiy	0.15	0.25	0.13	0.09	0.15	0.23	0.26
Varnenskiy	0.06	5.43	8.14	2.94	0.81	0.45	0.55
Verkhneuralskiy	0.71	0.70	0.55	0.23	0.25	0.49	0.53
Yemanzhelinskiy	0.15	0.49	1.27	1.44	0.74	0.49	0.08
Etkul'skiy	0.26	0.17	0.29	0.18	0.15	0.16	0.27
Kartalinskiy	0.08	0.06	0.10	0.06	0.09	0.08	0.09
Kaslinskiy	0.14	0.25	0.18	0.10	0.07	0.16	0.15
Katav-Ivanovskiy	0.17	0.09	0.18	0.17	0.19	0.10	0.08
Kizil'skiy	0.06	0.02	0.03	0.02	0.01	0.01	0.02
Korkinskiy	0.15	0.07	0.14	0.08	0.09	0.16	0.08
Krasnoarmeyskiy	0.67	0.47	0.21	0.10	0.17	0.35	0.27
Kunashakskiy	0.07	0.02	1.45	0.21	0.04	0.05	0.04
Kusinskiy	0.11	0.16	0.10	0.08	0.02	0.03	0.05
Nagaybakskiy	0.51	0.36	1.11	1.29	0.51	0.13	0.12
Nyazepetrovskiy	0.13	0.03	0.07	0.07	0.04	0.05	0.05
Octyabr'skiy	0.44	0.26	0.25	0.17	0.15	0.31	0.23
Plastovskiy	1.11	0.43	1.19	0.77	0.89	1.37	1.63
Satkinskiy	0.34	0.46	0.39	0.23	0.16	0.26	0.34
Sosnovskiy	0.34	0.72	0.75	0.48	0.62	0.39	0.63
Troitskiy	0.15	0.10	0.07	0.38	0.24	0.10	0.14
Uvel'skiy	0.27	0.27	6.83	7.11	2.41	0.57	0.37
Uyskiy	0.05	0.05	0.05	0.05	0.06	0.06	0.07
Chebarkul'skiy	0.70	0.31	0.28	0.33	0.43	0.33	0.44
Chesmenskiy	0.14	0.11	0.11	0.08	0.06	0.09	0.07
Total index	*0.28*	*0.47*	*0.87*	*0.60*	*0.32*	*0.26*	*0.28*

Calculated according to: the Database of municipalities. Federal State Statistics Service. Available at: http://www.gks.ru/dbscripts/munst/munst65/ DBInet.cgi; Regions of Russia. Socio-economic indicators. Federal State Statistics Service. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ ru/statistics/publications/catalog/doc_1138623506156.

2011. The complex capacity is 50 thousand tons of poultry meat a year. The project of the Nagaybakskiy poultry complex consists of eight production sites, each of which is located on the territory of a separate rural settlement[7].

Another district that demonstrated a sharp increase from 2.96 to 9.50 is the Uvel'skiy municipal district, although, in 2012–2013, it somewhat reduced the extent of presence in terms of agricultural production. The achievements of the district are directly associated with the "Uvelka" company based in the Uvel'skiy settlement engaged in the processing of cereals and legumes and actively investing in the economy of the district. The positive dynamics of the results at the end of the period were also shown by the Yemanzhelinskiy (from 2.67 to 2.74), Krasnoarmeyskiy (from 4.02 to 4.38), Kunashakskiy (from 2.67 to 5.27), Troitskiy (from 5.05 to 5.35), Uyskiy (from 3.21 to 3.39) municipal districts.

Indices of the municipal districts' presence in terms of "investment in fixed capital" for the Chelyabinsk Oblast are presented in *table 4*.

[7] OOO "Nagaybakskiy poultry complex" – SITNO. Available at: http://sitno.ru/enterprises/proizvodstvo-ptitsevodcheskoy-produktsii/ooo-nagaybakskiy-ptitsevodches kiy-kompleks-.

The spatial and temporal irregularity of presence in terms of investment is natural for municipal districts of the Chelyabinsk Oblast. The presence of municipal districts has not changed by the end of the period, and it does not exceed one (0.28), as in the Sverdlovsk Oblast.

In contrast to the Sverdlovsk Oblast, a significant number of the Chelyabinsk municipalities have the index of presence in terms of investments in fixed capital higher than one. These districts include Ashinskiy, Varnenskiy, Yemanzhelinskiy, Kunashakskiy, Nagaybakskiy, Plastovskiy, Uvel'skiy; the excess of the index accounted mainly for 2013–2014. The average index of presence in terms of investment is higher than in municipal districts of the Sverdlovsk Oblast, indicating a little more security with investments of the economy of municipal districts of the Chelyabinsk Oblast.

The second difference of the Chelyabinsk Oblast, according the dynamics of this indicator, is the presence of a substantial number of municipal districts demonstrating growth according to the results of the period – these are 11 out of 27 districts (Agapovskiy, Ashinskiy, Bredinskiy, Varnenskiy, Etkul'skiy, Kartlinskiy, Kaslinskiy, Plastovskiy, Sosnovskiy, Uvel'skiy, Uyskiy).

The municipal districts' indices of presence in terms of "retail trade turnover" for the Chelyabinsk Oblast are presented in *table 5*.

The total index of presence in terms of consumption in municipal districts of the Chelyabinsk Oblast has doubled and almost reached the level of the Sverdlovsk Oblast by 2017. However, the overall volumes of the municipal districts' consumption remain low in the region in comparison with urban districts. The relative leaders in terms of consumption are Ashinskiy, Yemanzhelinskiy, Etkul'skiy, Kaslinskiy, Katav-Ivanovskiy, Korkinskiy, Krasnoarmeyskiy, Kusinskiy, Plastovskiy, Satkinskiy, Sosnovskiy municipal districts. The index of presence in terms of retail trade turnover was generally higher in these districts than the final index for all the municipalities, and demonstrated a positive trend.

As a positive fact, it should be noted that the vast majority of municipal districts of the Chelyabinsk Oblast have increased their presence in terms of the regional index of retail trade turnover by the end of the period, with the exception of the Uvel'skiy and Chebarkul'skiy municipal districts.

Thus, the presence of municipal districts in the economic space of the Sverdlovsk and Chelyabinsk regions decreased in terms of population and investment, indicating the movement of labor and capital to the urban districts, taking into account the dynamics of the regional values for these indicators. However, it should be noted that the average index of presence in terms of distribution in municipal districts of the Sverdlovsk Oblast was lower than in the Chelyabinsk Oblast, pointing at their somewhat greater saturation with capital.

As for two remaining indices, despite their major similarities (in both regions, the index of presence in terms of agricultural products is above one, and the index of presence in terms of retail trade turnover is less than one), there are some differences.

In the Chelyabinsk Oblast the increase of the municipal districts' presence in terms of agricultural production was much less significant (63% vs 5%) than in the Sverdlovsk Oblast, and the dynamics of individual indices were negative in most districts. Consequently, the presence of municipal districts of the Chelyabinsk Oblast in the regional agricultural production is uneven. However, the value of the index of presence in terms of production agriculture higher than one (regional indicator

Table 5. Indices of presence of municipal districts in the economic space of the Chelyabinsk Oblast in terms of retail trade turnover

Municipal district	2011	2012	2013	2014	2015	2016	2017
Agapovskiy MD	0.04	0.03	0.04	0.07	0.09	0.10	0.12
Argayashskiy MD	0.10	0.16	0.14	0.14	0.18	0.17	0.16
Ashinskiy MD	0.04	0.11	0.15	0.12	0.16	0.19	0.31
Bredinskiy MD	0.06	0.05	0.05	0.06	0.08	0.09	0.13
Varnenskiy MD	0.05	0.04	0.08	0.09	0.12	0.11	0.13
Verkhneuralskiy MD	0.04	0.05	0.10	0.12	0.15	0.16	0.19
Yemanzhelinskiy MD	0.07	0.10	0.14	0.17	0.23	0.22	0.24
Etkul'skiy MD	0.12	0.18	0.17	0.14	0.18	0.20	0.21
Kartalinskiy MD	0.06	0.06	0.07	0.09	0.14	0.12	0.18
Kaslinskiy MD	0.29	0.26	0.26	0.30	0.37	0.36	0.38
Katav-Ivanovskiy MD	0.11	0.17	0.31	0.31	0.36	0.37	0.46
Kizil'skiy MD	0.03	0.02	0.03	0.03	0.03	0.04	0.05
Korkinskiy MD	0.14	0.20	0.22	0.21	0.26	0.26	0.31
Krasnoarmeyskiy MD	0.17	0.23	0.36	0.38	0.35	0.32	0.26
Kunashakskiy MD	0.05	0.07	0.08	0.11	0.12	0.11	0.10
Kusinskiy MD	0.07	0.11	0.12	0.12	0.16	0.18	0.21
Nagaybakskiy MD	0.02	0.04	0.07	0.09	0.10	0.11	0.11
Nyazepetrovskiy MD	0.07	0.07	0.07	0.08	0.13	0.13	0.14
Octyabr'skiy MD	0.09	0.05	0.06	0.07	0.09	0.14	0.11
Plastovskiy MD	0.17	0.23	0.24	0.23	0.25	0.26	0.30
Satkinskiy MD	0.14	0.16	0.19	0.21	0.26	0.25	0.31
Sosnovskiy MD	0.25	0.41	0.33	0.37	0.39	0.40	0.31
Troitskiy MD	0.02	0.03	0.04	0.03	0.05	0.04	0.03
Uvel'skiy MD	0.05	0.03	0.02	0.04	0.04	0.03	0.03
Uyskiy MD	0.03	0.03	0.03	0.04	0.05	0.06	0.07
Chebarkul'skiy MD	0.06	0.03	0.02	0.04	0.12	0.14	0.05
Chesmenskiy MD	0.06	0.06	0.10	0.11	0.14	0.14	0.15
Total index	*0.10*	*0.13*	*0.15*	*0.16*	*0.19*	*0.20*	*0.21*

Calculated by the Database of municipalities. Federal State Statistics Service. Available at: http://www.gks.ru/dbscripts/munst/munst65/DBInet.cgi; Regions of Russia. Socio-economic indicators / Federal State Statistics Service. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ ru/statistics/publications/catalog/doc_1138623506156.

is mostly formed by means of municipal districts) suggests that the development of characteristic economic activities on the territory of municipal districts balances and diversifies regional ES of a traditionally industrial region, providing the ability to maintain relatively stable presence in the region in terms of consumption, which did not change significantly during the analyzed period. In addition, we suppose that the achieved value may be a certain limit of consumption for the investigated area type, regardless of income level, because, in the countryside, some commodities can be bought only in large urban settlements as a substantial amount of them is produced by people.

2nd stage. Assessment of the municipal districts' economic dynamics. The next stage of the methodological approach to identify the trends of the municipalities' economic development in the region's economic space is the assessment of their own economic dynamics in three groups of indicators: saturation of economic space with economic agents' activities, the development of the spatial framework, and coherence of economic space.

The analysis of the saturation of the municipal districts' economic space by economic agents' activities is presented from the point of view of the reproductive process in municipal districts through the characteristics of the index of production (agricultural production), distribution (investment in fixed capital), and consumption (retail trade turnover).

The analysis of dynamics of *municipal districts' agricultural production* index in the Chelyabinsk Oblast showed that most regions are characterized by alternating dynamics of the indicator with the growth of the results during the analyzed period. The regions that reduced the volume of agricultural production include the Ashinskiy, Verkhneural'skiy, Kaslinskiy, Katav-Ivanovskiy, Kusinskiy, Nyazepetrovskiy, Plastovskiy, Satkinskiy municipal districts. The Chesmensky municipal district barely changed the original production volume (change, more or less, is within 1%). Significant growth of agricultural production was observed in the Uvel'skiy municipal district – 4.8 times, the Nagaybakskiy – 2.9 times, the Kunashakskiy – 2.8 times at the end of the period.

On average, agricultural production in municipal districts of the Chelyabinsk Oblast increased from 75.592 rub. per capita of the district's population in 2011 to 118.299 rub. in 2017. Municipal districts produce 88.6% (2017) of agricultural products in the region. The growth of agricultural production in municipal districts of the Chelyabinsk Oblast was smaller than in the Sverdlovsk Oblast, and made up 49.9%, while agricultural production in the region grew by 49.6%.

Regarding the index of investment in fixed capital of the Chelyabinsk Oblast's municipal districts, we can say that they make up, averagely, about 13% of investments in the region in the period. Investment process in municipal districts of the Chelyabinsk Oblast is more active than in the Sverdlovsk Oblast: the share of municipalities, which increased the volume of investments in fixed capital at the end of the period, is higher than in the Sverdlovsk Oblast (12 out of 27 vs 1 out of 5).

The visible increase of the volume *of investments,* according to the results at the period's end, was achieved by the Varnenskiy (almost 9 times) and the Sosnovskiy (2.3 times) municipal districts. In general, the dynamics of municipal districts of the Chelyabinsk Oblast in terms of investments in fixed capital repeats the regional one, although the decline of investment starts earlier in municipal districts than in the region: if the regional volume of investments began to decline in 2014, the total investments in municipal districts had decreased the year earlier.

The positive dynamics of consumption (*retail trade turnover*) at the end of the period was observed in all municipalities except in the Uvel'skiy and Chebarkul'skiy districts, where the turnover of retail trade declined in the same way as the corresponding index.

The consumption of municipal districts of the Chelyabinsk Oblast, by 2017, increased 2.4 times and was 5.8% of the regional rate of consumption. The growth rates were above the regional ones, and the decline of the regional rate, which began in 2015, had been repeated by municipalities a year later. While the regional consumption figure continued to fall in 2017, municipal districts, by contrast, increased consumption.

In the Chelyabinsk Oblast, agricultural growth was even less than in the Sverdlovsk Oblast, although it was observed in most municipal districts (with the exception of eight). In contrast to the Sverdlovsk Oblast, investments in fixed capital were made more actively, and consumption grew more rapidly on the territory of municipal districts of the Chelyabinsk Oblast.

The analysis of indicators characterizing the spatial frame (the physical basis) of the economic space including the dynamics of the economic agents' density, municipal-territorial organization, specialized (crops, perennial plantations) and general (housing building) land uses.

The density of economic agents characterizing the distribution of economic agents in space will be considered the first indicator. The population density of municipal districts of the Chelyabinsk Oblast presents a mixed picture: there are 13 municipal districts in the region the population density of which does not exceed 10 people per 1 km^2, 12 municipal districts with density above 10 people per 1 km^2, but less than the regional average of 39.5 people per 1 km^2, and two municipal districts with population density many times higher than the regional population, the districts of Yemanzhelinskiy and Korkinskiy. The high population density of two last districts (437.6 and 580.1 people per 1 km^2, respectively) is due to the proximity to the city of Chelyabinsk, as the administrative center of these municipal districts is located within 50 km from the center of the region. However, even in these municipalities, the density of economic agents had been decreasing for the whole period.

The population density decreases in most municipal districts. The only exceptions were the Sosnovskiy and Uvel'skiy municipal districts, where the density and the number of population increased by the end of the period. In the Chebarkul'skiy municipal district, population was unchanged. However, it should be noted that the Sosnovskiy municipal district is the only one where the increase of population density amounted to 15% and lasted throughout the studied period largely due to its proximity to Chelyabinsk. The identified trend is confirmed by previously conducted study of A.V. Schmidt, V.S. Antonyuk, A. Franchini on the impact of the Chelyabinsk agglomeration including migration growth (decline) of urban districts and municipal districts. The authors write that "the characteristic shows that, for 2006–2014, population growth increased only in municipalities nearby Chelyabinsk (Kopeysk – by 102.41% and Sosnovskiy district – 121.83%). In Chelyabinsk, the growth rate of the population amounted to 122.35%. In all other urban and municipal districts, migration loss of the population occurred" [16, p. 783]. We should emphasize that agglomeration generally increases the uneven, unbalanced development of economic space due to the high concentration of population and economic activities in them [17, p. 28], and they are an important factor in territorial planning [18].

The reduction of the economic agents' density on studied territories is an extremely negative trend, as the agents create and develop economic space, as bearers of economic activities. Economic agents also form the territory's labor potential, which is the main driving force of the social and economic development of territories [19, p. 244, 20, p. 97]. The reduction of the economic agents' density is all more critical, because the employment potential could be reduced more rapidly than the total population (and, therefore, the density), as it happens, for example, in municipal and urban districts of the Vologda Oblast [21, p. 176].

The next step in the analysis of the development of the spatial framework is the assessment of changes in *the regions' municipal-territorial structure*. As noted above, the development of economic space is reflected in the emergence of new settlements, and their disappearance is a sign of its destruction. The concept of settlement will be considered both in a geographical sense (a locality), and from the point of view of the municipal structure (a municipality).

Table 6. The number of municipal districts (MD), rural and urban settlements (RS, US) in the Sverdlovsk and Chelyabinsk oblasts in 2011 and 2017

Region	2011			2017		
	MD	RS	US	MD	RS	US
Sverdlovsk Oblast	5	16	5	5	16	5
Chelyabinsk Oblast	27	246	27	27	242	27

Source: *Formirovanie mestnogo samoupravleniya v Rossiiskoi Federatsii na 1 yanvarya 2012: byulleten'*. Federal State Statistics Service. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/ doc_1244553308453.

The dynamics of the municipal structure in the Sverdlovsk and Chelyabinsk oblasts are presented in *table 6*.

In the Chelyabinsk Oblast, the number of rural settlements reduced from 246 to 242 due to consolidation at a constant number of municipal districts, while the municipal structure of the Sverdlovsk Oblast has not changed.

From the point of view of the number of localities, the number of the Chelyabinsk Oblast's municipal districts remained unchanged, with the exception of the Sosnovskiy municipal district: in 2014, it has added 1 locality, the village of Terema[8]. The Sosnovskiy municipal district is located in close proximity to the city district with intracity division Chelyabinsk, previously, it was part of it territorially. In this regard, the territory of the municipal district is actively used for the construction of country villages and summer cottages. A newly formed locality has emerged as one of such settlements. The appearance of the settlement can be seen as a positive sign of a long-term expansion of the habitable space and the development of physical basis of economic space.

The analysis of *general land use* is based on the indicator of the land plots area provided for housing construction, individual housing construction and integrated development for housing construction, per 10 thousand persons of the population. Data available for the Chelyabinsk Oblast provides little material for analysis; however, it is evident that land for housing construction is allocated there. Positive dynamics of provision of land plots for housing construction, per 10 thousand persons of population is observed in the Ashinskiy, Emanzhelinskiy, Kartalinskiy, Kaslinskiy and Uyskiy municipalities. However, we may assume that the allocation of land in the Sverdlovsk Oblast is carried out in larger scale and more systematically.

The analysis *of specialized land use* is based on the figures of the cultivated land of all crops in all categories of farms and areas of perennial plantations of fruit-berry crops. These indicators provide an opportunity to assess the degree of physical basis development in accordance with the characteristics of municipal districts as areas of rural settlements concentration. 99.6% of cultivated land of all agricultural crops in all categories of farms in the Chelyabinsk Oblast consist of municipal districts' cultivated land, therefore, the 7.2 % reduction of cultivated area in the region in the whole period means a reduction of municipal districts' areas by the same amount, although it should be noted that, in the last two years, the increase of cultivated lands resumed. Most municipal districts

[8] On coordination of the formation of a newly emerged settlement on the territory of the Kremenkulskoye rural settlement of the Sosnovskiy municipal district and naming it "Terema": Resolution of the Governor of the Chelyabinsk Oblast no. 245, dated March 5, 2014; On assigning a name to a geographical object in the Chelyabinsk Oblast and on amending the Decree of the Government of the Russian Federation no. 379, dated April 28, 2014: Decree of the Government of the Russian Federation no. 825, dated August 19, 2014.

(20) showed a negative result at the end of the period, indicating the compression of the ecumene. We should emphasize that, in this case, municipalities have a decisive influence on the development of physical basis of economic space.

The area of perennial plantations of fruit-berry crops in municipal districts of the Chelyabinsk Oblast generally does not show positive dynamics (the change from 2011 to 2017 amounted to -5%). By 2017, the area of fruit-berry crops increased only in the Nagaybakskiy MD by 3 ha (11%) and the Kaslinskiy MD by 7 ha (4%); it remained unchanged in the Varnenskiy MD. In other municipal districts, the area of fruit-berry crops decreased by about 7% by the end of the period, with the exception of the Agapovskiy municipal district, where the decrease of the perennial area of fruit-berry plantations was 47%. In municipal districts of the Chelyabinsk Oblast, the volume of plantings of fruit and berry crops in absolute values has not sharply changed, but there is a gradual decline throughout the period.

In relation to the development of physical basis of economic space, we can draw the following conclusions. Specialized land use in most districts of the Chelyabinsk Oblast decreases, which may partly be caused by the changes on food markets (due to the high degree of the region's self-sufficiency[9] a part of agricultural output is exported to other regions), positive trend in total land use is also non-obvious. However, one settlement appeared in the Chelyabinsk Oblast, unlike the Sverdlovsk one. The positive dynamics of the population density is observed in both municipal districts, but one of them is in the vicinity of the Chelyabinsk agglomeration, and it experiences its impact.

The analysis of indicators characterizing the coherence of economic space. At this stage of the analysis of the municipal districts' own economic dynamics, the four indicators reflecting the development of roads and railways network, postal and telephone communications are reviewed[10].

In the Chelyabinsk Oblast, the situation with the quality of automotive coating in municipal districts is relatively good (compared to the Sverdlovsk Oblast, where, averagely, 54% of local roads do not meet regulatory requirements). However, regular bus and railway connection to the center of the municipal district is not serviced for more than 0.8% of the population, or 30.631 people (which is almost equal to the population of the Etkul'skiy municipal district). In conditions of rural settlements' high dispersion, it is a negative indicator of the level of economic space coherence. Provision of postal and telephone communications is extremely uneven among municipal districts of the Chelyabinsk Oblast, which has additional adverse effects on the coherence of economic space in the region, and internal and external integration of municipal districts into it.

On *the 3rd and 4th stages of the methodology,* we perform a generalization of the estimates of saturation of economic space of municipal districts, the development of their spatial framework and coherence of economic space that allows identifying the type of economic trends and making final conclusions about the municipal districts' impact on the economic space of the region.

[9] The issue of food security of the Chelyabinsk Oblast and import substitution is considered by a Committee of the Legislative Assembly on agrarian policy. Available at: https://www.zs74.ru/news/vopros-obespecheniya-prodovolstvennoy-bezopasnosti-chelyabin'skoy-oblasti-i-importozameshcheniya.

[10] Data on mail and telephone communications is available only since 2014.

Table 7. Scoring of economic development of municipal districts of the Chelyabinsk Oblast in 2017

Municipal district	MD's presence in the region				Saturation of MD's territory with economic agents' activity			MD's physical basis development					MD's economic space coherence				Total
	Share in the population	Index of presence by agricultural products	Index of presence by investment in fixed capital	Index of presence by retail trade turnover	Agricultural production	investments in fixed capital	Retail trade turnover	Density of economic agents	Municipal territorial structure	Land for housing and utilities	Crops	Perennial plantings	Without a bus or railway connection to the MD center	Non-compliance of roads with epy standards	Availability of postal service	Availability of telephone service	
Agapovskiy MD	0	1	3	3	3	3	3	0	2	2	3	0	0	2	4	0	29
Argayashskiy MD	1	1	1	3	3	1	3	1	2	0	0	1	1	4	4	4	30
Ashinskiy MD	0	1	3	3	1	3	3	0	2	3	1	1	1	2	0	2	26
Bredinskiy MD	0	1	3	3	3	3	3	0	2	2	3	1	1	2	2	1	30
Varnenskiy MD	0	1	3	3	3	3	3	0	2	2	1	2	0	1	4	4	32
Verkhneuralskiy MD	0	1	1	4	1	1	3	0	2	2	1	1	3	4	0	0	24
Yemanzhelinskiy MD	0	3	1	3	3	1	3	0	2	3	1	1	2	2	2	2	29
Etkul'skiy MD	0	1	3	3	3	3	3	0	2	4	1	1	2	4	4	4	38
Kartalinskiy MD	0	2	3	3	3	3	3	0	2	4	1	0	4	1	4	4	37
Kaslinskiy MD	0	1	3	3	1	3	3	0	2	3	1	3	3	3	1	3	33
Katav-Ivanovskiy MD	0	1	1	4	1	1	3	0	2	1	0	1	1	2	2	4	24
Kizil'skiy MD	0	1	1	3	3	1	3	0	2	0	1	1	4	4	4	4	32
Korkinskiy MD	0	1	1	3	3	1	3	0	2	1	1	1	2	3	2	4	28
Krasnoarmeyskiy MD	1	3	1	3	3	1	3	1	2	2	1	1	1	2	0	4	29
Kunashakskiy MD	0	3	1	3	3	1	3	1	2	2	1	1	3	2	0	0	26
Kusinskiy MD	0	1	1	4	1	1	4	0	2	2	1	1	3	2	0	4	27
Nagaybakskiy MD	0	3	1	4	4	1	4	0	2	1	1	3	1	2	4	4	35
Nyazepetrovskiy MD	0	1	1	4	1	1	3	0	2	1	1	1	3	2	2	0	23
Octyabr'skiy MD	0	1	1	3	3	1	3	0	2	0	1	1	1	2	4	4	27
Plastovskiy MD	1	0	3	3	1	3	3	1	2	4	3	0	2	1	1	0	28
Satkinskiy MD	0	0	2	3	1	3	3	0	2	1	1	1	4	1	4	0	26
Sosnovskiy MD	4	1	3	3	3	3	3	4	4	1	1	1	1	4	4	0	40
Troitskiy MD	0	3	1	3	3	1	3	0	2	0	2	1	4	2	4	4	33
Uvel'skiy MD	2	3	3	1	3	3	1	3	2	3	2	0	2	2	4	4	38
Uyskiy MD	0	3	4	4	3	3	4	0	2	3	3	0	3	0	0	4	36
Chebarkul'skiy MD	2	1	1	1	3	1	1	2	2	0	3	1	3	2	3	4	30
Chesmenskiy MD	0	3	1	4	3	1	3	0	2	0	1	0	1	2	2	2	25

For aggregate estimates a scoring method is used, and the points are assigned to the municipal districts' dynamics according to the following criteria:

– 4 points – growth of the index for the entirety period;

– 3 points – unstable dynamics, growth by the results at the end of the period;

– 2 points – unstable dynamics, the index has not changed or the index was not changing during the period by the results at the end of the period;

– 1 point – unstable dynamics, the index dropped by the results at the end of the period;

– 0 points – negative dynamics for the entire period.

These criteria are applied to all indices, except two, which have a negative meaning (for them, the criteria are applied in reverse order):

– the share of the population, living in settlements without regular bus service and (or) railway communication with the administrative center of the municipal district, in the total population of the municipal district;

– the share of the length of public roads of local importance that do not meet regulatory requirements, in the total length of public roads of local importance.

In addition, regarding the indices of provision with telephone and post communication, in case, if the index retains the maximum value during the whole analyzed period, the dynamics is estimated at 4 points.

The maximum number of points is 64; then is possible to consider the trends of the municipal districts' economic development as constructive, if they received from 33 to 64 points, destructive – from 0 to 32 points. If the data is absent, the dynamics is estimated at 2 points (stable). The total estimate of economic development of municipal districts of the Chelyabinsk Oblast is presented in *table 7*.

According to the calculations, the development trends are constructive in the following municipal districts: the Chelyabinsk Oblast, the Etkul'skiy, Kartalinskiy, Kaslinskiy, Nagaybakskiy, Sosnovskiy, Troitskiy, Uvel'skiy, Uysky. The remaining 19 municipal districts have destructive trends of economic development, i.e. they have a devastating impact on the economic space of the region.

Conclusions

A brief summary of some of indices (*Tab. 8*) allows drawing a conclusion about a higher overall productivity and effectiveness of economic activities in municipal districts of the Sverdlovsk Oblast in comparison with the Chelyabinsk Oblast.

Despite similar problems with the number of economic agents, municipal districts of the Sverdlovsk Oblast have more unified and high scores of production activities (agricultural products), the development of the spatial framework, in terms of general and specialized land use, and the coherence of economic space

Table 8. The share of municipal districts of the Chelyabinsk and Sverdlovsk oblasts by some regional indicators

Regional indicator	MD of the Sverdlovsk Oblast		MD of the Chelyabinsk Oblast	
	2011	2017	2011	2017
Population	2.4	2.3	28.4	27.08
Agricultural products	7.1	10.9	88.5	88.6
Investments in fixed capital	1.1	0.4	8.2	7.5
Retail trade turnover	0.5	0.5	2.8	5.8
Area of MD's lands	11.0	11.5	88.7	88.7
Cultivated land	10.1	13.9	98.95	99.6

by the indicators of bus and railway connection, and availability of postal and telephone services than municipal districts of the Chelyabinsk Oblast.

In the Chelyabinsk Oblast, municipal districts occupy 88.7% of the territory of the region, that is why their even development is less expected. However, agricultural production is an important component of the economic base in municipal districts of the region, and its results have a significant impact on the regional economic space. The reproductive process in the economic space of municipal districts of the Chelyabinsk Oblast, in terms of consumption and distribution, is more dynamic than in the Sverdlovsk Oblast: there is rather more active investment in comparison with the Sverdlovsk Oblast, and the consumption grows rapidly. The development of the spatial framework of the economic space has rather negative dynamics, despite the emergence of a new settlement and the growth of population density in two municipalities. The most critical is the situation with the coherence of economic space and municipal districts' integration in regions' economic space and in the regions – it is very uneven, which is a sign of devastating effects on the region's economic space.

In accordance with the conducted analysis, the economic and spatial development of municipal districts could be aimed at:

1) the growth of economic activity and economically significant results, given the centrifugal nature of industrial relations on the territory;

2) the preservation and improvement of qualitative characteristics of physical basis and the extent of its development;

3) the growth of municipal districts' integration into the economic space of a region and the coherence of economic space within a municipal district;

4) balanced development of rural-urban relations (urban and rural settlements within a municipal district; municipal and urban districts within a region).

These areas, along with the obtained results of testing the methodological approach to the identification of trends (constructive and destructive) of the development of municipal districts in the region's economic space and the results of comparative analysis of municipal districts of two traditional industrial regions in terms of numerical superiority of different types of municipal formations (municipal and urban districts), constitute the scientific novelty of the paper. The analysis of the objects' economic and spatial development in the regional economic space contributes to the development of the methodology of spatial economics aimed at studying the spatial behavior of economic agents.

We should also note that proposed directions could be formalized in the form of software tools of territorial control (municipal and regional programs), as well as projects, i.e., they may serve as the basis of tactical tools of regional and municipal management. In addition, proposed directions could be used in the preparation of strategic planning documents on regional and municipal levels: in particular, the strategies of socio-economic development.

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Features of Socio-Economic Development of Modern Single-Industry Towns in the Republic of Bashkortostan

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Abstract. Study and monitoring of the current condition of Russian single-industry towns are among the most relevant issues of the state's socio-economic policy: especially within the implementation of national priority projects and the strategy of the spatial development. The purpose of the article is to define specifics of the socio-economic development of single-industry towns in the Republic of Bashkortostan on the basis of complex analysis of empirical data using sociological set of instruments. To achieve this goal, we conducted the analysis of the current state of social and labor sphere, sociological and statistical indicators of population's living standards. We also studied demographic processes and trends of the Republic's single-industry towns. The research of six single-industry towns (Blagoveshchensk, Uchaly, Neftekamsk, Belebey, Beloretsk, Kumertau) allowed us to define features of each territory and to rank them according to the level of the socio-economic welfare. The results differed from characteristics (categories) given in

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the latest list of Russian single-industry towns provided by the Ministry of Economic Development of the Russian Federation. According to updated data, only Neftekamsk could be called a town with the stable socio-economic situation. Blagoveshchensk, Uchaly, Belebey are at the risk of the socio-economic situation worsening. Beloretsk and Kumertau are among towns with the most difficult socio-economic conditions. Towns with high business potential were identified (Belebey, Beloretsk, Blagoveshchensk). However, this potential is usually implemented in the informal sector of the economy, which significantly worsens population's social well-being. Business potential of other towns (Uchaly, Neftekamsk, Kumertau) is very low. In Uchaly and Kumertau, there are almost no employment alternatives: it defines citizens' heavy dependence on the town-forming enterprise. At the same time, municipal authorities do not have an opportunity to change the socio-economic situation in towns. Usage of sociological instruments in the course of the research allowed us to reveal internal factors and features of single-industry towns' development, which are manifested in the population's life attitudes and social well-being, but they are not reflected by statistical indicators. Developed methodology might be used for complex studies of other Russian single-industry towns and the search for efficient strategy of their modernization.

Key words: single-industry town, town-forming enterprise, socio-economic development, living standards, employment, demography.

Introduction

The novelty of the research of the socio-economic situation of modern single-industry towns is caused by objective risks of the population's worsening living standards. Within market economy, the state of a town-forming enterprise (or sector) and its capabilities to provide jobs for population become defining factors of town's viability. Besides, many Russian single-industry towns remain large industrial facilities. The transition from the state sector to the private one caused the following processes: significant decrease of town-forming enterprises' budgets and its capabilities to support previous amounts of production, change of owners' interests and priorities, optimization of enterprises' social costs, salaries, and investments.

The federal centralization of budget resources makes municipalities less independent in the process of dealing with financial, investment, and other issues, which, in turn, affects local population's living standards. The income security of municipalities is extremely low: especially in single-industry areas, where the local economy is represented by one or several industries [1]. Single-industry towns with a low variety of economic activities wound up on the periphery of primary economic and modernization processes [2].

Despite broad state support of single-industry towns (creation of the Fund for the development of single-industry towns, territories of advanced socio-economic development – TASED; deve-lopment of federal programs, special legal acts, etc., various management seminars for municipal authorities, initiation of joint infrastructure and investment projects, based on public-private partnership), there are no significant structural shifts in the economy of single-industry towns.

Comprehensive program of single-industry towns' development was initiated in 2016 and was ended early on November 1, 2019. The decree of the Government of the Russian

Federation, dated February 13, 2019, approved the Spatial Development Strategy of the Russian Federation for the period up to 2025[1].

The results of the RF Accounts Chamber's assessment of single-industry towns support efficiency were published in the "Russian Gazette" on July 30, 2019. According to it, "in two years, 18 billion dollars were spent on subsidies within the single-industry towns development program, but the number of able-bodied population decreased by 350 thousand people...., business activity declined...., the number of legal entities decreased by 22.7%"[2]. One of the significant omissions was that "the opportunity to support single-industry towns, depending on their socio-economic and geographical features, was ignored", and "it is possible to spend budget money efficiently, if you take into account the specific situation"[3].

Adoption of efficient management decisions is also hindered by the limited capacity of municipal statistics, the incompleteness of dynamic data on the level of enterprises. This situation further highlights the need for comprehensive studies on the socio-economic development of Russian single-industry towns. Currently, there are scientific works on problems of the socio-economic development of single-industry towns situated in the Kemerovo Oblast (V.A. Trifonov, V.A. Shabashev, I.V. Dobrycheva, I.S. Antonova, E.A. Pchelintsev, R.A. Galimova) [2–4], the Irkutsk Oblast (E.A. Vetrova, M.A. Atamanova, T.V. Kulakova, E.I. Nefed'eva, O.V. Taraban) [5, 6], the Vologda Oblast (T.V. Uskova, L.G. Iogman, S.N. Tkachuk, A.N. Nesterov, N.Yu. Litvinova) [7], the Perm Oblast (A.D. Rizov) [8], the Tyumen Oblast (M.L. Belonozhko, I.S. Samboretskii, N.V. Gal'tseva) [9, 10], Central Black Earth regions (S.N. Rastvortseva, I.V. Manaeva) [11, 12], etc. Domestic scientists studied and analyzed features of the emergence and the development of Russian and foreign single-industrial towns (C.V. Kulai, M.G. Meerovich, G.V. Kutergina, A.V. Lapin, I.V. Manaeva) [13–15].

The analysis of domestic and foreign scientists' works shows that many countries (Great Britain, USA, Canada, Germany, France, CIS countries, etc.) faced different problems of single-profiled territories [16–19]. In the search for scientifically sound conceptual solutions to the problem of modernizing the economy and improving the quality of population's life in single-industry towns, monographs were published [7, 20, 21], dissertations were defended [see e.g. 10], and analytical reports[4] were prepared, etc. The basic concept of "recovery" of the single-profiled economy was the diversification strategy through the establishment of special economic zones, support programs, and entrepreneurship development in them [23]. At the same time, experts underline the importance of taking into account local conditions and features; the quality of local management; features of cooperation between a municipality and a town-forming enterprise; the "quality" of

[1] On the approval of the Spatial Development Strategy of the Russian Federation for the period up to 2025 №207-p, dated 13.02.2019 (ed. on 31.08.2019).

[2] Gaiva E. Did not think so. *Russian Gazette*, 2019, №165 (7923), July 30, p. 5.

[3] Same source.

[4] Analytical report on managing the development of single-industry towns. Moscow: The Institute for Urban Economics, 2011. Available at: http://www.urbaneconomics.ru/sites/default/files/a_monogoroda_iue_2011.pdf (accessed: 20.10.2019); Overview of Russian ingle-industry towns: Analytical report of the Institute for Integrated Strategic Studies. Moscow: IKSI, 2017. Available at: https://icss.ru/images/pdf/research_pdf/MONOTOWNS.pdf (accessed: 20.10.2019).

population; budget security, the scale of the economy, socio-cultural, geographical, climatic features, etc.

Meanwhile, due to the absence of adequate and comparable data on the labor market, living standards, wages, and the lack of unified methodology for assessing social well-being on the municipal level, etc., any conscientious study on the state of single-industry towns contributes to the formation of a more complete and real picture of life in these settlements.

The purpose of this study is to define specifics of socio-economic development of single-industry towns in the Republic of Bashkortostan on the basis of comprehensive analysis of empirical data using sociological instruments.

The scientific novelty of this work is the usage of the author's method for studying single-industry towns on the basis of comprehensive and comparative analysis of official statistics and sociological data. To expand and deepen knowledge on single-industry towns within limited statistics of municipal institutions and corporative sector, we suggest adding sociological indicators to groups of statistical values (entrepreneurial activity, subjective assessment of the financial situation, flexibility and quality of the labor market, migration attitudes, confidence in the future, etc.).

The absence of such studies in the Republic of Bashkortostan underlines practical relevance of this work. We believe that the study will allow developing scientifically sound management decisions on strengthening and diversifying the economy of single-industry towns in the Republic and improving living standards of the population.

Methodology of the research

We examine single-industry towns as complex and specific systems, which require corresponding systemic approach to their analysis. According to this logic, we have identified three groups of indicators: 1) the development, functioning and efficiency of town-forming enterprises; 2) the social and labor sphere and population's living standards; 3) demographic development and migration attractiveness. The feature of the author's technique is the comparison of official statistics with the results of the sociological research that allowed clarification and "revival" of the image of life in single-industry towns, enriching it with information on business potential, the presence, and nature of alternative employment strategies, socio-economic well-being and health, migration installations, and other information. The developed method can be used for a comprehensive study of other Russian single-industry towns, the search for efficient strategies of their modernization, and the development of targeted measures to support their modernization.

Objects of the research are six single-industry towns in the Republic of Bashkortostan included in the list of single-profile municipal institutions of the Russian Federation (single-industry towns), approved by the RF Government decree no. 1398-p, dated July 29, 2014. Empirical basis of the research is municipal statistical data, financial reports of town-forming enterprises, investment plans and strategic planning documents of studied towns, legal acts of the Russian Federation and the Republic of Bashkortostan. To represent life in single-industry towns more comprehensively,

Table 1. Main indicators of the socio-economic situation in single-industry towns of the Republic of Bashkortostan

Indicators	Neftekamsk	Blagoveshchensk	Uchaly	Beloretsk	Belebey	Kumertau
Local budget incomes, 2018, thousand rubles per 1 person.	16.74	8.16	4.41	4.86	4.22	19.54
Net profit (loss) of the city-forming enterprise, 2017, thousand rubles.	44	-263* 1886**	303	1004	91	-3413
Increase of the number of organizations per 1000 people, 2018 in % to 2010	9.5	2.8	-11.2	-9.7	5.0	7.7
Increase of entrepreneurs per 1000 people, 2018 in % to 2010	-25.7	-11.8	-8.6	-15.8	-17.0	-26.4
Share of those who have a business and plan to start one in the near future, 2015, %	2.1	14.3	9.5	16.8	12.0	2.7
Population growth, 2010–2018, people	16685	403	-2945	-22028	43	-8943
Average age of the population, 2018, years	36.7	36.5	38.28	39.48	39.25	39.55
Share of the able-bodied population in the total population, 2018, %	57.8	55.9	52.5	53.3	56.0	53.9
Average salary of employees, 2017, thousand rubles per month	31.3	35.8	34.9	27.7	25.7	28.0
Level of subjective poverty, 2015, %	16.6	29.6	40.4	32.0	36.2	34.9

* JSC "BAZ".
** JSC "Polief".
Source: own compilation on the basis of official statistics data and sociological studies (specific sources are listed in the analysis and explanation of results section below).

we used database of the sociological research "Strategy of social and economic development of the Republic of Bashkortostan until 2030" (RB Strategy – 2030)[5]. We chose this study as an empirical basis, because we had to conduct the analysis on the municipal level, which required a large sample size. A study of such scale was last conducted in 2015 as part of the development of the "Strategy of social and economic development of the Republic of Bashkortostan until 2030".

[5] Organizers of the research: The Ministry of Economic Development of the Republic of Bashkortostan, the Bashkir Branch of the ISRAS, Institute of socio-political and legal studies of the Republic of Bashkortostan. Object of the research – RB population aged from 18 to 75. The sample is zoned by socio-economic zones of the RB, stratified, with gender and age quotas at the household selection stage. Sample size – 6300 people. The research method is self-filling of a sociological survey (questionnaire) blank. Field work dates: July–October 2015.

Results of the research

The comprehensive study of single-industry towns allowed: 1) ranking towns according to the level of socio-economic welfare; 2) revealing specifics of their development, relevant issues and risks, potential; 3) defining the role of local authorities and town-forming enterprises in single-industry towns. These results are reflected in images of single-industry towns, given later according to the increase of ill-being risks. Primary socio-economic indicators are given in *Table 1.*

Neftekamsk is placed second according to the level of local budget income per 1 person. Financial indicators of the town-forming enterprise have positive trends, the number of organizations in the town grows, but the number of employees in organizations decreases.

Salaries of employees are higher than national average numbers. The working population mostly has indefinite employment contracts. At the same time, the population notes a lack of employment opportunities in case of the loss of the main job. The entrepreneurial potential[6] is low. The city has the lowest level of subjective poverty. The town's population is the youngest, and the share of the able-bodied population is the highest. This is the only single-industry town in the Republic, where the population grows due to natural and migration processes.

Blagoveshchensk has two functioning oil town-forming enterprises. Therefore, it has the highest salaries among single-industry towns. However, local budget incomes per 1 person are quite low. The town is characterized by the highest entrepreneurship activity and a low growth of the number of organizations. It shows the growth of informal employment, which is quite contradictory. On the one hand, it increases the flexibility of the local labor market and employment opportunities. On the other hand, it contributes to the growth of socio-economic differentiation among population, the reduction of average salaries and employment quality. The population has a lot of loans. The share of the poor population is not as high as in other single-industry towns, but it is significant. The population number has not changed much in 2010–2018. Blagoveshchensk is the youngest town according to age composition of the population. It, probably, explains the desire of many people to leave it, because young people do not see any opportunities for themselves in this town.

In Uchaly, there is the highest level of concentration of able-bodied population at the town-forming enterprise, which implies heavy dependence of the socio-economic status of its residents on the state of the primary employer. Employees of the town's organizations receive a fairly high salary (above the national average). However, the financial position of the town-forming enterprise worsens, although it is still characterized as profitable. Let us note that the growth rate of the sector itself, i.e. mining, has significantly decreased in recent years. This town is characterized by the lowest local budget revenues per person. The number of organizations deceases; the level of business activity remains low. A third part of the surveyed population thinks that they could lose their jobs, but the possibility of finding a new job is very low. With the highest level of subjective poverty, the population has a lot of loans. The share of able-bodied population is the lowest. The rate of natural population growth rapidly decreases, and there is a trend of increasing migration outflow. However, in 2015, the majority of respondents had no desire to leave the town. When asked about confidence in the future, a significant number of Uchaly's residents could not give a definite answer. In our opinion, a single-industry town is at risk of the socio-economic situation deterioration.

Beloretsk has low local budget incomes per one person. The town-forming enterprise provides jobs for almost a third part of all organizations' employees. The enterprise is profitable, but the level of salaries in the town is lower than average numbers in the Republic. The decline of the growth rate of nominal salaries began in 2014. In our opinion, it happened because of the reduction of the

[6] The entrepreneurial potential in this article was evaluated on the basis of sociological data on the availability and / or desire to have own business (SP, private enterprise, farm, etc.).

number of employees in the town, the growth of flexible working regimes, informal employment, and self-employment. More than a quarter of respondents said (the highest rate among single-industry towns) that they would easily find a new job in case of losing a current one. Almost 30% of the town's residents considered themselves poor, and two thirds of respondents do not have loans. The town's population is relatively old, and there is a stable natural and migration decline. Despite all difficulties, the population is quite optimistic about the future.

Belebey is a town with low local budget incomes per one resident and the lowest salaries among all Republic's single-industry towns. At the same time, there is a small increase in the number of organizations (and the reduction of the number of employees in them) and a fairly high business potential. It is mostly implemented in the informal sector of the economy and self-employment. Responses confirm this statement: it is relatively easier for local residents to find another job than for residents of other single-industry towns. The population of Belebey is not young. There is a high level of subjective poverty among people. They are very cautious about loans. Belebey is the only town in the Republic where the net profit of the town-forming enterprise, over the past three years, has increased in more than 2 times and, since 2017, the city has faced a migration increase. However, the natural decline (as a consequence of the population aging) is still preserved.

Kumertau has the highest local budget incomes per one person, which is related to low salaries in towns' organizations. The share of wealthy population here, according to sociological polls, is the lowest among all single-industry towns of the Republic. It indirectly shows a high social stratification. The population has a lot of loans. The city-forming enterprise provides jobs for a third part of organizations' employees. The company is unprofitable, fixed assets are worn out by 60%. The number of employees in organizations decreases. The town has the least flexible work regimes, there are basically no employment alternatives, and entrepreneurship is badly developed. TASED education attracted 12 residents into the city in 2015, but its socio-economic impact is not noticeable. However, growth rate of local budget incomes significantly increased. There are the highest population loses in the city, the main reason of which is the migration flow. At the same time, the natural decline of the population increases.

Analysis and explanation of gained results

1. The state of town-forming enterprises and the economy of single-industry towns in the Republic of Bashkortostan. Town-forming enterprises play a key role in the economic development of single-industry towns. The situation on the labor market, budget filling, and the state of urban infrastructure largely depend on them. Most of the town-forming enterprises of the Republic's single-industry territories specialize in processing industry: production of vehicles, machinery and equipment, finished metal products, production of plastic products, etc. The exception is Uchaly, where the town-forming enterprise belongs to the extractive industry. In general, industrial production indices show positive dynamics. However, in comparison with 2010 level, their growth rate has significantly decreased: especially, in the extractive industry. Emerging signs of post-crisis recovery let us hope for certain stability

Table 2. Characteristics of main town-forming enterprises of single-industry towns in the Republic of Bashkortostan

Town-forming enterprises (name, year of foundation)	Sector of specialization	The share of the enterprise's employees in the total number of employees in town's organizations, %	The share of the enterprise's employees in the total number of town's able-bodied population, %
JSC Belebeevsky zavod "Avtonormal" (JSC "BelZAN", 1971)	Manufacture of fasteners and springs for the automotive industry	20.0	7.6
OOO Belebeevskii zavod "Avtokomplekt" (OOO "BZAK", 1998)	Manufacture of electrical and electronic equipment for motor vehicles	2.7	1.0
OOO Belebeevskoe predpriyatie "Avtodetal" (OOO "Belavtodetal",1945)		1.8	0.7
PJSC "Kumertauskoe aviatsionnoe proizvodstvennoe predpriyatie" (JSC "KumAPP")	Manufacture of helicopters, planes, and other aircraft	31.3	10.6
PJSC "Beloretskii metallurgicheskii kombinat" (JSC "BMK", 1762)	Manufacture of wire by cold drawing	31.6	16.1
PAO "Neftekamskii avtozavod" (PAO "NEFAZ", 1972)	Manufacture of bodies for motor vehicles; production of trailers and semi-trailers	19.5	7.5
PJSC "Blagoveshchenskii armaturnyi zavod" (JSC "BAZ", 1756)	Manufacture of other cranes and valves	18.6	8.6
JSC "Polief" (1985)	Manufacture of plastics and synthetic resins in primary forms	12.5	5.8
PJSC "Uchalinskii gorno-obogatitel'nyi kombinat" (JSC "UGOK", 1961)	Mining and processing of copper ore	52.9	31.0
Sources: complied and calculated according to the following data: 1) Socio-economic situation in municipal districts and urban districts of the Republic of Bashkortostan: stat. coll. Bashkortostan. Ufa, 2018; 2) Official websites of town-forming enterprises.			

and opportunities to improve the situation in single-industry towns, provided that a well-thought-out management strategy is selected and implemented.

Main activities and key characteristics of the town-forming enterprises in single-industry towns of the Republic are given in the *table 2.*

Indicators of financial and economic activity of the Republics' town-forming enterprises show its insufficient efficiency *(Tab. 3)*. In 2015–2017, among all the enterprises, net profit amounts grew up only in JSC "BelZAN" (more than 2 times) and PAO "NEFAZ". Incomes of JSC "BMK" and JSC "UGOK" heavily decreased. JSC "KumAPP" and JSC "BAZ" became unprofitable. Despite the positive balance of accounts payable and receivable of JSC "KumAPP", the positions of it and JSC "BAZ" are the least stable. In terms of revenue and turnover, the largest enterprises are JSC "UGOK" and JSC "BMK", and this is reflected in the number of their employees.

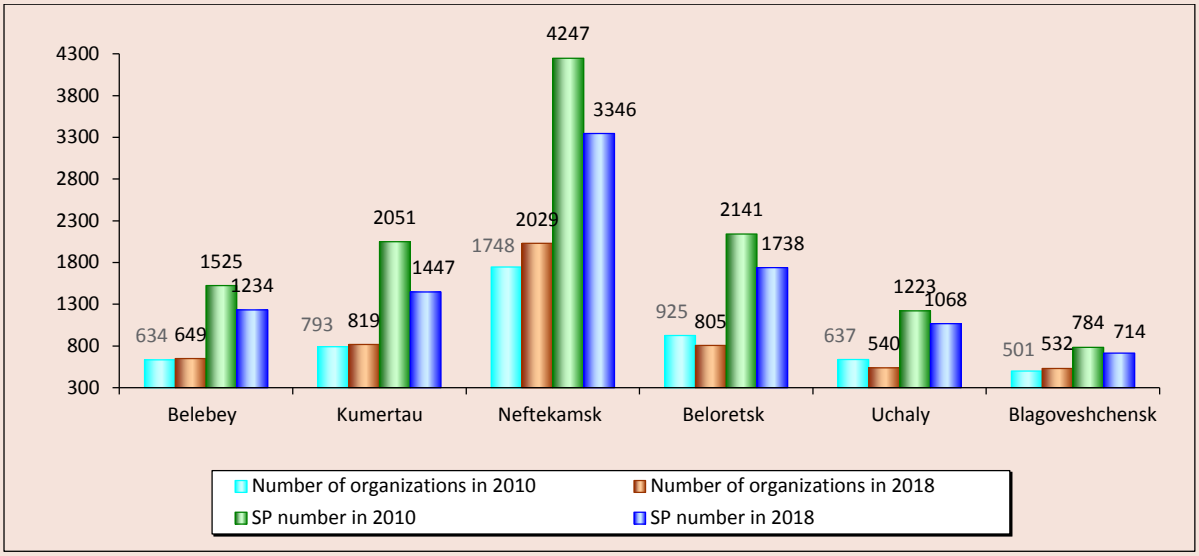
The strengthening of the socio-economic position of single-industry towns is impossible without diversification of economic activity types, the growth of organizations, and enterprises' busi-ness activity. In 2010–2018, the growing number of organizations was noticed in Neftekamsk (16.1%), Blagoveshchensk (6.2%), Belebey (2.4%), and Kumertau (3.3%). Creation of TASED in Belebey and Kumertau in 2016 did not lead to the significant increase of organizations in them. In Uchaly, the number of organizations decreased by 97 units, in Beloretsk – by 120 units (*Fig. 1*).

Table 3. Indicators of financial and economic activity of town-forming enterprises of the Republic of Bashkortostan

Years	JSC "BelZAN"	JSC "KumAPP"	JSC "BMK"	PAO "NEFAZ"	JSC "BAZ"	JSC "UGOK"
Net profit (loss), thousand rubles						
2015	45688	…	2096550	-393000	47585	3300720
2016	36028	…	315524	37041	-278602	3018990
2017	91385	-3412520	1003970	44356	-262687	302812
Revenue, thousand rubles						
2015	4178250	…	23466700	8661430	2832180	24151900
2016	4421470	…	22889400	12246600	2701930	21749100
2017	4811400	7656410	23932300	13139400	2540990	20486400
Accounts receivable, thousand rubles						
2015	766283	…	3168060	1573700	531629	1398210
2016	672860	…	4154530	2644270	422157	5474920
2017	481335	3616340	6273560	2047250	401525	3087100
Accounts payable, thousand rubles						
2015	427278	…	3672580	1889160	328774	2420560
2016	539868	…	3565010	3180300	250981	1988620
2017	401553	5861310	3310870	2620870	389265	3229150

Source: Accounting reports of town-forming enterprises: https://www.audit-it.ru/buh_otchet/

Figure 1. Dynamics of the number of organizations and individual entrepreneurs in single-industry towns of the Republic of Bashkortostan, units



Sources: 1) *Socio-economic situation in municipal districts and urban districts of the Republic of Bashkortostan: stat. coll.* Bashkortostan. Ufa, 2011; 2) Same source. Ufa, 2018.

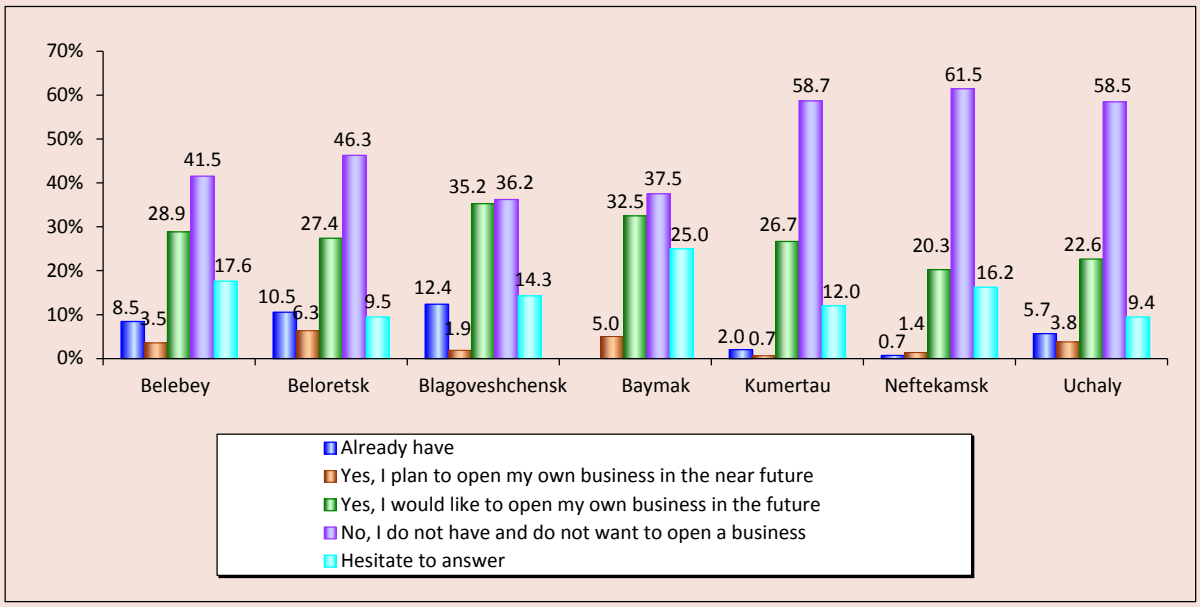
In this period, there was a decrease of the number of sole proprietorships in all single-industry towns. The highest number of closed SP was registered in Neftekamsk: where were 900 entrepreneurs more in 2010 than in 2018. In relative terms (per 1.000 people), the largest reduction of the number of sole proprietorships was observed in Kumertau – by 26.4%. The main reasons are the increase of taxes for entrepreneurs and the decrease of the

population's purchasing power. Sociological data from 2015 show a higher entrepreneurial potential in Blagoveshchensk, Beloretsk, and Belebey: the situation is different in other single-industry towns (*Fig. 2*).

In order to diversify, modernize, and improve the socio-economic situation of single-industry towns, TOSEDs are created. Currently, they operate in five of six single-industry towns of the Republic *(Tab. 4)*.

Socio-economic situation of a single-industry town and its potential heavily depend on budgetary security. Income of a municipality is also an indicator of the efficiency of local self-government bodies and their interaction with economic entities.

Figure 2. Distribution of answers to the question: "Would You like to have your own business? (SP, private enterprise, farm, etc.)?"



Source: data of the sociological study "RB Strategy – 2030".

Table 4. Main features of territories of advanced socio-economic development in the Republic of Bashkortostan (TASED)

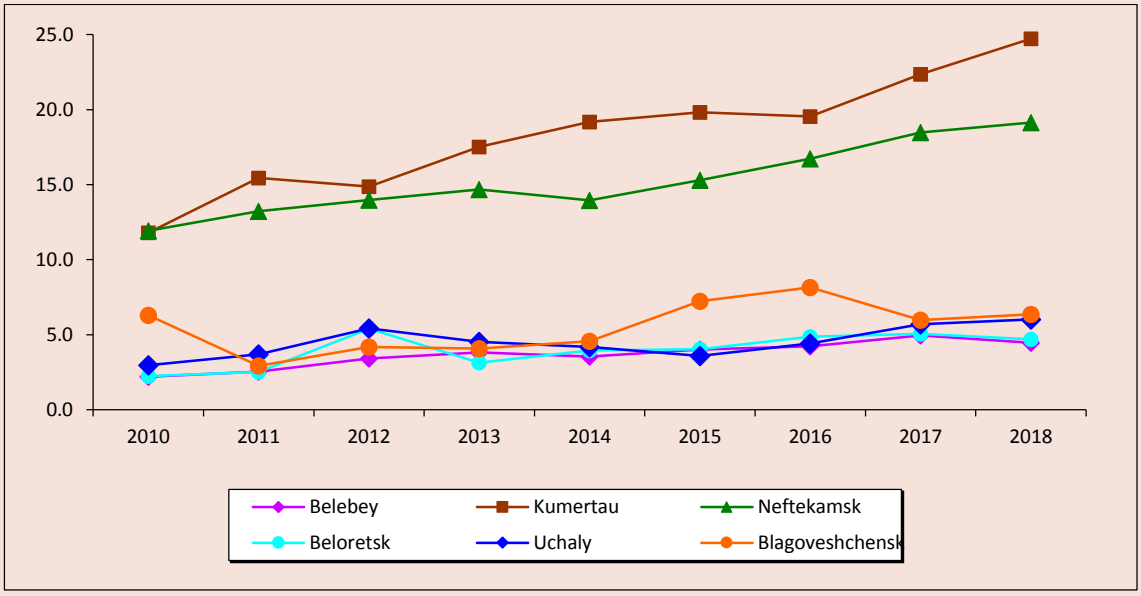
Town	Year of TASED creation	Number of residents	Project implementation area	Expected results
Belebey	2016	12	Manufacture of equipment for the oil industry, mineral fertilizers, reinforced concrete products, metal structures; food industry	More than 2.9 billion rubles of investments, more than 2 thousand new work places
Kumertau	2016	12		
Neftekamsk	2019	2	Light and food industry, construction	More than 3.3 billion rubles of investments; more than 1 thousand new work places
Beloretsk	2019	1		
Blagoveshchensk	2019	1		
Uchaly	Work to create TASED is underway			
Sources: 1) TADs in Russian single-industry towns attracted billion rubles of investments. URL: https://economy.bashkortostan.ru/press-tsentr/news/tor-v-monogorodakh-rossii-privlekli-22-mlrd-rubley-investitsiy/ (accessed: 10.10.2019); 2) The first residents of the Bashkir TASEDs "Beloretsk" and "Blagoveshchensk" are included in the register of TASED residents of the Ministry of economic development of Russia. URL: https://realnoevremya.ru/news/153416-pervye-rezidenty-bashkirskih-toser-beloreck-i-blagoveschensk-vklyucheny-v-reestr-rezidentov-toser-minekonomrazvitiya-rossii (accessed: 10.10.2019).				

Budget revenues of such towns significantly differ in per resident calculation. Kumertau (24.7 thousand rubles per capita) and Neftekamsk (19.1 thousand rubles) were more successful in this regard. In other towns, this indicator is in the range of 4.7–6.3 thousand rubles per capita *(Fig. 3)*.

Interesting results were shown by the sociological assessment of the efficiency of authorities' actions and management on regional and local levels[7]. People think that municipal power is better informed about citizens' needs than regional authorities, but it is less concerned about using this knowledge in the work: on the municipal level, the distance between awareness of problems and their usage in the work is longer than on the regional level. It shows the lack of real opportunities (legal, organizational, financial) for local authorities to solve local problems on their own. These data indicate that local and regional authorities do not take into account the needs of the town's population.

2. Employment, living standards, and social well-being of the population of single-industry towns. The town-forming enterprises of studied towns include a significant share of able-bodied population. However, the share of employees in these enterprises differs in the total number of employees in organizations. JSC "UGOK" is the employer to 52.9% of workers of all town's organizations, JSC "BMK" – to 31.6%, JSC "KumAPP" – to 31.1%. There are two large functioning enterprises in Blagoveshchensk (JSC "BAZ" and JSC "Polief"), which include 31.1% of the towns' employees in organizations. In Belebey, almost 25% of employees work in three enterprises which produce equipment and products for motor transport industry. In PJSC "NEFAZ" – 20% of town's employees (Tab. 2).

Figure 3. Dynamics of local budgets income indicators of single-industry towns in the Republic of Bashkortostan, thousand rubles per capita



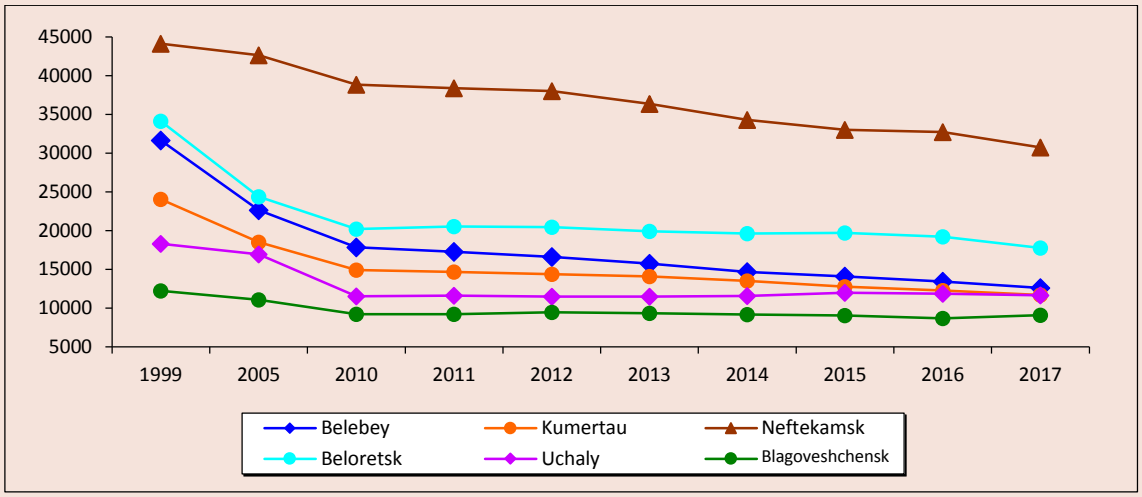
Source: Unified Interdepartmental Statistical Information System (UISIS).

[7] Results of the same study "RB Strategy – 2030", 2015.

The number of employees in single-industry towns' organizations had noticebly decreased by 2010. In the following years, the situation has relatively stabilized, but the decline continued in Neftekamsk (-8100 people in 2010–2017), Belebey (-5266 people), Kumertau (-3217 people), Beloretsk (-2466 people). In Uchaly and Blagoveshchensk, which are "economically stable" towns, the number of employees in organizations has not changed (*Fig. 4*).

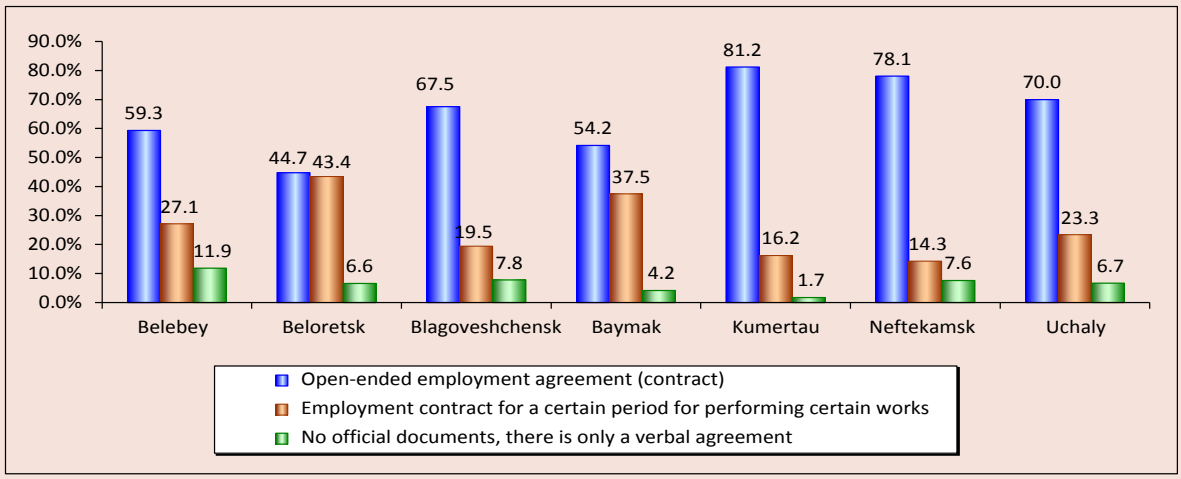
In single-industry towns, less flexible work regimes are maintained. Uchaly, Kumertau, and Neftekamsk are particularly noticeable: 70–80% of the working population there has indefinite employment contracts *(Fig. 5)*.

Figure 4. Average number of employees in all organizations of RB single-industry towns for 1999–2017, people



Sources: 1) *Socio-economic situation in municipal districts and urban districts of the Republic of Bashkortostan: stat. coll.* Bashkortostan. Ufa, 2011; 2) Same source. Ufa, 2018.

Figure 5. Distribution of answers to the question "Are Your relations with an employer at the primary job officially registered or not?»



Source: data of the sociological study "RB Strategy – 2030".

At the same time, according to sociological data, about a third of the employees of these towns think that they could lose their jobs. If it happens, it will be very difficult for them to find another job, especially in Kumertau and Uchaly. In Neftekamsk (a large town with institutions of higher education), there are more chances to find another job, but it is still a difficult task there too.

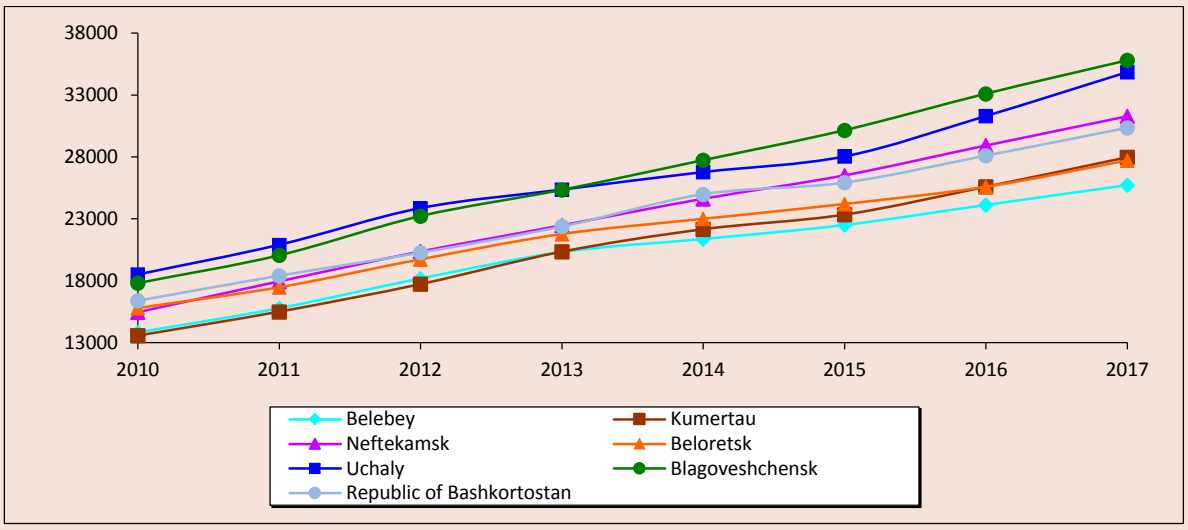
There are more opportunities for employment in places where more flexible working regimes are practiced. In our situation – in Belebey, Beloretsk, and Blagoveshchensk. The highest share of respondents, who answered "I can easily find another job", is in Beloretsk (28%) and Belebey (24%); for comparison: in Kumertau – 6%, Uchaly – 10%, Neftekamsk – 13%. At the same time, these towns have lower salaries and, apparently, higher level of informal employment.

The highest salaries are in Blagoveshchensk, Uchaly, and Neftekamsk *(Fig. 6)*. Average monthly salaries of organizations' employees in these towns exceed average salaries' numbers in the Republic. Beloretsk, Kumertau, and Belebey lag behind according to this indicator, and salaries' in them are below average numbers in the Republic. Neftekamsk "broke away" from its neighbor in the category "with risks of the socio-economic deterioration" since 2014, when the growth rate of salaries in Beloretsk slowed down.

Most of the single-industry towns' population, as well as the Republic's population, do not speak highly of their financial situation ("there is enough money for clothes and food, but it is difficult to purchase household appliances and furniture") (*Fig. 7*).

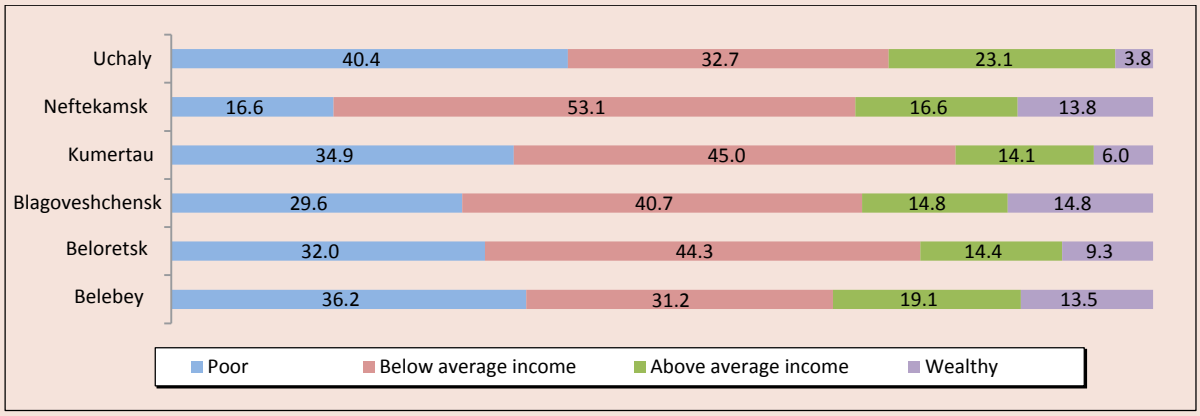
This is also relevant for relatively prosperous single-industry towns of Neftekamsk and Blago-veshchensk. At the same time, Neftekamsk has the lowest level of poverty – 16.6%. In other single-industry towns, the share of poor people is 30–40%. In the districts

Figure 6. Average monthly salary of organizations' employees, rubles



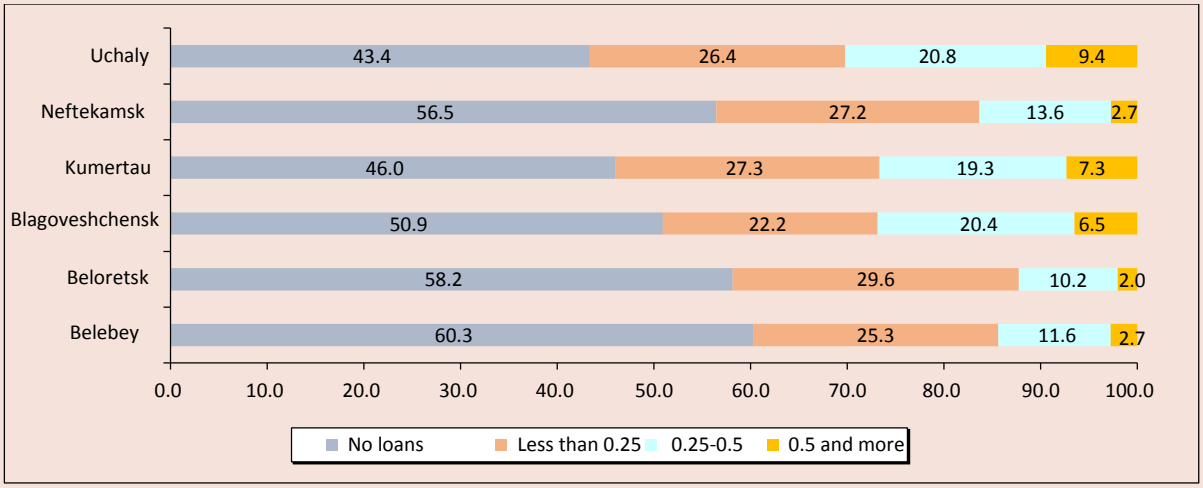
Sources: 1) *Socio-economic situation in municipal districts and urban districts of the Republic of Bashkortostan: stat. coll.* Bashkortostan. Ufa, 2011; 2) Same source. Ufa, 2018.

Figure 7. Structure of the population of single-industry towns according to financial status



Source: data of the sociological study "RB Strategy – 2030".

Figure 8. Distribution of answers to the question "Do you have loans (mortgages, car loans, consumer loans, etc.) and, if so, how much of Your family budget You spend on these loans?"



Source: data of the sociological study "RB Strategy – 2030".

where the highest level of salaries is observed, there is a fairly strong stratification: the highest share of the poor population with a high share of the population with incomes above the average level. Strong income differentiation is also observed in Belebey, mainly due to the growth of informal employment.

Uchaly, with the highest level of poverty, is also characterized by its high level of huge debt load: approximately one person out of ten has a loan on which he spends 50% of the family budget. Every fifth person spends 25–50% of family budget on loan payments. The population of Kumertau (the town with a low number of wealthy population), as well as people in Blagoveshchensk (with fairly high salaries), have lesser, but still significant, debt loads *(Fig. 8)*.

3. Demography and migration attractiveness of territories. Population change (natural, mechanical, qualitative, and structural) is one of the most striking indicators of the social well-being. The population of single-industry towns of the Republic, as of 01.01.2019, was 400.980 people (10% of the total population). In 2000–2018, this figure decreased by 4% (or 16.8 thousand people). The number barely changed in Belebey and Blagoveshchensk, and it decreased in Beloretsk by 22 thousand people, in Kumertau – by 8.9 thousand people, in Uchaly – by 2.9 thousand people. Neftekamsk was the only town with positive dynamics of the population number, the growth of population in which was 113.6% (16.7 thousand people).

The assessment of the contribution of natural and migration growth to the population dynamics of single-industry towns in recent years shows that they lost 1.246 people due to migration outflow in 2015–2018 and gained 1.108 people due to natural growth. In general, natural growth was observed in towns with younger population: in Neftekamsk (the highest), in Uchaly and Blagoveshchensk (more modest results). In Kumertau, the main reason of the population decline was migration decline, in Beloretsk –natural decline, as the result of population aging. Since 2017, there has been a migration increase in Belebey (as a result of investments in the town's development). However, in order to reduce the natural loss, a significant rejuvenation of the town's population is required (*Tab. 5*).

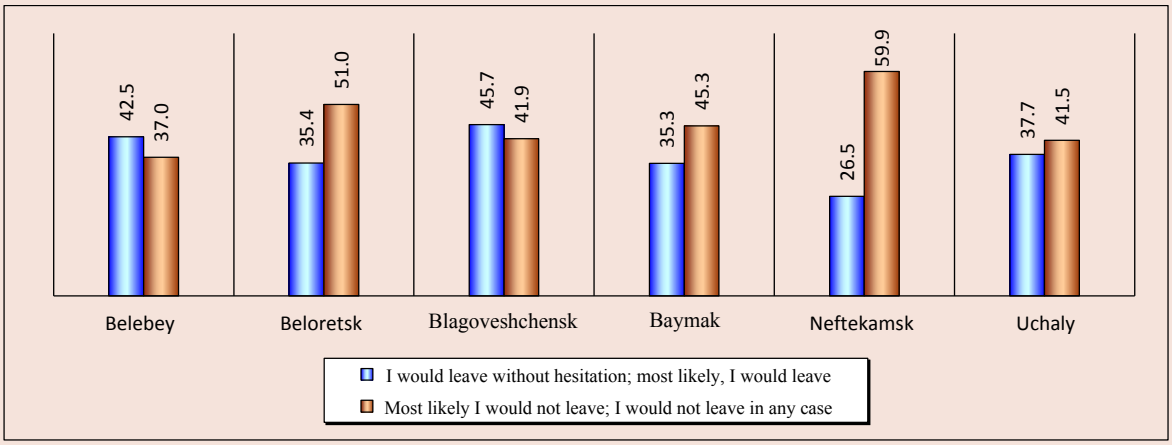
In the absence of employment alternatives (and career/personal growth prospects for young people), single-industry towns cannot retain the population. Sociological studies show a high migration potential in these towns. In general, in 2015, the share of people, who wanted to leave their single-industry towns, was 32%, the share of those, who did not want, was 48%, and the share of those, who could not decide, was 20%. The share of people, who wanted to leave their towns, was below national average numbers only in Neftekamsk. In relatively prosperous Blagoveshchensk, the share of potential migrants even exceeded the share of those who did not want to leave the town. This could be partlially explained by the population's youth. The same unfavorable ratio was observed in Belebey (*Fig. 9*).

Table 5. Contribution of natural and migration growth to the population number dynamics of single-industry towns in 2015–2018

Single-industry town	Migration increase (loss), people				Natural increase (loss), people				Overall for 2015–2018		
	2015	2016	2017	2018	2015	2016	2017	2018	Migration increase (loss), people	Natural increase (loss), people	Overall increase, people
Belebey	-225	-83	292	153	-1	2	-240	-191	137	-430	-293
Kumertau	-529	-420	-492	-238	-70	-97	-216	-209	**-1679**	**-592**	**-2271**
Neftekamsk	-44	24	377	845	904	698	572	396	1202	2570	3772
Beloretsk	-225	-187	-48	-85	-188	-183	-276	-338	**-545**	**-985**	**-1530**
Uchaly	-127	126	185	-240	163	73	33	17	-56	286	230
Blagoveshchensk	-53	-184	-14	-54	77	102	67	13	-305	259	-46

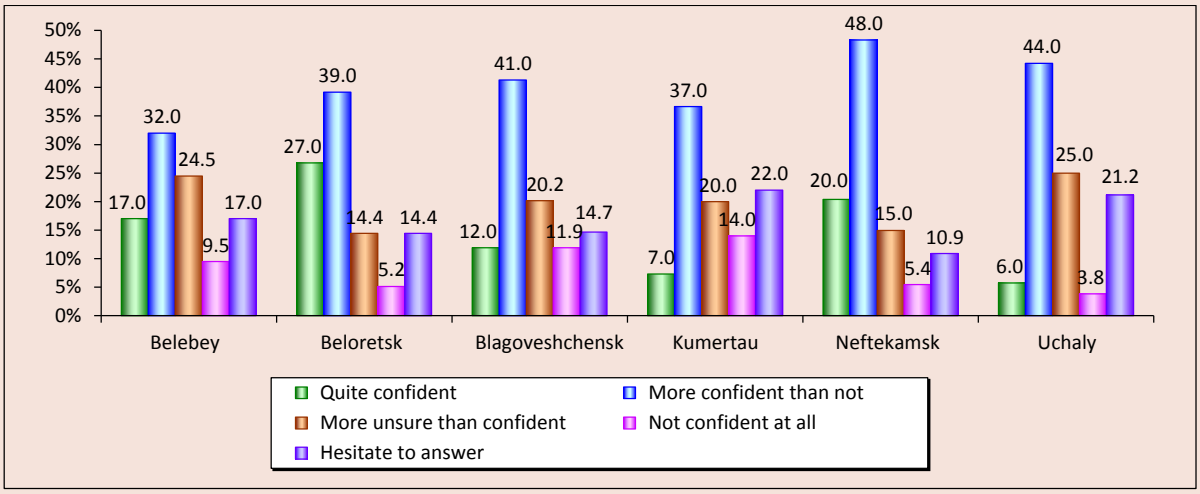
Sources: 1) *Socio-economic situation in municipal districts and urban districts of the Republic of Bashkortostan: stat. coll*. Bashkortostan. Ufa, 2011; 2) Same source. Ufa, 2018.

Figure 9. Distribution of answers to the question "If You had the opportunity to leave Your city for another place of residence, what would You do?"



Source: data of the sociological study "RB Strategy – 2030".

Figure 10. Population's confidence in the future



Source: data of the sociological study "RB Strategy – 2030".

Nevertheless, despite the difficulties, most residents of single-industry towns are optimistic about the future. The largest share of people, confident in their future, lives in Neftekamsk (20.4% are absolutely sure, 48% are more confident than not) and Beloretsk (27% are quite sure, 39% are more confident). The largest share of "pessimists" was recorded in Belebey, Kumertau, and Blagoveshchensk: 20–25% of respondents are more uncertain than confident, including 9–14% of those who are completely unsure about their future. Uchaly and Kumertau have a high percentage of those who found it difficult to answer this question (from 17 to 22%), which, in our opinion, cannot be evaluated positively (*Fig. 10*).

Conclusions

At the end of the research, we would like to start a discussion on the following topics.

In accordance with criteria of the Ministry of Economic Development of the Russian Federa-tion, single-industry towns of the Republic of Bashkortostan are divided into three categories: 1) with the most difficult socio-economic situation (Belebey, Kumertau); 2) with risks of the socio-economic deterioration (Neftekamsk, Beloretsk); 3) with stable socio-economic situation (Uchaly, Blagoveshchensk). However, according to the obtained results, only Neftekamsk may be considered a town with a stable current socio-economic situation; Blagoveshchensk, Uchaly, Belebey are towns with risks of the socio-economic deterioration; Beloretsk and Kumertau are towns with the most difficult socio-economic situation. The category of single-industry towns does not contain significant information, and it is not related to the support system of single-industry towns or the creation of TASED. The decision to allocate the necessary support funds is always made in a targeted manner.

According to studies, including foreign ones, the most efficient way to strengthen the position of single-industry territories is to diversify their economy and to develop small and medium-sized businesses. The creation of TASED is aimed at attracting investments in the amount of, at least, 5 million rubles and creating, at least, 10 job places in the first year of the project. This requirement is unaffordable for most start-up entrepreneurs and does not encourage the development of honest entrepreneurship and small businesses. This study showed that, in several towns with high entrepreneurial potential, there is a "spontaneous" diversification of the economy and the growth of informal employment, which are difficult to control and take into account. Despite the decrease of dependence on a city-forming enterprise, such development leads to the decrease of the employment quality, deterioration of the material and legal status of employees, and, ultimately, negatively affects the viability of the city. If the creation of TASED is aimed at attracting investment and developing industries with an export orientation, the development of small businesses should stimulate domestic demand and economic activity of the population. At the same time, municipal authorities do not have the opportunity to significantly influence the socio-economic development of a town due to limited budgetary and organizational resources. Consideration of the specifics of single-industry towns, which is achieved by usage of sociological data, allows developing more efficient targeted measures of their modernization.

As noted at the beginning of the article, along with available and relatively new statistical materials, we used empirical data collected at the end of 2015. For a comprehensive assessment of progress, a new and more focused sociological study, which would include an in-depth, qualitative analysis of opinions and assessments from the expert community, is required. It will allow giving more complete answers to new challenges and issues, faced during the development of single-industry towns, assessing the efficiency of management measures and decisions on their socio-economic and demographic development.

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Tax Administration in the Forest Management System and its Influence on the Budgets of Northern Territories*

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Abstract. The subject of the paper is related to the need to eliminate the discrepancy between the theory of taxation in terms of forest management tax administration and forest resources rational use. The purpose of the paper is to present the results of the research on tax administration in the forest management system and its influence on the budgets of the Northern territories. Scientific novelty of the research consists of the development of the theory of tax administration in forest management and the determination of its impact on the budgets of the Northern territories: the concepts of "tax administration in forest management" and "tax potential of forest management" are specified; the necessity of highlighting the special role of tax administration in forest management in the forestry sector development programs is substantiated; the classification of fiscal payments in forest management is proposed; the criteria and indicators for assessing the effectiveness of tax administration in forest management are defined. Theoretical and practical significance of the research lies in the fixing of urgent current problems of tax administration in forest management, interrelated with the management of forests in the Northern regions; the grouping of tax authorities' control measures in the forest sector, which makes it possible to identify tax law violations systematically; the analysis and evaluation of the effectiveness of tax administration in forest management and its influence on the budgets of Russian Northern territories (the case of the Republic of Komi); the analysis of domestic and foreign practices (USA, UK, Finland) of tax administration through information technologies; the systematization of problem areas of tax administration in the field of forest management in the Northern regions of Russia (geographical, infrastructure, socio-economic, organizational, information technology); the development of ways of improving tax administration of the forest usage in the Northern territories, based on the introduction of information technologies, state and public control over forest usage, and support services for taxpayers. The research methodology is based on the theories of taxation, environmental economics, and regional economics. To achieve the goal of the study, the methods of dynamic and static analysis of the effectiveness of tax administration in forest management were used. It allowed us to identify urgent problems.

Key words: tax administration, tax and non-tax payments, corporate income tax, value added tax, budget, forest management, Northern regions, information technologies.

Introduction

The model of tax administration used in Russia [1, 2] is often the target of fair criticism. Currently, tax administration in the forest management system is based on the general provisions of the Tax code of the Russian Federation. However, this document does not reflect the specific features of this type of activity that are taken into account in taxation. In addition, the Forest code of the Russian Federation establishes a number of non-tax payments the administration of which is outside the tax authorities' competence. Insufficient elaboration of the legal framework and low level of tax culture cause the usage of various tax evasion schemes and, thus, prevent the budget from being fully filled.

Based on the factual material, collected in the course of the research, we tried to introduce the analysis of current tax administration problems in forest management, related to problems influencing budgets of the Northern territories, into the mainstream of existing tax theories from the point of view of the necessity to improve tax policy.

The key purpose of the paper is to present the results of the research on tax administration in the forest management system and its influence

on the budgets of the Northern territories. ***The objectives*** are the following: definition of theoretical and methodological bases of the research; determination of the deficiency of forest management as a factor contributing to the tax gap; analysis of strategic documents of forest sector development and taxes reflection as a result of their successful implementation; analysis of fiscal payments for forests use, their classification; systematization of tax authorities' control measures in the forest sector; analysis of domestic and foreign practices of tax administration in forest management using information technologies, identification of areas for improvement.

Scientific novelty of the research consists of the development of the theory of tax administration in forest management and the determination of its influence on the budgets of the Northern territories: the concepts of "tax administration in forest management" and "tax potential offorest management" are *specified*; the necessityof highlighting the special role of tax admini-stration in forest management in the forestry sector development programs is *substantiated*; the classification of fiscal payments in forest management is *developed*; the criteria and indicators for assessing the effectiveness of tax administration in forest management and its influence on the budgets of the Northern territories are *proposed*; the grouping of the tax authorities' control measures to assess the performance of forest sector organizations, helping to systematically identify the violations of the tax legislation, is *proposed*; problem areas of tax administration in the field of forest management in the Northern regions of Russia (geographical, infrastructural, socio-economic, organizational, information technology) are *systematized*; directions for improving tax administration of forest usage are *developed*.

Theoretical and practical significance of the research is in the fixing of urgent current problems of tax administration in forest use interrelated with forest management in the Northern regions of Russia as an objective basis for taxation and budget formation; systematization of tax authorities' control measures in the forest sector; analysis and evaluation of the effectiveness of tax administration in forest management and its influence on the budgets of the Northern territories of Russia (the case of the Republic of Komi); development of the ways of the improvement of tax administration in forest use in the Northern territories, based on the introduction of information technologies, state and public control over forest use and support services for taxpayers.

Research methods: the research is based on the theories of taxation, environmental economics,and regional economics. To achieve the goal of the study, the methods of dynamic and static analysis of the effectiveness of tax administration in forest management were used.

Problem setting

The results of the analysis of the theory and practice of tax administration in the forest management system show an increasing trend of imbalances in forest management and tax administration which affected the budgets of the Northern territories of Russia.

The conducted research allowed us to identify organizational and financial problems caused by the lack of a unified forest management system in the country including interrelated management elements, i.e. forest management, and admini-stration of tax and non-tax payments for the use of forest resources which affected the lack of budget revenues needed to finance public goods in the Northern territories.

Analysts note that "in fact, the forest industry began to destroy the forests of Russia on its own, doing it uncontrollably. This is related to the idea of using the forest, as well as the idea of the market economy self-regulation. ... It is necessary to change the attitude to this sector in order to get away from the idea that the forest can only be used for profit. The authorities should realize the global and strategic importance of forest resources for the development of Russia and the forest sector of the economy in order to revive it, make it better, more progressive and developed"[1], including as a source of budget revenues needed to finance public goods. It should be noted that in the bioresource economy, commercialization is becoming increasingly important (both for business as a source of profit, and for budget as tax revenue), regulated and aimed at modernizing forest management through the production of biological products and the provision of ecosystem services [3, 4].

Losses of forest resources and uncontrolled forest use influence the shortfall of budget revenues. In our opinion, the judgments made on the basis of the analysis of specific situations (in addition to the overall socio-economic assessment of forests) may be useful for revising main theoretical positions in terms of forest management, interrelated with the tax administration in forest use.

One of the examples of such analysis [5] allows making the following theoretical assump-tions:

– forest use management, interrelated with tax administration, includes the whole complex of measures on protection, use and reproduction of biological resources affecting the tax base of the territories;

– capitalization of biological resources covers not only tangible assets (as a basis of taxation), but also the forests' ecological function (therefore, it is necessary to consider taxes' ecological potential when forming tax policy);

– the transition to a recovery model of conservation of forests' natural capital (causing the transformation of economic potential into tax potential) is possible only within the boundaries of a relatively large areas of the taiga territories (not less than 10 sq km) where the (taxable) economic activity may be arranged on a geosystem basis;

– the territorial dimension of forestry activities (of taxpayers) assumes the presence of a relevant administrative center for forest management (which in the past, up to 2006[2], was a forestry enterprise of leskhoz) which would interact with the tax authorities and help improve the performance of tax administration in forest management.

It should be noted that tax administration and forest management in the Republic of Komi were previously connected territorially and informationally. Thus, in terms of location, the forestry enterprises were equivalent to the forest economic districts, organized on the principles of forests' cyclical reproduction, taking into account the configuration of population settlement, and served as a standard of life of the taiga territories where tax control, carried out by territorial tax authorities, contributed to the growth of tax collection,

[1] Forest sector of the Russian economy. Website "Author24". Available at: https://spravochnick.EN/ekonomika/struktura_sektorov_ekonomiki/lesnoy_sektor_ekonomiki_rossii/ (accessed December 24, 2019)

[2] The current Forest code of the Russian Federation was adopted in 2006. Experts believe that the pre-existing system of forestry and the state forest protection service were destroyed after its entry into force. Available at: https://EN.wikipedia.org/wiki/.

and the standard of living of the population and financing public goods attracted able-bodied population (currently, the emigration reduced the number of taxpayers more than by one third). It is necessary to improve the interrelated tax administration and forest management (based on the experience of forestry enterprises' activities and other subordinate lower structures of forest management) for the creation of obstacles to the predatory deforestation[3] and tax evasion too. Such system would improve the current effectiveness of tax administration in forest management in terms of control over taxpayers and increase tax potential of the Northern territories.

One should also take into account theoretical thesis, confirmed by calculations, that account of the deterioration of natural resources (including forest) radically changes the assessment of the results of economic development in most regions of Russia [8] and their fiscal security. A combined evaluation of natural capital deterioration and forest resources marketability in the most valuable forest areas (slices) allows setting the amount of the income underpaid to a particular region or municipality [9], including those in the form of taxes and non-tax payments from timber producers.

Attempts to apply theory to practice are immediately unsuccessful, since the current practice is not compatible with the basics of rational forest management itself. The practice is unsatisfactory, especially in terms of accounting, assessment, and capitalization of forest resources, as a basis for taxation and their protection at the expense of the budget. In addition, there is an excessive fragmentation of organizational forms of logging allowing to report on the "volume" of small businesses successfully (using special preferential tax regimes), but violating the rules and regulations of forest management, leading to budget losses. There is no correlation between the interests of entrepreneurs (taxpayers) and the local population (recipients of public goods from budget tax revenues), as well as territorial planning, aimed at forest reproduction (growth of the tax potential of forest use) and their socio-environmental functions.

Theoretical and methodological basis of the research

We revealed that the works of domestic and foreign scientists present separate issues of forest management and forest utilization fees [10], the interpretation of the concept of forest rent as an income received from forest use, reduced by the cost of wood harvesting and transportation, with considering a number of factors affecting the processes occurring during forest use. For example, in Finland, the economic organization and management of forests is based on the principle of commensuration of costs and results obtained from forest management. [11]. Perhaps, forest rents should have included land rent, as the quality of forest depends on the quality of land – bonitet, the quality of which affects the price of harvested timber, and, accordingly, the price of taxable income. The lack of a clear conceptual framework of tax regulations and the difficulty of determining the amount of forest rent as a basis for taxation, related to the issues of state control, affected the current system of forest use tax administration.

[3] According to the World Wildlife Fund, Russia annually loses about 1 billion US dollars due to illegal logging [6]. When the Forest code was prepared to be adopted (available at: https://ru.wikipedia.org/wiki/кс), there was a warning that "rapid liberalization of forest management can lead to an increase of forest theft and other violations of the law" [7, p. 44].

In the scientific economic literature, there is no uniform interpretation of the concept of "tax administration". We have established the similarity of interpretations of domestic and foreign economists: tax administration is the daily activity of tax bodies and their officials to ensure timely payment of taxes and fees [12, p. 35]; the practical activities of the competent authorities, primarily the tax ones, to ensure the collection of mandatory payments to the budget system of the state [13–16].

At the same time, there is no clear understanding of the concept of "tax administration in forest management" in scientific papers. In this study, we propose the following definition. Tax administration in forest management is a part of forest taxation management system in the country, including the development of legislation on taxes and fees taking into account the peculiarities of activities of the forestry sector taxpayers, methodological tax support, authorized bodies' control over their implementation, aimed at the formation of budget revenues.

Any state should be interested in the development of its economy, growth of tax revenues, and the increase of taxable capacity. Taxable capacity is interpreted almost in the same way in economic literature: according to Chernick H., it is the ability of the government to transform the results of economic activities, which are localized within certain limits, into the expenditure of the public sector [17]; according to Barro S.M., it is the ability of the territory to obtain tax revenues from its own sources, regardless of the level of fiscal effort under given conditions of taxation [18]. The authors offer the following definition: taxable capacity of forest management is the transformation of the results of forest users' economic activities into tax revenues of different budgets, necessary for the funding of public goods, under given conditions of taxation.

Results of the research

The research determined the following initial points:

– tax system management of forest use should be interrelated with forest management consistent with principles of sustainability which, in turn, are determined by the multifunctional purpose of forests and their value as a public good;

– development of tax administration includes increasing control over the observance of tax legislation, as well as organizational, methodological and analytical support of control activities exactly in the direction of its strengthening given the current critical situation in the use and protection of Russian forests[4];

– introduction of new information technologies in the field of tax administration is first of all advisable to coordinate with the task of improving of accounting and integrated assessment of forest resources as a tax base, and secondly with the formation of the taxable capacity of forestry sector and tax revenues of the Northern territories.

The results of the research are recorded to reflect tax revenues as the efficiency of forest sector programs development, the evaluation of the effectiveness of tax administration in forest management, in the implementation of control measures by tax authorities and tax administration in the field of forest management in the Northern regions of Russia through information technologies.

[4] The non-observance of forest use rules is especially relevant for remote areas where state control is difficult, and, therefore, the use of shadow schemes of "black logging" and tax evasion have become a norm of wasteful behavior. The local population is deprived of its natural foundations of life. In recent years, this "specificity" could be observed in areas adjacent to large cities. Pine forests, located 50–70 km from Syktyvkar, are cut down mercilessly. 650–700 thousand cubic meters of wood (8–9% of the total volume of felling in the Republic) are cut down annually in the forest areas of Syktyvkarskoye and Syktyvdinskoye, situated around Syktyvkar.

Analysis and explanation of the obtained results

Taxes treatment in the strategic documents on forest sector development

The conducted content analysis of several documents, including the Strategy of Development of the Forest Complex of the Russian Federation until 2030, the State Program "Forestry Development" for the period of 2013–2020, the Forest Plan of the Komi Republic, etc., allowed stating that the increase of tax revenues is recorded as one of the expected results of their (the Strategy, the State programs, the Plan) successful implementation.

The implementation of the Strategy of Development of the Forest Complex of the Russian Federation until 2030 (approved 20.09.2018) should result in the increase of tax revenues in budgets of the budgetary system of the Russian Federation twice (from 91 to 189 billion rubles), as well as the growth of value added, the increased contribution of the forest complex in GDP from 0.5% to 1%, the increase of the number of personnel in the forestry sector from 500 to 820 thousand people. Moving in the direction of economic instruments for sustainable forest management the application of which is reflected in tax revenues, can be traced in the State Program "Forestry Development" for the period of 2013–2020.

The constituent entities of the Russian Federation also approved program documents of the forest sector development which include tax and non-tax revenues from forests use. Thus, the Forest plan of the Komi Republic provides the total income from forests use in the amount of 27986 million rubles in 2020–2029, including 20250 million rubles (72% of all revenues), incoming to the Federal budget, and 7735 million rubles (28%) for the budget of the Komi Republic [19].

The estimated nationwide dynamics of the forest complex development is interesting because of the correlation of forest exploitation and tax revenues: the area of deforestation (clear cutting) will increase by 20%, the production of forestry complex per unit of commercial forests area, and value added of the forestry industry, as well as tax revenues from the forest complex enterprises and payment for forests use to the budget system, will increase to 50%[5]. However, the "Strategy" barely addresses the issues of reforestation, causing the growth of economic and taxable potential. Meanwhile, there is a problematic situation, especially in terms of artificial forest restoration. For example, in 2016, 1153 thousand hectares of forest were carved, and only 995 hectares were restored, including 179 of artificial plantings. If you take into account the forest area exterminated by fires, and a large amounts of forest sites cut but not restored, it would be useful to provide forests restoration at the rate outpacing the scales of cutting areas that would affect the growth of tax revenues in subsequent periods.

A positive trend is also evident. It is achieved (if you look at the current situation in the forest sector) mainly through the increase of coefficients of payment rates indexation (non-tax payment) per unit of forest resources volume (2.17 in 2018; 2.62 in 2020) and payment rates for forest land area unit (1.57 in 2018; 2.26 in 2020)[6]. This, of course, is a positive process, if we take into account the need of forest resources capitalization in accordance with their increasing public value and budget revenues from forest management.

[5] According to the Strategy of Development of the Forest Complex of the Russian Federation until 2030, approved by Decree of the Government of the Russian Federation no. 1989-R, dated 20.09.2018.

[6] Coefficients of payment rates indexation per unit of forest resources volume and payment rates for forest land unit area. [Electronic resource]. Mode of access: URL: http://www.consultant.EN/document/cons_doc_LAW_156323/

According to the authors, the Strategy of Development of the Forest Complex of the Russian Federation, the State Program "Forestry Development", the Forest Plan of the Komi Republic and other subjects of the Russian Federation ought to highlight the role of the forest management tax administration. Since the control measures of tax authorities reveal the use of various schemes of tax evasion by unfair taxpayers. They are mostly based on fraud connected with value added tax, tax on organizations' profit, the simplified system of taxation – one of special tax regimes types. It usually happens in the sphere of shadow economy. According to calculation methods, proposed by D.Yu. Fedotov, the level of shadow economy in the Komi Republic was 47.5% in 2013, 74.7%. in the Sakhalin Oblast [20, p. 144–145].

Thus, in the strategic documents on the development of forest sector, the growth of tax revenues is reflected as a result of their

Table 1. The dynamics of taxes and fees in the consolidated budget of the Russian Federation by the type of economic activity of "forestry and logging" in 2015–2018, mill. rub.

Indicators	2015	2016	2017	2018	Share, %	2018 in % to 2015
Payments received into the consolidated budget of the Russian Federation, total, including:	11697	14585	15797	21007	100	180
Federal taxes and fees, total, including:	8520	11383	12025	15999	76	188
- tax on profit of organizations	1897	2410	2673	4184	20	221
- personal income tax	5689	6633	6537	7748	37	136
- value added tax	913	2309	2776	4029	19	441
- taxes and fees for using natural resources	22	30	39	38	0	173
Regional taxes, total, including:	1211	959	861	1169	6	97
- tax on property of organizations	632	576	511	790	4	125
- transport tax	578	382	349	379	2	66
Local taxes and fees	289	235	404	700	3	242
Taxes envisaged in special tax regimes	1677	2008	2508	3139	15	187
Source: compiled by the authors according to the statistical tax reporting the Federal Tax Service of Russia [Electronic resource]. Available at: http://www.nalog.ru (accessed 14.06.2019)						

Table 2. Dynamics of income taxes in the consolidated budget of the Russian Federation in the Komi Republic by kind "forestry and logging" economic activity in 2015–2018, mill. rub.

Indicators	2015	2016	2017	2018	Share, %	2018 in % to 2015
Payments received into the consolidated budget of the Russian Federation, total, including:	387	515	507	303	100	78
Federal taxes and fees, total, including:	325	444	424	183	60	56
- tax on profit of organizations	81	124	210	144	48	178
- personal incomes tax	155	160	188	233	77	150
- value added tax	89	160	25	- 193	-	-
- taxes and fees for using natural resources	0	0	1	0	-	-
Regional taxes, total, including:	22	25	23	42	14	191
- tax on property of organizations	11	15	13	32	11	291
- transport tax	12	11	10	10	3	83
Local taxes and fees	2	2	3	3	1	150
Taxes envisaged in special tax regimes	38	43	57	75	25	197
Source: compiled by the authors according to the statistical tax reporting the Federal tax service of Russia [Electronic resource]. Available at: http://www.nalog.ru (accessed 14.06.2019)						

implementation. However, the low reliability of data on forest resources and their utilization is one of the problems hindering the development of the forest sector as an objective basis of taxation and formation of tax and non-tax revenues. Therefore, in our opinion, it is necessary to highlight the special role of forest management tax administration in these documents.

Evaluating performance of tax administration in forest management

We found out that the current system of fiscal payments from forest users, including tax and non-tax payments, is divided between different subjects and objects of taxation little related to the forests' ecological functions, and it is administered by various authorities, including tax authorities, forests committees, Ministry of natural resources of the constituent entities of the Russian Federation.

A study of the regulatory framework allowed making a ***classification of fiscal payments for forest use*** including:

– taxes from the general tax system (profit tax of organizations, value added tax (VAT), fees for the use of fauna objects, tax on property of organizations, transport tax, land tax, personal income tax), and taxes envisaged in

Table 3. Dynamics of revenues for forest use in the budget system of the Russian Federation in the Republic of Komi in 2015–2018, mill. rub.

Non-tax budget revenues	2015	2016	2017	2018	Share, %	2018 in % to 2015
Federal budget, total, including:	***980***	***1083***	***1141***	***1602***	71	***163***
Fee for the use of forests in terms of the minimum size of payment under the contract of forest plantations sale	70	75	104	146	7	209
Fee for use of forests in terms of the minimum size of a rent	890	987	1008	1421	63	160
Monetary penalties (fines) for the violation of forest legislation in forest areas	9	14	23	30	1	333
Monetary penalties (fines) for the violation of the legislation of the Russian Federation on fire safety	1	1	2	1	0	100
Other revenues from financial penalties (fines) and other sums in damages	10	5	3	4	0	40
Budgets of the constituent entities of the Russian Federation, total, including:	***366***	***451***	***507***	***661***	29	***181***
Fee for the use of forests in terms of exceeding the minimum amount of payment under the contract of purchase and sale	166	202	267	331	15	199
Fee for the use of forests in terms of exceeding minimum rent	184	226	221	309	13	168
Fee for the use of forests in terms of payment under the contract of sale and purchase of forest plantations for own needs	14	15	16	17	1	121
Fee for the provision of the information, documents contained in state registers maintained by state bodies, agencies by the public authorities and state agencies of the constituent entities of the Russian Federation	0	1	2	1	0	-
Other revenues from financial penalties (fines) and other sums in damages payable to the budgets of constituent entities of the Russian Federation	1	6	0	2	0	200
Monetary penalties (fines) for the violation of the legislation of the Russian Federation on fire safety	1	1	2	1	0	100
Total	***1345***	***1533***	***1648***	***2263***	***100***	***168***

Source: own compilation according to the Ministry of natural resources and environmental protection of the Komi Republic [Electronic resource]. Available at: http://mpr.rkomi.ru/ (accessed 15.10.2019)

special tax regimes (simplified tax system); insurance contributions to the Pension Fund of the Russian Federation, Social Insurance Fund of the Russian Federation, Federal Compulsory Medical Insurance Fund;

– non-tax fees provided by the Forest Code of the Russian Federation in the form of specific payments (lease of forest land; contract of forest plantations sale; for the use of forests located on forest fund lands; for the use of forests located on lands of other categories, being the federal property; for the use of forests located on lands of other categories, owned by the constituent entities of the Russian Federation; for the use of forests located on municipal lands).

To evaluate the performance of tax administration in forest management and its impact on the budgets of the Northern territories (the case of the Komi Republic) the following criteria were defined: growth of taxes (federal, state and local taxes at special tax regimes), growth of non-tax payments to the budget, reduction of tax debt. The composition and analysis of dynamic and static indicators are given in *tables 1–5*.

On tax payments

The data reflect the set of taxes that enterprises of forest sector of the economy pay to the state. The growth of this type of payments to the budget of the Russian Federation is evident (80% in 2018 compared to 2015), although their share in the total amount of taxes is not significant (0.1% in 2018 in the RF).

We should note that the overall tax burden (the ratio of taxes to GDP given the fiscal burden on insurance fees) is insignificant in the forestry sector of the economy and amounted to 16.8%; for comparison, it makes up 45.1% in the mining sector, 14.3% by all types of economic activity.

In the Komi Republic, tax revenues from forestry and logging decreased by 22% in 2018 in comparison with 2015 (*Tab. 2*). The share of taxes in the forest sector of the Republic specializing in the management of natural

Table 4. Dynamics of tax debts, duties, insurance contributions, fines, and other sanctions by the "forestry and logging" economic activity in the budget system of the Russian Federation in 2015–2018, mill. rub.

Indicators	2015	2016	2017	2018	Share, %	2018 in % to 2015
Total tax debts, including:	5512	5942	4623	4315	100	78
- uncollected taxes	3428	3326	3372	1715	40	50
- debts on fines and tax penalties.	2084	2313	1250	886	21	43
Arrears on taxes, fees, fines, and penalties, total, including:	2353	2919	2524	2363	55	100
- tax on profit of organizations	278	302	307	595	14	214
- value added tax	1741	2239	1738	1392	32	80
- payments for using natural resources	1	0	3	1	0	100
- other Federal taxes and duties	333	378	476	375	9	113
Arrears on regional taxes, total, including:	317	201	92	515	12	162
- tax on property of organizations	106	125	44	386	9	364
- transport tax from organisations	76	75	47	127	3	167
Arrears on local taxes and duties, total, including:	105	79	64	87	2	83
- land tax from organisations	66	77	61	81	2	123
Arrears on taxes in special tax regimes	126	127	175	212	5	168

Source: own compilation according to the statistical tax reporting of the Federal Tax Service of Russia [Electronic resource]. Available at: http://www.nalog.ru (accessed 14.06.2019)

Table 5. Dynamics of payable taxes, duties, insurance contributions, fines and other sanctions by the type of economic activity of "forestry and logging" in the budget system of the Russian Federation in the Republic of Komi in 2015-2018, mill. rub.

Indicators	2015	2016	2017	2018	Share, %	2018 in % to 2015
Taxes payable total, including:	93	212	74	58	100	62
- uncollected taxes	41	144	44	30	52	73
- debts on fines and tax penalties.	52	68	29	13	22	25
Arrears on taxes, fees, fines, and penalties, total, including:	49	139	56	30	51	63
- tax on profit of organizations	15	41	8	2	3	13
- value added tax	32	96	45	25	43	78
- payments for using natural resources	0	0	0	0	0	0
- other Federal taxes and duties	2	2	3	3	5	150
Arrears on regional taxes, total, including:	4	2	2	6	10	150
- tax on property of organizations	1	0	1	2	3	200
- transport tax from organisations	2	2	0	4	7	200
Arrears on local taxes and duties, total, including:	0	0	0	0	0	-
- land tax from organisations	0	0	0	0	0	-
Arrears of taxes in special tax regimes	3	3	4	14	24	467
Source: own compilation according to the statistical tax reporting the Federal Tax Service of Russia [Electronic resource]. Available at: http://www.nalog.ru (accessed 14.06.2019)						

resources is low – 0.13 percent in 2018. The volume of logging has not decreased at the same time. To some extent this is due to the illegal forest use and tax deductions increase. Thus, the excess of VAT deductions over the amount of the assessed tax resulted in the formation of a negative index of 193 million rubles.

On non-tax payments

Non-tax payments for forest use are much more than tax payments and are described in detail by the types and objects of taxation (*Tab. 3*). In 2018, the total amount of non-tax payments in the Republic of Komi amounted to 2263 thousand rubles (68% increase in comparison with 2015) including 1602 million rubles of payments to the federal budget (63% increase), 661 million rubles to the Republican budget (81% increase). We should pay attention to the structural positions: the sum of total payments is dominated by the fee for the use of forests in terms of the minimum rent (incoming to the federal budget) – the forest fees for the timber – 63% and fee for forests use in terms of exceeding minimum rent (incoming to the budget of the RF entity) – 14%.

Forest sector specialists, the bodies of state, and municipal management negotiate about the choice of a "lease" or "purchase and sale". In relations with large logging companies, "rent" is preferred; with small and medium entrepreneurship, it is usually "purchase and sale". In this case, realization of the state's and local communities' interests is that these two types of forest use were interconnected. This is mainly achieved by subcontracts between large tenants with small businesses, operating in the same space. Technological scheme of forest resources development and reproduction is becoming common, and forest payments of all the participants of the "forest development" should relate to this scheme in some way.

In our opinion, control over the execution of norms and rules of forest non-tax payments should be similar to the taxes' control: it should be carried out within the tax administration. It becomes more urgent with the increasing

complexity of the specified interaction scheme and a substantial growth of payments and a high level of forest users' taxes payable.

On tax debts

The next subject of analysis is the tax debts of forest users, one part of which is paid off, voluntarily or involuntarily, and another part becomes uncollectible (*Tab. 4*).

By reducing tax debts of the forest sector in the budget system of the Russian Federation by 22%, its value remains high – 4315 mill. rubles, which is, approximately, 20% of all forest taxes. The largest share of debts in the forest sector of the Russian Federation on federal taxes: VAT – 32%, and 14% of organizations' profit tax. Regional taxes (62% increase) and taxes on special tax regimes (68% increase) also have large amounts of debt.

In the Republic of Komi, with the reduction of forest sector's tax debts by 38%, its sum in 2018 amounted to 58 million rubles: it is 19% of all forest taxes (*Tab. 5*).

The largest share of debt in the forest sector of the Komi Republic is made on VAT – 43% (22% reduction) and on taxes on special tax regimes – 24% (4.7 times increase). Our analysis of the taxes debts, established by tax authorities, demonstrates similar trends across the country and in the entity of the Russian Federation. Arrears dominate in the structure of forest users' tax debts; VAT debts lead according to the types of taxes.

The analysis allowed establishing the fact that, despite considerable forest resources in Russia, including the Komi Republic, the tax administration of forest management does not have a significant influence on the formation of budget revenues, i.e.: the low share of tax revenues from forestry (0.1%); the decrease of tax revenues from forest management in in the Komi Republic, despite its growth across the country; at the same time, under the current regulatory framework, the amount of forest non-tax payments (the administration of which is beyond the competence of tax authorities) is more than seven times higher than tax payments in the Komi Republic; however, there is a high level of tax arrears in the forestry sector (about 20% of all forest taxes).

Reduction of the forest sector debt, and positive dynamics of tax and non-tax payments to the budget system of the Russian Federation, in our opinion, is largely the result of tax administration and control measures of tax authorities.

Control measures of tax authorities

The conducted research made it possible to group the control measures of tax authorities in the sphere of forest management:

– the collection of evidence of dishonest taxpayers' existence and activities, i.e. short–lived companies, technical companies;

– analysis of indicators of different accountability forms containing information directly or indirectly influencing the tax base, tax liability of the organizations – counterparties – participants of the scheme[7];

– the tax authorities' requests to regulatory authorities, and the use of information available in tax authority;

– the tax authorities' requests to the banks about transactions in the taxpayer's accounts;

– the analysis of movement of funds on the accounts of organizations, engaged in timber extraction, and the analysis of indicators of the purchase ledger which is used for VAT calculations;

[7] Due to the control and analytical measures, the tax authorities determine that the counterparties of the forestry organization lack the proper logistical and managerial staff with the proper professional competence. Such counterparties are typically short–lived companies established to minimize taxes and cash withdrawal.

– the search and identification of a taxpayer, doing the timber cutting, removal, and timber processing – an actual recipient of funds;

– the collection of documents, research, and compilation of indirect information for tax purposes[8];

– the interrogation and questioning of witnesses directly related to the process of logging;

– the direction of instructions demanding and requiring the submission of documents (information) to the organizations (contractors, authorities, budget organization, banks) and individuals[9];

– the formation of data on activities of organizations, included into the group of interrelated (interdependent) individuals, the identification of dishonest taxpayers' formal workflow.

We believe that the usage of these types of tax control in the analysis of the forest sector organizations' activity allows us to identify the violations of tax legislation more systematically. For example, we conducted the analysis of the review of activities of a certain company tentatively named "Logging", conducted by tax inspection. The company signed agreements with three organizations (also tentatively named): Forest Services, Timber Trade, and Transportation. Their work and services: logging, young growth tending, transporting, loading, unloading and transshipment of timber, lease of special vehicles; sales of lubricants and spare parts.

The scheme of "tax minimization" of the company and its counterparties is shown in *figure*. We found that the application of this type of scheme results in budget losses: the maximum possible VAT deduction of 99% and complete deliverance from tax on profit of organizations, transport tax, personal income tax, and insurance contributions.

As the case of "contractual" violations of the rules and regulations of taxes is taken from the analysis of the activities of logging companies in the Komi Republic, we considered it appropriate to complement the grouping of control measures by the systematization of tax administration difficulties in the North.

Systematization of the difficulties of forest management tax administration in the Northern territories

There are ***five main blocks of problems of tax administration in the field of forest management in the Northern regions of Russia***.

Geographical: The Northern territories' remoteness and inaccessibility, causing the difficulty of establishing actual use of particular vehicles, specialized logging machinery, their accessories and locations, performing certain types of work and services associated with logging.

Infrastructural: insufficiently developed infrastructure in remote Northern areas (lack of roads and bridges, cell communication, the Internet) coupled with a significant reduction of foresters who control the vast territory of the forest sector.

Socio-economic: underestimation of the local population's capacity in the sphere of public control of forest management, ignoring their interests when granting forest plots in

[8] One of such measures is tax authority's request to the Ministry of natural resources of the Russian Federation, the territorial committees of forests on the provision of: project of forests, documents confirming the permission for the deforestation, forest leases, contracts of forest sale, forest use report, other documents (e.g., tailgate safety session for the operators of logging machinery (harvester and forwarder).

[9] Thus, only one of manifold tax audits of taxpayers in the forestry sector included the analysis of documents from more than 60 commercial organizations and individual entrepreneurs, the territorial branch of Sberbank, the Ministry of industry, natural resources, energy and transport of the Russian Federation, five state-owned forestry agencies. More than 40 interviews of specialized logging equipment operators, managers, staff and contractors were conducted.

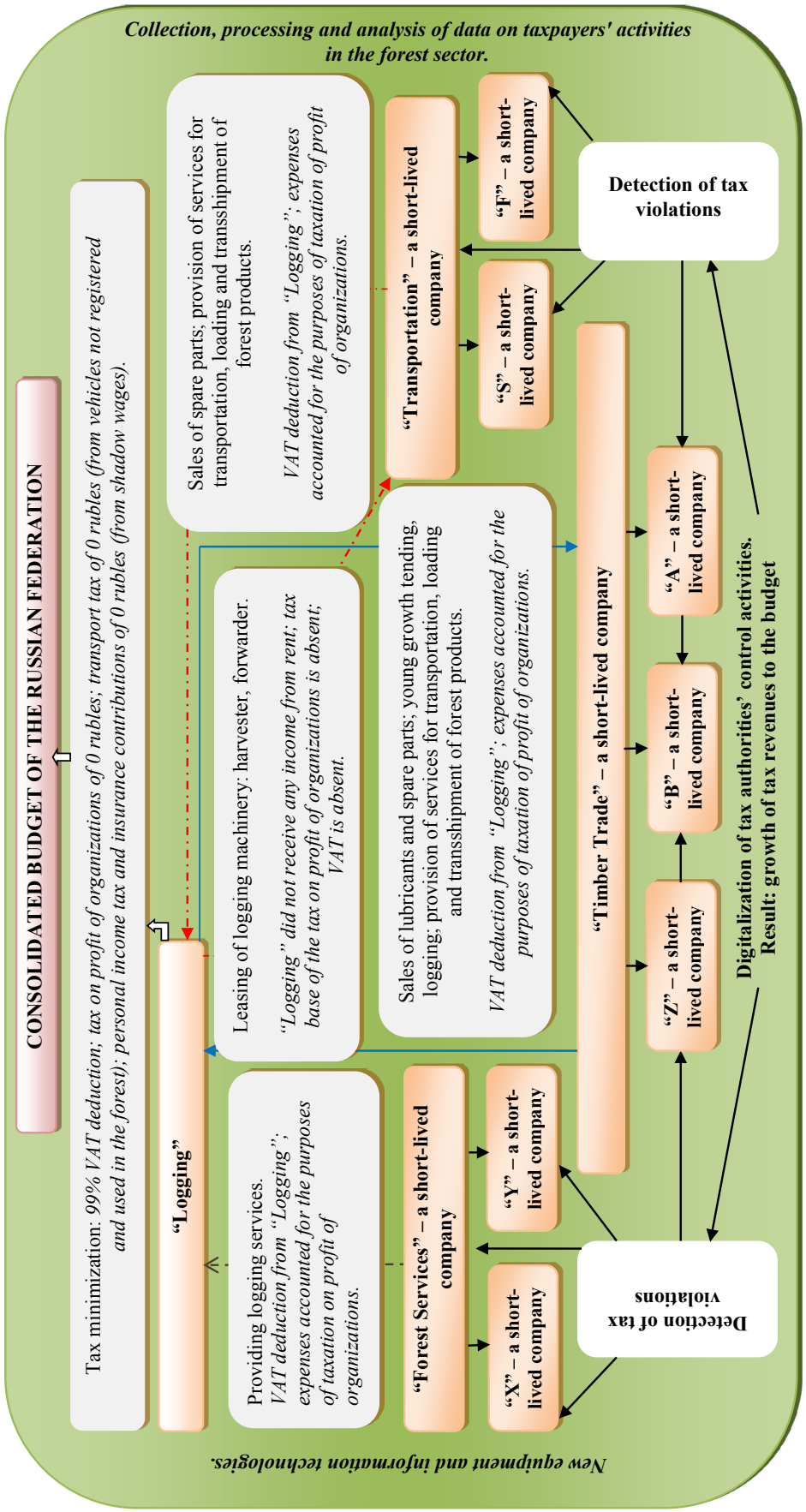

Fig.1. Scheme of "tax minimization" with the participation of interrelated (interdependent) individuals revealed by the tax authorities in the forest sector

Source: own compilation according to the data obtained in the course of the research.

rent, contributing to the growth of the shadow economy in the forest sector.

Organizational: currently, the rental system of forest land for a long period (up to 50 years) leads to the tax base reduction. In particular, the natural growth of forest plantations is often not taken into account by dishonest taxpayers. In addition, there is the lack of adaptedness of tax authorities' information resources, and other authorities' bureaucratic methods of work, leading to the increase of terms of tax audits, the difficulty of identifying the dishonest taxpayers' violations.

Information technology: insufficient usage of digitization opportunities in tax bodies' control measures in the sphere of forest management. A significant amount of tax inspectors' control work, limited tax audits terms, deficiency of attention and other factors influence the performance of tax control. The requests of taxpayers' documents, required for specifying information about the correctness of the tax base formation, the legitimacy of tax deductions, the substantiation of expenses, which can only be confirmed during a field tax audit, are not always implemented in time.

The necessity to find solutions to mentioned problems of tax administration of forest management in northern conditions made it relevant to analyze the best practices of use of information technologies and their application.

Analysis of domestic and foreign practice of tax administration by means of information technology

The World Bank provides information on the 159 member States of the United Nations on the implementation of digital technology for tax administration [21]. For example, the UK tax authorities (HMRC – Her Majesty's Revenue and Customs) gradually bring the time of the tax control to the real-time operations on the basis of information technologies. In 2015, they embedded a program "Making tax easier: The end of the tax return", but three years later it was replaced with a new program (Making tax Digital). This is how quickly they improve the control technology [22]. For example, the new program reflects the need to provide access to digital tax account for small and medium business for online interaction with tax authorities. In addition, in 2020, UK taxpayers will be able to register with the tax authority, to pay taxes, to file a tax return, to update (refresh) their personal information, if necessary, anytime [23].

Internal Revenue Service of the USA (IRS) compensated for more than five billion dollars on tax returns in 2013, later established to be fraudulent. In 2016, the new items of the US information technologies allowed IRS to prevent tax fraud in the amount of 4.1 billion US dollars. Utah State identified an attempted fraud in declaring income tax: the possible damage would amount to 11 million US dollars. The expenses of the state on the introduction of new software and modified methods of tax control for analyzing the fraud income were less than 20 thousand US dollars [24].

In Finland, a Strategy for Tax Administration 2019–2024 [25] was adopted. The Finnish tax administration is integrated with external business platforms. The information system of tax administration MyTax is implemented there. Taxpayers are able to log into the system using their personal online banking codes, mobile certificate, and a Katso ID. In MyTax system, taxpayers can request a tax card, pay taxes, file a tax return (personal or corporate), to obtain and clarify the necessary information (personal data, tax liabilities) [26]. Gathering of information on taxpayer's operations is as close to real time as possible, the tax is levied simultaneously with a taxable event.

Best practices of tax administration in the Russian forest sector are also associated with the introduction of new information technology. For example, with the software USAIS Les and AIS VAT–3. They (technologies) can effectively implement control measures, conduct analysis of relationships between counterparties, follow the business chain, from the origin of timber prior to sale to the final consumer, identify tax offences, conduct additional taxes and fees payments.

Currently, it is already possible to see the positive results of the digitalization of tax administration in forest management. Thus, the basis of the proceedings in criminal cases in the sphere of taxation has become more evident. In 2018, materials on the fact of extremely serious taxes evasion by OOO "LokchinLesProm" in the amount of 160 million rubles[10] were submitted to the court.

Directions of improvement of tax administration in forest management

The conducted research allowed determining the following directions of improvement of tax administration in forest management intercon-nected with the management of forests, in terms of the economy digitalization:

– ***information technology development.*** In 2018, the FTS of the Russian Federation started the final phase of the project aimed at the introduction of automated tax administration system of the third generation – AIS Nalog-3. The information system (AIS Nalog-3) administers individual entrepreneurs and natural persons. In 2019, it is planned to complete the implementation processes of the tax administration of legal entities, i.e. the largest block of the information system of Russian FTS [27];

– ***formation and structuring of big data base in the field of taxation*** including collecting and processing information about the forests' state and structure (species and product) as an objective basis for taxation, the activities of taxpayers in forest management, emergencies (forest fires, flooding, etc.);

– ***increase of tax officials' competence in the field of information technology***: preparing highly qualified economists and, IT-specialists for the tax authorities;

– ***improvement of tax authorities' Internet-services,*** which will help raise taxpayers' awareness and comfort of interaction with tax authorities; make electronic interaction with other authorities and government agencies; use the opportunities of digital technologies in forest management tax administration effectively; exercise caution and assess taxpayers' integrity when choosing the contractors from the standpoint of business transparency, etc.;

– ***use of information technology for citizens' participation in the tax base control.*** Crowdsourcing for data collection is widely used in global practice [28, p. 270]. This area of crowdsourcing has emerged as a mechanism for obtaining information from citizens for more complete picture and concepts of the community [29]. Information received from citizens on the basis of information technologies through various means (text messages, social media, programs in smartphones, websites) can be used to generate and update a number of maps such as map of forest fires, illegal logging map, map of pollutant emissions into the environment in the forest sector, etc.) This will help reduce illegal logging, identify and bring the guilty to financial responsibility for the committed illegal actions in the forest sector etc.

[10] The Komi inhabitant avoided paying 160 million rubles of taxes. BNK news agency. [Electronic resource]. Available at: https://www.bnkomi.ru/data/news/86527/ (accessed 11.09.2019).

In addition, the digitalization of tax administration in forest management, ensuring the integrity of tax collection and authorities' communication, will allow local governments to provide economic justification to allocate a portion of natural resource rents of loggers and users of mineral resources to finance the construction and maintenance of roads of local significance and environmental measures in the forest sector, which will reduce the financial burden on local budgets.

Discussion of the Results

Scientific recommendations for improving tax administration related to the rationalization of forest management in the regions, interested in the growth of tax revenues, do not have a destination; formally, the main part of managerial functions in accordance with the Forest code is transferred to constituent entities of the Russian Federation, but the economy of forest management and tax administration in forest management is still beyond the scope of their powers. It turns out that the issue of improving public relations in the sphere of forest management and its tax administration in connection with the territorial development has long been studied, and it is widely presented in the works of domestic and foreign researchers, but it remains "infinitely urgent" and is essentially difficult to resolve.

The overcoming of the mentioned difficulties can be contributed to by the rationalization of the forestry activities management which structurally binds public and private interests such as taxation and tax administration. It means that the formation of a new tax administration system based on the relationship of forest management and administration of tax and non-tax payments for the use of forest resources is required, the successful functioning of which will increase the budget revenues necessary to finance public goods in the Northern territories of Russia.

Conclusion

Studied practical experience of tax administration in the system of forest management and its impact on the budgets of the Northern territories, taking into account the issues of forest management, revealed some deficiencies reflected in the shortfall of tax and non-tax revenues.

The conducted research allowed determining the areas of improvement of tax administration in forest management in the Northern regions of Russia interconnected with the system of forest management, based on the results of the analysis of fiscal payments for forest use and practices of tax administration by means of information technology, fixing, while assessing the impact of the implementation of programs for the development of forest sector, changes in tax revenues, using domestic and foreign experience of tax administration.

But it requires fulfilling three conditions:

1) to systematize tax control over forest management, including the usage of proposed groups of control measures and their implementation conditions;

2) to include non-tax forestry payments into the system of tax control;

3) to align forestry payments with the requirements of integrated forest management, taking into account their geosystem reproduction and preservation of ecological functions.

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The Usage of Renewable Energy Sources in the Arctic: The Role of Public-Private Partnership

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Abstract. Sustainable development of the Arctic regions of the Russian Federation requires reliable energy supply, which is possible to achieve through searching for new environmentally clean energy sources. The Russian part of the Arctic possesses a great potential of renewable energy sources (RES), and it has required prerequisites for their accelerated development. In these conditions, the transition to renewable energy sources allows not only the provision of required energy resources to the region, supplement and partial substitution of the usage of expensive imported fuel, but the minimization of environmental damage and the preservation of natural resources for future generations. In this article, problems and prospects of the renewable energy usage in the energy system of the Arctic regions of the Russian Federation are systemized and presented. On the basis of the content analysis, the successful experience of their application in the Russian part of the Arctic is summarized, and the tasks of their promotion on these territories are shown. Besides, pros and cons of the renewable energy sources usage in the economy of the Arctic regions are defined. It is revealed that one of the most acute problems of the further development of the RES potential is related to the attraction of funding for "green" energy projects. To solve this problem, we propose the activation of cooperation between the state and business through the development of public-private partnership. We present the specifics of public-private partnership in the field of non-traditional energy and justify the importance of its application for the Arctic regions of the Russian Federation. The scientific novelty of the research is the development of theoretical provisions aimed at the cooperation between government authorities, business structures, and modern society in solving energy issues of the Russian Arctic with the goal of the sustainable development of its territories. The practical relevance of the study is the development of conditions for applying the public-private partnership mechanism to the solution of the priority objectives related to the usage of renewable energy sources in the Arctic region.

Key words: sustainable development, regional economy, the Arctic region, Northern territories, renewable energy sources (RES), alternative energy, funding, public-private partnership.

Introduction

The development strategy of the Russian part of the Arctic[1] pursues the solution of such priorities as strengthening its contribution to the economic development of the Russian Federation in general, the acceleration of economic growth of the regions and municipalities, located within its boundaries, the improving and maintaining the quality of people's life on the level not lower than the national average. Priority tasks of the Arctic's development also include protecting the vulnerable nature of the North, reducing the burden on the environment during investment projects implementation, preserving traditional culture and lifestyle of indigenous peoples. The solution of these tasks is closely connected with the development of energy sector, reliable provision of production and population with energy taking into account environmental requirements in the context of climate change managing. In the 2030 Agenda for Sustainable Development[2], adopted by the UN in 2015, one of 17 designated purposes is associated with the provision of society with clean energy at an affordable price. Scientists from different countries are actively discussing the problems of the establishment of "green" economy, which

[1] The Strategy for the Development of the Arctic Zone of the Russian Federation and National Security up to 2020. Available at: http://www.consultant.ru/document/cons_doc_LAW_142561

[2] The 2030 Agenda for Sustainable Development. Available at: https://www.un.org/sustainabledevelopment/ru/about/development-agenda/

is also closely linked with issues of renewable energy sources, the reduction of greenhouse gas emissions [1–4].

The Energy Strategy of the Russian Federation (2009)[3] provides for the development of autonomous generation systems, based on renewable energy sources. Taking into account the fact that the zones of decentralized electricity supply of the country are concentrated in the Far North, the Far East, Siberia, it could be argued that the development of renewable energy facilities is particularly important for these areas. Energy system of constituent entities of the Russian Federation in the Arctic zone[4], the area of which is about 3 million square km (18% of the country) and the population of which exceeds 2.5 million people, is mainly based on imported fuels: petroleum, coal, liquefied gas, and nuclear fuel processing at nuclear power plants. Taking into account climate, the volume of required fuel is very considerable, and the infrastructure, providing this volume, is limited by natural reasons (remoteness, permafrost, lack of personnel for maintenance, etc.). In this regard, an important economic and social challenge is a reliable energy supply to remote settlements of the Arctic. For example, currently, in the Arctic regions of the Sakha Republic (Yakutia), more than 150 thousand people live in the settlements where energy is supplied by physically and mentally outdated diesel power plants, and the electricity is available with long-term disruptions. The price of electricity for consumers is 15 times higher than the average rate. Thus, the task of implementing renewable energy sources in the Russian Arctic becomes more urgent every day. One of the most promising financing mechanisms of investment projects on renewable energy is a public-private partnership (PPP).

The purpose of this article is to study the possibility of applying the tools of public-private partnerships in order to develop the potential of renewable energy sources in the energy systems of the Arctic regions. In other words, we analyze two related issues: the meeting of energy needs of socio-economic systems of the Arctic zone of the Russian Federation and the greening of energy sector. The emphasis is put on the usage of energy resources of the zone that will act as a trigger of its rational exploration and development. The scientific novelty of the research is connected, first, with the compilation of scattered information on the actual usage of renewable energy sources in the Arctic zone of the Russian Federation, which gives a valuable testimony in favor of the effectiveness of renewable energy resources in meeting the needs of the population and economy of this part of the country, and, second, the conceptualization of using PPP mechanisms for the sustainable development of energy systems of the Arctic regions with renewable energy resources in the framework of the economic systems greening and considering the interests of indigenous population.

Renewable energy sources in the Arctic regions: A theoretical overview

World and domestic experience suggest that promotion of "green" energy is one of the priorities of modern economy. In this regard, it is necessary to divide the concepts of "green energy" and "renewable energy", although they substantially overlap. The first concept refers to all activities associated with the production, transmission, distribution, and consumption of

[3] Energy Strategy of the Russian Federation until 2030: Adopted by the Decree of the Government of the RF № 1715-p, dated 13.11.2009. Available at: https://minenergo.gov.ru/node/1026

[4] On Land Territories of the Arctic zone of the Russian Federation: Decree of the President of the Russian Federation no. 296, dated 05.02.2014. Available at: http://static.kremlin.ru/media/events/files/41d4d8e8206d56fc949d.pdf

energy using the tools of greening. The second concept is more narrowed, and it refers to the usage of renewable energy sources. In recent scientific literature, the issue of renewable energy becomes increasingly urgent. Thus, B.V. Lukutin, O A. Surzhikova, E.B. Shandarova [5] propose the solution of problems of energy supply through developing renewable energy, they pay special attention to local power generation with the usage of renewable energy sources. The monograph, edited by V.V. Elistratov, N.B. Kobysheva, G.I. Sidorenko [6], is noteworthy. In this work, scientists, in addition to the studies of renewable energy technologies, assess climate resource potential of renewable energy in various regions of the Russian Federation. Energy, economic, and environmental characteristics of different RES are summarized by A.B. Alkhasov [7].

Due to the fact that a large potential of renewable energy (related to the action of solar radiation, wind, geothermal fields, etc.) in the Russian Federation is concentrated in the Arctic, the majority of scientists, who deal with renewable energy in their researches, make strong emphasis on the study of the territory. Currently, the traditional energy systems of the Russian Arctic use resources of coal, oil, natural gas, water, and nuclear power in their production process [8].

In particular, O.S. Popel', et al. in the work [9] characterize the Arctic zone of the Russian Federation from the point of view of energy consumption, and they justify the solar energy application in the region.

V.R. Kiuskina [10] studies energy security in decentralized areas with isolated generation in detail on the example of territories of the Arctic regions, and she recommends forming autonomous power supply systems in these areas using renewable energy sources in order to reduce economic, environmental, and social risks. A.L. Elyakov in his work objectively justifies the use of RES in the energy system of the Arctic regions, and he argues that the influence of the energy system on the environment and its consumers depends more on the type of used energy resources [11].

High expanses of conventional energy in this part of the country, financed from the federal budget in the form of subsidies for the Northern fuel delivery to the Arctic regions, thermal power stations operating on imported fuel oil and coal with outdated production technologies of electricity and heat, deteriorate the environment and population's health, increase the attractiveness of energy, generated by renewable energy sources, and provide substitution of the hydrocarbon fuel (in the form of diesel and gas condensate fuel, oil, natural gas, liquefied gas, and coal) with other types of energy.

Studies, conducted by the Kola Research Center of the Russian Academy of Sciences, have shown that the usage of RES is currently very important for the Arctic regions. For example, A.A. Gasnikova notes in her work that the development of alternative energy is of particular importance for the Arctic regions. This is cause by the following reasons: the presence of many small decentralized energy consumers; low transport accessibility and the associated problem of fuel supply; long duration of the heating period [12]. The author emphasizes that alternative energy in the North is based on the usage of local resources (energy of winds, energy of small rivers, solar energy), so their involvement in the regional energy system will solve the problem of fuel supply to the settlements of the Arctic regions and will enhance the Arctic territories' energy security. Technical aspects of using renewable energy sources in the Arctic regions are described in detail in the research of the Center of Physical

and Technical Energy Problems of the North, the Kola Research Center of RAS [13, 14].

According to O.B. Dubinsky, who studies the perspectives of using renewable energy sources in the Arctic zone of the Russian Federation [15], the proposals for the optimization of RES development in these regions should include the initiatives taken on the legislative level: the establishment of a fixed rate for generating facilities, based on renewable energy sources for the period of their recoupment; providing tax incentives for renewable energy power plants for the payback period; the development and implementation of programs for state co-financing of RES development projects.

The possibilities of RES application in the Arctic territories are discussed not only by Russian but also by foreign scientists. In particular, the researchers from the University of Alaska in Fairbanks E. Whitney, W.E. Schnabel, S. Aggarwal and others [16] propose a mechanism for assessing the impact of RES on food, energy, and water security of these territories when studying the conditions of human life in isolated communities in the Arctic and subarctic regions of Alaska.

Chinese researchers under the supervision of G. Zhuo [17] were studying the problems of continuous power supply of unmanned and automatic observation systems in the polar regions and simultaneously came to the conclusion that an energy system based on renewable energy sources is a perfect solution for achieving environmentally friendly and reliable energy supply in the polar regions.

In a joint comprehensive study of a group of Chinese and Pakistani scientists under the supervision of S.F. Rafik [18], the transcontinental interconnection of power system and the development of environmentally friendly energy for providing sustainability are the main objectives to be addressed within the framework of the Global Energy Association. The researchers are concerned about the depletion of fossil fuels, and they explore the opportunities for renewable energy sources in the Arctic and Equatorial zones and the methods of production and delivery of clean energy around the world within the limits of available generating capacity.

A group of scientists from Denmark, the Netherlands, Canada under the supervision of L. Mortensen [19] study the possibility of transition from fossil fuels to renewable energy in four Arctic regions: Alaska, the Canadian Arctic, Greenland, and Russian Arctic. These researchers identified the problems associated with access to fossil fuels and its deliveries to the Arctic settlements, they emphasized the importance of the global agenda concerning the climate change counterreaction and proposed the concentration of efforts in order to stimulate the introduction of renewable energy sources in such key factors as the economy and technological infrastructure.

Thus, in the course of studies on the prospects of renewable energy in the Arctic areas, most scientists came to the conclusion that the construction of new energy facilities requires substantial capital investment, the economic efficiency of which is doubtful. Moreover, in some areas, the construction of traditional energy infrastructure is impossible due to their natural characteristics (especially, the complexity of construction in permafrost conditions). In this regard, the most efficient solution for providing consumers with energy resources could be renewable energy sources.

All studied works also allow concluding that main advantages of renewable energy sources in comparison with non-renewable ones, which are actively used in the traditional energy sector, are their relative environmental friendliness

and nonterminability. Disadvantages include nonpermanent nature of presence (e.g., wind resource is available for the usage only with a wind of a specific strength and direction) and the high cost of technological development (significant investments in the development of tools of extracting energy from the source are required). In this regard, the usage of environmentally friendly energy sources is the most promising in the areas with its increased capacity and, at the same time, with a lack of usual traditional fuel resources.

Analysis of the usage of renewable energy sources in the Russian Arctic

In the current situation, energy is the basis for the state's economic growth, because it promotes the development of sectors of the economy. Energy sector's state determines the nature and pace of the development of the scientific-technical revolution. The global energy industry undergoes significant changes toward the development of renewable energy sources and technologies for their usage. This very area rapidly technologically progresses in the developed world. Renewable energy includes a wide range of primary sources of energy with specific characteristics and features. The classification of the main types of RES is presented in *table 1.*

It should be noted that, in the 1990s in the Russian Federation, there was no wide usage of renewable energy in the Northern territories of the country due to the high cost of the electrical and thermal energy produced this way. In the modern period of the Russian economy development, when the environmental laws become more stringent, the state support of renewable energy development is being implemented, the cost of produced electricity and heat energy is equalized significantly, and the prerequisites to ensure that this trend of pricing on the renewable energy market will remain in the future are formed gradually. Main reasons for renewable energy sources usage in the Arctic territories should include the depletion of natural resources, the possible prospect of a crisis of the regional energy system, the negative impact of traditional energy systems on the environment, the risk of an environmental disaster. The distinctive characteristics of traditional and renewable energy are represented in *table 2* describing the advantages and disadvantages of these two types of energy.

For many decades, the Arctic regions' energy system has been developing due to the exploitation of hydropower resources and the

Table 1. Classification of renewable energy sources

Renewable energy sources	Examples
Traditional	Hydraulic energy converted into electric power used (mostly by large hydropower stations with a capacity of 30 MW) Energy derived from biomass used to produce thermal energy by conventional methods (burning wood, peat and other fuels) Geothermal energy
Renewable	Solar energy Wind energy Energy of sea waves Energy flows Energy of the tides of the seas and oceans Hydraulic energy converted into electrical energy by small and micro hydroelectric power plants Biomass energy not used to produce thermal energy by traditional methods Low-grade thermal energy

Table 2. Main distinctions between traditional and renewable energy

Distinctive characteristic	Traditional energy	Renewable energy
The exhaustion of used energy resources	Used resources are exhaustible and non-renewable	Used resources are inexhaustible and renewable
The limited use	Used depending on the conditions of the territory	Used depending on the availability of renewable energy sources and manifestations of the corresponding phenomenon in a specific locus and at a specific time
The cost of energy production	Relatively high	Relatively low
Transport component in the cost structure of energy production	High	Low
The ability of continuous energy supply to the settlements of the Arctic regions	Low	High
The influence of power objects on the environment	Relatively high	Relatively low
Potential capacity of energy produced	Very high	Low
Dependence on climatic conditions	Low	High
The reliability of the power system objects	High	Average
Legal regulation of the activities of the power systems	Full	Partial
The possibility of public-private partnership in the projects' implementation	Limited	High
Source: own compilation.		

usage of imported fuel (fuel oil, coal, diesel fuel, etc.). It should be noted that the delivery of such fuel to the Arctic regions usually depends on the navigation season for the Northern sea route, the possibilities of river communication, and the availability of winter roads, which affect the cost of the resulting electricity and thermal energy.

As noted in the draft of the Strategy for Socio-Economic Development of the Arctic Zone of the Sakha Republic (Yakutia) up to 2030[5], the climatic features of this area require increased reliability and efficiency of the engineering systems for the settlements' life activity. It is rather difficult to provide the essential services for the population due to the territory's vastness, the settlements' remoteness, low population density. The average heating period in the Russian Arctic continues for more than 9 months of the year, and it lasts for the whole year in some localities.

It should be emphasized that the Arctic regions belong to the zone of decentralized power supply on the basis of low power energy sources, mostly diesel power plants (95% in the structure of electric energy production), which significantly increases the cost of a kWh of electricity. Currently, for example, in the Arctic regions of Yakutia, there are 170 diesel and 16 solar power plants operating with a total capacity of 308 MW. The total volume of electricity supply is 334 million kWh per year, or 80% of the total for the whole of the AO "Sakhaenergo" *(Tab. 3)*. The power supply of the Cherskiy settlement of the Nizhnekolymskiy district and several settlements in the Oymyakonskiy district is implemented by the Chukotka and Magadan energy systems, respectively.

The wear of diesel generators in the power utilities of aforementioned uluses (districts) ranges from 43% in the Anabarskiy district to 85% in the Momskiy district. The buildings

[5] Strategy for Socio-Economic Development of the Arctic Zone of the Republic of Sakha (Yakutia) until 2030 (draft). Center for Strategic Studies under the Head of the Republic of Sakha (Yakutia). Available at: http://src-sakha.ru/previews/strategiya-sotsialno-ekonomicheskogo-razvitiya-arkticheskoy-zonyi-respubliki-saha-yakutiya-do-2030-goda/

Table 3. The state of the local energy sector in the Arctic zone of the Sakha Republic (Yakutia), 2019

Arctic regions	The number of DPP	The number of SPP	Electric power, kW	Including SES	Net electricity supply, thousand kWh
Total:	170	16	308 128	1 240	334 000
Anabarskaya group	5	1	9 855	40	18 200
Anabarskiy	2	0	4 295	0	8 800
Olenekskiy	3	1	5 560	40	9 400
Prilenskaya group	13	0	34 930	0	41 400
Bulunskiy	9	0	26 325	0	29 000
Zhiganskiy	4	0	8 605	0	12 400
Yanskaya group	32	6	48 835	0	53 700
Ust-Yanskiy	9	0	24 750	0	21 400
Verkhoyanskiy	20	5	20 460	1 110	28 200
Eveno-Bytantayskiy	3	1	3 625	10	4 100
Indigirksaya group	16	1	22 623	20	28 000
Allaikhovskiy	5	0	9 387	0	8 900
Abyyskiy	7	1	7 471	20	9 300
Momskiy	4	0	5 765	0	9 800
Kolymskaya group	19	0	37 821	0	50 250
Nizhnekolymskiy	4	0	12 052	0	14 200
Srednekolymskiy	10	0	11 244	0	17 000
Verkhnekolymskiy	5	0	14 525	0	19 050

Note: DPP – diesel power plants, SPP – solar power plant.
Source: Program of Optimization of the Local Energy of the Republic of Sakha (Yakutia) for the period of 2016–2025.

deterioration makes up 20% in the Eveno-Bytantayskiy ulus to 76% in the Srednekolymskiy district. More than 60% of the cost of the electricity, generated in the Arctic regions of the Sakha Republic (Yakutia), is accounted by the fuel delivered by means of water and road transport. The delivery averagely takes 2 years, the number of transshipments in different types of transport reaches 5–6 times. The savings from using solar power plants is about 450 tons of diesel fuel per year. A significant portion of the diesel fuel volume was formed at the expense of full capacity of the largest Far Eastern solar power plant of 1 MW in the Batagay settlement of the Verkhoyanskiy district.

In 2018, a wind power plant was commissioned in the settlement of Tiksi; the plant is a technological complex combining wind turbines, diesel generators, and the system of electricity accumulation. The wind power plant includes 3 turbines with total capacity of 900 kW. The diesel fuel savings will amount to nearly 500 tons per year. The settlement of Tiksi is proposed to be used as a testing ground (technopark) for the development and exploitation of renewable sources of energy in the field of renewable energy sources, energy and resource saving, including for the study of joint operation of wind turbines, solar power plants, and mini-hydro power plants for heat and electricity supply of the Arctic zone of the Russian Federation[6].

Currently, the mentioned area is used for the implementation of the projects on construction of wind, solar, geothermal power plants and boiler plants using biofuels. *Table 4* represents the renewable energy projects in the Arctic regions of the country based on the analysis of Internet news resources.

[6] Available at: http://www.rushydro.ru/press/news/107013.html

Table 4. Examples of existing and upcoming RES in the Russian Arctic

Type of RES	Pilot projects	Power	Region
Wind energy	Ostrich farm "Severnoye Siyaniye" (since 2011) – up to 50% of electricity from RES	5 kW	Murmansk Oblast
	The company "Green House" producing wooden windows and doors (since 2015) – up to 20% of electricity from RES	500 kW	
	Lighting of the fishing and tourism complex on the Mudyug island (2014)	1.5 kW	Arkhangelsk Oblast
	Pilot project "Polyaris" realized in the framework of the international program *Kolarctic,* 4 wind power plants (since 2016)	200 kW	Nenets Autonomous Okrug
	Anadyrskaya wind power plant on the Cape of the Anadyrskiy district Observation, including 10 wind turbines (since 2002)	2.5 MW	Chukotka Autonomous Okrug
	Experimental wind power station in the city of Labytnangi (since 2014)	250 kW	Yamalo-Nenets Autonomous Okrug
	Wind power park "Zapolyarniy" consisting of 6 wind turbines (since 1993 to 2014)	1.5 MW	The Republic of Komi
	Installation of the wind turbine at the railway station "Tsentralnaya" (since 2013)	6 kW	
	Construction of a pilot wind power station "Bykov Mys" in the settlement of Tiksi	1.9 MW	The Republic of Sakha (Yakutia)
Solar energy	Ostrich farm "Severnoye Siyaniye" – the project of polycrystalline solar panel with high efficiency (since 2013)	N/a	Murmansk Oblast
	Project of a wind-solar installation for the supply of the office of the youth ecological organization "Etas" (since 2015)	1.6 kW	Arkhangelsk Oblast
	Wind-solar installation for the supply of a house on the Cape of Zhelaniye in the national park "Russian Arctic" (since 2015)	8 kW	
	Installation of solar photovoltaic panels to supply power to the beacons: in the Yugorsky Shar Strait and the coast of the Kara Sea (capes of Khabarov, belyi Yugorskiy, Yaraselya, Sokoliy, etc.), on the Vaygach island (Cape of Gomsasal)	No data	Nenets Autonomous Okrug
	Wind-solar generators on gas fields operated by the company "Gazprom Dobycha Yamburg". Installed more than 200 management systems on 15 fields and pipelines in the ares of Noviy Urengoy, Urengoy, Nadym, Tarko-Sale and others (since 2004)	No data	Yamalo-Nenets Autonomous Okrug
	Solar power plants in the settlements of Batamay (since 2011), Dulgalakh and Kudu-Kyuel (since2013), Kuberganya, Eyik, Dzhargalakh, Toyon-Ary (since 2014), Batagay, Betenkes, Unkyur, Stolby, Uluu, Verkhnyaya Amga, Delgey, Innyakh (since 2015)	Total about 1.4 MW	
Energy of bioresources	Boilers running on biofuel (wood waste): the settlements of Kuropta (since 1969); Luven'ga (since 2012)	1,75–3 Gcal/h	Murmansk Oblast
	The project of the Arkhangelsk pulp and paper mill on operation of 3 biomass steam boilers; the project of the company ZAO "Lesozavod" on operation of CHP plant running on wood waste	Total about 210 MW	Arkhangelsk Oblast
	PAO "Bionet" launched a plant for the production of torrefied pellets (biochar) from hydrolytic lignin in the town of Onega (since 2015)	No data	
	404 boiler houses operating on biofuel	Total about 930 MW	
	The project of boilers installation for the Syktyvkar CHP running on waste wood production of the Syktyvkar sawmill (since 2020)	240 MW	The Republic of Komi
Energy of small and medium rivers	Operation of 60 hydropower plants of collective farms (since the 50-ies of the XX century)	6.5–107 kW	Arkhangelsk Oblast
	The projects of AO "Nord Gydro" on the construction and reconstruction of small hydropower plants on the basis of water energy sources: small HPP "Lyaskelya", small HPP "Ryumyakoski", small HPP "Kalpiokoski" (since 2011)	0.63–4.8 MW	Republic of Karelia
	The projects of AO "Nord Gydro" financed by the Bank "BRIKS" on the construction of Beloporozhskiye HPPs (HPP-1 and HPP-2) on the Kem' river in the Republic of Karelia	49.8 MW	

Source: own compiled.

Another area of renewable energy development is the project for pellets production and conversion of boilers to biofuel. The organization of such kind of plants for the production of biofuel (pellets, briquettes) and the modernization of boilers for their partial conversion to bio-fuels in the Arctic regions will contribute to the protection of the environment and the improvement of human settlements by processing the wood waste (driftwood, wood chips, construction waste), the optimization of costs on the expensive imported fuel consumption. In addition, the implementation of projects for the production of biofuel, the pellets, will contribute to the development of small and medium businesses and partial substitution of imported fuel and energy with local energy sources.

Thus, the regions of the Arctic zone of the Russian Federation have already been using the power plants for the exploitation of local renewable energy which contributes to the alleviation of the annual problem of "Northern fuel delivery", the reduction of electricity generation cost, the increase of the reliability of local consumers' energy supply, and the improvement of the population's life quality. The usage of RES in the Arctic regions does not mean that it is possible to completely abandon the traditional capacity on these territories. On the contrary, it is necessary to double the renewable energy capacity by the capacity of traditional energy, so that, in case of the fall-down (termination) of energy production from a renewable source, it would be possible instantly switch to the backup power supply [12].

On this basis, we can formulate a list of tasks for the development of renewable energy in the Arctic zone of the Russian Federation which includes the actions for the involvement of renewable energy sources in the energy balance of these territories with the reflection in regional programs, the increase of the share of renewable energy sources in the region's energy balance, the saving of expensive diesel fuel.

Advantages and disadvantages of using renewable energy in the Arctic regions

It is obvious that the adoption of renewable energy sources in the Arctic are influenced by various conditions. First, it is a climatic factor which implies seasonal and weather dependence of the RES efficiency. The climatic design of the equipment should meet stringent requirements, so, for example, the building-up of snow on the solar panels would be prevented. It is also important to take into account the permafrost and its melting due to the possible climate warming in the Arctic, which, respectively, will require the construction of expensive foundations and involving of special machinery to the construction. Second, the logistics factor, which involves seasonal dependence of the equipment delivery, the area, the availability of specialized machinery. Third, an important condition for the active promotion of renewable energy in the Russian Arctic is highly skilled RES designers and personnel trained to operate the relevant equipment. This will require corresponding training in Russian universities. Some universities already have a successful experience of such training.

The modern period of using renewable energy in the country is characterized by its weak development in the Arctic regions. However, the importance of renewable energy in the Arctic is increasing right now, when the raw model of the economy creates additional load on the environment. It is obvious that, in order for a number of projects in the field of renewable energy sources in the Arctic zone of the Russian Federation to increase every

Table 5. Advantages and disadvantages of using renewable energy sources in the Russian part of Arctic

Advantages	Disadvantages
- Relative inexhaustibility of energy. - Lack of dependence on transport costs for fuel supply to the settlements of the Arctic regions. - Relatively low cost of produced electricity and thermal energy. - Reducing the negative impact on the environment. - Use in conjunction with traditional sources of energy. - Reduction of tariffs on electricity and thermal energy. - Attractive for small consumers (small towns, small farms).	- Dependence on natural, climatic and weather conditions of a particular locality. - Relatively small potential capacity of the energy produced. - High initial costs for the construction and installation of power facilities and the payback period of the project. - Lack of domestic equipment and dependence on imported components. - The inability to support smooth operation of power facilities without a backup power supply. - Gaps in the legal regulation of energy facilities' activities, lack of tax preferences and exemptions to the participants of alternative power market.
Source: own compilation.	

year, it is necessary to ensure a favorable investment climate, effective legal and regulatory framework, and the high level of state support. The current status of "green" energy is characterized on the basis of the analysis of its advantages and disadvantages *(Tab. 5),* and it allows outlining specific actions to increase the share of renewable energy in the energy balance of the Arctic constituent entities of the Russian Federation.

The presented analysis allows us to make a basis for the further development of renewable energy in the Russian Arctic and to define a basic set of actions for the application of "green" technologies in its regions. It is particularly important to pay attention to the following circumstance. The formation of "green" energy, including RES-based, is not only an attempt to diversify energy resources, but also a tool for greening the energy sector in the studied area. However, such measures cannot prevent large-scale natural changes in the Arctic caused by global climate change, which, in turn, is a consequence of the international economic system's functioning. If this is true, then the attempts of greening the human activity in the Arctic zone of the Russian Federation will encounter a serious obstacle in the form of environment transformation. The latter implies a qualitative change of renewable energy sources. In particular, the ice sheet's shrinking in the Arctic ocean will increase the width of the "open sea" and the duration of the season, during which it is possible to use the corresponding resources (for example, wave activity). However, this will require restructuring of technologies used to generate this kind of energy. Wind power generating is doubtful, because the speed and direction of prevailing winds can also change with climate transformation. The initiatives in the sphere of the regional and local development of renewable energy should definitely take into account these kinds of risks. In other words, it should be realized that its development makes the population and the economic system of the Arctic zone of the Russian Federation much more dependent on the global environmental factor.

The development of renewable energy in the Arctic zone of the Russian Federation should be carried out gradually and systematically. Currently, the regulatory framework in the field of RES is constantly being updated, new laws are issued almost every year, new regulations, focused on the renewable energy support measures, are adopted.

Public-private partnership in the implementation of renewable energy projects in the Russian Arctic

Currently, one of the main tools of attracting investment resources into infrastructure projects is a public-private partnership. However, as noted at the meeting of the Arctic and Antarctic Expert Council under the Federation Council of the Federal Assembly of the Russian Federation (Yakutsk, 2019)[7], the total volume of attracted private investments is rather small – only 1%, while, in many developed countries, this figure reaches 20%. In these conditions, it is necessary to encourage private investment in the infrastructure and facilities, related to the renewable energy usage, to develop the mechanism of private and public cooperation in the Arctic.

For legal and economic regulation in this sphere, it is necessary to develop and adopt changes in the legislation aimed at the development of new forms of public-private partnerships (PPPs), such as, for example, infrastructure mortgage[8] that will allow the state to buy the facilities, built by investors, through private loans that will be repaid in parts from budgets of different levels during the facility operation. The possibility of the implementation of some Arctic projects on the basis of infrastructure mortgage is currently being discussed. These projects are the construction of the North latitudinal way and the development of the Murmansk transport hub. This approach, of course, should be extended to the construction of energy infrastructure for the production and use of renewable energy sources.

It should be noted that, since 2015, special investment contracts (SPIC) have been applied[9] in order to stimulate the attraction of investments into the creation and modernization of production, to guarantee the provision of investors with industry-specific privileges and preferences, and to create a stable business environment. In our opinion, it is useful to extend SPIC mechanism not only for the industrial enterprises creation, but also for the construction of energy infrastructure. For these purposes, mechanisms of project management should be used [20].

An important area of the new technologies support, which are necessary for work in the Arctic, including the ones based on the renewable energy sources usage, is the creation of the Fund for the Development of Arctic Technologies. The Fund will intentionally support necessary for the Arctic technological, infrastructural, and energy projects, including ones at the initial phase – at the research and development stage.

Our analysis of the potential of renewable energy sources and their usage in energy systems of the Arctic zone of the Russian Federation showed that most constituent entities have sufficient quantities of renewable energy resources, and their usage is the condition for the economical and efficient spending of energy resources and the minimization of harmful impact on the environment.

At the same time, despite the considerable potential, the regions of the Russian Arctic implement a relatively small number of projects in the field of renewable energy sources. One of the main reasons, in our opinion, is the lack

[7] https://www.sakhatimes.ru/gov/news/il-tumen/v-yakutske-sostoyalos-zasedanie-soveta-po-arktike-i-antarktike-pri-sovete-federatsii-rf/

[8] https://porarctic.ru/blog/2019/04/08/arktiku-pomozhet-razvivat-infrastrukturnaya-ipoteka/

[9] Special investment contracts (SPIC). Industrial Development Fund. Available at: https://frprf.ru/gospodderzhka/o-spetsialnykh-investitsionnykh-kontraktakh-dlya-otdelnykh-otrasley-promyshlennosti/

of available sources of funding of economic entities. Therefore, in order to implement projects on the construction and exploitation of renewable energy sources in the Arctic zone of the country, it is advisable to use the mechanism of public-private partnership, which involves a legal agreement between public authorities and businesses about the construction and operation of these facilities.

A specific feature of such a mechanism in the field of renewable energy sources, in our opinion, is the fact that the agreement between public authorities of the Arctic region and business includes:

– the consolidation of private and public sources of project financing;

– the allocation of risks during project implementation;

– the attraction of additional private investments in the economy;

– the accessibility for consumers and the increase of the quality of services for the production and transmission of electric and thermal energy by RES;

– the creation of new jobs through the construction and operation of alternative energy facilities;

– mutually beneficial cooperation of public authorities and businesses during the implementation of projects on the construction and usage of renewable energy facilities in the Russian Arctic;

– businesses' usage of innovative methods, initiated and applied by the public sector, in the process of implementation of investment projects on the development of renewable energy sources in the Arctic region;

– joint implementation of projects on the construction and operation of renewable energy facilities, necessary for the Arctic region.

Another important advantage of PPP is the fact of public attention to this project. On the one hand, it emphasizes the importance of the latter (since one of obstacles, preventing RES from the wider usage, is the business representatives' narrow vision, because they consider such projects marginal ones). On the other hand, PPP is some kind of a guarantee for business, which is also important in order to ensure the willingness of the latter to participate in the implementation of technologically and environmentally innovative projects. Moreover, the state's participation will provide the attention and support of municipal authorities and local population.

According to the Analytical Center "Rosinfra" (a platform for supporting infrastructure projects), public-private partnership will be used for the implementation of the project of reconstruction of the Anadyr wind power plant in the Chukotka Autonomous Okrug in the form of a concession agreement. The implementation of this project will involve 143.3 million rubles of private funds, the return of the private partner's investment will be carried out by consumers' charge for the object usage, the project implementation timeline is 20 years (until 2039). The participants of the project are the Chukotka Autonomous Okrug and OOO "Stroyindustriya"[10]. The public partner's obligation is to ensure that the concessionaire will have necessary conditions for performing the reconstruction of the object of the concession agreement, the terms of implementation, and the assistance in the development of project documentation in accordance with the requirements of the legislation of the Russian Federation. Thus, the reconstruction and operation of the wind power plant with 2.5 MW capacity will be ensured.

[10] A platform for supporting infrastructure projects. Available at: https://rosinfra.ru/project/short-view/rekonstrukcia-vetroelektrostancii-s-dispetcerskim-punktom-v-anadyrskom-rajone-na-myse-observacii-v-cukotskom-avtonomnom-okruge

The sources of projects' co-financing in the renewable energy sector within PPP may be federal budget funds, the RF constituent entities' budgets, local budgets, and private investors. The usage of such mechanism in the field of renewable energy will allow implementing the investment projects on the construction and operation of renewable energy facilities successfully, improving the quality of services provided in the sphere of energy for the region's consumers, increasing the flows to the budgets of different levels (through the fiscal mechanism), providing employment, improving the ecological situation in the region, reducing the costs of transporting fuel to the settlements of the Russian Arctic. Therefore, the mechanism of attracting private funds with federal support in the form of tariffs' subsidizing will allow modernizing operating diesel power stations with partial substitution of diesel generation with solar, wind energy.

In order to lend financial assistance to small and medium businesses and support projects designed to increase the Arctic-produced value added, it is offered, along with the PPPs, to provide preferential financing for such projects and to use the mechanism of subsidizing interest rates on loans, which will allow attracting funds at the rate of not more than 5% per annum.

A new direction for PPP and a way of attracting investments for the implementation of environmentally and socially significant projects is the conclusion of agreements on the socio-economic development of territories between the bodies of state administration, the mining company, and indigenous peoples of the North in the implementation of projects of industrial development of the Arctic. This approach is based on the ethnological expertise of the projects in the Republic of Sakha (Yakutia), and it has been used since 2011. Its essence is that the potential losses of indigenous peoples of the North from the effects of economic and other activities' impact on their traditional occupations are defined in the framework of such ethnological expertise and compensated by the mining company [21, 22]. In the Republic of Sakha (Yakutia), the necessary legal conditions for holding the ethnological expertise and compensating losses to indigenous peoples, while implementing mining projects and mineral exploration, are created [23]. This compensation may be offered in the form of a direct payment to local people in the zone of the mining project's influence or in the form of a financial support for the development of social, transport, and energy infrastructure. For example, in the Bulunskiy ulus of the Sakha Republic (Yakutia), the implementation of the project of coal gasification at the expense of funds attracted with the help of compensation agreements is considered [24]. This approach is essentially the implementation of the concept of obtaining and using benefits in the Arctic and the interaction of concerned parties in the territory's development [25].

Conclusion

In the last decade, renewable energy in the Arctic regions has been gradually showing power growth, special programs and measures of state support, aimed at the acceleration of the development of environmentally friendly energy sources in the Arctic zone of the Russian Federation, are being developed. The development of the Arctic territories should take into account the environmental requirements and protect the habitat and traditional lifestyle of indigenous low-numbered peoples of the North.

In conditions of limited budget financing, one of the proposed sources of attracting funds for the implementation of investment projects on the usage of renewable energy sources in the Arctic regions' energy systems is the mechanism of public-private partnership, which includes

the application of project financing methods, the usage of special investment contracts (SPIC) for energy infrastructure that will stimulate the investments attraction into the creation and modernization of production, ensure the provision of benefits and preferences to the investor, and create a stable business environment.

One of the proposed sources for funding renewable energy investment projects in the Arctic regions' energy systems is the usage of part of funds paid by mining companies to indigenous peoples of the North in the framework of the ethnological expertise of projects on the territories of traditional nature use.

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The Impact of the Retirement Age Increase on the Economy and Attitudes of the Population of the Murmansk Oblast*

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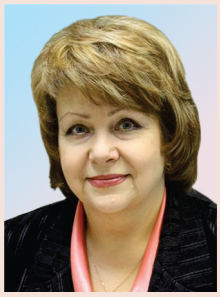

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Abstract. The article is devoted to a meaningful analysis of the impact of the retirement age increase on the economy of the Murmansk Oblast and the attitude of its residents. The pension system, which includes protectionism for the population of the North, has a significant impact on the economy, social life, and migration of the population. Therefore, the assessment of the impact of the retirement age changes on social and economic processes is particularly relevant for the Northern and Arctic territories. Three objectives were achieved: 1. Considering the change of the retirement age, the forecast for the number of able-bodied population of the Murmansk Oblast was made. It is shown that the increase of the retirement age will halt the steady decline of able-bodied population in the region, but it will not break the trend. Comparison with the results of the forecast for Russia as a whole showed that it qualitatively distinguishes the situation in the region from the national situation. 2. The features of GRP production in the Murmansk region, based on economic and statistical modeling, are reviewed. It is established that, with the current structure of the economy, a slight reduction of the decrease rate of the able-bodied population number will not have a significant impact on the production of GRP. 3. On the basis of the survey, conducted according to a representative regional sample of the Murmansk Oblast in 2019, attitudes of the Murmansk's population were revealed. There is a very painful perception of the retirement age increase by the population; there is a persistent opinion that change of the retirement age does not meet the interests of the population of the North and the Arctic. A negative effect of the retirement age increase was diagnosed: a change of migration attitudes among the most significant group of the Murmansk Oblast's population (from the perspectives of regional production) – people of young (18–29 years old) and middle (30–49 years old) ages. For example, a significant number of members of these age groups have already decided to leave the Murmansk Oblast. They link their decision to the factor of the retirement age increase. Thus, the positive effect – a decrease of the rate of the able-bodied population decline in the Murmansk region, caused by the retirement age increase – will be offset by a negative effect – the growth of the rate of migration losses in the region.

Key words: retirement age increase, Arctic, Murmansk Oblast, GRP, number of able-bodied population, modelling, survey, people's attitides.

Introduction

The overview of the required transformation of pension systems in developed and developing countries is the spotlight of world science. It is defined by the fact that, despite external diversity, economic and interconnected demographic processes in different countries lead to the single result – the reduction of able-bodied population (the process has different scales and speed of population ageing) [1, 2, 3, 4, 5]. Increased social vulnerability is the reality of older people. "Successful ageing" phenomenon of developed countries' population, created by the pension system, is obscured by objective economic situation. Thus, the common point of view assumes that the population ageing will lead to further increase of capital intensity with simultaneous decrease of the capital return rate and growth of salaries [1, 2, 5, 6].

The basic problem of population ageing is solved by unpopular measures: raise of pension contributions, reduction of pension payments, and the retirement age increase [1, 2, 3, 6, 7, 8]. Summary of the research results shows that the retirement age increase is the preferred option for the economy and social sphere [9, 10]. Numerous domestic studies

confirm this conclusion [4, 11, 12, 13, 14]. Thus, the authors' studies [14] show that the steady decline of the number of able-bodied population in Russia is corrected by the retirement age increase. Studies on the specifics of Russian GDP production also confirm the thesis about the positive impact of the shift of the number of able-bodied population on economic growth [4]. It is worth mentioning many works that indicate the universality of the retirement age increase recipe for maintaining the welfare of the population and ensuring the stability of the pension system, regardless of its type and the birth rate [15, 16].

According to world studies, the retirement age increase is also based on internal demographic reserves – lengthening of a healthy life duration [17, 18]. The same trend is objectively typical for Russia: according to real data and demographic forecasts, further increase of Russians' life expectancy is expected [19, 20]. This trend is clearly visible for residents of the Russian part of the Arctic, which is largely caused by the development of social infrastructure with the goal of bringing indicators of regional and municipal statistics of the Arctic territories closer to all-Russian ones [14, 21].

However, territorial "attachment" to the problem of population ageing has a different aspect for extremely diverse Russian regions: it is an assessment of the retirement age changes' impact on regional processes. Numerous studies of the macroeconomic movements' impact on the regional development show that this reaction can be very specific [22, 23, 24]. Also, a number of researchers demonstrate significant economic and social risks of regional features' under-accounting in management practice [25, 26, 27, 28].

The pension system, which includes protectionism for the Northern territories' population, particularly concerning the retirement age, has a significant impact on the economy, social life, and migration of the population. Therefore, the assessment of the impact of the retirement age increase on social and economic processes is particularly relevant for the Northern and Arctic territories.

Our research is based on the test of the hypothesis that the retirement age increase is a factor that can change the state of labor resources, the population's behavior, and significantly affect the processes of the economic development in the Arctic regions.

The purpose of the work is to analyze the impact of the retirement age increase on the economy and attitudes of residents of the Arctic region – the Murmansk Oblast.

Objectives: 1) to make a long-term forecast, which takes into account the retirement age increase, for the number of able-bodied population in the Murmansk Oblast; 2) to review the features of the GRP production in the Murmansk Oblast; 3) to reveal attitudes of the Murmansk Oblast's population, caused by the retirement age increase.

It should be noted that there are still no such assessments: this fact determines not only the fundamental novelty, manifested in the established interconnections and the development trends of the Murmansk Oblast, caused by the retirement age shift, but also the obvious scientific and practical novelty, caused by new strategic objectives of the Russian Arctic's development.

Forecast for the number of able-bodied population in the Murmansk Oblast, which considers the retirement age changes

The Murmansk Oblast shows quite high rates of population ageing, which corresponds with the situation across Northwestern Federal District (*Tab. 1*). The analysis of the population's natural movement (*Tab. 2*) and

Table 1. Age composition of the population by regions of Northwestern Federal District (year-end estimate, % of the total population)

Territory	People below working age						People of working age						People above working age					
	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017
Northwestern Federal District	**15**	**15**	**16**	**16**	**17**	**17**	**61**	**60**	**59**	**58**	**57**	**57**	**24**	**25**	**25**	**26**	**26**	**27**
Republic of Karelia	17	17	17	18	18	18	59	58	57	56	55	55	24	25	25	26	27	27
Komi Republic	19	19	19	20	20	20	62	61	60	59	58	57	19	20	20	21	22	23
Arkhangelsk Oblast	17	18	18	19	19	19	59	58	57	56	55	55	23	24	25	25	26	26
including:																		
Nenets Auton. Okrug	23	24	24	24	25	25	61	60	60	59	58	57	15	16	16	17	18	18
Arkhangelsk Oblast without Auton. Okrug	17	18	18	18	19	19	59	58	57	56	55	54	23	24	25	26	26	27
Vologda Oblast	17	18	18	19	19	19	59	58	57	56	55	54	24	24	25	25	26	27
Kaliningrad Oblast	16	16	17	17	17	18	61	60	59	58	58	57	23	24	24	25	25	25
Leningrad Oblast	14	14	14	15	15	15	60	60	59	58	57	57	26	26	27	27	28	28
Murmansk Oblast	17	17	18	18	18	19	64	63	62	61	60	59	20	20	21	21	22	22
Novgorod Oblast	16	16	17	17	17	18	57	56	55	54	54	53	27	28	28	29	29	30
Pskov Oblast	15	15	16	16	16	16	58	57	56	55	54	54	27	28	28	29	29	30
Saint-Petersburg	13	13	14	14	15	15	61	61	60	59	58	58	26	26	26	26	27	27
For reference, Russia	17	17	18	18	18	19	60	59	58	57	57	56	23	24	24	25	25	25

Source: *Regions of Northwestern Federal District. Socio-Economic Indicators. 2018: stat.coll.* Komistat; Syktyvkar, 2018. 189 p.

Table 2. Number of births and deaths by regions of Northwestern Federal District, per 1000 people

Territory	Number of births per 1000 people						Number of deaths per 1000 people					
	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017
Northwestern Federal District	**12.2**	**12.2**	**12.3**	**12.5**	**12.4**	**11.1**	**13.8**	**13.4**	**13.3**	**13.4**	**13.2**	**12.8**
Republic of Karelia	12.6	11.9	12.3	12.2	12.0	10.3	15.4	14.6	14.6	15.3	14.8	14.6
Komi Republic	14.0	14.2	14.2	13.7	13.1	11.5	12.2	12.0	12.2	12.4	12.4	11.8
Arkhangelsk Oblast	12.8	12.8	12.6	12.4	12.0	10.7	13.6	13.3	13.3	13.5	13.5	13.0
including:												
Nenets Auton. Okrug	17.3	16.4	16.8	17.6	18.5	15.2	10.2	10.7	8.9	9.2	8.9	8.6
Arkhangelsk Oblast without Auton. Okrug	12.6	12.7	12.5	12.2	11.8	10.5	13.8	13.4	13.4	13.6	13.7	13.2
Vologda Oblast	14.0	13.8	13.6	13.7	13.3	11.4	15.1	15.0	14.8	14.8	15.0	14.4
Kaliningrad Oblast	12.4	12.4	12.6	12.7	12.4	11.0	13.2	13.1	13.3	13.2	12.5	12.5
Leningrad Oblast	9.0	8.8	9.1	9.0	9.2	8.3	14.7	14.4	14.5	14.0	14.0	13.3
Murmansk Oblast	11.8	11.9	11.7	11.9	11.2	10.3	11.3	11.0	11.4	11.6	11.5	11.1
Novgorod Oblast	12.1	11.8	12.0	11.9	11.7	10.3	17.9	17.8	17.4	17.5	17.5	17.1
Pskov Oblast	11.1	11.0	10.9	11.0	11.1	9.5	19.6	18.6	18.4	18.2	17.9	17.4
Saint-Petersburg	12.6	12.6	13.0	13.6	13.8	12.5	12.4	11.9	11.7	11.9	11.7	11.4
For reference, Russia	13.3	13.2	13.3	13.3	12.9	11.5	13.3	13.0	13.1	13.0	12.9	12.4

Source: *Regions of Northwestern Federal District. Socio-Economic Indicators. 2018: stat.coll.* Komistat; Syktyvkar, 2018. 189 p.

Table 3. Coefficients of migration growth (loss) by regions of Northwestern Federal District, per 1000 people

Territory	2012	2013	2014	2015	2016	2017
Northwestern Federal District	**5.8**	**7.2**	**4.1**	**1.6**	**4.1**	**5.5**
Republic of Karelia	-1.5	-1.3	-0.7	-1.2	-1.6	-3.1
Komi Republic	-12.2	-12.0	-10.7	-10.1	-8.1	-11.2
Arkhangelsk Oblast	-8.5	-8.2	-6.5	-6.8	-5.6	-6.9
including:						
Nenets Auton. Okrug	1.2	-0.3	0.1	2.3	-7.3	-5.3
Arkhangelsk Oblast without Auton. Okrug	-8.8	-8.5	-6.8	-7.2	-5.6	-7.0
Vologda Oblast	-0.9	-1.1	-0.7	-1.7	-1.5	-3.1
Kaliningrad Oblast	9.2	9.4	6.7	8.2	10.1	9.9
Leningrad Oblast	15.6	12.9	12.0	6.8	12.1	17.1
Murmansk Oblast	-10.1	-12.9	-6.5	-5.7	-5.7	-4.6
Novgorod Oblast	-0.4	0.5	-0.6	0.7	0.6	-3.1
Pskov Oblast	0.4	0.1	-0.8	-0.1	0.3	-0.9
Saint-Petersburg	14.8	19.7	10.2	4.9	8.5	12.1
For reference, Russia	2.1	2.1	1.9	1.7	1.8	1.4

Source: *Regions of Northwestern Federal District. Socio-Economic Indicators.2018: stat.coll*. Komistat; Syktyvkar, 2018. 189 p.

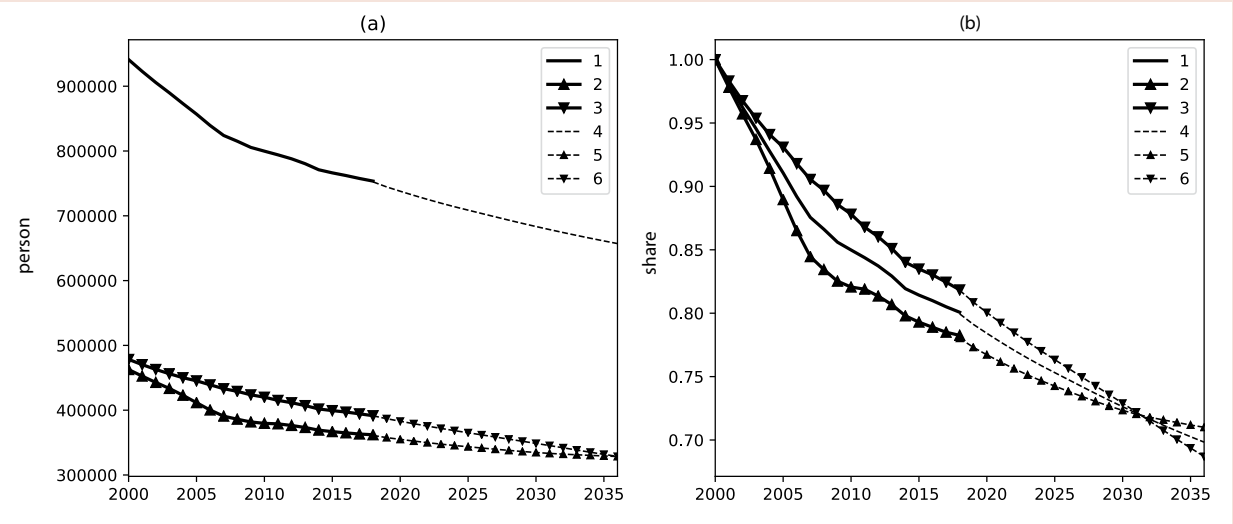
migration processes (*Tab. 3*) shows that, in the Murmansk Oblast, it is caused by two factors: the population's strong migration outflow and low birth rates.

Using the data of official demographic forecast until 2016, Rosstat data on the gender-age structure of the Murmansk Oblast's population, and the scheme of the retirement age increase, we did the long-term forecast for the number of able-bodied population of the Oblast, which took into account the increased retirement age. *Figure 1* contains forecast data, acquired in 2000, in absolute and relative values.

The decline of the able-bodied population number in the Murmansk region, which has been observed since 2000, is noteworthy (*Fig. 2*). If you keep the working age for women, aged from 16 to 50, and men, aged from 16 to 55 (for residents of the North, without pension reform), the further decline of able-bodied population, on the average level of 0.73% per year, is projected. By 2036, it will have reached 14% in comparison with 2018 (in the Murmansk Oblast, there will be 389.502 able-bodied people). With the new retirement scheme, the rate of able-bodied population decline is projected to decrease to 0.14% per year. Starting in 2027, the decline will practically stop and, by 2036, the number of able-bodied population will have decreased by 4.4% in comparison with 2018 (in the Murmansk Oblast, there will be 432.878 able-bodied people).

In our previous studies, we, taking into account the retirement age increase, made a three-variant forecast for the number of able-bodied population of the Russian Federation in 2018–2036 [12]. The forecast showed that the decline of the number of able-bodied population in the country has been observed since 2006 (the maximum value is 90157.93 thousand people). With the preservation of the working age (without pension reform), a further decline of the number of Russian able-bodied population is forecasted in all variants (*Fig. 3*). The retirement age increase changed decline trends – the number of able-bodied population will grow: the 2006 value, according to the high variant of the forecast,

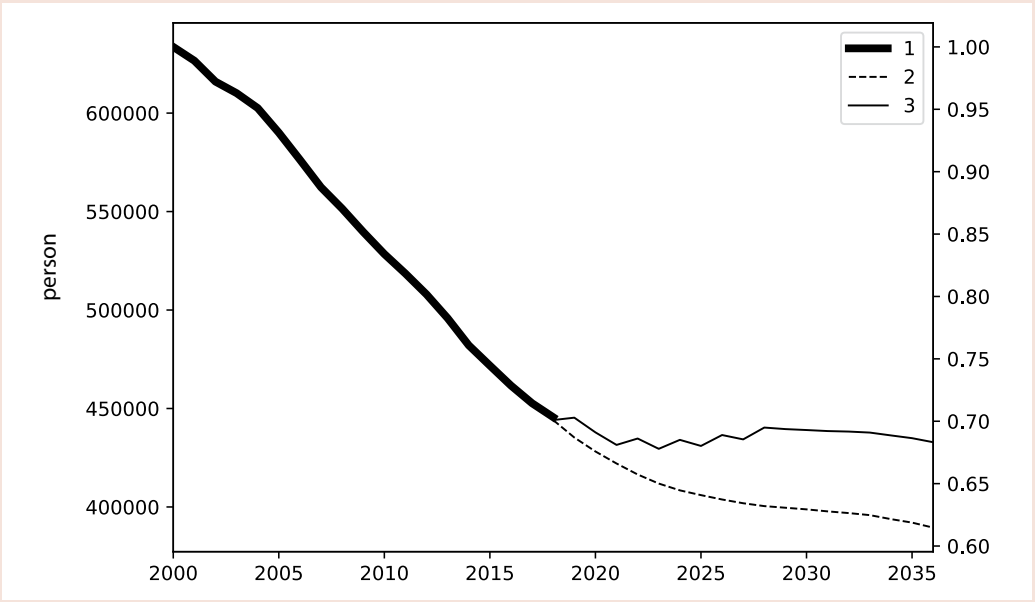
Figure 1. Dynamics of the number of the Murmansk Oblast's population for 2000–2036 in absolute values, people (a) and values are compared with the level of 2000 (b):



1 – actual data for the entire population in 2000–2018; 2 – actual data for men in 2000–2018; 3 – actual data for women in 2000–2018; 4 – forecast values for 2019–2036; 5 – forecast values for men in 2019–2036; 6 – forecast values for women in 2019–2036.

Source: own calculations according to data of Federal State Statistics Service.

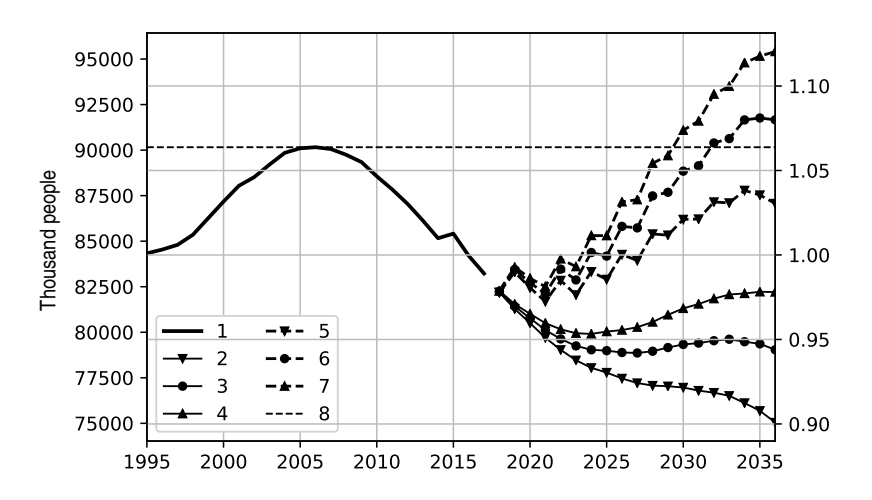
Figure 2. Dynamics of the number of able-bodied population (people) in the Murmansk Oblast for 2000–2036:



1 – actual data for 2000–2018; 2 – forecast values for 2019–2036 according to old retirement scheme; 3 – forecast values for 2019–2036 according to new retirement scheme.

Source: own calculations according to data of Federal State Statistics Service.

Figure 3. Dynamics of the number of able-bodied population (thousand people) for 1995–2036*:



1 – actual data for 1995–2017. Forecast values for 2018–2036 according to old retirement scheme (women – 16–54 years, men – 16–59 years): low (2), average (3), high (4) forecast variant. Forecast values for 2018–2036 with new retirement scheme: low (5), average (6), high (7) forecast variants. 8 – maximum number of able-bodied population, observed in 2006.

* On the right axis, the values of the indicator are given in comparison with the level of 1995.

Source: own calculations according to data of Federal State Statistics Service [12].

will have been achieved by 2029, according to the average variant – by 2032, according to the low variant – 2006 value will not be achieved.

Thus, the dynamics of the number of able-bodied population change in the Murmansk Oblast is significantly different from the national dynamics. In the Murmansk Oblast, the retirement age increase will not be able to provide the growth of this indicator's values.

Features of GRP production in the Murmansk Oblast

The pension reform, in terms of the retirement age increase, directly regulates the number of able-bodied population. Therefore, to identify the impact of the retirement age increase on GRP production, it is necessary to find a connection between these indicators.

Figure 4 contains the dynamics of values of accepted factors-indicators, which define the GRP production while modelling regional production processes – regression models and production functions (indices of the physical GRP volume, investments in fixed assets, and the index of able-bodied population) for 1998–2016 in comparison with 1997 [29, 30, 31, 32] – with traditional research instruments.

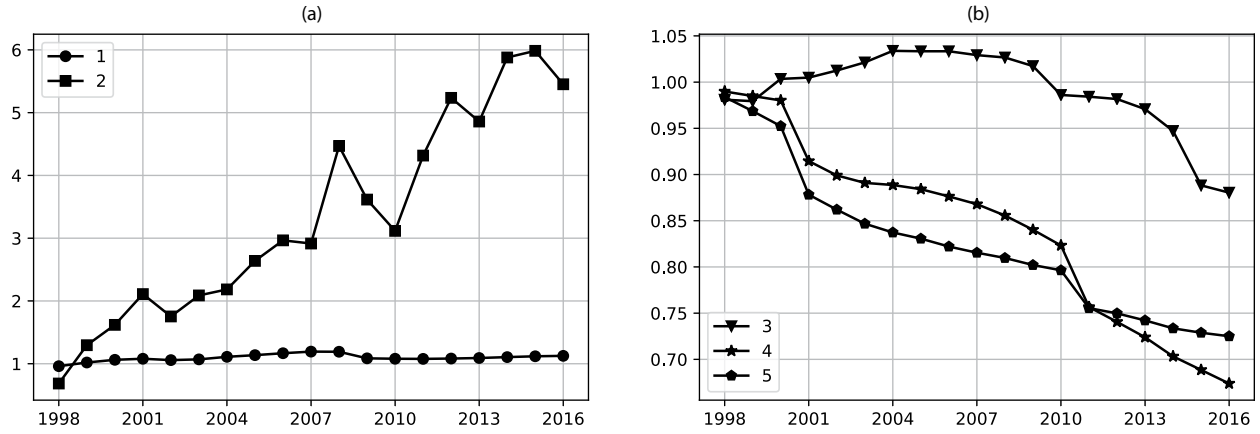
The connection between GRP, investments, and the number of able-bodied population will be overviewed as a production function:

$$Y = AK^pL^q,\ p + q = 1, \qquad (1)$$

where Y – GDP; K – investments in fixed capital; L – number of able-bodied population; $A = exp(a)$ – neutral technical progress; p – labor elasticity coefficient (number of able-bodied population), q – capital elasticity coefficient (investments in fixed capital).

Estimation of model parameters (1), using the least squares method, shows that the model does not correspond to the original data: the coeffici-ent of determination $R^2 = 0.50$ (*Fig. 5*). This conclusion corresponds to the

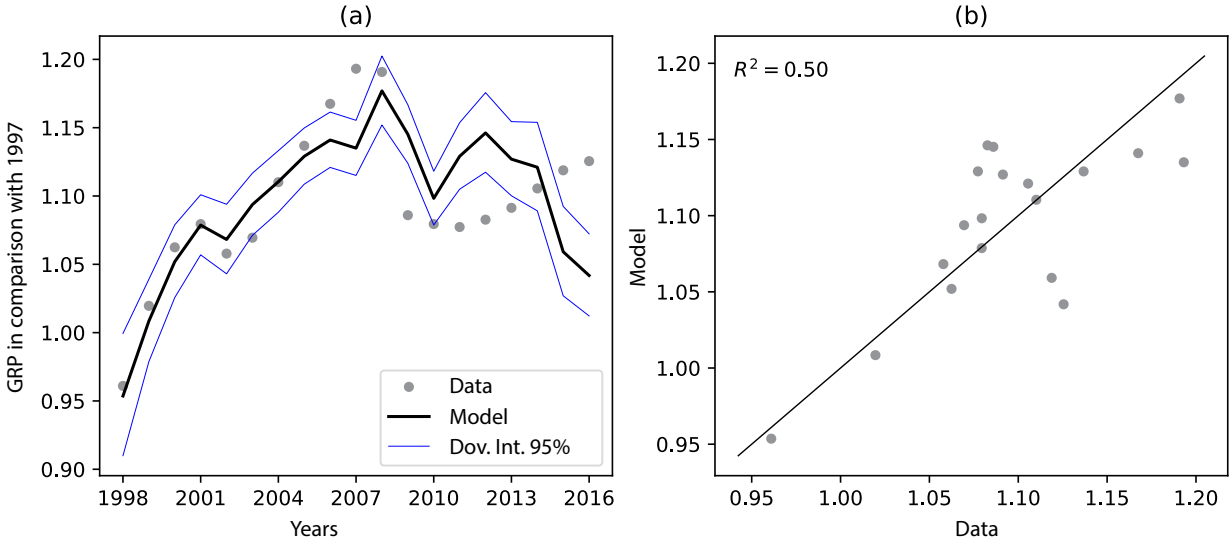
Figure 4. Dynamics of values of region's basic production indicators for the Murmansk Oblast in 1998–2016 compared with values of 1997:



(a) 1 – index of physical volume of GRP in comparable prices; 2 – index of physical volume of investments in fixed capital in comparable prices; (b) 3 – average annual number of people employed in the economy; 4 – number of able-bodied population in comparison with 1997; 5 –number of population in comparison with 1997.

Source: own calculations according to data of Federal State Statistics Service [12].

Figure 5. Estimation of parameters of the model (1) for the Murmansk Oblast:



(a) – dynamics of actual and model values of the GRP physical volume index; (b) – the degree of compliance of the actual model values of the GRP physical volume index (coefficient of determination $R^2 = 0.50$)

results obtained earlier, which were based on a detailed study of production processes in the Murmansk Oblast within the "all-Northern" and all-Russian situation and took into account fixed assets, the number of employed people in the economy of the Murmansk Oblast, and investments in fixed capital [4, 29].

Thus, for the Murmansk region, there is no clear link between GRP, investments in fixed capital, and the number of people employed in the economy. The same conclusion is true for the number of able-bodied population. This distinguishes the situation in the Murmansk Oblast from the situation across Russia and in most Northern regions [29].

The revealed specifics determined a paradox: *the six-time increase of the physical volume of investments in fixed capital of the Murmansk region, observed in 1997–2017, did not provide a significant increase of the physical volume of the region's GRP (the maximum value was 1.2 times in 2007)* (*Fig. 4*).

We believe that the reasons of the identified specifics must be found in the internal structure of the Murmansk Oblast's economy. Thus, our preliminary studies show that the lack of growth with multiple investment injections is largely caused by the extractive nature of the region's old-industrial economy. Let us explain. The largest share in the formation of the Murmansk Oblast's GRP traditionally belongs to the "Mining" economic activity. The deterioration of the region's mineral resource base leads to the need for increasing the cost of developing poorer ores, with difficult conditions of occurrence, etc. This requires larger investments, which, in fact, only replace the produced sources of minerals, without creating additional sources of growth. The problem is reinforced by outdated fixed assets. However, this only partially explains the identified effect. In-depth additional research, which goes beyond the subject of the study, presented in this article, is required.

Coming back to the objective of finding the economic effect from the retirement age increase for the economy of the Murmansk Oblast, it is possible to note the following. Given the current structure of the region's economy, minor fluctuations in the number of able-bodied people, caused by the retirement age increase, will not have a significant impact on the GRP production.

Attitudes of the Murmansk Oblast's population, caused by the retirement age increase

The empirical basis of the research of the Murmansk Oblast population's attitudes is the data of the survey, conducted according to the representative all-regional sample of the Murmansk Oblast in 2019 (with quotas based on gender, age, education, and Rosstat territorial zoning) in settlements Kovdor, Monchegorsk, Apatity, Kirovsk, Murmansk, Snezhnogorsk, Polyarny, Kola, Lovozero, Olenegorsk, Polyarnye Zori, Kandalaksha, Umba (number of respondents – 1291 people). The sampling error does not exceed 4%. The data is given in a percentage from the number of respondents. It is important to note that, in this article, we present only a small piece of a large-scale three-year study (2019–2021) funded by RFBR, project no. 19-010-00022. The expedition part of the research is aimed at investigating the specifics of the pension reform's reflection in minds of the Arctic regions' population.

Table 4. Distribution of responds of residents of the Murmansk Oblast to the question "How do you feel about the legislative increase of the retirement age?", in % from the total number of respondents

Respond	Region as a whole (total)	Men	Women
Entirely positive	0.8	1.3	0.3
Rather positive	4.1	5.0	3.2
Rather negative	22.5	20.9	24.1
Strongly negative	64.6	67.1	62.2
Hesitant to answer	8.0	5.8	10.2
Source: data of surveys, conducted by the authors.			

Let us first take a look at the overview of attitudes of the Murmansk Oblast's population toward retirement age increase (*Tab. 4*). Some received responds were quite predictable in terms of population's negative attitude toward the reform (87.1% of respondents). There is no country, where people would support the retirement age increase. However, the strong negative attitude, which was shown by 64.6% of respondents, attracts attention. 22.5% of survey participants were inclined to choose "rather negative" answer, 4.1% of respondents are "rather positive", and 0.8% of people said that they had "entirely positive" attitude toward the reform.

The social acuteness and special soreness of the retirement age increase are indirectly confirmed by the fact that only 8% of respondents found it difficult to answer to question. Such perception could be explained by the fact that Northern benefits include a lower retirement age. A popular behavior strategy of the regions' population, even regarding younger people, was the movement to climate-friendly areas. Thus, the retirement age change forced the population to significantly adjust their plans. It should be noted that, from the state's point of view, the relocation of pensioners from the Northern territories is a positive migration trend, which is associated with increased costs of social infrastructure maintenance in the North.

More than 70% of surveyed residents of the Murmansk Oblast believe that the retirement age change does not meet the interests of the population of the North and the Arctic (*Tab. 5*). Thus, according to 46.3% of respondents, the retirement age increase is definitely not in the interests of the population of the North and the Arctic; 24.7 % of respondents tend to believe that it is rather not in the interests of northerners. A little more than 14% of respondents see the positive effect of the reform for the

Table 5. Distribution of responds of residents of the Murmansk Oblast to the question "Do you agree that the retirement age change meets the interests of the population of the North and the Arctic?", in % from the total number of respondents

Respond	Region as a whole (total)	Men	Women
Definitely yes	6.2	7.9	4.6
Rather yes than no	7.9	8.2	7.6
Rather no than yes	24.7	23.7	25.6
Definitely not	46.3	45.8	46.8
Hesitant to answer	14.9	14.4	15.4
Source: data of surveys, conducted by the authors.			

Table 6. Distribution of responds of residents of the Murmansk Oblast to the question "Did you change your plans, concerning further residence in the Murmansk Oblast, because of the retirement age increase?", in % from the total number of respondents

Respond	Region as a whole (total)	Men	Women
No, they have not changed, I will live and work here	51.5	53.0	50.1
Rather changed, I think about moving to a more comfortable place	25.6	22.5	28.5
Definitely changed, I have already found another place for life and work	7.5	8.5	6.5
Hesitant to answer	15.4	15.9	14.9
Source: data of surveys, conducted by the authors.			

Table 7. Distribution of responds of residents of the Murmansk Oblast to the question "Did you change your plans, concerning further residence in the Murmansk Oblast, because of the retirement age increase?", taking into account age and gender, in % from the total number of respondents

Respond	Men				Women			
	18–29	30–49	50–64	65+	18–29	30–49	50–64	65+
No, they have not changed, I will live and work here	46.6	50.7	54.9	71.0	41.8	40.0	58.0	67.0
Rather changed, I think about moving to a more comfortable place	21.2	27.8	18.8	9.7	30.6	40.8	20.2	12.5
Definitely changed, I have already found another place for life and work	15.3	9.5	4.9	0.0	11.2	6.5	5.2	4.5
Hesitant to answer	16.9	12.0	21.5	19.4	16.3	12.7	16.6	16.1
Source: data of surveys, conducted by the authors.								

population of the North and the Arctic (out of this number, only 6.2% answered "definitely yes"). Complex and ambiguous influence of the reform on the interests of the population of the North and the Arctic made 14.9% of respondents hesitant to answer.

Out attention is also drawn to changes of migration attitudes among residents of the Murmansk Oblast. These shifts are associated with the retirement age increase by people (*Tab. 6*). For example, more than 33% of respondents responded positively to the question about changing their residence plans in the Murmansk Oblast due to the retirement age increase.7.5% of them said that their plans "have definitely changed, and they have already found another place of residence and work".

The most disturbing fact is that members of some groups, such as young people (18–29 years old) and middle-aged people (30–39 years old), have already changed their plans concerning further living in the Murmansk region and think about moving to more climate-friendly places (*Tab. 7*).

Among young people, 13.3% of respondents changed their plans and found another place of residence and work (15.3% of them are men, 11.2% are women); among the middle-aged people, 8% of the respondents did the same (9.5% of them are men, 6.5% are women). Among young people, 25.9% (21.2% of them are men, 30.6% are women) "started to think" about moving and "rather changed" their plans for further living in the Murmansk Oblast; among middle-aged people, 34.3% of respondents (27.8% of them are men, 40.8% are women) said the same. Such a significant orientation of the population toward migration to other regions creates significant risks for the stability of the economy of the Murmansk Oblast in the near future.

Conclusions

The hypothesis of the study that the retirement age increase is the factor that can change the state of labor resources, the population's behavior, and significantly alter processes of the economic development of the Arctic region – the Murmansk Oblast – is confirmed.

So, the constructed long-term forecast for the number of able-bodied population in the Murmansk Oblast shows that the retirement age change will suspend the steady trend of the able-bodied population decline in the region. However, we need to emphasize that the decrease of the number of able-bodied population in the Murmansk region will continue. In other words, the retirement age increase will not break the downward trend of the able-bodied population number. This is a qualitative difference from the situation across Russia. Thus, our three-variant forecast for the number of able-bodied population in Russia indicates that the retirement age increase has qualitatively changed the steady trend of the able-bodied population decline: it will increase according to two versions of the forecast. Only the least favorable forecast shows a downward trend, similar to the situation in the Murmansk Oblast.

The study of the GRP production in the Murmansk Oblast revealed that, *given the current structure of the region's economy, a slight decrease of the rate of the able-bodied population reduction, caused by the retirement age increase, will not have a significant impact on the GRP production*.

Surveys of residents of the Murmansk Oblast indicated an extremely painful perception of the retirement age change. As it was mentioned earlier, 64.6% of the population expressed strongly negative opinion about the reform, and 22.5% of respondents are "rather negative" about it. *Also, there is a strong opinion in the society that the retirement age change does not meet the interests of the population of the North and the Arctic. The vast majority of the region's residents, who participated in the survey, believe that the increase of able-bodied population (due to the retirement age change) will have a negative impact on the economic situation*. It corresponds with the results of the study on the GRP production in the region.

Thus, it is possible to transform the positive effect of slowing down the rate of the able-bodied population decline in the Murmansk Oblast into a noticeable economic result only after the change of the structure of the GRP production. However, there is a negative effect of the retirement age increase – a change of migration attitudes among the most economically active and significant groups of the region's population (in relation to regional production) – young people (18–29 years) and middle age people (30–49 years). Thus, a significant number of members of these age groups have definitely decided not to live in the Murmansk Oblast, and they link their decision to the increased retirement age.

There is a reason to believe that the positive effect – a shift in the number of able-bodied population of the Murmansk region, caused by the retirement age increase – will be offset by a negative effect – the increase of the rate of migration losses in the region. Comprehensive composite effects of the population decline imply a complex of direct and indirect losses for the regional economy, the calculation of which is another problem of the study.

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Problems and Prospects of Personnel Support of the Moscow Healthcare System

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Abstract. The article is devoted to the study of the problem of personnel support in the capital's healthcare. Its research is connected, on the one hand, with the analysis of statistical data on the medical personnel staff in organizations, which allows building (on the basis of theoretical model) the prognosis of availability/absence of staff (according to different indicators). On the other hand, it is connected with the analysis of motivational factors affecting entrance into the profession, long successful professional career, processes of "burnout" and retirement from the profession. In the article, we present the results of the scientific project, conducted in 2019, on studying problems of the quality of the staff in the Moscow's system of healthcare within the implementation of the current capital standard of providing medical assistance. The usage of statistical, mathematical, and sociological research methods allowed us to identify not only the characteristic features of the available labor resources, but also the prospects of personnel support of Moscow healthcare institutions. The forecast for the development of the personnel potential of Moscow's medical organizations is based on statistical data for the last 5 years (2014–2018). The prospects of changing of the age and gender structure of employees (doctors and nursing staff), the number of doctors of the most popular specialties in the capital are shown. On the basis of sociological surveys, we reveal the level of satisfaction of medical employees (depending on working experience) with working conditions (salaries in hospitals and clinics and its correspondence with the work performed). We also define main types of doctors and nursing staff's workload, which act as motivational factors affecting the quality of medical assistance. On the basis of expert opinions, we show material and non-material factors that determine the increase of the personnel potential of the Moscow's healthcare system.

Key words: healthcare, personnel support, working conditions, motivations, prospects of personnel needs, Moscow.

Introduction

One of the most important components of the improvement of the quality of medical services, provided to the population, is the personnel support of medical organizations. It causes the need for a timely and accurate forecast of the personnel needs of the city's healthcare system. However, the reliability of such forecast depends not only on the available corps of medical employees of different profiles and planned indicators of certain specialists' training, but also on how busy doctors, middle and junior medical staff of health care institutions are today, and are they satisfied with their work and ready to remain loyal to the chosen profession.

Degree of the problem's development

Due to the fact that the medical personnel is one of the most important structural elements of the healthcare system, it is studied not only within the academic and industry science, but also on the level of international organizations – WHO, the World Bank, OECD, etc. In particular, WHO report on labor resources of the healthcare system (2006) recorded the shortage of "the required number of health workers in the required places", revealed the reasons of the deficit and misbalances (poor planning, including the inability to collect relevant and up-to-date data necessary for making management decisions; insufficient investment in medical education, professional development and retraining; poor working conditions and low salaries, lack of career prospects, etc.) [1], and started the development of several WHO documents. One of them is the Global Strategy on Human Resources for Health addressed to management and planning bodies, vocational education institutions, employers, trade unions, etc. [2]. After highlighting the human resources problems, faced by countries with different income levels, the Strategy pointed to a universal "comprehensive package of measures" for ensuring "decent employment" – a necessary condition for optimal distribution of healthcare workers across territories and sectors (public/private) and improving their performance: job security; adequate premises and instruments for work; allowable load; allowances for working in difficult conditions; opportunities for professional development; clear career paths; social support in the form of housing grants, education grants, etc. Besides, low-and middle-income countries are encouraged to strengthen the potential of medical schools and colleges and improve the quality of education through accreditation of educational institutions, certification of diplomas, and investments in teaching staff (a "priority area for investments") to ensure the necessary number and competence of teachers. High-income countries are encouraged to strengthen measures aimed at developing the competencies of healthcare workers, helping graduates find job, and involving workers from other industries in the healthcare sector to perform functions that do not require a long period of training.

It is also worth noting WHO Resolutions, adopted before the approval of the Global Strategy, on increasing the scale of healthcare employees training (2009); strengthening nursing and midwifery (2006), primary healthcare personnel (2009), and other Statistical indicators of healthcare personnel provision and the analysis of main trends in training and movement of personnel are reflected in the materials published by the OECD [3], reports of WHO regional offices [4].

Considering problems of planning personnel's needs and optimal organization of available healthcare employees in less economically prosperous countries, under the WHO authority, the Handbook on monitoring and evaluation of human resources for health was released [5]. It proposes organizational mechanism and analytical instruments for collecting and analyzing data on medical staff, including successful

experience of several countries. The author's approach is based on the concept of "duration of labor activity", which considers labor resources within training, attracting and retaining, which involves the monitoring of the dynamics of the labor market for each stage and the prospects of healthcare employees. The main goal of the management structures at the first stage is the preparation of the sufficient number of competent and motivated employees and their optimal organization, which requires efficient planning, budgeting, and management of the process of creating powerful educational institutions and improving recruitment mechanisms. At the stage of active labor activity, efforts should be aimed at ensuring the availability, competence (including communicational) and productivity of employees, which requires the assessment of medical personnel from different workplaces in the context of the national labor market.

It is worth noting a special section of Recommendations, dedicated to qualitative research methods. Due to the fact that the study of healthcare personnel is a fairly new field of research, which does not have a solid theoretical foundation, numerous quantitative studies are mostly descriptive. Hence, it is expedient to use qualitative methods that allow us to better understand the working conditions and motives of healthcare employees' behavior and to improve methods for evaluating their activities.

The possibilities of qualitative methods are illustrated by numerous studies on the role of professional identity, motivation, etc. in the "survival" strategies used by medical professionals within healthcare reform [6, 7, 8]; the impact of professional insecurity on the attitude to patients and the quality of clinical care [9]; obstacles to attracting and retaining nurses [10] and the possibility of imposing broader functions on them [11]; the nature of part-time work among medical workers [12] and the impact of financial and non-financial incentives on the behavior patterns of doctors, simultaneously employed in the public and private sectors [13, 14]; features of secondary employment, which determines employment in a state institution as the main job [15], etc.

We should also mention the manual on assessing key factors in strategic planning of human resources (2009), released under WHO authority [16]. The authors emphasize that the goal of human resources policy in healthcare, given in the WHO Report of 2006, which is "to train the right people with the right skills, put them in the right place and give them the right task" and, at the same time, respond flexibly to emergencies, solve current problems, and predict future challenges, cannot be achieved in all countries using the same templates. In this regard, the approaches to the development and usage of tools, which allow adequate assessment of the situation and selection of the best solutions for improving the personnel support in healthcare sphere in specific conditions, are proposed. In addition, on the basis of several studies, for example [17], it is shown that the development of personnel policy, which can overcome the "human resources crisis", requires consideration of "cross-cutting issues", related to the demand for medical employees, associated risks, motivation, compatibility, etc.

Russian authors study healthcare personnel problems through analyzing the dynamics of changes in the number and composition of medical employees in the international context [18], studying the factors that determine the movement of medical personnel, the quality of their work [19], and the problems of forming corps of managers [20] and a personnel reserve [21], etc.

Informational and methodological basis of the research

The article presents results gained in 2019 during the implementation of the project "The development of the personnel potential of the capital's healthcare system" using sociological

(quantitative and qualitative) statistical and mathematical methods. An array of questionnaires (551 units), collected as part of a survey of employees of healthcare institutions under the city's jurisdiction (polyclinics and hospitals for children and adults), was formed. It is consistent with the official statistics of the Moscow Healthcare Department (MHD). A series of in-depth structured interviews (N=15) was conducted with the heads of clinics and outpatient institutions under the MHD jurisdiction, the management of medical universities and colleges, and FE institutions.

The forecast of the development of the capital's healthcare personnel potential was based on statistical data for the last 5 years (2014–2018), during which the personnel policy has undergone the most significant changes; the forecast horizon is 2020, 2025, and 2030. The assessment of the balance of labor resources was carried out on the basis of comparing the number of medical workers with various indicators of the form no. 30 "Information about a medical organization" (in wording of the Rosstat order no. 483, dated 03.08.2018). Formalized forecasting methods (extrapolation, moving average, expo-nential smoothing, least squares), as well as the method of individual expert assessments, were used to build the forecast model and the forecast itself [22]. At the first stage, gender and age indicators were calculated for categories "doctors" and "secondary medical personnel" (hereinafter – SMP). Then the personnel resources shortage forecast for categories "doctors", "SMP", and "junior medical personnel" (hereinafter – JMP) was built. The forecast of medical personnel staffing (percentage) was calculated for the same categories of medical employees using the formula

$$У_{ФЛ} = ЧД_{(занятых)} / ЧД_{(штатных)} \times 100, \quad (1)$$

where $У_{ФЛ}$ – indicator of doctors staffing (individuals);

$ЧД_{(занятых)}$ – number of positions in the organization (employed);

$ЧД_{(штатных)}$ – number of positions in the organization (staff).

In turn, the forecast of the deficit by positions (people) and the relative deficit by positions (percentage) for the same three categories of healthcare employees was calculated according to the formulas:

$$Д_{Д} = ЧД_{(штатных)} - ЧД_{(занятых)}, \quad (2)$$

where $Д_{Д}$ – deficit indicator by positions;

$ЧД_{(занятых)}$ – number of positions in the organization (employed);

$ЧД_{(штатных)}$ – number of positions in the organization (staff).

$$ОД_{Д} = Д_{Д} / ЧД_{(штатных)}, \quad (3)$$

where $ОД_{Д}$ –relative deficit indicator by positions;

$Д_{Д}$ – deficit indicator by positions;

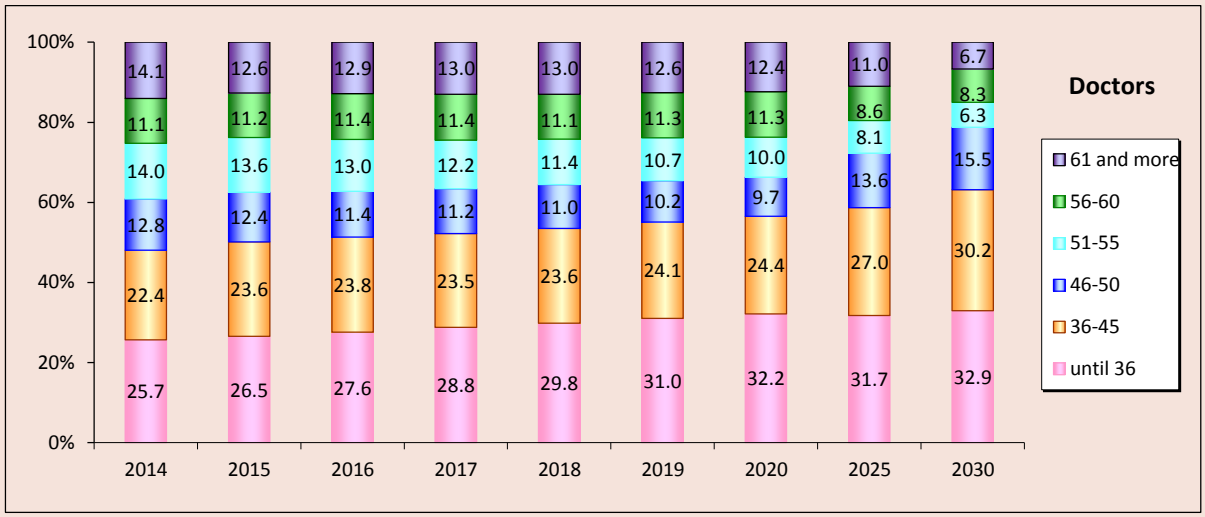
$ЧД_{(штатных)}$ – number of positions in the organization (staff).

Results of the research

The forecast calculated on the basis of the developed forecast model indicates the following prospects. The share indicators for age groups show the trend of doctors' "rejuvenation": by 2030, doctors under the age of 45 will have made up 2/3 ***of the total number;*** doctors of pre-retirement and retirement age will constitute 8.3 and 6.7%, respectively (*Fig. 1*).

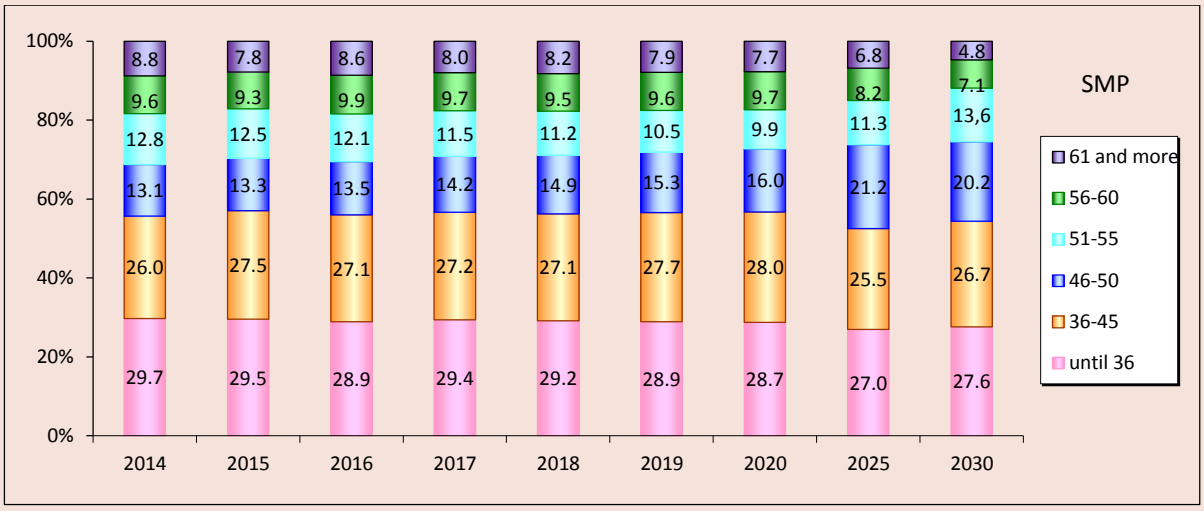
In comparison with doctors of the "SMP" category, the age structure will change slightly. There is no trend towards "rejuvenation", the share of the "46–50 years old" cohort will increase by 7%, the "51–55 years old" cohort will also increase slightly, the share of pensioners and pre-retirees will be 4.8 and 7.1%, respectively (*Fig. 2*).

Figure 1. Forecast for the doctors' age structure, %



Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

Figure 2. Forecast for the SMP's age structure, %



Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

As for the gender composition of healthcare employees, it remains unchanged: among doctors, the ratio of 30% of men to 70% of women will remain; among MSP, there are even fewer men – about 10%.

Prognostic indicators of the number of people – main employees in occupied positions in short- (2020), medium- (2025) and long-term (2030) perspective show the trend of the reduction of the number of healthcare employees in all categories, although in varying degrees. The number of doctors will change slightly in the long-term perspective; at the same time, the number of JMP, with the retention of current trends, will be reduced in 8 times in comparison with 2014, and in 1.2 times – in comparison with 2018 (*Tab. 1*).

Table 1. Forecast for the number of natural persons' key employees in occupied positions, people

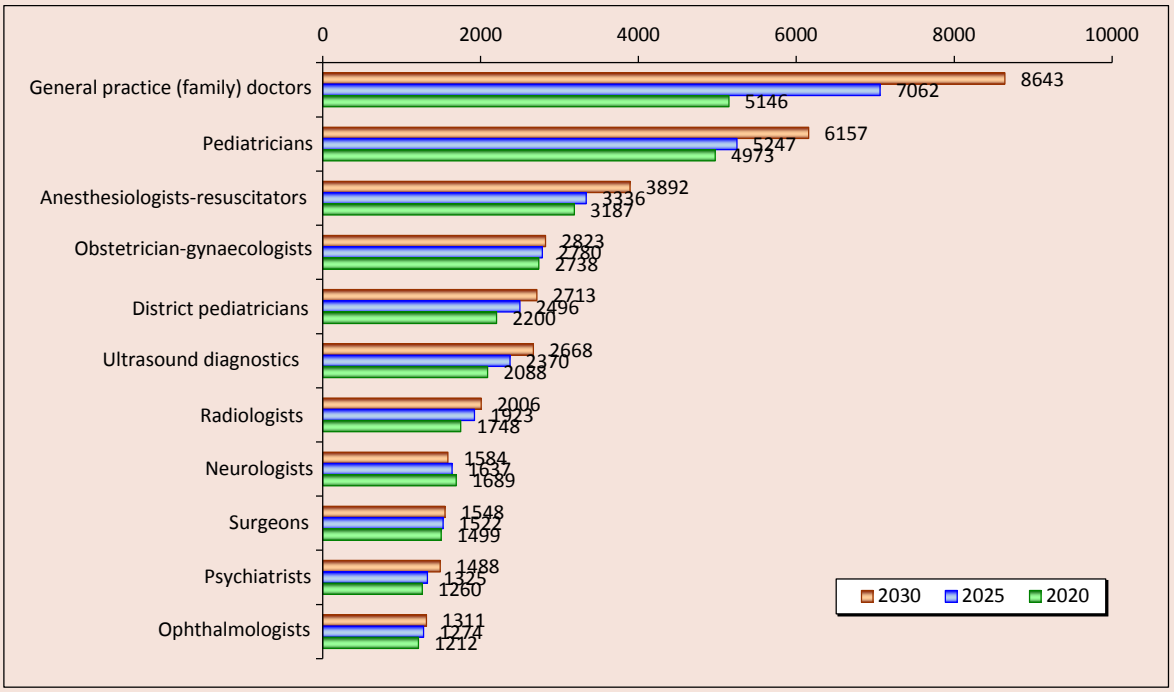
Category	2014	2016	2018	2020	2025	2030
Doctors	48289	43777	45689	43144	42624	41203
Secondary medical personnel	88832	79173	71320	61148	59984	57828
Junior medical personnel	25760	18451	3570	2830	3520	3130
Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.						

For a more detailed analysis, 44 positions (specialties) of doctors were allocated, 22 – SMP and 2 – JMP, the choice of which was determined by the possibilities of statistical analysis and forecast[1]. Then the doctors' data set was divided into 4 groups (11 positions/specialties in each) on the basis of the degree of the demand for a particular specialty in the short-, medium- and long-term perspective. In *figures 3* and *4*, the forecast for the first (most popular specialties) and the fourth (most non-popular) groups is presented.

According to the forecast, general practitioners (family doctors) will be the most numbered medical personnel. If current trends retain, their number will have tripled by 2030. In terms of future demand, the next are pediatricians and anesthesiologists-resuscitators, whose number will increase by 1.4 times (*Fig. 3*).

If current trends remain, surgeons (plastic and thoracic) and adolescent psychiatrists will be least demanded (*Fig. 4*).

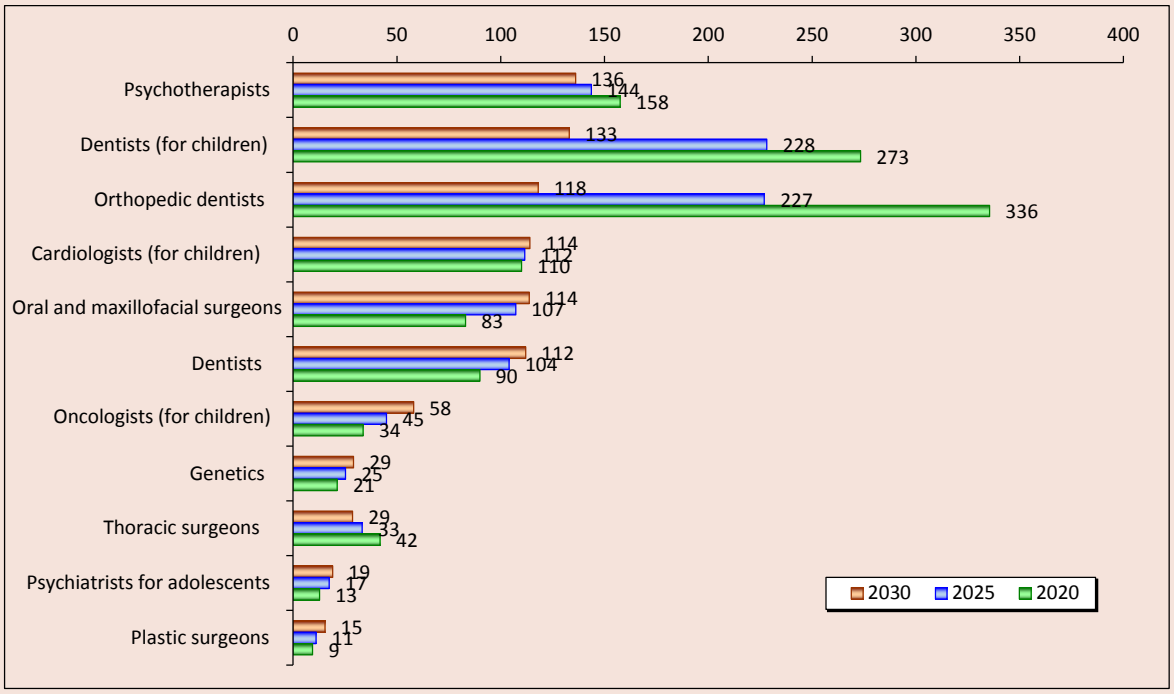
Figure 3. Forecast for the number of doctors of the most demanded specialties, people



Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

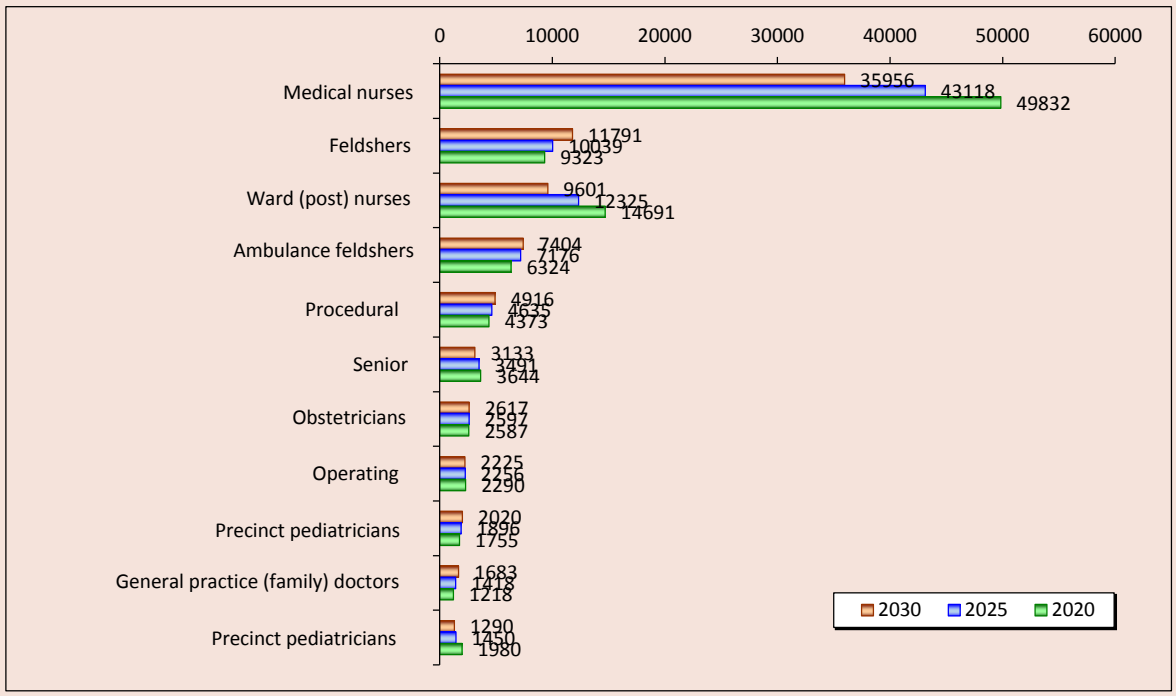
[1] For some positions (specialties), the lack of data for several years did not allow building time series.

Figure 4. Forecast for the number of doctors of the least demanded specialties, people



Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

Figure 5. Forecast for the number of SMPs of the most demanded specialties, people



Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

Secondary medical personnel were divided in 2 groups (11 positions/specialties in each one). As a result, nurses will become the most popular staff, despite the overall decrease of their number. The next most demanded doctors will be feldshers and ward (post) nurses (*Fig. 5*).

The forecast for the second group of SMP specialties showed a significant decrease of the need for dietary and medical nurses (ambulance feldshers), as well as the need for the secondary medical personnel working with dentists. As for JMP, there is still a trend of reduction of the number of orderlies and nursing assistances – in 2 and 1.3 times, respectively.

The short-term calculation of staffing indicators (individuals) is positive: the doctors' indicator will increase to 79.6%, SMP's indicator will remain within 78%, and JMP's indicator will reach 67%. For a more detailed analysis, the entire array of data on doctors was divided into 4 groups, formed according to the degree of doctors' staffing (individuals) of a particular specialty in the short-, medium-, and long-term perspectives. As the result, the less stuffed positions in the short-term perspective are positions of plastic surgeons (28.0%), psychotherapists (30.8%), and adolescent psychiatrists (60%). The situation with staffing is slightly better in the short-term perspective in the fourth group: cardiologists (92.3%), ophthalmologists (93.1%), endocrinologists (94.7%), and, especially, district pediatricians (almost 100%).

As for the projected shortage of personnel, in the long term perspective, if current trends retain, the deficit of doctors will remain almost unchanged (13.8%), the SMP deficit will grow slightly (up to 15.6%), and JMP deficit will increase quite noticeably (up to 32.1%). While dividing the array of doctors' data into 4 groups, which were formed according to the decreasing degree of doctors' shortage in a particular specialty in the short-, medium-, and long-term perspectives, it was revealed that in the first group, while maintaining current trends in the long-term perspective, the deficit of psychotherapists (72.7%), plastic surgeons (72.6%), and child psychiatrists (55.5%) will increase quite noticeably. The situation is better in the fourth group: if the current trends retain, the deficit of obstetricians-gynecologists in the long term perspective will be 3.4%, and the shortage of maxillofacial and thoracic surgeons will reach 2.7%.

In SMP group, the three most deficit specialties are secondary medical personnel working with dentists (38.0%), with district pediatricians (21.3%), and masseurs (20.0%). In the second SMP group (the SMP data set was divided according to the same principle as doctors' data, into 2 groups), the deficit is not expected in the long-term perspective among operating nurses, feldshers, and ambulance feldshers (6.4, 4.1, and 2.5%). As for JMP, the deficit of junior nurses will remain almost the same (16%), but the shortage of orderlies will noticeably increase (49.3%).

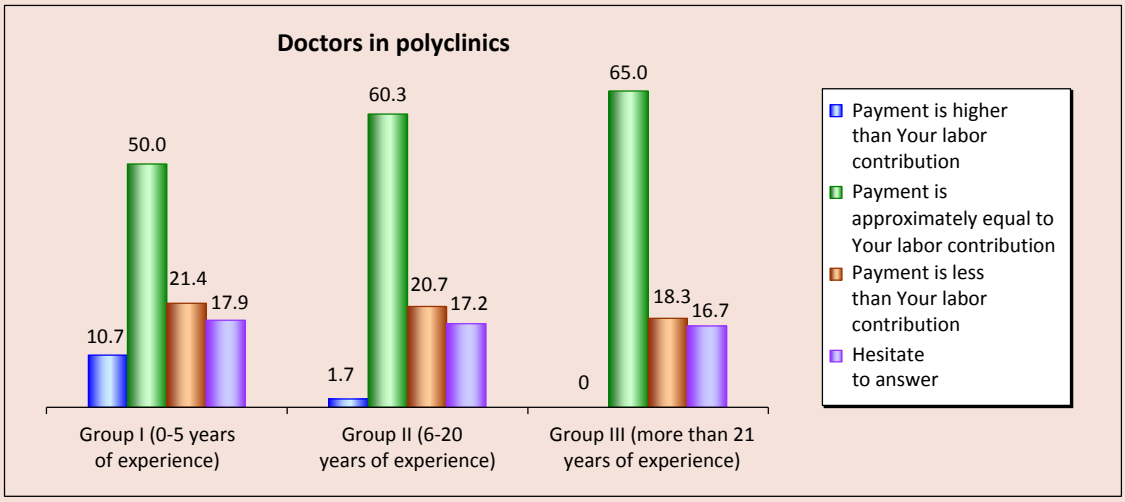
Thus, the forecast suggests that, in the long-term perspective, public health institutions in the capital may face certain personnel imbalances. In such a situation, it is important to understand how the doctors, working in them, feel, because their well-being affects the nature of the personnel movement (movement between the public and private sectors, between outpatient institutions and hospitals; loyalty to the profession) and the quality of provided medical assistance.

According to the results of the survey, the level of satisfaction with the amount of employees' salaries in hospitals and clinics significantly differs: if only 12.0% of doctors and 18.4% of nurses were dissatisfied with salaries in polyclinics, almost a third of hospitals' employees were not happy with their salaries (31.6% of doctors and 37.7% of nurses). Apparently, this is caused by their ideas on differences in responsibilities and labor efforts among specialists of the same profile working in the hospital and on the

primary level. For example, more than a third of hospital employees (35.5% of doctors and 38.2% of nurses: a third of them have 0–5 years of the work experience) believe that their salaries are less than their labor contribution. In polyclinics, 19.6% of doctors and 25.0% of nurses chose this answer (which, however, is also not enough). The experience positively affects doctors' attitudes – the higher it is, the more doctors think that their labor contribution is equal to the material reward: in hospitals, 46.9% of doctors with 6–20 years of experience and 59.3% of those with more than 20 years of experience think so; in polyclinics, this trend is even more noticeable (*Fig. 6*). In contrast, nurses have a negative attitude toward their experience. In hospitals, 22.2% of nurses with little experience are not satisfied with the ratio of their labor contribution and monetary remuneration (44% of respondents in this group consider it fair). With the growth of experience, the percentage of dissatisfied personnel doubles: 44.2% of nurses with 6–20 years of experience and 37.2% of those with more than 20 years of experience are not happy with their salaries. In polyclinics, the situation is quite similar.

The feeling of discrepancy between monetary remuneration and labor contribution appears, because, according to the results of the study, the majority of employees of the Moscow hospitals and polyclinics get very busy and tired at the main job. It is even more relevant for primary doctors than for their colleagues in hospitals *(Tab. 2)*.

Figure 6. Influence of the work experience on representations of doctors in polyclinics concerning the correspondence of labor contribution and material remuneration, %



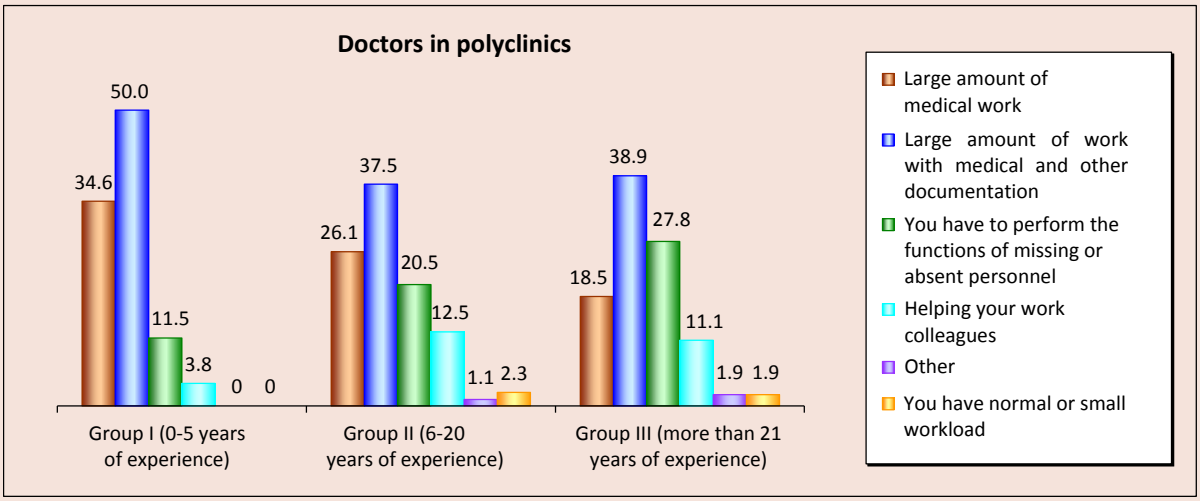
Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

Table 2. Distribution of health employees' answers to the question "How do You assess your workload, the intensity of work at the main job?", %

Personnel		Quite busy, very tired	Normal workload, work within own capabilities	Total
Hospitals	Doctors	63.7	36.3	100
	Nurses	75.5	24.5	100
Polyclinics	Doctors	71.2	28.8	100
	Nurses	72.4	27.6	100

Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

Figure 7. Main types of doctors' workload in hospitals, %



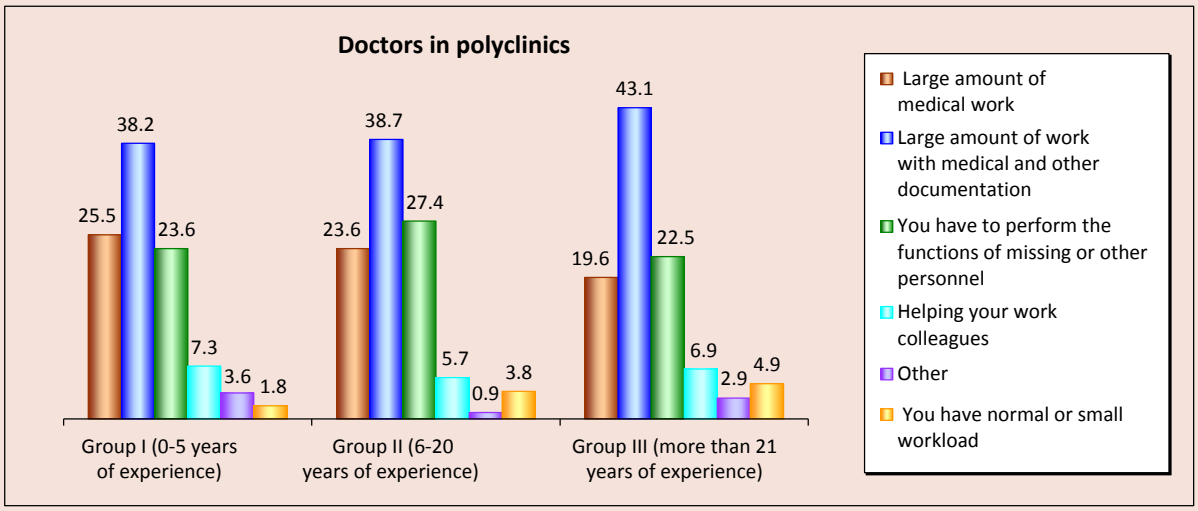
Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

According to data, given in *figure* 7, a significant part of the additional workload for young doctors (up to 5 years of experience), employed in hospitals, includes the work with medical and other documentation. The workload on more experienced doctors in hospitals (with 6–20 years of experience) grows due to the need to additionally perform the functions of missing or absent employees and help younger colleagues. Doctors with more than 20 years of experience also note the severity of the workload associated with medical and other documentation and with the necessity to work for others: they are less likely to feel the burden associated directly with the treatment of patients. It can be assumed that different estimates of the volume of a particular workload are caused by differences in professional skills and experience: it is unlikely that young specialists are significantly more loaded with medical work than their older colleagues. They, rather, compensate the lack of experience with more serious efforts. The same seems to go for work with documentation: with experience, the speed of filling in the report documentation increases (although it is impossible to exclude the transfer of some "paper" work to young specialists by more experienced doctors).

Unlike hospitals, in polyclinics, the functions of missing or absent staff are almost equally performed by doctors with a wide variety of work experience (in all groups, one out of four respondents notes that). Most of all, doctors complain about the large amount of work with documentation (*Fig. 8*).

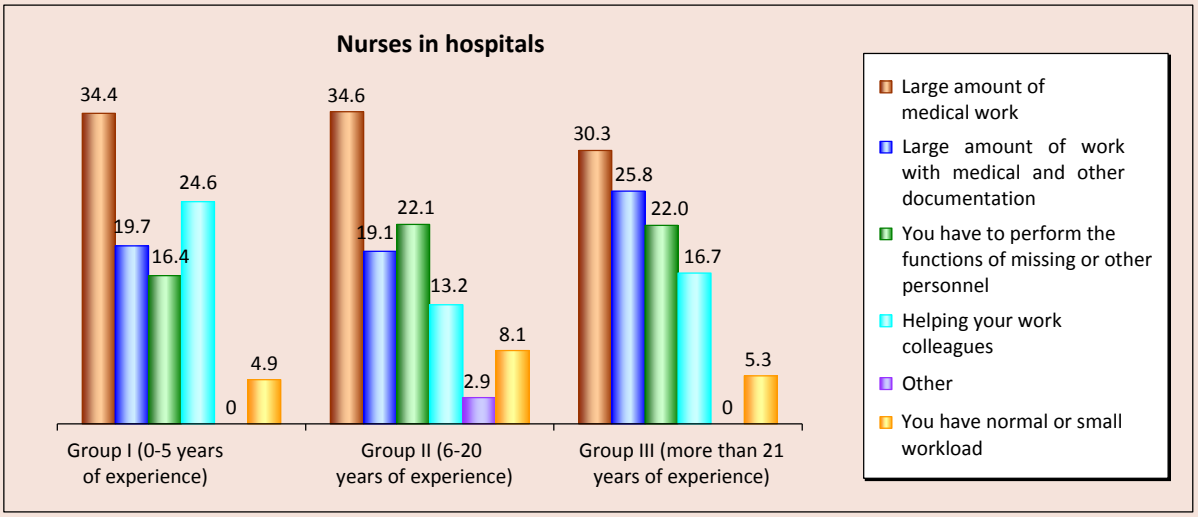
As for nurses who work in hospitals, regardless of the experience, their primary workload is associated with large amounts of medical work (*Fig. 9*). One out of four or five nurses (depending on their experience) pointed out the workload associated with filling in large volumes of medical and other documentation and performing the functions of missing or absent staff. It is worth noting that among SMPs, young employees are more likely to help their colleagues than more experienced personnel.

Figure 8. Main types of doctors' workload in polyclinics, %



Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

Figure 9. Main types of nurses' workload in hospitals, %

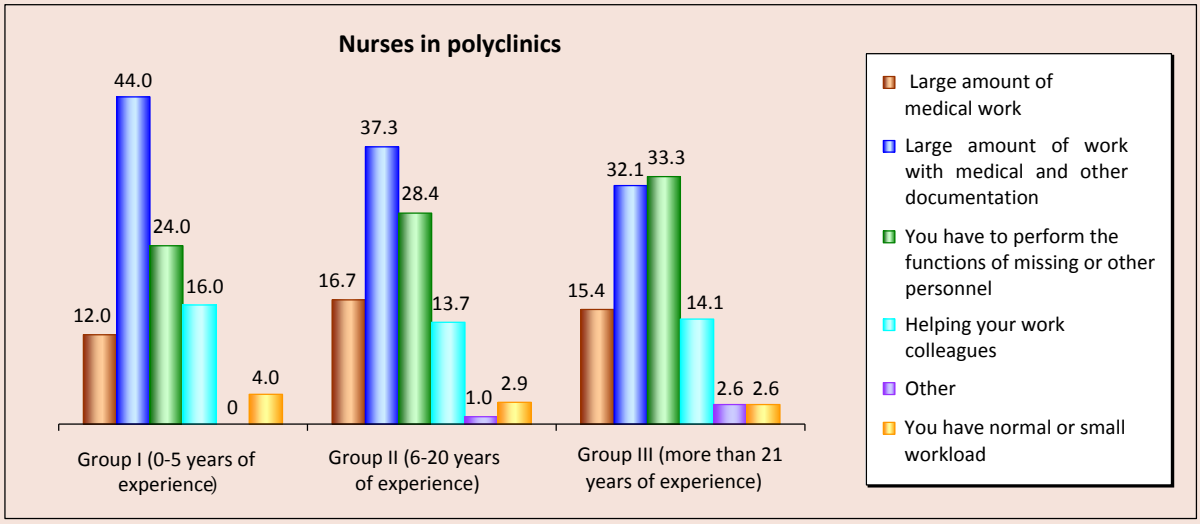


Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

In policlinics, nurses' primary workload is documentation (*Fig. 10*). More experienced professionals less feel this type of workload, but with more experience, the workload, associated with performing the duties of missing or absent personnel, increases.

The increase of workload, related to the sharp extension of regulations and reports, was confirmed by surveyed experts: "*Doctors and nurses' workload is not the same as it was 10 years ago. Not everyone is ready to stand it. Sometimes it forces them to leave for private clinics, where*

Figure 10. Main types of nurses' workload in polyclinics, %



Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

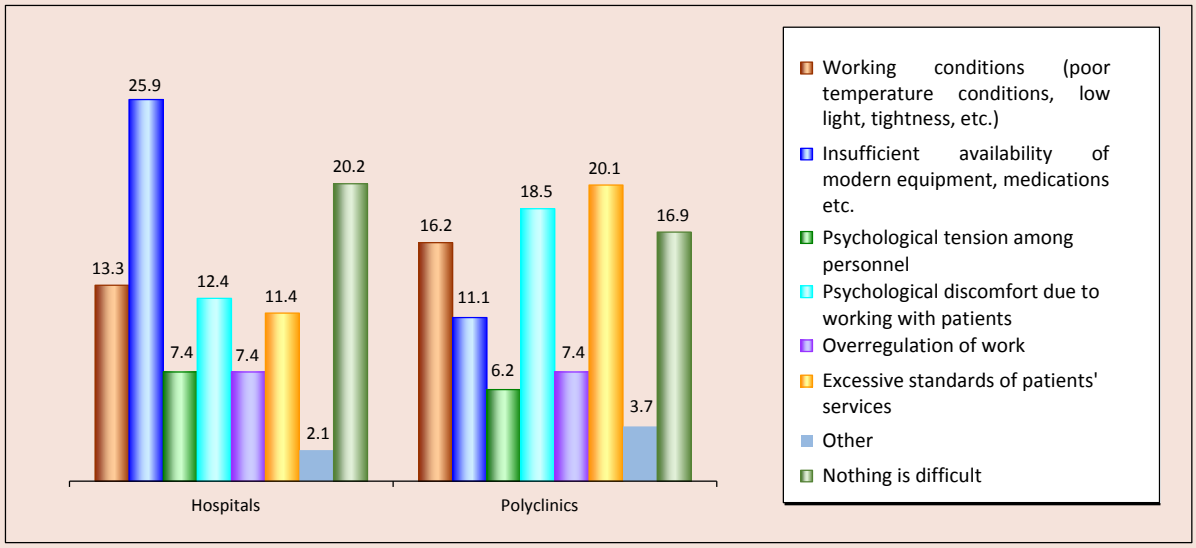
the workload is not as high as in public medical institutions"; "*Overregulation of work is high. It is impossible to comply with all the regulations at the same time, because it is impossible to remember everything at the moment when it is necessary. A person who constantly treats patients does not have time to go through legal bases: he does not even have an appropriate education for this...*"

Overloads increase the risk of a rapid professional burnout. However, experts emphasize that it could be prevented by "*even workload distribution*". Moreover, as it turns out, material reasons force many healthcare employees to look for opportunities for additional earnings. More than 30% of urban hospitals' personnel named this reason for justifying their other part-time jobs. According to the results of the survey, doctors working in hospitals are much more likely to work part-time or have other part-time jobs than doctors working in policlinics. Similar trends apply for nurses.

According to diagrams, shown in *figure 11*, except high personnel's workload, medical work is hindered by insufficient provision of modern equipment, medications, and materials. Excessive standards of patients' services and psychological discomfort caused by communications with them are also severe factors. For doctors and nurses in polyclinics, factors that make it difficult to work are excessive standards of patients' services, problems of communicating with patients, and uncomfortable working environment (tightness, etc.).

In turn, our experts also paid attention to negative influence of the shortage of equipment and materials on labor motivation ("If the equipment is old and you always have problems with consumables and forms, and a chair falls under you every time, then all of this is perceived as "they do not hear me and do not respect me"); communication problems with patients ("*People complain about being asked to wear shoe covers before entering the treatment room or to be quieter. It became a standard that a healthcare employee can be cursed or hit: nobody will be punished for it. It makes many people leave the profession. The risk of being misjudged or called a pest puts pressure on medical personnel: they*

Figure 11. Factors which make it difficult for medical staff to perform high-quality work in polyclinics and hospitals, %



Source: own compilation on the basis of the results of the scientific project "Development of the personnel potential of the capital's healthcare system", 2019.

know that they are right, but public opinion makes them feel unsafe"; "If a person tries to provide great medical assistance, he should be satisfied with the work. It goes beyond salaries: he should feel patients' gratitude and respect, because he really works in a difficult environment. It is very emotionally challenging to work in a situation, when you are considered an enemy. It greatly affects emotional burnout".

Psychological assistance should prevent conflicts with patients: "*There should be a balance of negative and positive emotions. Medical personnel should learn how to restore emotional strengths: a doctor is an enemy – he is just tired. This is why psychologists work with medical personnel in other countries. We do not have it*"; "*Even the most professional doctor will leave if he gets beaten by a patient. Medics should be taught to control a situation: it is quite a professional risk, and it is important that they keep such situations from happening themselves*".

The analysis of the results of the study allows us to point out a number of other tools of a material and non-material nature that allow consolidating the necessary medical personnel and improving the quality of their work:

1. Increase of the fixed part of the salary. Statistics show that this component of the remuneration of healthcare workers has changed slightly, and, taking into account inflation, it has not changed much. It is obvious that it is easier for employees to rely on their constant salary than on such a non-permanent component as a bonus. 58.8% of medical personnel, who work in hospitals, noted that the increase of the basic salary is necessary for a comfortable work (more than a third of respondents paid attention to incentive payments), as well as 65.5% of polyclinic employees (incentive payments were noted by a quarter of respondents from this group).

2. Payment of incentive allowances, the importance of which was noted by more than a half of the respondents and the experts ("*Salary should be differentiated. If there is a small difference between basic and maximum salary, it will not be a motivating factor*"), should be regulated: everyone have to understand how to get a bonus and what could be done for its increase without damaging primary work.

3. The provision of adequate working conditions:

– doctors should treat, and not engage in other activities (to plan purchases of medical equipment, medicines, etc., and, moreover, to search for suppliers and purchases);

– it is necessary to increase the amount of time for patients' reception – otherwise, the doctor can't get satisfaction from his own work, let alone the result (this is also indicated by foreign studies [23]);

– adequate planning of medical employees' working hours – exclusion/limitation of overtime work;

– creation of opportunities for proper rest (in some cases an effective method of preventing professional burnout could be a mandatory sending to an unscheduled vacation in a sanatorium or preventorium);

– planning of an "individual employee professional development map": since the moment of employment until retirement, a healthcare employee must have an idea about possible trajectories of professional and career growth, including the terms in which certain career stages could be achieved.

Conclusions

Thus, the study showed that even Moscow's medical organizations with its diverse capabilities may face a number of personnel shortages and imbalances in the future. Although they are not critical, such forecast makes us look more closely at how the capital's medical employees feel themselves today. It should be done in order to correct, if possible, the detected problems. The data, obtained in the course of the study, correspond to the conclusions of numerous experts – scientists and practitioners – that, as the result of optimization and achievement of salary indicators corresponding to so-called "May decrees" (2012), the level of medical employees' workload has significantly increased. Meanwhile, excessive intensity of work, even with an increase of material remuneration, leads to a reduction of physical, intellectual, and psycho-emotional resources of medical personnel, provokes chronic diseases and emotional burnout. This, in turn, affects the quality of medical services and staff turnover, including withdrawal from the profession.

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Collective Actions and Social Capital: Implication of Concepts*

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Abstract. Collective actions are the basis of social interaction. Collective action is defined as the system of organized individuals, who are included in groups, which have a certain degree of organization. The pecularity of collective activities is the fact that almost all people are involved in them, in one form or another. One of the first sociologists, who started the study of collective activities, was M. Weber. It was him who designated a collective action as a social one. While studying consumer behavior, economists also paid attention to collective activities of people (E. Ostrom). The result was the emergence of the social action concept in Sociology and the theory of collective action in Economics. Later, the number of researchers and studied problems in the context of a collective action expanded. Economists and sociologists were joined by psychologists, political scientists, anthropologists, biologists, and others. The theory of collective action allows us to explain a wide range of social life phenomena. This concept is closely related to the theory of social capital, which emerged at the intersection of economic and social sciences. Social capital is a factor that determines the intensity, effectiveness, and mass scale of collective actions. However, social capital itself is formed under the influence of collective actions. In foreign science, the problems of collective action and social capital are considered interrelated. In domestic social science, it is yet to be achieved. The theory of social capital has the umbrella effect, which allows searching for opportunities of theoretical and methodological integration of social capital components and forms of collective actions. The purpose of this article is to show, on the basis of the overview of the main research areas of social capital and collective actions in scientific literature, the most promising points of their

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contact for studying social reality in Russia. It includes the research of subjects of collective actions, transformation of their goals, the enrichment of the repertoire due to the emergence of new practices and the usage of virtual space. The important aspect is the environment for the implementation of collective actions, which forms their target orientation. The implication of concepts of social capital and collective action should allow us to identify aspects of mutual influence between them.

Key words: collective actions, subjects of collective actions, repertoire of collective actions, social capital, types of social capital, social reality.

Problem statement

Collective actions are a kind of social actions representing an important phenomenon of social life. They form the basis of people's communities and are included in the everyday life of any person. Collective actions are very diverse and cover almost all spheres of human activity. They include social movements, electoral behavior, membership in interest groups, management of common property, cooperation in defending collective interests, confrontation, idols worship, etc. Despite a rather long-standing interest concerning this social phenomenon, the problem of collective actions continues to be relevant. Due to the fact that the collective action theory explains a wide range of phenomena associated with the achievement of collective public goods, they occupy an important place in social sciences and the humanities. During the last decades, the spread of collective actions and the growing interest in their study have been observed, which is largely caused by the changes from society globalization, expansion of post-industrialism, leveling of the majority of differences among peoples, which gives rise to identical practices. Collective actions cover a lot of various spheres of society, and the development of digital information and communication technology facilitates actors' interaction, allows expanding the number of participants. According to the sociological tradition, collective actions are defined as "joint actions (or inactions) of people pursuing common interests" [1]. In modern interpretation, collective actions are defined as a system of organized individuals included into groups with a certain organization [2].

The repertoire of actions can be very diverse. The most notable are the overt actions of a direct nature, such as mass rallies, marches, strikes, pickets, flash mobs [3]. As far as new communication possibilities appear, the indirect actions in the form of petitions and appeals, open letters, interviews and video messages, sending of information, sharing of news, virtual discussion platforms, etc. become widespread. The growth of collective actions in the last decade is an evidence of an increasing number of social problems, which are not solved by governments and elites, and the growth of individuals' subjectivity in societies, which are different in the levels of development, cultural traditions, and historical heritage. The fact that, only in our country, in the 2017–2018 period, there had been more than two and a half thousand collective actions, which used methods of direct action, may serve as an example. Most of them were implemented in the form of protests aimed at drawing attention to socio-economic, environmental, labor, and other issues concerning Russian citizens[1].

[1] Rost protestnoy aktivnosti v Rossii: rezul'taty vserossiyskogo monitoringa 2017–2018 gg./ Centr ekonomicheskih i politicheskih reform. [Growth of protest activity in Russia: results of the all-Russian monitoring of 2017–2018/ Center for economic and political reforms]. Available at: http://cepr.su/wp-content/uploads/2018/11/pdf (accessed 10.08. 2019).

International events in recent years also indicate a high level of collective actions: the movement of "yellow jackets" in France[2] or the events in Chile[3]. The UN emphasizes the growth of protest movements all around the world[4].

The study of collective actions is possible on the basis of different conceptual foundations. The theories of collective actions, relative deprivation, rational choice, resource mobilization, new social movements are most frequently used. At the same time, the concept of social capital is less demanded. The purpose of this article is to show the heuristic possibilities of synthesis of the concepts of social capital and collective actions to explain the actual phenomena of collective actions.

Social capital: The concept basis.

By the end of the 20th century, a powerful scientific direction, defined by a popular and successful metaphor of "social capital", has formed in the field of social sciences. This concept, interpreted in the context of social relations that affect personal interactions, is successfully used to explain many phenomena. There is a significant number of publications proving that social capital is important for understanding the differences existing at individual and group levels, and that political decisions should be made taking into account their impact on communities' social capital. However, despite the significant amount of research, there is still no unambiguous interpretation of social capital. Moreover, there is the view that it is overly optimistic to assume that it is possible to create a unified concept of social capital which is able to explain the processes in such diverse areas of society as economy, politics, social sphere [4]. It would be more appropriate to assume that social capital is a concept that is able to form an interdisciplinary research and combine scientific studies which are isolated and intertwined.

The first reference of social capital in the works of L. Hannifan, D. Jacobs was more metaphorical in its nature. A fundamental contribution to the concept generation, made by J. Coleman, R. Putnam and P. Bourdieu, allows us to consider these researchers as the classics of the concept. J. Coleman and R. Putnam have focused on the values and networks, P. Bourdieu drew attention to the problems of inequality and social justice.

The concept appeared due to the comparative study of regions. R. Putnam and J. Halliwell managed to reveal differences in the regions' development on the basis of comparative analysis of their economic indicators [5]. The main result of the research was the conclusion about the presence of close relationship between government structures and civil society structures in the regions of Northern Italy. Later, R. Putnam overviewed the situation in the American society where he noted a decline of social capital stocks [6]. The scientist believes that the weakening of social ties leads to the fact that Americans are less inclined to participate in the activities of various public associations, their electoral activity is reducing, trade union membership is declining, neighborhood ties are becoming

[2] "Zheltye zhilety" podderzhali protestuyushchih v Chili ["Yellow vests" supported the protesters in Chile]. Available at: https://tass.ru/mezhdunarodnaya-panorama/7049801 (accessed 28.10.2019).

[3] Pochti 900 tysyach chilyjtsev prishli na aktsiyu protesta v Sant'jago [Almost 900 thousand Chileans came to protest in Santiago]. Available at: https://rg.ru/2019/10/26/pochti-900-tysiach-chelovek-prishli-na-akciiu-protesta-v-stolice-chili.html (accessed 26.10.2019).

[4] V OON otmetili rost protestnyh dvizheniy po vsemu miru. [The UN noted the growth of protest movements around the world]. Available at: https://ria.ru/20191025/1560222133.html?utm_source=yxnews&utm_medium=desktop&utm_referrer=https%3A%2F%2Fyandex.ru%2Fnews (accessed: 26.10.2019).

weaker, education system is being destroyed, etc. He came to the conclusion that social capital loss can adversely affect the prosperity of the American community.

Putnam used the concept of social capital to shed further light on this difference in the performance of civic duties. He argued that "social capital refers to the properties of social organization, such as trust, norms, relationships networks, which can improve the efficiency of society by facilitating coordinated actions" [6]. Since social capital facilitates collective actions, strengthens the rules, necessary for interaction, provides opportunities for obtaining and disseminating information, including information about the reputation of network members, Putnam describes it as the embodiment of positive results of previous joint actions and as the model for future cooperation. Thus, Putnam has identified relationships networks, norms, and trust as basic components of social capital. In his opinion, the essence of the social capital theory lies in the recognition of the value of relationships networks and the influence of contacts on the performance of the interaction between individuals and groups.

R. Patnem's contribution to the concept is also associated with the beginning of his structural analysis. Based on identified functions, he identified different types of capital. The first type bridges or overlaps social capital; it is focused on connecting people, creating widespread relationships outside the group. The second type, bonding or bounding, is focused on creating strong group relations aimed at strengthening the identity and homogeneity of the association. The identification of these types has an important semantic value, since each type engenders completely different external effects. In the first case, networks uniting different people are formed, and effects are more likely to be positive, and, in the second case, networks unite similar people. Effects here are less significant and the risk of negative consequences is higher [6]. Other researchers also noted this difference. In particular, M. Granovetter revealed strong and weak ties, considering the last to be more efficient, for example, for the searching for work, because they make the required information more available [7]. Weak ties create conditions for effective exchange of information and facilitate collective action. There is another vision of social capital structure. F. Pichler and C. Wallace proposed the following types of social capital, formal, informal, and family [8]. According to their interpretation, formal social capital is based on a generalized trust and participation in NPOs, the informal one arises from relationships with relatives, friends, colleagues. Finally, the family type means strong orientation toward the family and getting its assistance.

P. Bourdieu describes social capital as one of the forms of total capital [9]. He set it along with economic capital, which he considered to be basic, but understood it as a set of resources, real or potential. According to P. Bourdieu, this form of capital can exist only in the "practical state", in the form of an exchange that contributes to its maintenance. Social capital can be seen at the level of individual agents, but it manifests itself only in interaction, at the level of relations. But it becomes most noticeable "when various individuals get too unequal profits with virtually equal capital (economic or cultural)" [9, p. 66]. P. Bourdieu recognized the importance of individual's ties ("the volume of social capital"), represented by the number of connections that he or she can use later. Individual social capital in this form requires investment which is expressed in the contacts support [9, p. 67]. The aim of the support, according to P. Bourdieu, is the

transformation of random contacts that occur among friends, relatives, colleagues at work, into such social relationships which can be used directly in the near future. "These relationships can be directly applied in the short or long term periods of time when the transformation of casual relationships (e.g., in case of relationships in a workplace, a neighborhood, or even kinship) into the ties which are both compulsory and selective and demand a long commitment perceived on the subjective level (e.g., feelings of gratitude, respect, friendship, etc.) or institutionally guaranteed (rights)". [9, p. 67]. By studying social capital, P. Bourdieu faces the issues of social inequality, generating and perpetuating it. N. Lin also identified two social mechanisms preserving the inequality in the distribution of social capital. The first one is associated with unequal access to valuable public resources (money, influence, information), which is caused by different positions in socio-economic hierarchies. The second one is based on social-psychological tendency to the formation of contacts with people with similar characteristics (gender, education, values, attitudes, socio-economic status). Collectively, these mechanisms support the existing inequalities [10].

J. Coleman took a different approach to the interpretation of social capital, which could be described as a resource one. According to him, social capital is "...a set of resources inherent in family relations and community social organization that can be useful for the cognitive, or social, development of children, or young people. These resources are different for different people, and they could be an important advantage for children and adolescents in the development of their human capital" [11]. Social capital becomes a resource due to the presence of trust as of reciprocity expectations. It, in turn, creates prospects of inclusion in a wider network of interaction, based on common values, for an individual. A resource, in particular, is "commitment", "the level of confidence". This also allows interpreting social capital as a public good available to everyone included in the appropriate structure, not just those who take the action to implement their capital [11]. It is a kind of by-product of human activity. J. Coleman used the concept of social capital to study cooperation mechanisms, especially when searching for a choice of cooperation strategy instead of competition [12].

The concept of social capital is actively used for various studies. The regional context is widely represented in it. Thus, S. Panebianco used it to explore the German regions [13]. L. Blum and D. Zak showed the influence of social capital patterns on the pace and nature of economic growth in West Germany [14]. J.-M Callois and B. Schmitt [15] relied on the concept of social capital while analyzing the data for rural areas of France. J. Dzialek [16] described spatial structures of the identified social capital in Poland. On the European material (world values survey), S. Knack and P. Keefer, R. La Porta examined the relationship between trust and economic growth of several countries, having identified the relationship between these parameters [17; 18]. The issue of social capital continues to expand thematically and geographically. This includes a comprehensive study of social capital in the American society and in Britain [19; 20]. There are other similar country-specific studies [21]. Attention is paid to the problems of interaction between social capital and its other types, the influence on the solution of economic and environmental problems [22; 23; 24].

Advantages of social capital are analyzed well enough on micro-, meso- and macro-levels. Thus, the works of S. Moore, S. Daniel, and others were devoted to the micro-level of this phenomenon. On the micro-level, social capital is viewed as individual's quality or property [25]. Meso-level of social capital is defined by scientists as social capital of an organization, or a group, or a community [26]. Some researchers define it as a "corporate social capital" widely interpreting the corporation [27]. The role and importance of social capital for the sustainable development of society as a whole is overviewed on the macro level. For example, H. Lowry interprets social capital in the context of market relations, drawing attention to its investment components [28]. The economic value of social capital for the society's development is emphasized by F. Fukuyama [29].

Recognition of the fact that social capital facilitates the solution of problems of collective action has become a well-established position today. This is caused by the fact that this concept has a basic idea that social relations and social norms can provide access to valuable resources that can improve the well-being of individuals, families, communities, regions, or countries [30; 31].

One of the established points of view in the literature is the assertion that social capital can facilitate the solution of problems of collective actions. For example, in the sphere of politics, citizens, based on generalized trust and other civic mindsets, unite in social and political groups which allow them to rally for the implementation of civil initiatives. The research of the problem has shown that effects of social capital, of course, generate social benefits for individuals. Thus, a direct link between certain aspects of social capital and large-scale impacts of social development was established. First of all, it concerns economic growth [32, 33; 34], crime rate reduction [35], the increase of authorities' responsibility to the society [36]. E. Ostrom, one of the founders of the theory of collective actions, argues that "social capital is the shared knowledge, understanding, norms, rules, and expectations about patterns of interactions, which groups of individuals bring to a recurrent activity" [37].

Collective actions: A theoretical analysis.

Research interest in the study of collective actions has deep roots in the history of science. As human society has always assumed collective behavior and collective actions, we can find mentions of them, attempts to describe and analyze them in the writings of thinkers of various historical periods. However, a proper scientific approach to the study of the phenomenon of collective actions should be sought in the history of economic and political studies in the period of industrialism. A lot of interesting thoughts on the nature of collective actions can be found in classic theories. Many scholars of this period tried to explain, how the structural changes gave rise to the patterns of collective actions, how industrialization and trade development, urbanization and concentration of population, changes of the political system and the system of legislation, old and new ideological trends, etc. facilitated their formation. Such attempts can be found in the works of researchers on the "economic man's" behavior driven by an "invisible hand of the market" in order to achieve personal and public goods (A. Smith, J. Bentham, J. Mill, K. Marx, T. Veblen, etc.). A distinctive feature of these philosophers' views is their understanding of collective actions as a product of structural changes in a particular institutional environment. It is the institutions that act as a collective subject whose actions are rational in

nature. Institutional approach later became the basis of paradigm of collective action.

It is no accident that an economist, a representative of new institutional economics M. Olson was one of the first modern researchers of collective actions [38]. He identified and described the connection between collective actions and material benefits, and also linked the possibility/impossibility of collective actions with a kind of a good, obtained as its result. As it turned out, the type of good, which causes a collective action, is important. He also indicated the problem of a "free rider", who receives public benefits but does not participate in collective actions. M. Olson considers the individual's view of a good to be an essential condition for the provision of a collective good. The effect of a particular individual on the view of this good within the borders of a large group is of low value for the groupwide representation, while the possibility of influence depends on the personal contribution or individual's costs while creating the good. According to M. Olson, an individual's contribution should be encouraged and the size of a benefit should be related to the size of the contribution.

E. Ostrom (Nobel laureate) continued to study the problem, aiming to identify the quality of the good and the institutional arrangements that accompany the usage of this good. E. Ostrom identified a number of factors that, in her opinion, contribute to the possibility of a collective action. She included "…the number of participants, the type of received goods, participants' heterogeneity, the need of "face to face" communication, the form of the production function, the availability of information about past actions, the method of communication between individuals and the possibility of individual way-out" [39]. Her significant contribution to the theory of collective actions is associated with the substantiation of the importance of rules and regulations for this type of social action [40]. In addition to the rules and regulations, the role of intangible incentives for collective actions was established. Thus, K.D. Opp in his study [41], on the basis of empirical data, showed the importance of the group engagement factor for the participants of collective actions.

Further development of the collective action theory is connected with the inclusion into its explanation of the category of identity which became a significant variable in the theory. This gave the opportunity to reveal how the actor identifies himself or herself with the group [42]. An important aspect of the theory is presented by a thesis about the actors' acquisition of subjectivity in the participatory process. The effect shows itself in the implementation of the right to vote, the requirement to take into account interests in decision-making [43]. The researchers note the need for freedom and the institutional capacity as conditions of collective actions to start this category [44].

Rather stable concepts have gradually formed, which allowed analyzing existing and emerging collective actions. A powerful impetus to the development of the theory was given by social processes that took place in the 80–90s of the 20th century. This time is characterized by the institutionalization of many social movements and the acquisition of clear organizational forms by them, which resulted in the creation of many non-profit organizations, which became the basis of civil society and had the opportunity to initiate collective actions. A significant contribution to the development of a collective action paradigm was made by J. McCarthy and M. Zald. They interpret collective action as "a set of opinions and perceptions, which expressed a desire to change social institutions or social structures

of a society" [45]. They propose the term "countermovement" understanding it as "a set of opinions and beliefs, having an opposite direction to the movement".

When studying organizational forms of social actions, the scientists emphasize their network nature. It was noted that the majority of participants in collective actions had various social connections with other participants that contributed to their involvement [46].

A major contribution to the study of forms of collective actions was made by H. Tilly who enriched the theory with the "repertoire of a collective action" [1]. He understands the repertoire as different ways of committing collective actions including processions, meetings, rallies, pickets, strikes, appeals, petitions, etc. The repertoire is formed under the influence of the institutional and cultural context, accumulated experience, traditions and historical circumstances of a place and time of the event, etc. The study of the repertoire of actions is useful and relevant, because, as society developed and experienced revolutions, wars, changes of government forms, and expansion of democratic trends in the increasing number of countries, the formation of civil society structures, new patterns of collective actions emerged. Consequently, the scientific knowledge of this phenomenon was deepening, new conceptual approaches, showing that social activity has different nature, were forming.

Collective actions and social capital

Today, collective action theories and social capital are integral parts of human behavior explanations and are applied to a wide range of different phenomena. The concept of collective action explains social movements, protests, electoral behavior, membership in interest groups. It is effective while analyzing volunteering and political action in the absence of the interested group or coordinators; it is demanded while understanding its attachment to a wide range of online organizations outside formal procedures, "membership" incentives and while explaining personal, voluntarily contributed information "benefits" for common usage through the creation of web content, etc. One of the focuses of its development is the discussion of "problems of a collective action" arising in connection with the temptation of dependency which may interfere with mutually beneficial collective efforts.

The modern theory of social capital describes the reasons for cooperation and its avoidance in the situations of collective actions. Various aspects of social life are analyzed on the basis of this concept. Researchers pay attention to the issues of sustainable development, the relationship between social capital and its other types, the importance of regional and local social capital as a factor of survival in a situation of economic structural crises, solutions of environmental problems. The diversity of reviewed issues suggests a significant heuristic potential of concepts that led to the formation of ideas on the necessity of synthesis of two concepts, which was proposed by E. Ostrom, who was one of the first to speak about it [37].

In foreign literature, there is a certain cooperation of concepts of collective action and social capital, which allowed expanding and diversifying the repertoire of studied issues. Quite a lot of publications have been devoted to the economic approach to the reviewing of the connection between social capital and collective actions. Collective actions are reviewed in the framework of the theory of institutional change [47], the approach of new institutional economics is used in the study of strategies of collective action [48], and collective actions

are studied in the connection with cooperation [49]. In general, the problems of environmental management (environmental economics) are reviewed [50]. Most of researches are based on the examples of interaction practices in developing countries [21]. Social capital is described as the condition for collective actions [51, 52]; its role in overcoming the barriers to collective action among poor population is being studied [24]. The environmental sphere is also the intersection of social capital and collective actions, especially considering the fact that the problem becomes more global [53]. The theme of collective actions is widely represented in psychological science studying its various aspects [54, 55].

Researchers' attention is also attracted by the opportunity to create and strengthen social capital through collective action in the sphere of health care. An example is the analysis of the situation with HIV-infection [56].

Scientists noted the productivity of the connection of two concepts for the study of political aspects of society. Political scientists review collective actions primarily in connection with the functioning of civil society. The search for new formats of collective action in the political sphere in the context of globalization and urbanization is in process [57].

The concept of social capital is now widely used in studying different aspects of Russian society. Domestic researchers of social capital L. Polishchuk and R. Menyashev analyze this phenomenon in detail and describe its impact on the economic development [58]. Its effect on social relationships [59], the formation of boundaries and spheres of local communities' responsibility [60, 61], the interaction in network structures, etc. are studied [62, 63]. Scientists also pay a lot of attention to various forms of collective actions [64, 65].

However, the explanatory power of the concept in the analysis of collective actions' practices in Russia is definitely underestimated. One of few Russian researchers' publications is an attempt to compare available Western European and Russian experiences of collective actions and relate it to social capital, to show the influence of historical and cultural context [66]. The paper is an attempt to understand the historical experience of collective actions that emerged in different cultural and historical context and does not contain any research data, which would allow judging the mutual influence of collective actions and social capital in modern conditions.

Conclusions

The study of collective actions in relation to their participants' social capital seems to be a field requiring urgent attention. Research tasks, which scientists face in this context, could cover a number of areas.

First, there is a change of actual subjects of collective actions. It is manifested in the number of facts. The social base of movements changes. The working class, operating in the manufacturing sector, is in many cases replaced by the "new" middle class, existing in the non-manufacturing sector. The layers and groups, occupying a specific place in the social structure of society (students, pensioners, representatives of professional communities), become activists. The emergence of online organizations, operating outside formal procedures, and lack of "membership" in them lead to the fact that their borders sometimes become quite blurred. It is not always possible to identify the subject due to the actual absence a concerned group.

Second, there is a change of goals of social movements, which are subjects of collective action. The focus of their interests is increasingly affected by issues of identity, autonomy,

solidarity, etc., while the basis of their formulation is the objective scientific evidence (environmental movements).

Third, it is necessary to study collective actions in different spheres of life (labor, social, cultural, political, environmental, etc.) and factors, influencing their occurrence and determining the development direction, as well as the presence of barriers while involving into an action, into the coordination, and accomplishment.

Fourth, the repertoire of collective actions expands and changes. Traditional forms of public actions are complemented by new ones, emerging due to the opportunities, provided by virtual communication channels. This is largely caused by the weakening of the usage of rigid organizational forms of interaction, based on a hierarchy of relations, their replacement with more flexible forms, focused on horizontal connections.

Fifth, we need to further study the interconnection between collective actions and social capital of their subjects, their impact on social capital formation, and its impact on the improvement of their performance and the overcome of barriers, preventing their functioning.

Given the fact that collective actions are natural for any sphere of human activity, it might be argued that the concept of social capital allows implementing integrated and interdisciplinary approach to studying the most urgent problems, appearing in networks of human relations, within boundaries of everyday interaction.

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Identification of Interconnection between Health and Employment of Retirement Age Women*

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Abstract. Recently, Russia has been actively developing and implementing the state policy of encouraging the employment of people of the older generation. The purpose of the paper is to identify the interconnection between the employment of pensioners and their health (on the example of pension age women in the most active age group), which will allow justifying the more efficient policy in this area. The study is aimed at the test of two hypotheses, put forward due to the analysis of theoretical models and sociological surveys of the population. The first one suggests that retirees' labor activity contributes to the preservation of their health; the second one states that only retirees, whose health allows doing it, continue to work. A diagram of the dependencies between the retirees' employment, their health, and other factors, which formed the basis of the regression models, is generated. As a criterion of testing the hypotheses set in the

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research, two multivariate linear regression models, which evaluate the statistical dependence between employment, health status of pensioners, and other variables, were constructed. Based on the calculation of the determinant of the correlation matrix, the existence of linear dependence between explanatory variables in regression models was excluded. The study was conducted on the example of women at the age of 55–59 according to statistical data of Federal State Statistics Service, Federal Service for Supervision in the Sphere of Nature and of the Federal Treasury. The results of the regression analysis confirmed only the first hypothesis, the second one was rejected. The proportion of working women at the age of 55–59 is largely statistically associated with the mortality rate of women of the same age. In turn, economic growth, tensions on the labor market, and the level of pension provision appeared to be statistically significant factors influencing the employment of women at the age of 55–59.

Key words: pensioners, employment, health, regression analysis.

Introduction

According to Rosstat[1], the population in Russia is gradually ageing, and, by 2036, every third resident will be over the working age[2]. In the future, the Russian economy, its industries, and regions of the country may experience a shortage of one of the basic factors of production – labor [1]. In 2018, the number of employed in the economy per a retiree was 1.7 persons[3], and, in the future, the burden on the working population will increase. Many researchers [2-4] consider retirees' labor activity as a tool for labor shortage mitigating. The usage of older people's potential is not only additional manpower for the economy, but, first and foremost, the opportunity for senior citizens' self-fulfillment [5]. Continuing labor activity retirees maintain social ties and take care of their health [6]. At the same time, it is necessary to consider the quality of human capital of older people. The study of Maleva T.M. and Sinyavskaya O.V. [7] showed that, by the time a person reaches retirement age, he or she usually has a number of chronic diseases and often disability. Therefore, the involvement of old people into labor activity and the building of the capacity of active ageing, as the researchers of the Higher School of Economics note [8], may encounter significant limitation. Pensioners' health may limit their performance. The state policy of encouraging the employment of people of older generation ("the new pension formula", "Strategy of action concerning senior citizens up to 2025", raising retirement age), which has been actively developed and implemented in recent years in Russia, needs not only to create the possibility of extending the employment period for old people, but also to ensure the preservation of their satisfactory state of health. The study of the relationships between the employment of pensioners and their health will allow conducting a more effective policy in this area. Therefore, the purpose of this research is to identify the causal relationships by on the example of the retirement age women in the most active age group.

Literature overview

The age structure of the population is an important factor contributing to the socio-economic development, which is reflected in a

[1] The estimated population of the Russian Federation. Federal State Statistics Service. Available at: https://gks.EN/compendium/document/13285 (accessed 01.10.2019).

[2] Men at the age of 60 and older, women at the age of 55 and older.

[3] Employment and unemployment. Federal State Statistics Service. Available at: https://www.gks.ru/labour_force (date treatment: 13.11.2019).

huge number of works devoted to the economics of ageing [9-10]. As F. Notestein rightly pointed out [11], the problem of demographic ageing of population is not a problem, but just a pessimistic view on the mankind's greatest triumph. Undoubtedly, the increase of life expectancy is the main achievement of the socio-economic development, but the ageing of the population brings major challenges to social institutions that require the development of sound policy in this area.

Recently, the emphasis in the approach to improving the quality of life of older people shifted from providing various social protection mechanisms to the stimulation of their potential development and use [12]. Not long ago, new terms have appeared within the framework of this approach, these are the people of "third age" [13] and "fourth age" [14] who deny past ideas about the old age.

The concept of active ageing, which was formed in the 1990s and was aimed at solving the problems of population ageing, became widespread [15]. The concept of active ageing shifts the focus of discussing the effects of ageing from the negative expectations of the growing burden of public expenditure to the analysis of the possibility of using old people's potential [16]. According to the World Health Organization[4] active ageing is the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age. The provision of active ageing, i.e. optimizing opportunities for health, participation, and security in order to enhance the quality of life as people age is an important growth strategy. For the active ageing policy to be successful, a radical change of views about the meaning of ageing in economic and social terms is required [17]. Active ageing allows people to realize their potential for physical, social, and mental well-being throughout life and to participate in the life of society in accordance with their needs, desires, and capacities, providing them with adequate protection, security, and care when they need it. Active ageing aims to increase life expectancy and quality of healthy life for all people as they grow old, including those who are weak, infirm, and need care. Labor and physical activity of elderly people here is considered to be the basis of their health [6].

The data of monitoring of public health of the Vologda Oblast's population, carried out by the Vologda Research Center of the Russian Academy of Sciences [18], showed that working pensioners more positively characterize their own health. The results of the quantitative research, conducted in 2012 in the Ivanovo Oblast [19], revealed that a greater impact on the subjective evaluation of health is made not by the age, but the level of education, current employment, diversity of employment practices. Rogozin D.M. explains it by the fact that employed pensioners independently manage their time, they are included in various social networks and do not depend on the state's care. Similar results were obtained by Lezhnina Yu.P. according to the research of the Institute of Sociology of the Russian Academy of Sciences "Social policy and social reforms as viewed by the Russians"[5]. Pensioners' involvement in the labor process provides them not only with additional income, but it also increases their self-esteem and improves health.

[4] *Active ageing: a policy framework*. WHO. Geneva, Switzeland, 2002. 59 p.

[5] Lezhnina Yu.P. Rossiyskie pensionery: uroven' zhizni, zdorovye, zanyatost' [Russian retirees: standard of living, health, employment]. Rossiya reformiruyushchayasya: Ezhegodnik. [Reforming Russia: Yearbook]. Executive editor M.K Gorshkov, vol. 7, Moscow: Institut sotsiologii, 2008, pp. 178–195.

At the same time, the study by O.V. Egorova[6], the basis of which was the data from the polyclinics, revealed that employed retirement age women have a higher level of general and chronic morbidity. A complex medico-social study on lifestyle and health status of working women of retirement age (on the example of the Penza Oblast) [20] showed that no one noted the positive effects of work on health among working women over the age of 60. A survey of the population[7], conducted in 2013 by the Institute of Social Analysis and Forecasting of the Russian Presidential Academy of National Economy and Public Administration [21], showed that the reasons for abandoning work upon reaching the retirement age are ill health and fatigue, because these factors determine the elderly people's capabilities to work.

Thus, in the scientific literature, there are two viewpoints regarding health of working pensioners. The first view is based on the concept of active ageing and suggests the involvement of older people in the workforce that will not only solve the problems of population ageing (labor shortage, the burden on the employed population, etc.), but it will also contribute to the preservation of their health. The second point of view takes into account the fact that Russian elderly people reach the retirement age with poor health, and the continuation of labor activity may aggravate their condition. To confirm or refute these opposing points of view, causal connections between retirees' employment and their health were revealed in this study.

Approach to the research

On the basis of reviewed theoretical models and the sociological surveys of the population, the following hypotheses were put forward:

H_1: retirees continue to work, and it preserves their good health;

H_2: only retirees with good health continue to work.

If the retirees' satisfactory health condition appears as the result of their labor activity in the hypothesis H_1, the situation is opposite in the hypothesis H_2, where health condition is the reason of employment. Usually, the studies of health and labor activity of pensioners are carried out within incentives and constraints[8]. In this work, the regression models, revealing the relationship between these variables, were constructed for the verification of set hypotheses. For this purpose, the authors formed a scheme of causal relationships between the retirees' employment and their health, which also shows other potential factors of influence *(Fig. 1)*.

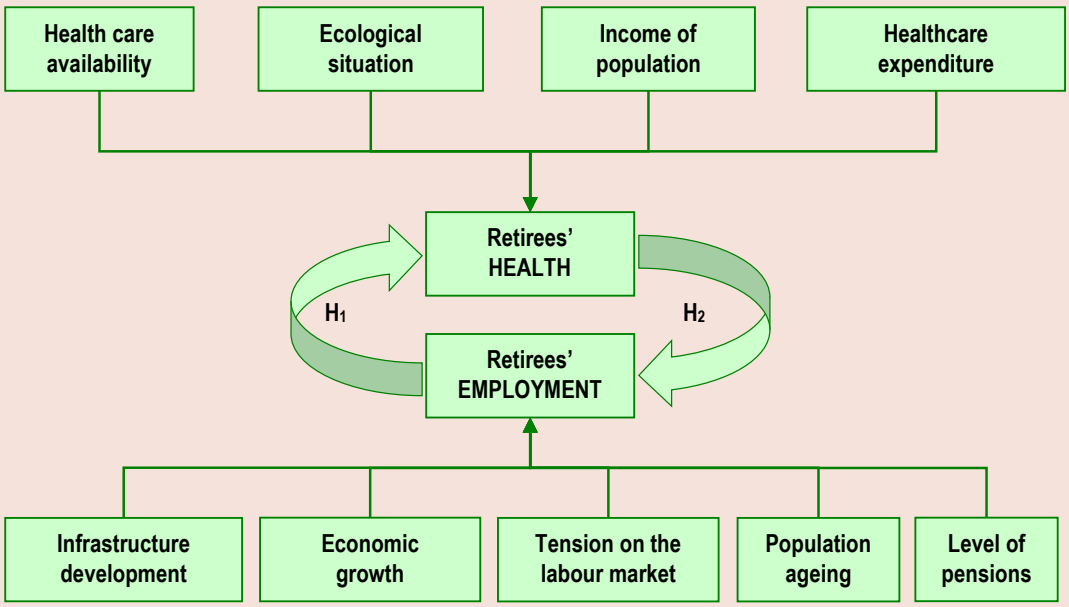
The first regression model is built in order to test hypothesis H_1 and includes a dependent variable – retirees' health, which, in addition to their employment, is influenced by such factors (input variables) as the availability of healthcare, ecological situation, income of the population, and public expenditure on healthcare. This set of variables is based on

[6] Egorova O.V. *Obraz zhizni i sostoyanie zdorov'ya rabotayushchih zhenshchin pensionnogo vozrasta: diss. ... kandidata meditsinskikh nauk: 14.02.03* [Lifestyle and health condition of working women of retirement age: Candidate of Medical Sciences dissertation: 14.02.03]. Moscow, 2011, 173 p.

[7] *Vliyanie trudovogo i pensionnogo povedeniya naseleniya na obespechenie dolgosrochnoy ustojchivosti pensionnoy sistemy v Rossijskoy Federacii i snizhenie riskov deprivacionnoy bednosti sredi grazhdan pozhilogo vozrasta: preprint* [The influence of labor and retirement behavior of the population on the ensuring of the long-term sustainability of the pension system in the Russian Federation and reducing the risks of deprivation poverty among the elderly: Preprint]. A.Ya. Burdyack, E.E. Grishina, Yu.A. Dormidontova, Yu.M. Kazakova, V.Yu. Lyashok, E.A. Tsatsura; RANKHiGS, Moscow: Delo, 2014, 80 p.

[8] Maltseva E. Slaboe zdorov'e meshaet pensioneram rabotat' [Poor health prevents retirees from work]. Scientific-educational portal IQ. Available at: https://iq.hse.EN/news/177667217.html. (accessed: 01.10.2019).

Figure 1. Diagram of the relationship between the retirees' employment, their health, and other factors



WHO proposed factors affecting health [22]: lifestyle, genetics, state of healthcare, and environment. The first of these factors in our model is described by the indicators of retirees' employment and incomes of the population, the third one – by the indicators of population's provision with doctors and healthcare costs, the fourth one – by the indicator of the ecological situation. The second factor is not included into the model since, as noted by V.A. Chereshnev [22], it is relevant for children up to 3-6 years of age.

The second model (hypothesis H_2) includes the dependent variable – retirees' employment and explanatory variables – internal factors (retirees' health and pensions level) and environmental factors (infrastructure development, economic growth, tensions in the labor market, and the demographic situation). According to numerous polls, these are the internal factors that have a larger influence on the elderly people's labor activity. The choice of internal factors is substantiated by the results of numerous sociological studies. According to them, the retirees' involvement in labor activity is involuntary[9] [23–24]. The reason why they stop working after reaching the retirement age, as already noted, is their poor health condition[10] [21]. In addition to mentioned factors, the external environment also affects the seniors' decision of the possibility of continuing employment. Retirees' labor activity is considered as a tool to mitigate labor shortage [2–3], and that is why the model includes such factors as tension in the

[9] Burdyack A.Ya., Grishina E.E., Dormidontova Yu.A., Kazakova Yu.M., Lyashok V.Yu., Tsatsura E.A. *Vliyanie trudovogo i pensionnogo povedeniya naseleniya na obespechenie dolgosrochnoy ustojchivosti pensionnoy sistemy v Rossijskoy Federacii i snizhenie riskov deprivacionnoy bednosti sredi grazhdan pozhilogo vozrasta*. RANKHiGS, Moscow: Delo, 2014, 80 p.

[10] O*sobennosti trudovoy zanyatosti rossijskih pensionerov. Center for pension reform study.* Available at: http://rospens.EN/research/analytics/osobennosti-trudovoy-zanyatosti-rossiyskikh-pensionerov.htm (accessed: 15.11.2019); Burdyack A.Ya., Grishina E.E., Dormidontova Yu.A., Kazakova Yu.M., Lyashok V.Yu., Tsatsura E.A. *Vliyanie trudovogo i pensionnogo povedeniya naseleniya na obespechenie dolgosrochnoy ustojchivosti pensionnoy sistemy v Rossijskoy Federacii i snizhenie riskov deprivacionnoy bednosti sredi grazhdan pozhilogo vozrasta*. RANKHiGS, Moscow: Delo, 2014, 80 p.

labor market, economic growth, demographic situation, and infrastructure development. The first of these factors is described by the unemployment rate. As several studies emphasize [25], the competitiveness of individuals who have reached the retirement age on the labor market is extremely low, and their chances for employment are lower than those of younger candidates [26]. Therefore, the presence of vacant jobs creates the need for additional manpower. The second factor also reflects the formation of interest in the retirees' employment: this is economic growth, which, as a rule, is accompanied by the growth of the anthropogenic load on the environment[11] [27]. The third factor characterizes the level of demographic ageing of the population, which naturally increases the average age of economically active population. As demographers note [28], the demographic pyramid of economically active population of Russia generally follows the demographic pyramid of the country in the age interval from 15 to 72 years. The indicator of infrastructure development (in particular healthcare, which is especially important for the elderly), is considered to be the fourth factor, because it creates the conditions for life, including the reproduction of labor resources [29–30].

The logic of the research is as follows. If the explanatory variable is statistically significantly associated with the dependent variable, then the hypothesis is not rejected (accepted). The statistical significance of the coefficient before the explanatory variable in the multivariate linear regression was used as the criterion. And the regression model should meet the quality indicators.

The research data

Usually, while studying health status of elderly population, the authors use data from sociological surveys that has some limitations for the regression models. First, to ensure a sufficient array of data to build an effective model, the surveys should be regular. Secondly, which is more important, the data on health status are based on the individual's self-esteem, as V.Yu. Lyashok and S.Yu. Roshchin rightly note [31], which has no clear criteria of response selection. Therefore, the given research is based on the statistical data of the Federal State Statistics Service, the Federal Service for Supervision of Natural Resources, and the Federal Treasury.

To assess health condition, mortality indices are used. This choice is justified, firstly, by a close correlation between the health of people in old age and their mortality. According to the Central Research Institute for Health Organization and Informatization of the Ministry of Health of the Russian Federation[12] for 2017, 88.9% of mortality cases among the elderly occur due to the endogenous reasons, i.e. from disease, not from external causes. Secondly, the use of mortality indices, while evaluating health status of the population, allows mitigating the impact of problems of underreporting and detection of latent disease. The problems existing in medical statistics [32] (from problems of detection of hidden latent morbidity of the population [33–34] to the deliberate distortion of information[13] [35]) often lead to the fact that the statistical data are contradictory or closed [36]. Therefore,

[11] Economic growth is accompanied by increasing emissions of pollutants. *Demoskop Weekly,* 2004, no. 173–174. Available at: http://www.demoscope.EN/weekly/2004/0173/barom01.php (accessed: 14.11.2019).

[12] *Mediko-demograficheskie pokazateli Rossijskoy Federacii v 2017 godu: stat. spravochnik.* Ministry of Health of Russia, Moscow, 2018, 264 p.

[13] ... O pripiskah v medicine [... On postscripts in medicine]. Demoskop Weekly, 2015, no. 667–668. Available at: http://www.demoscope.EN/weekly/2015/0667/gazeta013.php (accessed: 15.11.2018).

the use of mortality indices is widely used for the evaluation of health status in many studies, including medical ones. For example, the index of accounting reliability (the ratio of the number of deaths to the number of initially reported cases of malignant tumors) is considered one of the most objective indices of evaluation of the condition of the oncologic help to the population reflecting the level of primary cases underreporting [37]. All the more so, the statistical information on the morbidity of the population over working age has being developed by the Ministry of Health of Russia only since 2010. Thirdly, the use of different subjective measures of health assessment has its methodological limitations [38–42].

The regression models were built according to data on women of 55–59 years old, which is due to the methodology of the study, on the one hand. According to the results of the Comprehensive monitoring of living conditions of the population[14] the average labor experience after retirement is 6.4 years. On the other hand, according to the statistical information, published by the Russian Federal State Statistics Service, the employment of men of the retirement age is presented only in one age group of 60–72 years, which is quite a long time frame for the purpose of the study.

For each hypothesis, a regression model was built and a set of informative indicators was selected. To test hypothesis H_1, age-specific mortality index of women aged 55–59, per mille was taken as the dependent variable *Y*. As input (explanatory) variables, the following indicators were used:

X_1 – the proportion of women aged 55–59 in the total number of employed[15], %;

X_2 – the number of doctors per 10.000 of population;

X_3 – emissions of air pollutants per person, kg;

X_4 – the average income of population (in the prices of 2018), thousand rubles;

X_5 – the expenditures of the consolidated budget of a constituent entity of the Russian Federation and territorial state extra-budgetary fund for the healthcare sector (in the prices of 2018) per capita, thousand rubles.

To test hypothesis H_2, the proportion of women aged 55–59 in the total number of employed people (%), was reviewed as the dependent variable *Y*. As input (explanatory) variables, the following indicators were used:

X_1 – life expectancy after achieving 55 years of age by women, years;

X_2 – the number of doctors per 10.000 of population;

X_3 – emissions of air pollutants per year per person, kg.;

X_4 – unemployment rate (by ILO methodology), %;

X_5 – the share of population over the working age in total population, %;

X_6 – replacement ratio (the level of replacement of lost earnings by pension), %.

The calculations of the research were conducted in Statistica package.

Results of the research

Testing hypotheses H_1

To reveal causal connection between the employment of women aged 55–59 and their health, a correlation and regression analysis was

[14] Itogi kompleksnogo nablyudeniya usloviy zhizni naseleniya [The results of the comprehensive monitoring of living conditions of the population]. Federal State Statistics Service. Available at: https://www.gks.EN/free_doc/new_site/KOUZ18/index.html (accessed: 01.10.2019).

[15] *Itogi vyborochnogo obsledovaniya rabochey sily 2018: stat. sb.* Rosstat, Moscow, 2019.; Rabochaya sila, zanyatost' i bezrabotica v Rossii (po rezul'tatam vyborochnyh obsledovanij rabochey sily). 2018: stat. sb. Rosstat, Moscow, 2018. 142 p.; *Ekonomicheskaya aktivnost' naseleniya Rossii (po rezul'tatam vyborochnyh obsledovaniy). 2008: stat. sb.* Rosstat, Moscow, 2008, 165 p.

Table 1. Correlation matrix for input and dependent variables

	X_1	X_2	X_3	X_4	X_5	Y
X_1	1.000	-0.136	-0.430	0.797	0.786	-0.848
X_2	-0.136	1.000	0.362	0.155	0.213	0.143
X_3	-0.430	0.362	1.000	-0.637	-0.483	0.787
X_4	0.797	0.155	-0.637	1.000	0.944	-0.912
X_5	0.786	0.213	-0.483	0.944	1.000	-0.846
Y	-0.848	0.143	0.787	-0.912	-0.846	1.000

Table 2. The results of the regression analysis

	Beta	Std.Err. of Beta	B	Std.Err. of B	$t(13)$	p-level
Intercept			13.5647	3.64125	3.72528	0.002544
X_1	-0.41793	0.078887	-0.34714	0.065524	-5.29787	0.000144
X_3	0.466521	0.055641	0.0633	0.007551	8.38455	0.000001
X_5	-0.2925	0.081338	-0.0902	0.025092	-3.59609	0.003256

Table 3. Basic statistics of the regression analysis

Index	Value
Multiple R	0.9846
Multiple R^2	0.9694
Adjusted R^2	0.9623
$F(3.13)$	137.2551
p	0.0000
Std.Err. of Estimate	0.3658

Table 4. Paired and partial correlation coefficients between the input variables and the dependent variable

i	1	2	3	4	5
$r_{x_i y}$	-0.848	0.143	0.787	-0.912	-0.846
$r_{x_i y \setminus x_1 \ldots x_5}$	-0.744	-0.122	0.789	-0.028	-0.366

conducted. The data were taken from the Rosstat references for the period of 2002–2018. In *table 1* a correlation matrix for input and dependent variables for hypothesis H_1 testing is presented.

The input variables appeared to be multicollinearity[16], i.e. the determinant of the correlation matrix is equal to 0.0058. After removing the statistically insignificant factors (X_2 and X_4) from the model, the regression model was obtained (*Tab. 2* and *Tab. 3*). Multicollinearity for three remaining significant factors is absent, the determinant of the correlation matrix for input variables (X_1, X_3, and X_5) is equal to 0.2902.

Additionally, pair and partial correlation between the input variables and the dependent variable were calculated *(Tab. 4)*.

The results presented in table 4 are consistent with the results of the regression analysis. Variables X_2 and X_4 also appeared to be not correlated with the dependent variable Y when fixing the other factors. High pair correlation between X_4 and Y was caused by the impact of other factors (the effect of multicollinearity of input variables).

[16] Magnus Ya.R., Katyshev P.K., Peresetskiy A.A. *Ekonometrika. Nachal'nyi kurs.* Moscow, Delo, 2004, 576 p.

Thus, we obtained a regression model based on age-specific mortality rate of women of 55–59 years old from the number of women, aged 55–59, in the total number of employed people, the specific emissions of air pollutants and specific expenditures of the consolidated budget of a constituent entity of the Russian Federation and territorial state extra-budgetary fund for health:

$$\overline{Y}(\mathbf{X}) = 13{,}565 - 0{,}347X_1 + 0{,}0633X_3 - 0{,}0902X_5. \quad (1)$$

Equation (1) shows that, as far as the employment of women aged 55–59 grows by 1%, the mortality rate of women of the same age declines by 0.347 per mille while the emissions of air pollutants and public health costs maintain at the same level.

Formally, to estimate the parameters of model (1), the compliance with the conditions of $\mathrm{Rg}X = m + 1 = 4 < n$ is sufficient, i.e. there should be more than 4 linearly independent observations (the number of model parameters)[17]. However, to ensure the statistical reliability of the model estimation it is typically required that the number of observations (in this case $n = 17$) should at least 3 times exceed the number of estimated parameters (it equals 4 for model (1))[18]. It is evident that this condition is met, and the sample can be considered representative.

Testing hypotheses H_2

The statistics were taken from Rosstat references for the period of 2000–2018. To test hypothesis H_2, we have also built a correlation matrix for input and dependent variables, the results are presented in *table 5*.

As shown by the calculation of the determinant of the correlation matrix (it is equal to 0.00027), the input variables are multicollinearity; to exclude this, the statistically insignificant factors (X_1, X_2, and X_5) were removed from the model. The obtained regression model is presented in *tables 6* and *7*. Multicollinearity for the three remaining significant factors is absent, the determinant of the correlation matrix for input variables (X_3, X_4, and X_6) is equal to 0.2378.

Table 5. Correlation matrix for input and dependent variables

	X_1	X_2	X_3	X_4	X_5	X_6	Y_1
X_1	1.000	0.024	-0.632	-0.835	0.957	0.531	0.704
X_2	0.024	1.000	0.391	-0.111	-0.206	-0.048	0.304
X_3	-0.632	0.391	1.000	0.249	-0.724	-0.861	-0.023
X_4	-0.835	-0.111	0.249	1.000	-0.780	-0.144	-0.902
X_5	0.957	-0.206	-0.724	-0.780	1.000	0.548	0.613
X_6	0.531	-0.048	-0.861	-0.144	0.548	1.000	0.049
Y_1	0.704	0.304	-0.023	-0.902	0.613	0.049	1.000

Table 6. The results of the regression analysis

	Beta	Std.Err. of Beta	B	Std.Err. of B	$t(15)$	p-level
Intercept			6.0613	21.2036	0.2859	0.7789
X_3	0.5491	0.1713	0.2121	0.0662	3.2050	0.0059
X_4	-0.9837	0.0881	-3.2787	0.2935	-11.1709	0.0000
X_6	0.3803	0.1677	0.5114	0.2255	2.2681	0.0385

[17] Ayvazyan S.A., Mkhitaryan V.S. *Prikladnaya statistika i osnovy ekonometriki.* Moscow, YUNITI, 1998. 1005 p.
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Table 7. Basic statistics of the regression analysis

Index	Value
Multiple *R*	0.9450
Multiple R^2	0.8931
Adjusted R^2	0.8717
F(3,15)	41.7754
p	0.0000
Std.Err. of Estimate	1.8418

Table 8. Pair and partial correlation coefficients between input variables and dependent variable

i	1	2	3	4	5	6
$r_{x_i y}$	0.704	0.304	-0.023	-0.902	0.613	0.049
$r_{x_i y \setminus x_1 .. x_5}$	-0.040	0.051	0.575	-0.682	0.247	0.446

The results of the calculations of pair and partial correlation between the input variables and the dependent variable are presented in *table 8*.

The results presented in table 8 are also consistent with the results of the regression analysis. Variables X_1, X_2, and X_5 also appeared to be not correlated (X_1, X_2) or weakly correlated (X_5) with the dependent variable Y when fixing the other factors. The difference of partial correlation coefficients $r_{x_3 y \setminus x_1 \ldots x_6}$ and $r_{x_6 y \setminus x_1 \ldots x_5}$ from the pair of coefficients $r_{x_3 y}$ and $r_{x_6 y}$ were caused by the influence of other factors due to the effect of multicollinearity.

As a result, we have obtained a regression model for the dependence of the proportion of women aged 55–59 in the total number of the employed from specific emissions of air pollutants, unemployment rate and the replacement rate of the lost earnings by pension:

$$\overline{Y}(\mathbf{X}) = 6{,}061 + 0{,}212 X_3 - 3{,}279 X_4 + 0{,}511 X_6. \quad (2)$$

The analysis of equation (2) allows concluding that, with the growth of emissions of polluting substances per 1 person per 1 kg, the share of women aged 55–59 and employed in the economy increases by 0.212%, while other factors remain unchanged. This dependence corresponds to the environmental Kuznets curve, which is an inverted U-shaped curve that describes the impact of the economy on the environment. It is expected that, with the growing prosperity of the population to a certain level, the volume of pollution grows [43]. The increase of the unemployment rate by 1% will cause a decrease of employment among women aged 55–59 by 3.279% while fixing the values of other factors. The increase of the replacement rate by 1% at constant values of other factors requires additional employment growth by 0.511%. In other words, the higher the level of substitution of the lost income is, the higher the number of working retirees, wishing to maintain their previous level of financial security, is.

Estimation of the parameters of model (2) was carried out on the basis of 19 observations, so the data sample is representative, and the parameters' estimates have adequate statistical reliability.

Conclusions

The results of the research confirmed hypothesis H_1 that the retirees' labor activity keeps them healthy. The proportion of working women aged 55–59 years is statistically

significantly associated with the mortality rate of women of the same age. While fixing all other factors, the increase of the average proportion of employed women by 1% reduces their mortality by 0.347 per mille, or by 3.79% on average for the period of 2002–2018.

During the research, we rejected hypothesis H_2 on the influence of health condition on the decision of the women, aged 55–59, concerning the continuation of employment. The following statistically significant factors appeared to influence the employment of women, aged 55–59: economic growth (accompanied by the increase of anthropogenic burden on the environment in the form of air emissions), tensions on the labor market (causing unemployment) and the level of pensions (level of replacement of the lost earnings by pension). The first two factors describe the labor demand on the part of the labor market, the third factor describes financial interest on the part of the retirees.

Thus, the results of the research testify that the age of active longevity lasts longer than the productive age. That is why, in the ageing of population (the increase of labor shortage and economic burden on the working population), the retirees are significant labor resources, which have necessary experience and skills. At the same time, the involvement of pensioners in economic activity should not be excessive and total, the old people's employment should take into account their capabilities and requirements. It is obvious that the further work on the development of government measures to create conditions for the active participation of the older generation in public relations, which could positively affect their health, is necessary.

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Universities in Transition: The 6i Model for Strategic Governance and Management

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Abstract. The 6i Model (Caro-Gonzalez, 2019) offers an archetype for research management to devise and implement integrative institutional strategies by combining six dimensions that start with 'i': internationalisation, interdisciplinarity, intersectorality, impact, innovation and inclusion. This innovative model focuses on the expanding critical role of universities as social innovators and proposes ways to shape performance through principles of collaboration (international, interdisciplinary, and intersectoral) and values-based rationales for action (impact, innovation, and inclusion). When adopted strategically, these dimensions can reconfigure universities' multi-level fields of action, transforming their often slow and disconnected institutional changing processes. By analysing the case of the University of Deusto, Spain, and using a qualitative approach, this paper aims to critically examine whether this comprehensive model can be a powerful improvement methodology for the strategic governance and management

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system of university research. The research unveils the way the model performs in practice and unfolds its key performance features and critical success factors while addressing the fundamental challenges and barriers faced by universities nowadays. The research carried out suggests that a holistic view of research management can better inform research policy, support decision-making, and generate more focused and integrative implementation of the research strategy. Based on this research strategy framework at a specific university, further implementations and assessments of the model in other institutions and settings will contribute to further explore the potential of the 6i model as a comprehensive strategic design with which universities can steer their priorities, activities and role within local, regional and global ecosystems.

Keywords: research policy, research management, systems thinking, interdisciplinarity, research excellence, social impact, internationalisation.

1. Introduction

In recent decades, Higher Education institutions have been re-organising their resources and re-thinking their activities in order to generate dynamics to respond to new demands posed by a changing environment with rapidly evolving societal needs and Science, Technology and Innovation (STI) systems in transitions. Delivering quality impactful research has become a labour of managing "a complex web of relationships, institutional cultures, and political agendas that require that we open up the categories to see how they are conceived of by different actors" [1, p. 141]

Although universities have historically demonstrated the ability to adapt to their economic and political environment [2], according to Thoenig et al. [3], more than ever, strategic capacity is required because "massive changes continue to occur in the field of higher education and research". The authors argue that "an organisation unable to be strategic becomes vulnerable and erratic" and that strategy equips local academic institutions with an action theory enabling them to anticipate societal dynamics and changes in steering bodies' priorities, and therefore, in times when resources are scarce and competition tough, to define and implement distinctive policies designed to produce outcomes that correspond to expected demands and service missions [3, p. 319].

In this direction, some Higher Education institutions have been creatively deploying research management strategies to address real-world problems, introducing more inter-disciplinary and intersectoral approaches to research and innovation and breaking down some of the boundaries between disciplines, sectors and professions.

Nonetheless, there is still much left to learn about the emerging organisational contexts of Higher Education institutions compelled as they are to channel societal needs to research questions, delivering knowledge, innovation and research results to society. In a current policy vacuum, it is necessary to understand how universities have been dealing with a number of variables including the traditional Cartesian university structures, the still existing mentality which isolates research work as an attempt to protect it, the high competition for obtaining grants and the conflicting criteria applied by different funding sources.

2. An overview of the 6i model

The 6i model (4) is a university management system that combines simultaneously and strategically six transversal dimensions –

(1) internationalisation, (2) interdisciplinarity, (3) intersectorality, (4) innovation, (5) impact, and (6) inclusion – that, when implemented in an innovative and intertwined manner, contribute to positive institutional outcomes. It has been developed and applied at the University of Deusto in Bilbao, Spain since 2010 to manage and propel the research internationalisation strategy, being in continuous evolution and adaptation to the changing landscape and needs of the university ecosystem.

By employing a systems perspective, the 6i model offers a framework that can impel universities towards a proactive rather than a reactive position. It draws on top-down and bottom-up feedback pathways that allow flexible support structures and mechanisms to emerge, thus maximising its relevance and take-up for the institution involved.

The dimensions of the 6i model embody three principles of collaboration (international, interdisciplinary, and intersectoral), underpinned by three rationales for action (impactful, innovative, inclusive). When adopted simultaneously and strategically, these elements can advance universities' multi-level spheres of action and replace the often disjointed and slow process of institutional change evident in higher education.

The three collaborative i's – international, interdisciplinary, and intersectoral – are founded on the premise that there is value in working along the boundaries, or between traditional domains of action. In operational terms, a boundary may be defined as: …a sociocultural difference leading to discontinuity in action or interaction. Boundaries simultaneously suggest a sameness and continuity in the sense that within discontinuity two or more sites are relevant to one another in a particular way [5, p. 133].

The three transversal and underlying principles – innovation, impact, and inclusion – are the i's that guide collaboration endeavours, acting as a compass with which universities can steer their institutional activities. The need to innovate is prompted by the evolving societal challenges and the need to generate real impact research and innovation. Creativity and ingenuity through a mix of collaboration and competition is thus paramount for universities to thrive excellence.

Taken as a whole, the 6i model serves as a tool for universities to develop robust internal and external ecosystems as they adapt to contemporary challenges. Based on the characteristics, culture, possibilities, resources and STI system of each institution, the model:

a) approaches research articulating the six "I" presented dimensions involved in a university's research system into the implementation of an adaptive, integrative and system oriented institutional strategy;

b) shapes different research operational management mechanisms;

c) develops inclusive value chains that involve different cultural objectives, interests and results by proposing win-win interactions and a result-oriented approach;

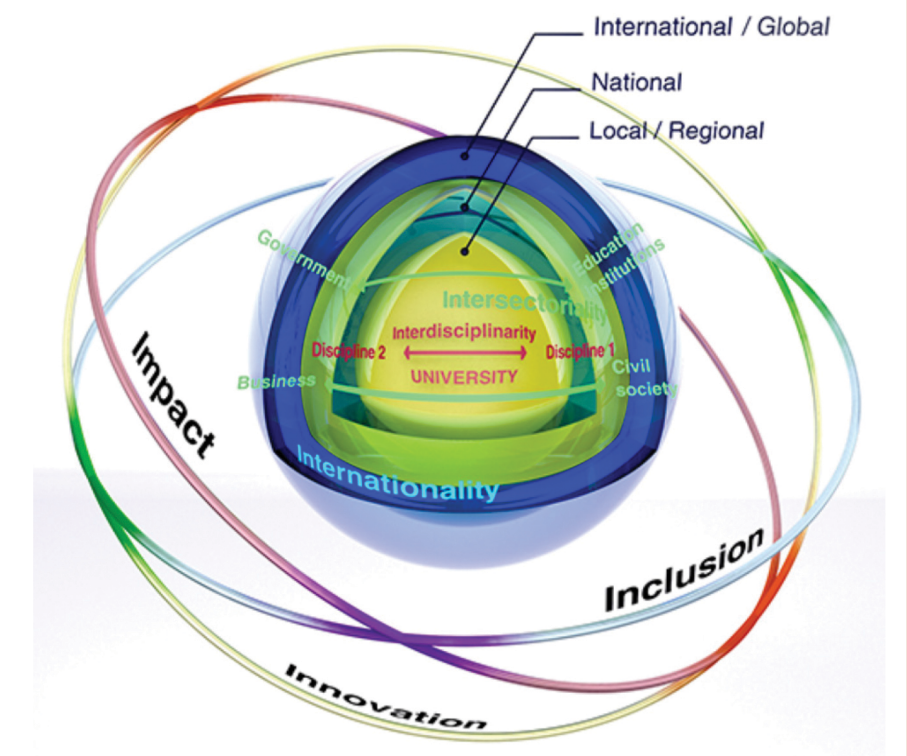
d) addresses the individual and institutional agency to overcome the obstacles that hinder the generation, use and expansion of knowledge, excellent science and innovation;

e) combines bottom-up, top-down and well-round initiatives to develop innovative workflows and dynamics in university research management systems; and

f) brings together different objectives, approaches, norms and logics in a never ending process of change.

This way, the 6i model acknowledges the robust learning space that exists along geographical, sectoral, and disciplinary

Figure 1. 6i model infographic



boundaries [6–8], thus making the international, intersectoral, and interdisciplinary dimensions vital parts in its proposal. It embodies promising elements that can be harnessed for universities to successfully manage their current and emerging contexts of operations.

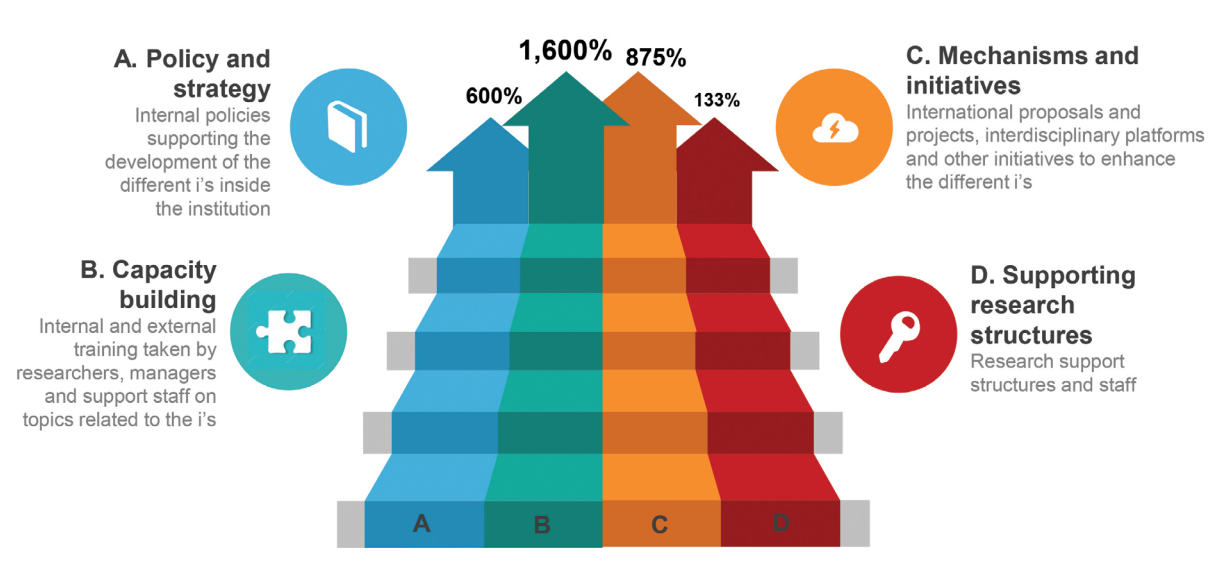
3. Research purpose

The aim of this paper is to understand how the 6i model integrates traditionally disconnected or even opposed elements (collaboration vs competition, disciplinary vs inter or multidisciplinary research) inside a given research system to respond to complex and urgent social issues. More specifically, we propose to explore how such model performs in practice at University of Deusto, a small-sized university in Spain which has been implementing the referred model to address the following four challenges that were identified by the leader of the research internationalisation strategy in alignment with institutional priorities and contextual needs at the beginning of the 2010s: a) the high competition for international research funding; b) the silo rigid, in many cases, "feudal-like", academic traditional organisation, c) the struggle to attract talent to carry out excellence research and d) the existing gap between academia and society and the quest for real societal impact of research results. In the sequence, we explain the research design adopted in this study.

4. Research design

This paper is part of a wider research endeavour which aims at understanding how hybrid and systemic organising is occurring within universities in the current STI landscapes described above. It builds on a previous work by Caro-González [4], which demonstrated that the development of the 6i Model in Deusto

Figure 2. Growth of Deusto's research system from 2010 to 2018



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went hand-in-hand with a drastic increase in the number of different university's resources and indicators during the period examined (2010–2018) as seen in *figure 2*.

While the analysis of tangible and quantitative indicators in such study initially revealed some growth patterns, a qualitative and more in-depth investigation is now needed to capture how the different elements of the 6i Model combine at Deusto as well as to understand the feasibility of the model and its evolution over time.

We relied on two sources of information (*Tab. 1*). First, we conducted semi-structured interviews with key people involved in the evolution of the 6i model at University of Deusto. The interviews were carried out between October 2017 and January 2019 and were recorded and transcribed with the permission of interviewees. The objective of such interviews was to capture the evolution of the 6i model from the perspective of the ones who have not only participated in the process but also influenced its development.

Table 1. Summary of instruments used in the study

	Interviews	Questionnaires
Date/period	Interviews held in 2018 and 2019	September 2018
Participants/ source	A total of 7 interviewees, being: - 3 members of the rector team who have been or are still in charge of pursuing the institutional strategy for research since 2014; - 1 leading manager and ideator of the 6i model; - 1 former technician from the IRPO office responsible for the Ageing and Wellbeing Interdisciplinary Platform during the crucial years of its inception; - 2 senior researchers	100 researchers answered the questionnaires, from which 49% participated in the Interdisciplinary Research Platforms

A second instrument used in this study consisted of an online web-based questionnaire sent out to all university's research staff with the aim of collecting the overall perceptions from researchers at different hierarchical levels. The questionnaire was composed of open-ended questions, which focused on the interdisciplinary and intersectoral collaborations carried out by the university and, therefore, provided information about one key enabling element of the system: the Deusto Interdisciplinary Research Platforms. It dig on the current status, the barriers and the potential of these platforms as mechanisms to build trust and to channel international, interdisciplinary and intersectoral collaborations based on impact-driven research questions. From a total of 281 researchers on the list, 100 forms were filled up.

All the qualitative material collected (interview transcripts and answers to questionnaires' open-ended questions) was analysed with the use of Atlas.ti software. The texts were coded and categorized by each of the given challenges and through two sets of variables: *contextual elements*, which consist of internal (institutional trajectory and organisational culture) and external circumstantial aspects influencing decisions (e.g. local, regional or international policies); and *institutional arrangements*, which include enabling conditions (mechanisms which previously existed or were created by the institution to respond to the posed challenges) and functionings (different combinations of bottom-up, top-down and middle-round forces to address problematic issues).

5. Results and discussion

Our case focuses on the implementation and evolution of the 6i Model – our research object – within Deusto's research "subsystem", (internationalisation strategy and management structures). In order to investigate *how* such model performs in practice, we have analysed how this model has been evolving for nearly a decade. While the effectiveness of the 6i model at Deusto had been previously demonstrated by Caro-González [4], the case study at hand aims at identifying *how* these and other elements of Deusto's research system interconnect while the university addresses four of the most pressing challenges that universities have been facing in current days.

As anticipated in the introduction, the challenges addressed in this research are the ones that were defined by the leader of the research internationalisation strategy, in regular contrast with the succeeding Vice-Rectors for Research and Transfer, to reshape and adjust the targets aligned with Deusto's priorities and contextual needs: (1) the search for international funding, (2) the launching and sustainability of interdisciplinary collaborations, (3) the creation of an attractive research environment to boost excellence and (4) the delivery of social impact of their research and innovation, beyond scientific impact.

In *table 2*, we summarise the results to be presented in this section. We present and discuss results per challenge addressed, analysing the contextual elements (external and internal variables) and the arrangements (enabling conditions and functionings) that have driven the implementation while integrating the 6i elements of the model (collaborative endeavours and value-driven principles), with internationalisation as the inception, boost and main operator of the model development, and the design and execution of specific actions.

First, regarding the internationalisation of research, the analysis revealed that Deusto's purposeful efforts in this direction began in the 2000s, when its institutional mission perceived changing directions of international research

Table 2. The 6i Research Model inside Deusto's system

Challenge	Contextual elements		Arrangements		Related i's of the model
	External variables	Internal variables	Enabling conditions	Functionings	
1: to obtain international funds to carry out excellence research	*International*: new directions of international research agenda *National*: cuts in research funding in the aftermath of the economic crisis and; being a private university inside a system that favours public institutions *Regional*: local grants launched in alignment with international agenda	An internationalisation culture that had been previously built based on student mobility	A mobilisation of internal resources Local and national funding channelled to internationalisation	*Top-down*: management support and allocation of budget to internationalisation *Middle-round*: the work of IRPO (International Research Projects O ffice) connecting European research funding with university's critical mass, and creating capacity building *Bottom-up*: researchers incorporating the proposed training into their career plans and engaging in international projects	*Internationalisation* Interdisciplinarity
2: to generate collaborative dynamics to overcome the "atomization" in university research	*International*: Funding agencies linking grants with interdisciplinary collaboration	Lack of time / teaching workload hindering interdisciplinarity	Interdisciplinary Research Platforms and core groups	*Top-down*: inclusion in institutional policy and strategy *Middle-round*: flexibility, neutral-coordination, international research projects as boundary objects, reconciliation of interests, trust *Bottom-up*: freedom and autonomy	*Interdisciplinarity* Internationalisation Intersectorality Impact
3: to attract talent to boost excellence	*International, national and regional:* Though talent attraction and retention programmes are available at the national and regional levels, aids are still scarce	Institutional re-organisation of resources	DIRS-COFUND project for the attraction of highly talented researchers	*Top-down*: support from vice-rector *Middle-round*: IRPO and Doctoral school finding a common ground to convince managers and supervisors about the need to re-think doctoral training to include the i's in order to meet the requirements from the European Commission *Bottom-up*: having supervisors and teams re-thinking doctoral training and to include i's	*Interdisciplinarity* *Internationalisation* Intersectorality Impact
4: to bring together university research, society and industry	*International, national and regional:* societal pressure to show applied research results *International, national and regional:* 'impact agenda' generating conflicting evaluation criteria at different levels – misalignment between discourse and practice	Deusto's Jesuit mission and tradition in serving the society Internal resistance to deliver work in a more accessible language and to work on what does not count for bibliometric evaluation Different rhythms between researchers and stakeholders	Inclusion of social impact in strategic plan A number of initiatives to promote social impact Research projects fostering inclusion in STEAM careers and in research	*Top-down*: inclusion of impact in strategy and budget allocated to impact initiatives and capacity building *Middle-round*: capacity building to prepare researchers in delivering impact research *Bottom-up*: a portfolio of previous collaborations with stakeholders to build upon and researchers' gradual engagement with social impact	Interdisciplinarity Internationalisation Intersectorality *Impact* Innovation Inclusion

policy towards meeting grand challenges. It is from Europe that the stimulus for innovation about the themes related to ageing come...and then the topic percolates from Brussels to the Basque Country, to Biscay...so, on one hand, there was a political pressure – funding for the topic – and, on the other hand, there were many groups in the university working on it.

Although different rationales are often used to justify the internationalisation of research [9[, international research collaborations have been increasingly driven by economic and competitive motivations [10,11], with participation in international projects becoming an important means for obtaining research funding. In Spain, the aftermath of the economic crisis resulted in cuts in the budget of Science, Technology and Education, forcing institutions to turn to European funds to cover the costs of activities in such areas. In addition, the way the Spanish research funding system is designed posed a challenge to Deusto, as an interviewee explains: "Deusto has an important handicap, which is to be a private institution inside a system which was created to finance only public universities. It is like arriving at a party to which one was not invited".

As enabling conditions and functionings, the mobilisations of internal resources as well as the work of the International Research Projects Office for the generation of collaborative and more focused research were perceived by interviewees: "I think that people were only able to bring their experience together because we had previously done the work of finding intersections between themes, so there was a labour of spreading information across different research teams in order to increase awareness about the importance of such theme to Europe".

As for the **second challenge**, in the case of University of Deusto, interviews revealed the "insurgent character" of interdisciplinary research [12] and showed how this trend came up in the institution as a bottom-up response to the new international research priorities, evidencing connections between internationalisation and interdisciplinarity:

In 2010 there was an intuition, we were going to Brussels and, each day, it was getting clearer that interdisciplinarity was entering into research programmes. At that time, the European Commission was talking about generating European Innovation Partnerships. The first one was on Active and Healthy Ageing. This made us comes back home and ask ourselves "what are doing in terms of ageing?"... and I started to make the first list on the plane back home and think..."let"s see, here we have people from psychology, here people from engineering...and then a map started to come up... but it was spread throughout different faculties and research groups". And then we started to look for ways of having people sitting together and this was the beginning of the interdisciplinary platforms.

Results also evidenced how, at Deusto, international projects acted as boundary objects (*Fig. 3*) around which different parties involved connected and operated as a key mechanism for building sustainable grounded collaborations:

As a researcher, I witnessed a movement which went from research which was more individual and disconnected to seeing the university starting to connect other points through internationalisation. From my personal experience, I could move towards the other i's, I mean, to move towards innovation, international funding, multidisciplinarity, when I started to participate in European research projects...it was through European projects that my personal experience connected with more advanced aspects and especially with the challenges... that was when I started to see the

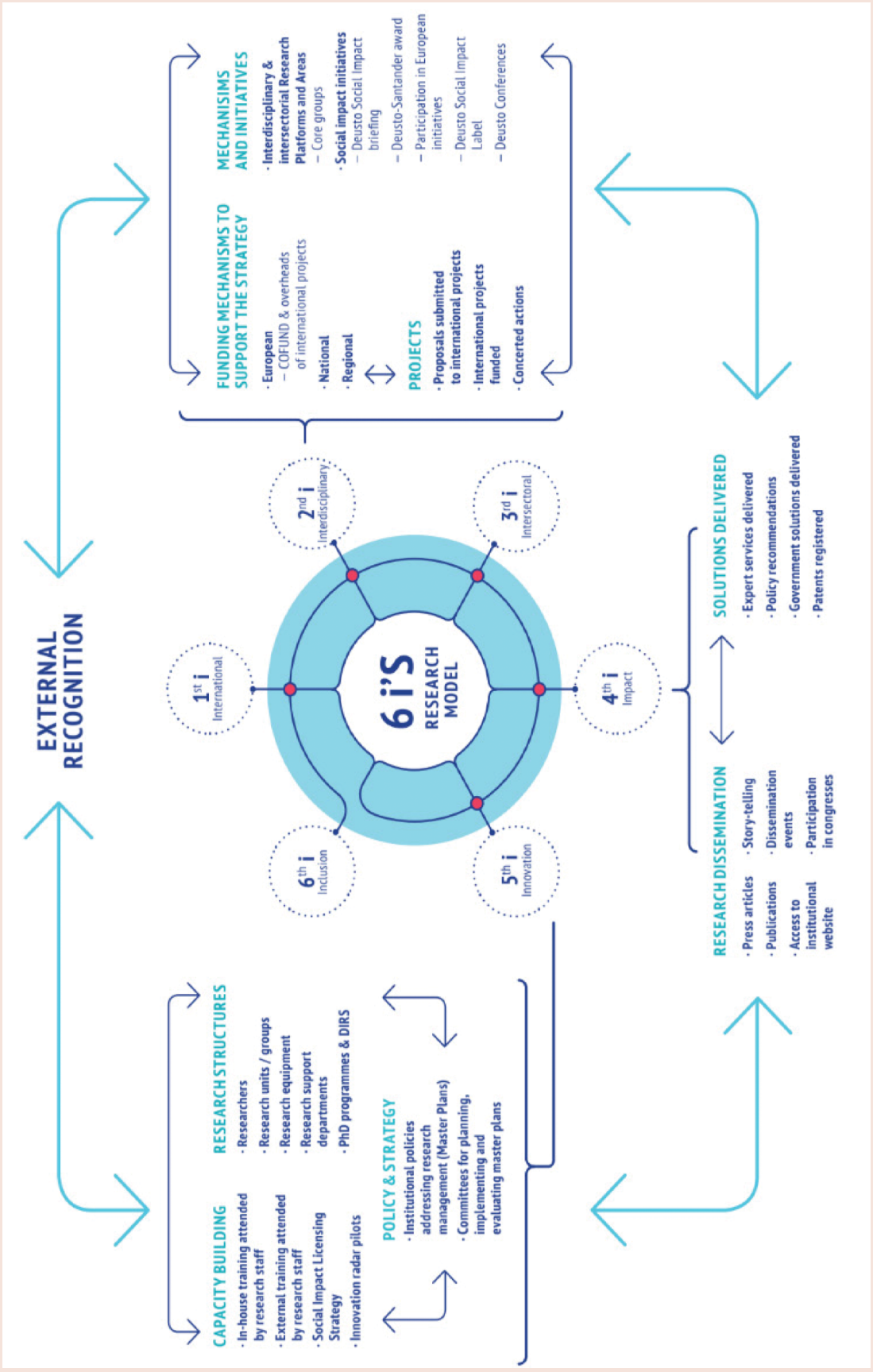


Figure 3. The 6i Model at Deusto's research system

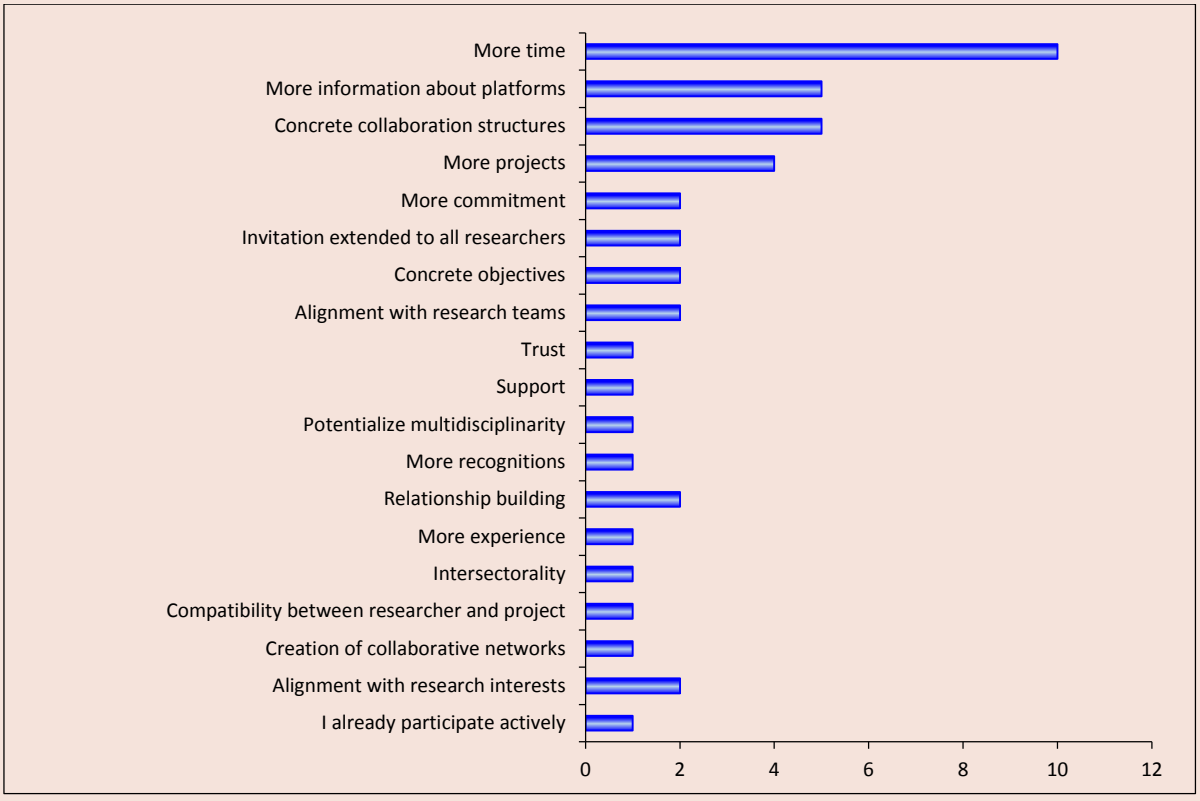
gap, to see that I am not only researching about things that I think that they are important but about questions which are social and political challenges.

Other key functionings to the sustainability of Deusto Interdisciplinary Research Platforms were flexibility and conciliation of interests, meaning that, in order to be integrated into the organisation, platforms could not compete with already existing structures and the work that was done prior to their creation (e.g. existing collaborations with stakeholders, prior achievements, etc.) should be recognised as so:

There were things that had already been done and that had to do with a trajectory of many years based on relationships with stakeholders... and taking this work to the platforms had to be done very carefully because there was a risk, something like "hey, I am taking my partner to the platform..." that is why the project level was more important and then the dissemination level, but always under permission.

The previous value of recognition and respect of prior achievements and structures, together with having a neutral coordinator for interdisciplinary collaborations – in Deusto's case, the research support staff – revealed to be an important element for the mediation between interested parties: a dialogue with research teams, on a clear leadership and, above all, on transparency, that is, on the fact that none of us who coordinated the platforms had any academic theme or any other kind interests...this means that we were there showing what could be done. The fact that

Figure 4. Responses to questionnaires: issues that could help researchers to engage with interdisciplinary collaborations more actively



none of the coordinators took part in the actual research done by the platform somehow made our task more legitimate...we did not privilege anyone...it was something like "these are the themes, they are not our themes"...I think this was positive.

In the meanwhile, data collected from the questionnaire reflects that the lack of time to dedicate to research still remains featured as the biggest barrier to the sustainability of interdisciplinarity at Deusto. When asked about what could help them to engage more actively with interdisciplinary collaboration, "more time" was the issue which was mostly mentioned by respondents (*Fig. 4*). This confirms findings from Kwiek [13], who demonstrated that top research performers are those who are much more research-oriented and are able to spend long overall working hours on research activities.

In spite of a "lack of widely acknowledged quality standards for research practice" (14, p. 595), there is a general agreement that delivering excellent and impactful research is key for enhancing innovation and, consequently, promoting economic competitiveness.

In what comes to the **third challenge** – talent attraction for raising research excellence – our study elucidated that Deusto's key response to attract early-career talented researchers to the institution was the DIRS-COFUND project, funded under Horizon 2020 Marie Sklodowska-Curie COFUND Programme. The COFUND project allowed University of Deusto to recruit a sound body of highly talented international doctoral researchers since its first call in 2016 (eight researchers were hired in 2016, eight more in the second call in 2017 and nineteen new doctoral researchers are to be hired by the institution under the two calls to be launched in the new related project – 6i DIRS – in the upcoming years).

The process of elaboration of the H2020 MSC DIRS-COFUND project was a long and demanding collaborative effort led by the Vice-Rector for Research and Transfer, leader of the Deusto Research Strategy at the time, with the help of the director of the Deusto International Research School (DIRS) and the director of the International Research Projects Office (IRPO). The process crystallised the barriers and the inherent tensions within the institution (e.g. disciplinary vs. interdisciplinary, international standards for selection and recruitment vs. internal modes and national criteria, interdepartmental coordination, etc.). The leading inter-departmental team learnt-by-doing building trust, conciliating interests and integrating requirements, processes and mechanisms that had not been put in interaction until then (e.g. Marie-Sklodowska Curie programme, the expectations of PhD tutors, national law, etc.):

That was a big bomb because, like in many universities, people here were used to the "I have a master student who want to take the PhD" and suddenly we had (COFUND) themes that took us to further reflections that needed to go beyond disciplines and needed to be international...and many people were not prepared for it.

As an interviewee explains: "we needed to create something in-between for this thing to happen", so "we opened an internal competition for the topics, and in these topics four "i's" started to come up" and, consequently, Deusto needed to re-think many of its processes:

So this took us to reflect that an inter-disciplinary thesis needs co-supervision, and there were also social agents as co-supervisors, and those could also be international, especially because the topic was linked to a European project...

This implied labour of sensitisation and capacity building for increasing the awareness of senior researchers about the requirements to attract such kind of talent. In the end, pieces were put together and the DIRS-COFUND project got the highest evaluation from the European Commission's selection board and, besides the interdisciplinary research platforms, it became a key mechanism through which the different "i's" of the 6i Model intertwine.

Finally, in regards to the fourth challenge addressed (the existing gap between academia and society and the quest for real societal impact of research results, beyond scientific impact), our analysis revealed the current misalignment between the discourse put forward by the so-called "impact agenda" and the objective requirements proposed by evaluation agencies at different levels. Interviews point out to the challenge of having, on one hand, to hold intersectoral, interdisciplinary research to meet social demands whereas, on the other hand, evaluation boards still apply indicators which put more value on individual disciplinary work:

...although political discourse is directed to collaboration and social impact, reality shows that people are always ahead and that there is reality on one side and then there is what can be written...so, for example, a call might be well thought but, if only members from groups accredited by the Basque Government can participate, others, who are participating in the project, but who are not members of such groups have to leave...and this weakens the work.

As Miettinen et al. [15] explains: "Indicators for this have been developed and methods of qualitative evaluation have been introduced, especially in the form of policy-oriented impact case studies. In this connection, serious doubts have been raised about the possibility to successfully account for social impact of science by extensive systems of indicators and related case information".

Still, our case shows how Deusto has officially acknowledged its compromise with society, the values and principles driving its internal policies that have been creating initiatives to enhance and valorise the production of impactful research.

Conclusions

In an age of fluidity and uncertainty, with STI systems in transitions and a growing pressure placed on universities to deliver to society, it has become important, more than ever, for Higher Education institutions to adopt a long-term view and a strategic vision that holistically can tackle highly intertwined challenges.

A systems thinking approach helped us to unveil the multidirectional character of the dynamics which take place inside a research system. In the four challenges discussed, a combination of top-down, bottom-up and middle-round forces was necessary in order to make things happen. As one interviewee describe well: "What comes from bottom-up also has to be backed up by top-down; and what comes top-down needs to be legitimated by the bottom-up. There needs to be a clear integration...it is such a new concept, so potent, even disruptive, that it wouldn't stand for long if there was not a fit between the institution, the people and the resources".

Findings also evidenced the international research agenda acting as a driving force within the system analysed. They also evidence the role of international projects and of research support structures as elements which connect all parties involved (Figure 3). Flexibility, conciliation of interests and neutral coordination demonstrated to promote the sustainability of interdisciplinary collaborations, while lack

of time to dedicate to research was found to be the greatest barrier to it. Measures based on scientific impact were found to hinder interdisciplinarity and intersectorality in the case analysed and the struggle of small universities to attract talent was identified.

In the meanwhile, other sources defend that "the absence of an obvious simple score by which social impact might be judged should not discourage the concept. Instead, it should stimulate imaginative consideration among scientists and the public about the relationship between academia, science, journals, and society" [16]

Summing up, the analysis showed the way that the different i's of the 6i model are closely tangled and evidenced the variables and mechanisms that work as points of contact between them. As so, we also see that barriers to and interventions in one "I" have unavoidable effects on the others. Such echoing effect has the potential to either exponentialise benefits or to aggravate problems and may not apply only to the analysed case. Therefore, it should be considered both in the elaboration of research policies and in decision-making processes within a given research system.

The 6i model comprises promising elements that can be harnessed for universities to successfully manage their current and emerging contexts of operations. Despite its initial and limited application as a research strategy framework at a specific university, further implementations and assessments of the model in other institutions (ex. research intensive universities, research centres), settings (ex. regional systems) and beyond de R&I systems for which the 6i model was originally conceptualised, will contribute to further explore the potential of the 6i model as a comprehensive strategic design with which universities can steer their priorities, activities and role within local, regional and global ecosystems.

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The Features of State Regulation of Agricultural and Rural Development of Territories in Hungary

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Abstract. The purpose of this paper is to highlight the effects of the rural development, particularly the main role of the subsidy system. The determining part of the agricultural and rural development is the relevant effective subsidy systems. The study is focusing on the New Hungarian Rural Development Programme operating specialities and influence, which are my PhD study main components. Political goals and directions can be manifold; they are determined by the leaders' vision, way of thinking, ideology, and view of spatial structures. At the same time, the development, i.e. the series of actual interventions and their technique, stems from the particularities of the area system. [1]; [2] After 1990, a change of the model took place in central and eastern European countries, the centralized, state-centred national administration had to be replaced with a democratic public administration. The relationship between central and local bodies had to be placed on new foundations, the same had to be done with the fulfilment of the tasks of the State and those of local governments. The countries of the region are characterized by continuous pathfinding [3]. At the time of EU accession in 2004 and even before that, Hungary was entitled to pre-accession funds such as ISPA, SHAPARD, PHARE [4]; [5]; [60]. The purpose of my paper is to shed light on the regional effects of rural development in regional politics, and among them, the decisive role played by the aid system. A key element of the possibilities of agricultural and rural development is the effective operation of relevant aid systems. The study focuses on the operational features of the New Hungary Rural Development Programme and their effects, which comprises an important part of my PhD thesis in the process of being completed.

Key words: agricultural support, rural development, economic development.

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Introduction

The EAGGF was the only fund to finance the Common Agricultural Policy. In 2006, it was split into two parts, the EAGF, that is the European Agricultural Guarantee Fund, and the EAFRD, that is the European Agricultural Fund for Rural Development [7]; [8]; [9]. Many developed countries struggle with major problems due to their ageing society and decreasing population [10], with Hungary as a whole among them, but particularly the eastern regions. These two pillars account for more than one third of the European Union's budget [11]; [12].

The development of rural areas may be greatly influenced by their access to available funds, their capabilities and skills for application, [13]; [14] as well as the establishment of the related tendering system and the specificity of its operation, of which I will make a brief overview in the following.

Evaluation of tendering systems, impact assessments

The term 'impact assessment' means the analysis of some kind of 'intervention', 'measure' or 'programme'. This analysis, all things considered, can be descriptive in general terms, presenting the participants, the implementation and the execution of the programme. The term 'impact assessment' is used in a narrower sense as the method of identifying and measuring the effects generated by the programmes, therefore its fundamental aim is to prove causal links.

In the course of different evaluations, the term 'programme' is generally used to refer to a set of interventions (action plans, measures, actions etc.) which gives rise to some kind of change in the participants, i.e. it has some kind of impact. Impact assessment is used to measure exactly these changes. The measurement of impacts means the quantification of the change that has taken place, therefore it is typical to use statistical and econometric methods in the examination. One of the most important function of econometric models is the prediction of economic variables. Time series forecast usually endeavours to estimate and forecast a variable's value on the basis of its own value in the past. Econometric forecast sets up a regression model based on the relationship between one or more result variables and some explanatory variables. It can be established that the most interesting element of time series analysis is the forecast. It has two forms, one being the 'ex post' (retrospective estimation), where estimations are made for the observation period, where the actual time series observations exist. The other is the 'ex ante' (prospective estimation), where estimations are made for a period outside of the observation period. [15] Thus, we can distinguish between posterior (ex post) and anterior (ex ante) impact assessments.

The basic principle of forecast is that, knowing the nature of the examined phenomenon, one aims to find a rule driving the phenomenon, and such rule is assumed to be unchanged outside the observation period, as well [16]. When preparing the forecasts, we should always bear in mind that it is not (only) formal regularities (e.g. shape of trend line) that we want to foresee, but the actual regularities behind them.

Impact assessments usually focus on the question whether a measure or a public policy programme does indeed bring about the impacts intended by the decision-maker. It is important to make it clear in the beginning that in the case of certain participants the impact can never be identified. The hope is that the average impact can be measured, however, in an ideal situation, this can be measured

very accurately. The validity and reliability of impact assessment results depends on the characteristics of the programme (method of selecting participants), the quantity and quality of available data (including data collection in the framework of the programme), and the chosen method of analysis, as well. All of these aspects will be discussed in this chapter in the appropriate place. The fundamental difficulty faced is that the distribution of Community or member state funds among market operators usually takes place in tendering systems. The essence of tendering systems is that they rank in some way the development plans submitted or those to be further elaborated.

The reason for ranking is that the development funds are limited and they are available within a time limit (bound to a programming period, or even further limited), so that it is not possible to finance every development idea, and it would not even be reasonable to do so from the social aspect, since unlimited support would result in considerable price increase in the input markets.

The need for ranking is also justified by the following:

1. Projects can only be compared on the basis of an elaborate scoring system.

2. Basic principles to be used in tendering systems can only be ensured in this way.

3. Processing capacity – review of applications for support – is limited, within any free text system the demand for certain human resources significantly increases, leading to significant costs. Therefore, only scoring systems with strict volume and content restrictions, comparing project ideas on the basis of adequate criteria can be operational.

In the light of the foregoing, it can be concluded that such scoring systems can serve adequately the interests of the community concerned that support development ideas bringing the most benefit as opposed to projects bringing less benefit.

Social benefit

In this case, benefit means social benefit, and not the benefit achieved by a market operator. Measuring the benefit faces numerous obstacles, and although on macro level, instead of GDP, i.e. added value, there are indicators taking into account other social benefits as well, at micro level – in the judgement of specific projects – this task has many difficulties [17].

The evaluation of each project must be made in such manner that the scoring systems will support projects offering the chance of the greatest social benefit, i.e. the goal is to find the best solutions – in other words, best practice.

In this regard, it is essential to differentiate between social and private benefit. In case of the support of market operators, in the absence of realizable private profit, social benefit cannot be realized either, as certain market operators will not decide altruistically to implement a development plan that is economically not sustainable. Social benefit, however, serves as evidence for the justification of the whole programme from the aspect of taxpayers. Ideas without social benefit, or only with social costs cannot be supported in the long term.

The examination of social benefit can also face problems, for example, how to evaluate each benefit, whether an investment to create jobs that also causes environmental damage can be supported, or, the other way round, whether support can be given to a precision development idea that would result in a decrease in the number of employees, but would also decrease the amount of chemicals discharged.

Material and methods

Since the beginning of my research I have studied both the Hungarian and the foreign scientific literature, of which I will present only a minor part in this paper.

During my supplementary research I have collected all information available to me in connection with the international practice of the writing of agricultural tender applications.

During my domestic and foreign study trips, I have always put great emphasis on the opinion of agricultural and rural development enterprises on tendering systems. During my activity of writing tender applications, I have met hundreds of enterprises, and the almost five hundred tender applications I have written and my special professional experience of almost 15 years provide a good basis for the soundness of my conclusions.

Results

Following a short introduction, I continue with the presentation of my findings, in which I organize and summarize my practical experiences and my knowledge gathered on the basis of the processed literature.

Risks of inappropriate evaluation

If the system supports the previously mentioned goal – i.e. not the best solutions -, the following risks are to be reckoned with:

• the supported development idea will not be implemented – for example, due to the absence of own financial contribution – thus it will tie up the available funds for a significant time, which means that the social benefit, the increase of added value will not ensue, or will ensue later;

• community financing of projects not fulfilling the basic principles will become impossible, instead, they will have to be financed from member state tax revenues;

• although the implemented project involves an increase of added value at the market operator's level, at local or regional level the implementation of the project will cause a setback, for example a decrease in workforce used;

• the project supported will not represent a step forwards either at the level of the enterprise or at local level, it will only contribute to the preservation of an existing, outdated business model, instead of being sufficiently innovative;

• the tendering systems will only support projects that are not adequately elaborated, it will only be revealed once the support is granted that the costs are much higher, or that the given project does not really fit into the long term approach of the market operator;

• the preparation and review of the applications will entail significant costs and time commitment for both the market operators and public actors. In case of projects supported but not implemented, the market operators lose the money spent on preparation, drawing funds away from normal daily operation. Public actors, on the other hand, lose the time spent on such applications, i.e. the time demand of the review and project management of the rest of the applications increases significantly, resulting in further expenditure at the market operator's level as well, e.g. in the market of input materials.

Interpretation of scoring criteria

For the sake of clarity, in the following I will make an overview of the scoring systems of the NHRDP and the RDP, and group the scoring criteria. Upon examination of the scoring related to horticultural investments, it can be stated that there was no significant difference between the two programming periods. The criteria were the following:

1. Professional criteria – the elements of examination classified here are the ones expected by the profession from its own members, i.e. it considers that those market operators can serve as a model within the profession who fulfil these criteria. In the framework of the NHRDP, membership in

producers' organizations and the participation in agri-environment management belong to this group. While the former aims to offset professional representative bodies and little bargaining power in the agricultural market, the latter can be expressed by the fact that only operators meeting higher requirements of environmental protection can take part in it. This latter criterion in the RDP was complemented with participation in a quality scheme, which does not mean the existence of a quality assurance system, but the participation in recognized Hungarian quality schemes.

2. Energy-related and environmental criteria – this group comprises energy-related criteria already appearing in the NHRDP, getting even more important in the RDP. These are related to projects, and characterize implemented projects. Community taxpayers expect that wasteful development plans that rank environmental considerations lower should not be financed from Community resources. Whereas in the NHRDP only the use of renewable energy was awarded with points, in the RDP this criterion was further refined, i.e. besides the use of renewable energy, saving water or wastewater, decreasing air pollution or decreasing the volume of waste produced have also appeared as scoring criteria. In addition, in the RDP the decreasing of specific energy consumption was also awarded with three points, depending on the percentage of energy savings. No other criteria related to projects were examined either in the RDP or in the NHRDP.

3. Client criteria – this includes the criteria characterizing clients. They are usually given parameters on the part of the applicants, which cannot be changed before the submission of the application. Evaluation according to place of implementation belongs to this group, which would be essentially that development ideas implemented in economically backward settlements should have advantage. The other criterion in this category was significantly different in the two programming periods: while disadvantaged workers or clients were rewarded in the first one, in the second programme SME status was scored with significantly high weight.

4. Creating and retaining jobs – while in the NHRDP it was possible for the client – although losing some points thereby – to decrease the number of its employees, in the RDP it was compulsory to retain it, therefore this latter criterion was not rewarded in the period ending in 2020.

The above criteria are fundamentally and sufficiently objective and transparent, nevertheless it is clear that within the total score they only have nearly half of the weight of all evaluation criteria. In the case of both the NHRDP and the RDP, the business and financial plan were evaluated with significant weight, but it was not always possible to know the related evaluation criteria in advance, and they were not specified in a sufficiently objective manner.

5. Business and financial plan criteria

As the above table shows, business plan and financial plan feature among evaluation criteria with significant weight in both programming periods. In both periods, these two parts, the business plan part and the financial plan part 'lived separate lives', i.e. the examination, scoring of one of them did not influence the scoring of the other. To turn this thought inside out: submitting the financial plan of a horticultural enterprise, but presenting an animal breeding facility in the narrative part could also yield the maximum number of points.

As a result, the question arises whether the business and financial plans submitted were real, or they were just simplified financial tables side by side with a textual description.

Table 1. Scoring used for tender applications for Horticultural development in the RDP and the NHRDP

Criterion	NHRDP (2007-2013)		RDP (2014-2020)	
	Beneficiary	Max. score	Beneficiary	Max. score
I. Professional:	Member of producers' group or producers' organization	10 points	Member of producers' group or producers' organization	4 points
	Participation in AEM programme	4 points	Organic farming	3 points
			Participation in quality scheme	4 points
II. Energy-related and environmental criteria:	Renewable energy resources	10 points	Renewable energy resources	3 points
			Implementation of environmental aspects	3 points
			Improving energy efficiency	3 points
III. Client:	Female, Roma origin, reduced working capacity	6 points	Small or medium enterprise	15 points
	Place of implementation	2 points	Place of implementation	5 points
IV. Creation of jobs:	Retention	6 points	Creation	6 points
	Creation	12 points		
V. Financial plan:		20 points		-
VI. Business plan:		30 points		55 points
VII. Total:		100 points		100 points
	Communication plan	(+) 5 points		-
	Social responsibility of enterprise	(+) 5 points		-
VIII. Max.		110 points		100 points
Source: own compilation, 2019.				

Both in the practice of the NHRDP and the RDP, the textual parts included the following:

1. Merits part – description of the applicant and its activity, its customers and suppliers in detail, simplified SWOT analysis.

2. Sustainability part – presentation of investment, goals, composition of resources, effects, risks.

3. Innovation part – presentation of product and technological innovation.

4. Cost efficiency part – presentation of the cost-efficient nature of the investment.

The applicants made a financial plan separately from the textual part, but there was no scoring criterion or regulation to examine the connection between the two parts.

As an example, during the review of financial plans the yields, the material or personnel costs were not examined, i.e. if the client stated that it would increase its greenhouse tomato production tenfold, it was not cross-checked whether this increase had any trace in the personnel and material costs, and in the profits. Likewise, the balance sheet parts were not checked to see whether the investment, the support granted, the intended capital increase or fund raising appeared in the appropriate lines of the financial plan.

Instead of the above, the scoring of the financial plan considered only such criteria as whether the turnover would increase, whether the profit before tax was always positive, and whether the planned investment support would exceed the turnover of the previous closed financial year multiplied by ten.

The review of the financial plan was not always carried out in this manner. At the start of the NHRDP, there were attempts to evaluate the financial plans in a way different from the above, in a more sophisticated manner, I will discuss these in the part on good practices.

Other important, but not evaluated criteria

Both in the case of NHRDP and RDP the following criteria were not, or not sufficiently evaluated.

Among them, what I regard as the most important criterion is the ***examination of the degree of preparation***. For example, it was not evaluated in either programming period whether the client had obtained a final building permit, or, in addition, whether it had implementation plans or in the case of larger investments, an environmental permit. In both programmes it was sufficient that the clients proved that they had applied for the permit, therefore many clients made use of the possibility to halt the costly process of the permission until they got the decision on support. This involved that it was not the well-conceived projects with permits obtained that were granted support, thus the funds were tied up by projects that, for example, could not be implemented on the target site.

Neither programming period evaluated the ***existence of the sources of funding***. This means that support was granted in many cases to projects where, besides the permits, the required own financial contribution was not available when the application was submitted, nor when the support was granted. In these cases many applicants took the view that they would arrange for the required funds once the application for support was accepted, or they trusted the assumption that by significantly overpricing the development, thereby substantially increasing – although it was against the rule – the ratio of the support, they would be able to finance the investment themselves For this reasons, many market operators planned investments of such magnitude that was, in the current situation of the enterprise, unjustified and excessive.

In the case of applications submitted within the framework of NHRDP and RDP, ***previous experience in the field of project management*** was not or not sufficiently evaluated. Enterprises that have already implemented an investment have more experience to avoid the pitfalls of a project. Although this criteria system can be subject to the criticism that support will be granted again to those who received support earlier and accounted for it, but if the governmental objective is to draw down Community funds as early as possible, this should have been taken into consideration as well.

In addition to the previous aspect, other criteria not evaluated were those related to ***external experts*** involved to assist the internal project management: what qualifications they have in project preparation, planning and implementation, and what experience they have in project management. I regard as a major flaw of the previous years that the criteria related to enterprises writing tender applications were not defined. As a result, this cannot be currently evaluated in an objective way, but it is certainly true that the involvement of a tender advisory enterprise with experience in finance, public procurement, planning, and budgeting in a project will speed up both the preparation and the execution, and will facilitate the success of implementation.

In relation to applications, the question of ***how long the enterprises have been operating*** was not evaluated either. A long period of operation always means greater commitment on the part of the owners. These owners consider their development ideas more thoroughly, and will not embark upon a development that would threaten the long-term viability of the enterprise.

In addition to the above, we could determine numerous ***other criteria***, such as the system of relationships of the management and owners of the enterprise, role played in other organizations (farmers' associations, producers' groups, representative bodies, chambers etc.), history of bank financing and so on, which criteria certainly have positive effect on the

implementation of an investment, however, these criteria are difficult to quantify, therefore it is uncertain that their inclusion in scoring would be justified.

The most common mistakes made in scoring systems

Both the Rural Development Programme, both the preceding NHRDP programme contained a number of mistakes in their scoring methods, which adversely affected certain applicants, I will look at some of these – a non-exhaustive list – in order to call attention to the problems of scoring.

Inappropriate examination of effect exerted on enterprise

As it can be seen in the previous table, 3-3 points could be awarded for using renewable energy and improving energy efficiency in RDP. The condition for the first one was that the plan should include the use of renewable energy, but its effect on the size of the enterprise was not examined. For example, if the client applied for a solar system of minimal size with a power of 1-2 kW, it could get the same score for it as it would if its whole electricity demand was supplied by a photovoltaic system. In the same manner, in the case of energy saving, it was enough to save 10% of energy, but its base was not defined, whether this should be interpreted to apply to each building, each business site or each applicant. If, for example, the client planned energy modernization of a porter's building of 10 square metres, it could achieve the same score as with the insulation of a poultry house of 2000 square metres.

Inappropriate weighting between certain criteria

In the framework of RDP, the size of the enterprise was awarded with 5/15 points if the number of employees was below 50, i.e. the enterprise was not a medium enterprise. This weight of 15% practically predetermined the range of winners under the items 'Modernization of bovine holdings' and 'Building, modernization of small sized facilities for storing, drying and cleaning of crops'. Those having more than 50 employees in the first case, or more than 10 employees in the latter, started out with little chance, as with -10 or -15 points they would certainly fall below the line drawn during evaluation.

Inappropriate parameterization

In the RDP, a total of 6 points could be given for the creation of jobs, as follows:

More than 50 million forints / new job	0
10 – 50 million forints / new job	3
Less than 10 million forints / new job	6

In the case of an animal breeding facility demanding the maximum amount of support (500 million Forints) the enterprise should have undertaken to employ 51 people for 6 points. Today, a poultry or swine breeding facility can be sustained with 4-5 permanent employees, therefore this was an unrealistic requirement on the authorities' part. At least 11 employees should have been undertaken even for 3 points.

As a result, many applicants simply 'let go' of this 6 points, i.e. they did not undertake to have a certain number of employees, despite the fact that the employment of 3-4 persons would have been feasible for them.

Pointless scoring criterion

It was already included in the programme of the RDP – erroneously, I note –, that extra points are given for the client's participation in a quality scheme (4 points). However, at the start of the RDP in 2016 and at the time of the avalanche of applications in 2017, there were no accepted and operating quality schemes in Hungary, it was only at the end of 2018 that the MA issued a decree on their establishment. Accordingly, nobody could get points for this criterion.

Scoring affecting certain applicants adversely

In the NHRDP the scoring system favoured the employment of Roma people – but not for all clients. If the client was a legal entity, it was sufficient to undertake to employ Roma people, however, in the case of natural persons (private entrepreneurs, primary producers) this criteria earned points only if the client himself/herself was of Roma origin – independent of how many Roma persons he/she employed, or planned to employ after the development.

Useless criteria

I have already pointed out in connection with the scoring of the business and financial plans that the fact that the client lists three risks and three methods of risk management, or whether the turnover in the financial plan increases continuously, are not adequate criteria for granting a support amounting to 500 million forints. When tying up an amount of support of such size, more elaborate evaluation criteria should be used, even those also used by banks, in order to prevent a situation where, due to the lack of bank financing, the granted support would be tied up for an unnecessarily long period.

Good or better solutions in the evaluation systems

In the foregoing I have expressed quite a lot of criticism of the scoring system of both the RDP and the NHRDP, however, I must point to one advantage they have compared to the ARDOP programme, being that they were able to evaluate a large number of applications for support with comparatively small time commitment. It is true that these time savings were lost due to other administrative demands in the case of RDP, nevertheless, if these bureaucratic obstacles were removed, the above scoring methods would make quick evaluation possible.

Pest County applications

There are, of course, many scoring systems which accompany the rest of the operative programmes. Based on my professional experience so far, I regard the scoring system of Pest County Application as one of the clearest evaluation systems.

Among evaluation criteria, the scoring of corporate past clearly appears here, awarding significantly less points to project companies – i.e. those founded only to draw down funds. Financial indicators like performance, investment proportional to turnover (either too high or too low is not good), growth potential and investment proportional to return on assets are presented in a clear and well-defined way to the applicants, thus the applicants can estimate the achievable scores in advance.

Degree of preparation also receives points, so those who elaborate their applications thoroughly and obtain all proposals can achieve the maximum score, as opposed to the practice in the RDP that the applicants only needed to present the proposals when they put the application in order, therefore those who prepared their applications for support in a hasty way, less thoroughly, could start out with equal chance.

In addition to the above criteria, the principle of programming also appears in this scoring system – under the heading 'complexity'. Thus, if the client verified that the development is linked to another development started earlier, the client could receive additional points.

Evaluation system of financial plans at the start of NHRDP

In 2007, an evaluation system of financial plans was elaborated by Szent István University and the Agricultural Economy Research Institution, which took distinctive features of the applicants and the support titles into consideration.

The reason for the elaboration of the system was that the assessment of financial evaluation systems used in the previous ARDOP programme was time- and energy-consuming, and at the same time it was not adequately objective and professional.

The scoring system was comprised of five groups of criteria. The first was the coherence examination for the years of investment, for which a total of 4 points could be given as follows:

1. The increase of the value of fixed assets minus the value of that year's amortisation equals to +5, -10 percent of the investment amount: 1 point

2. The increase of the value of equity equals to the sum of non-repayable grants and the given year's profit/loss according to the balance sheet. If the difference is +/-10%: 1 point.

3. The increase of the value of depreciation expense equals to the amortisation calculated for assets acquired (or to be acquired) +/-20%: 2 points, if it is +/-40%: 1 point, otherwise: 0 points.

The second criterion was the coherence examination for the years of operation, as follows:

4. The equity has to increase by the given year's profit/loss according to the balance sheet, as well. If the difference is between +/-5%: 2 points, otherwise: 0 points.

The aim of both coherence examinations was to find out whether the rules of financial planning were adopted at the preparation of the financial plan, i.e. the financial plan was made according to well-founded rules or used numbers entered on an ad hoc basis.

The third group of criteria was the evaluation of base data. During this the following base values of the previously classified holding were compared with the standardized values of the sample holdings in the farm accountancy data network of the AERI:

1. Production value per 1 ESU without agricultural services (thousand forints/ESU),

2. Profit/loss before tax per 1 ESU (thousand forints/ESU)

3. Production value proportional profitability adjusted with agricultural services (%).

If the applicant's indicator fell between the average of the lower and the upper quarter, 1 point, if it fell between the lower and the upper quarter +30%, 2 points, i.e. a maximum of 6 points were given to the applicant.

The fourth group of criteria was the veracity of the financial plan, where the indicators of the previous group were examined, not for the base period but for the fourth year of operation. If the indicator of the holding is less than the lower quarter, or higher than the upper quarter +30%, the applicant received 0 points. This means that unrealistically low or high numbers in the plan scored zero. However, if an indicator was between the lower and upper quarter +30%, the score could be 1 point for each criteria.

The last criterion of examination was the growth of the holding:

If the utilized agricultural land of the holding increases by the fourth year, 1 point can be given for each 5 percentage points, but a total of 5 points can be awarded.

In this way, the 5 groups of criteria could yield a total of 20 points for the applicant. The advantages of the system were the following:

• The evaluation was fully objective, the scoring could be carried out in an automated way on the basis of the table for holding size and the financial plan.

• Indicators of the holding were not compared with arbitrarily predefined values, but with those of holdings actually existing in Hungary, operating in the same sector and of similar size.

• The system contained a "saddle point". This involved that neither an underestimated, nor a too optimistic, unrealistically high turnover or profit planned by applicants would lead to a maximum score.

• The system examined standardized values, therefore the differences between the applicants arising out of holding sizes could be filtered out.

Like all scoring systems, this one has problematic elements, too:

• The reference values – although the AERI made them public in their data disclosures – were not known to many, so the applicants did not know in advance the score they could achieve. (However, if they had known, the veracity examination would not have made sense.)

• The system demanded sophisticated preliminary programming, but afterwards it could be used for quick scoring.

• Both private entrepreneurs and primary producers had to make plans using the double-entry method to ensure comparability, which was a further challenge for many clients.

Conclusions, suggestions

The studying of tendering systems of different types and related to different sectors have a long history [18], which was greatly influenced by the quantitative and qualitative questions of economic, natural and human resources, and by the constant changes of related political wills, however, the examination of this issue will continue to be on the agenda due to its complex effect on social and economic processes.

Most of the studies on this subject so far aimed to reveal the sets of problems affecting the majority of tendering systems. In many cases, the subject of the studies was the vulnerable social structure, adverse social and demographic processes, ageing population, migration, unemployment, and efficiency improvement of certain sectors. Besides causal links, comprehensive processes based on historical specificities have also been unveiled. The overall picture in the end is that there is a great need for more efficient operation of the domestic agricultural aid system, and there are vast reserves from the point of view of the improvement of efficiency.

My study was basically motivated by the fact that I wanted to examine the operation of the Hungarian agricultural tendering systems, since, after the thorough analysis of this issue, I intend to contribute to the further development and setting up of the system with several modifying proposals in order to facilitate its operation in a way that, in my view, is more efficient.

One of the main features of project cycle management is that we incorporate the experiences gathered during earlier projects into the new project. This can essentially work not only on project level, but on programming level as well, i.e. the scoring experiences gained during the execution of the NHRDP could have been used in the RDP as well, although there was limited intention to do so, and there was not an adequate amount of resources available to process the large amount of data generated, in order to draw conclusions.

The fundamental task would be to operate a dynamic evaluation system, [19]; [20]; [21] one that would record the specificities of former evaluations and executions in a database, analyse these data, and fine-tune the scoring systems accordingly. This is what I call a dynamic evaluation system.

The features of a dynamic evaluation system are the following:

• it takes the results of the previous programming period, or mid-term review as its starting point;

• collects the outcome indicators of successful projects, e.g. on the basis of number of employees, qualifications, experience, past, innovation, financial data, public visibility;

• in addition to the above data, it summarizes the data of rejected applications, projects supported but not implemented, and projects supported but not working, as well;

• 'fine-tuning' of criteria is done on the basis of the resulting data.

After considering the criteria studied in the previous parts and describing the errors made in connection with certain evaluation criteria, as well as presenting the possible good or better solutions, the requirements for evaluation criteria can be specified as follows:

1. The scoring systems are adequately objective, and these objective criteria can be known in advance, i.e. the market operators are aware of how much chance they have for a successful application.

2. The control of each criterion is ensured, it does not demand significant time or expenditures on the part of any participants.

3. Each criterion is evaluated according to its weight.

4. The scoring does not contain logical flaws, mistakes in adding up and quantification.

5. Criteria that cannot be fulfilled by all applicants or any applicants are not imposed.

6. Criteria are determined in such way that the scores achieved by projects evaluated will vary significantly, so that it is possible to draw a clear dividing line between projects supported and those rejected.

7. Scoring criteria and the related procedures are indisputable and objective, and do not give grounds for contest.

8. There should be a theoretical possibility for every market operator to fulfil or undertake to fulfil the scoring criteria, the criteria should not impose unrealistic requirements.

9. The criteria should take the specificities of the target group into consideration.

10. Scoring should mean selection, i.e. scoring systems where all the applications are rejected or supported make no sense and have no significance.

11. A realistic sanction system should be attached to it.

12. The scoring systems should be dynamic, i.e. the experiences of the previous tender periods should be incorporated into the following periods, or programming periods, we should not make the same mistake repeatedly.

The results of the research are of scientific value in the aspect of studying tender systems. Application of the requirements to the evaluation criteria, which we have formulated, will help solve many of the problems that currently hinder and slow down decision-making. In our opinion, this would lead to a noticeable improvement of the studied tender system's operation. As far as we know, such a large-scale study has not yet been conducted in Hungary. Moreover, taking into account the proposals made, it would be possible to significantly improve the efficiency of expenditures on rural development.

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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 monitoring of public opinion concerning the state of the Russian society conducted by VolRC RAS in the Vologda Oblast[1].

The following tables show the dynamics of a number of parameters of social well-being and socio-political moods of the region's population based on the results of the last "wave" of monitoring (December 2019 – February 2020), as well as for the period from February 2019 to February 2020.

We compare the results of the surveys with the data for 2007 (the last year of V. Putin's second presidential term, when the assessment of the President's work was the highest), 2011 (the last year of Dmitry Medvedev's presidency) and 2012 (the first year of V. Putin's third presidential term).

We also provide yearly dynamics of the data for 2017–2019.

In December 2019 – February, the level of approval of the work of the President of the Russian Federation did not change significantly: the share of positive assessments is 54%, the share of negative assessments is 31%.

In general, the level of approval of the work of the President in the beginning of 2020 is slightly lower than assessments in February 2019 (59%) and average assessments in 2019 (56%).

For reference:

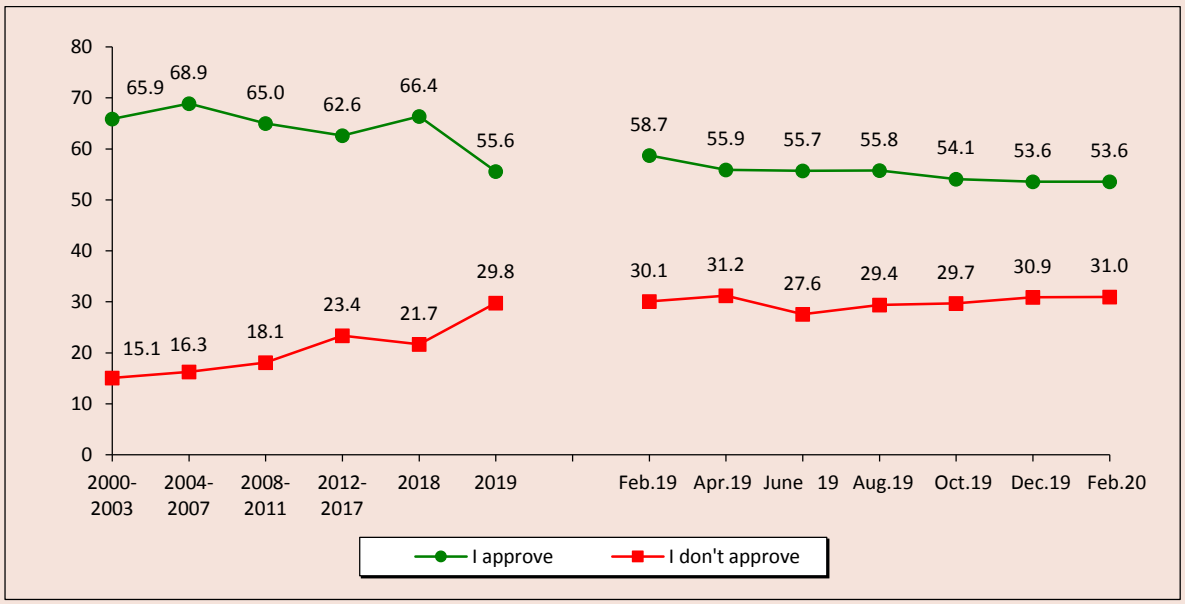
According to VCIOM, the level of approval of the work of the President of the Russian Federation in December 2019 – first half of February 2020 increased by 3% (from 63 to 66%), the share of negative judgments decreased from 28 to 25%.

According to Levada-Center, in December 2019 – January 2020, the share of positive assessments of the work of the head of state was 68%, and the proportion of negative evaluations was 31%.

[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 1,500 people 18 years of age 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 information on the results of VolRC RAS polls is available at: http:// www.vscc.ac.ru/.

In general, do you approve or disapprove of the work of the President of Russia? (% of respondents)



How do you assess the current performance of..? (% of respondents)

Answer	2007	2011	2012	2017	2018	2019	Feb. 2019	Apr. 2019	June 2019	Aug. 2019	Oct. 2019	Dec. 2019	Feb. 2020	Dynamics (+/-) Feb. 20 to…	
														Dec. 19	Feb. 19
RF President															
I approve	75.3	58.7	51.7	67.3	66.4	55.6	58.7	55.9	55.7	55.8	54.1	53.6	53.6	0	-5
I don't approve	11.5	25.5	32.6	20.0	21.7	29.8	30.1	31.2	27.6	29.4	29.7	30.9	31.0	0	+1
Former Chairman of the RF Government*															
I approve	-*	59.3	49.6	49.5	48.0	41.1	41.6	38.8	40.9	43.1	41.1	41.1	37.9	-3	-4
I don't approve	-	24.7	33.3	31.1	31.6	38.4	39.3	40.2	38.0	36.3	37.5	38.9	40.9	+2	+2
Governor															
I approve	55.8	45.7	41.9	39.8	38.4	35.7	36.5	34.7	35.4	36.1	35.6	35.6	36.2	+1	0
I don't approve	22.2	30.5	33.3	39.3	37.6	40.2	41.5	41.4	38.6	38.5	40.1	40.8	41.8	+1	0

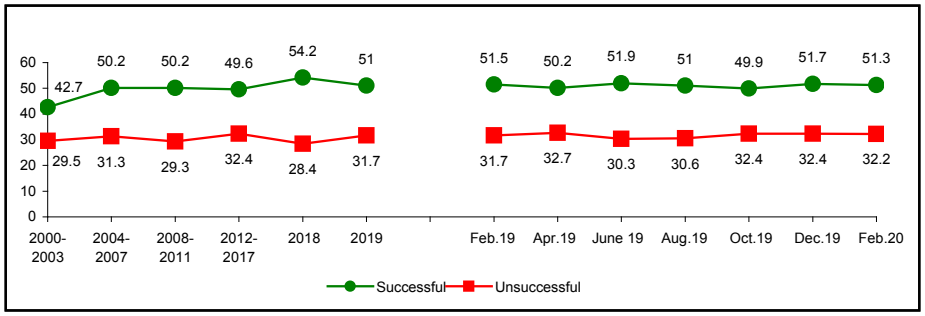
* The question has been asked since 2008. In 2020, the survey was conducted in the period from January 24 to February 12. Current Chairman of the RF Gevernment is M.V. Mishustin has just stepped into his new role (January 16, 2020), therefore, respondents were asked about the activities of former Prime Minister D. A. Medvedev.

Over the past two months, there have been no significant changes in the assessment of the success with which the President solves the country's key problems: 51–52% of residents of the Oblast positively assess the work of the head of state aimed at strengthening Russia's international positions, 44% positively assess his efforts aimed at restoring order in the country, 34–35% positively assess his efforts aimed at protecting democracy and strengthening the freedoms of citizens, 26% positively assess his efforts aimed at boosting the economy and increasing the welfare of the population.

Assessments of residents in February of 2020 correspond to the level of February 2019 and average annual assessments of 2019. At the same time, over the past 12 months (from February 2019 to February 2020) the share of people who are not satisfied with the work of the President aimed at boosting the economy and increasing the welfare of the population slightly increased (by 3%, from 57 to 60%).

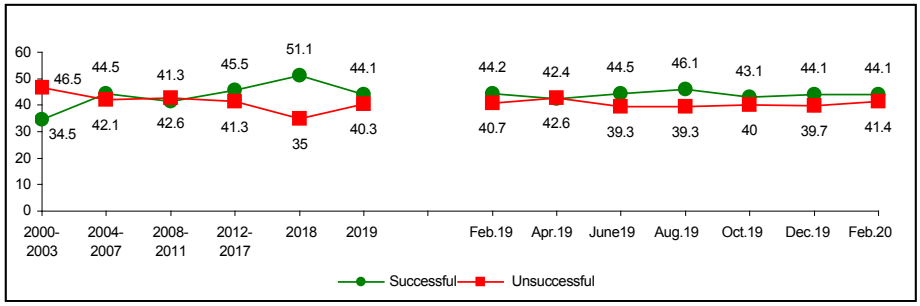
In your opinion, how successful is the RF President in coping with challenging issues?*
(% of respondents)

Strengthening Russia's international standing



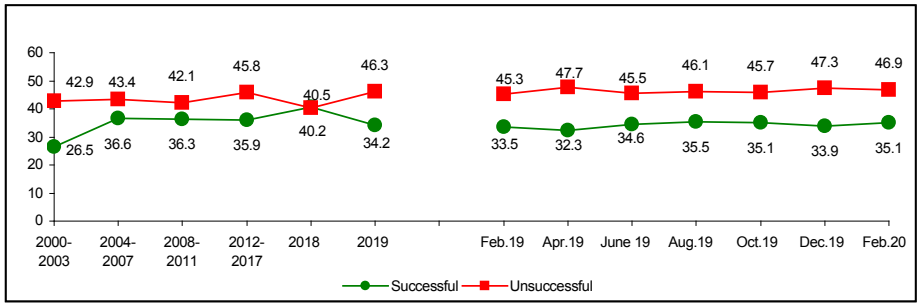
Dynamics (+/-) Feb. 2020 compared to		
Answer	Dec. 19	Feb. 19
Successful	0	0
Unsuccessful	0	+1

Imposing order in the country



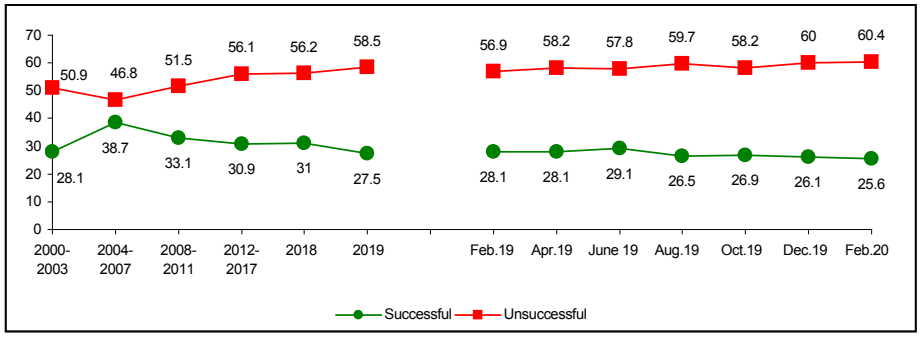
Dynamics (+/-) Feb. 2020 compared to		
Answer	Dec. 19	Feb. 19
Successful	0	0
Unsuccessful	+2	+1

Protecting democracy and strengthening citizens' freedoms



Dynamics (+/-) Feb. 2020 compared to		
Answer	Dec. 19	Feb. 19
Successful	+1	+2
Unsuccessful	0	+2

Economic recovery and increase in citizens' welfare



Dynamics (+/-) Feb. 2020 compared to		
Answer	Dec. 19	Feb. 19
Successful	-1	-3
Unsuccessful	0	+4

In December 2019 – February 2020, the structure of people's political preferences has not changed: the level of support for the United Russia party is 33–34%, LDPR and KPRF – 8–9%, the Just Russia party – 4–5%.

As in February of last year and on average in 2019, the share of people who believe that none of the political forces represented in Parliament expresses their interests is 34%, which is much higher than in 2017–2018 (29%).

Which party expresses your interests? (% of respondents)

Party	2007	2011	Election to the RF State Duma 2011, fact	2012	2016	Election to the RF State Duma 2016, fact	2017	2018	2019	Feb. 2019	Apr. 2019	June 2019	Aug. 2019	Oct. 2019	Dec. 2019	Feb. 2020	Dynamics (+/-) Feb. 20 to…	
																	Dec. 19	Feb. 19
United Russia	30.2	31.1	33.4	29.1	35.4	38.0	34.7	37.9	33.8	34.6	33.3	34.8	33.5	32.8	33.7	33.2	-1	-1
KPRF	7.0	10.3	16.8	10.6	8.3	14.2	7.6	9.2	8.8	9.1	8.0	8.5	8.7	9.1	9.2	8.9	0	0
LDPR	7.5	7.8	15.4	7.8	10.4	21.9	11.0	9.6	9.1	8.9	8.2	9.1	10.5	8.3	9.4	9.9	+1	+1
Just Russia	7.8	5.6	27.2	6.6	4.2	10.8	4.8	2.9	3.4	2.9	2.9	2.5	3.9	4.2	4.0	4.7	+1	+2
Other	1.8	1.9	–	2.1	0.3	–	0.5	0.7	0.3	0.6	0.3	0.3	0.4	0.1	0.1	0.6	+1	0
None	17.8	29.4	–	31.3	29.4	–	29.2	28.5	33.7	34.2	34.7	32.3	32.1	34.3	34.3	34.0	0	0
It's difficult to answer	21.2	13.2	–	11.7	12.0	–	12.2	11.2	11.0	9.7	12.6	12.4	10.9	11.2	9.3	8.7	-1	-1

The estimates of social well-being of the population slightly decreased over the last two months. The share of people who characterize their mood as "usual, good" decreased by 3% (from 70 to 67%), and the share of those who think that "everything is no so bad and we can live; it's difficult to live, but it's possible to stand it" decreased from 78 to 75%.

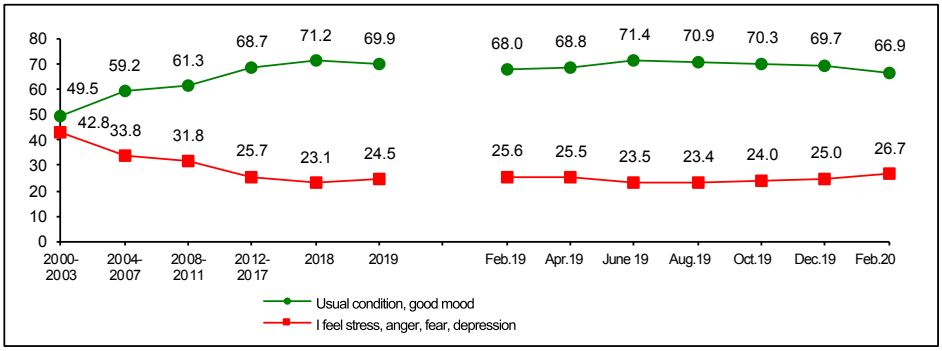
These numbers correspond to values of February 2019, but they are lower than average numbers in 2019.

At the same time, in the short-term (for the last two months) retrospective, there is no significant changes in the estimates: the proportion of residents of the Oblast who subjectively refer to themselves as "middle-class" citizens is 40–41%; the consumer sentiment index (showing people's ideas about the future of the Russian economy and their personal financial situation) is 91 points.

The changes of the estimates of financial well-being in the long-term retrospective are more negative: thus, over the last 12 months (from February 2019 to February 2020), the share of "middle class" people decreased by 4% (from 44 to 40%), and the share of "poor and extremely poor" increased from 45 to 49%.

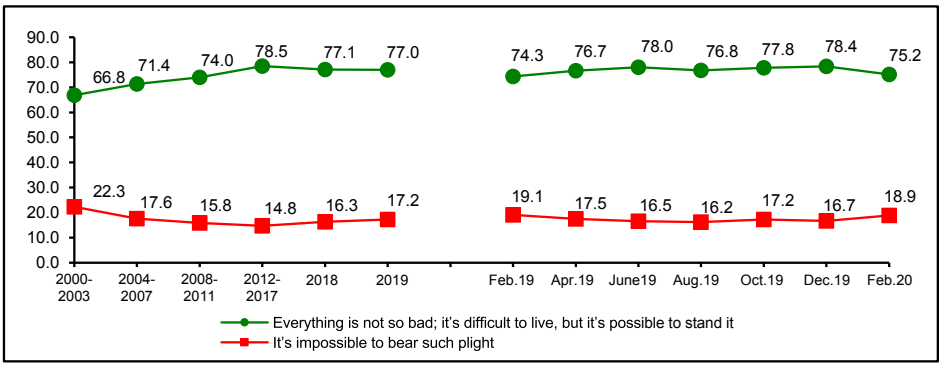
Estimation of social condition (% of respondents)

Social mood



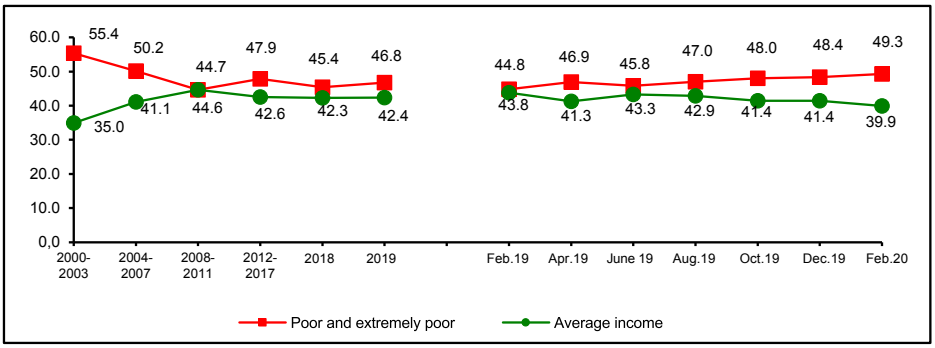
Dynamics (+/-) Feb. 2020 compared to		
Answer	Dec. 19	Feb. 19
Usual condition, good mood	-3	-1
I feel stress, anger, fear, depression	+2	+1

Stock of patience



Dynamics (+/-) Feb. 2020 compared to		
Answer	Dec. 19	Feb. 19
Everything is not so bad; it's difficult to live, but it's possible to stand it	-3	+1
It's impossible to bear such plight	+2	0

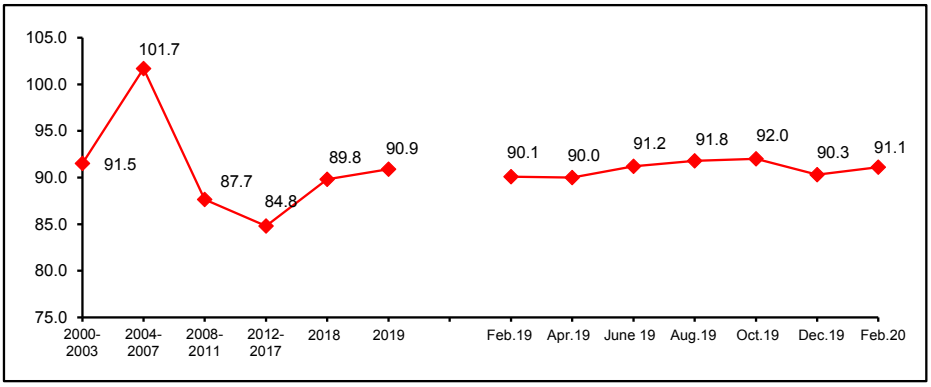
Social self-identification*



Dynamics (+/-) Feb. 2020 compared to		
Answer	Dec. 19	Feb. 19
Share of people who consider their income average	-2	-4
Share of people who consider themselves poor and extremely poor	+1	+5

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

Consumer Sentiment Index (CSI)



Dynamics (+/-) Feb. 2020 compared to		
CSI	Dec. 19	Feb. 19
Value of index in points	+1	+1

In the context of main socio-demographic groups in the beginning of 2020, there are mostly negative changes (in 10 groups out of 14). Against the general background, the decrease of social mood estimates among women (by 10%, from 81 to 71%), among people with higher and incomplete higher education (by 6%, from 75 to 69%), and among people who refer to themselves as members of the 60% of middle-income residents group (by 5%, from 73 to 68%) is particularly noticeable.

In fact, no positive changes of social mood were observed in any of the analyzed socio-demographic groups over the last two months. Moreover, in 10 out of 14 groups, the estimates are lower than average numbers in 2019.

Social mood in different social groups (answer: "Good mood, normal condition", % of respondents)

Population group	2007	2011	2012	2017	2018	2019	Feb. 2019	Apr. 2019	June 2019	Aug. 2019	Oct. 2019	Dec. 2019	Feb. 2020	Dynamics (+/-) Feb. 20 to…	
														Dec. 19	Feb. 19
Sex															
Men	65.9	64.5	69.1	70.6	72.8	70.1	69.9	68.6	72.1	71.8	69.2	69.0	67.0	-2	-3
Women	61.7	62.0	65.8	70.2	69.8	69.6	66.4	69.0	70.8	70.1	71.2	70.3	66.9	-3	+1
Age															
Under 30	71.3	70.0	72.3	78.1	80.0	81.1	76.3	81.2	82.9	85.2	79.9	81.3	71.7	-10	-5
30-55	64.8	62.5	67.9	71.5	72.6	71.2	68.0	71.5	70.5	74.0	71.1	71.9	67.5	-4	-1
Over 55	54.8	58.3	62.1	64.9	65.2	63.3	64.3	59.8	67.4	60.7	65.1	62.6	64.3	+2	0
Education															
Secondary and incomplete secondary	58.4	57.4	57.2	63.6	64.8	63.2	61.5	60.4	64.4	65.6	63.4	64.0	63.1	-1	+2
Secondary vocational	64.6	63.6	66.7	72.0	72.2	72.7	68.6	73.0	77.3	72.8	73.9	70.4	69.0	-1	0
Higher and incomplete higher	68.6	68.3	77.0	75.8	76.8	73.4	73.8	73.3	72.1	73.9	72.6	74.7	68.6	-6	-5
Income groups															
Bottom 20%	51.6	45.3	51.5	52.9	57.3	53.2	50.4	56.1	54.9	53.2	54.1	50.2	48.4	-2	-2
Middle 60%	62.9	65.3	68.7	72.0	71.9	71.4	67.2	69.9	74.1	72.1	72.6	72.6	68.4	-5	+1
Top 20%	74.9	75.3	81.1	83.7	82.9	81.8	86.2	81.0	81.0	81.4	80.5	80.5	79.1	-1	-7
Territories															
Vologda	63.1	67.1	73.6	72.6	71.0	68.6	65.5	68.5	70.3	68.0	70.8	68.6	66.9	-2	+1
Cherepovets	68.1	71.2	76.2	75.7	75.8	71.2	71.1	67.8	72.1	74.4	72.0	69.9	67.3	-3	-4
Districts	61.6	57.1	59.8	66.1	68.7	69.8	67.6	69.6	71.7	70.5	69.0	70.3	66.8	-4	-1
Oblast	63.6	63.1	67.3	70.4	71.2	69.9	68.0	68.8	71.4	70.9	70.3	69.7	66.9	-3	-1

Conclusion

The main political event of recent months was the Address of the Russian President V. Putin to the Federal Assembly. In his speech, the President proposed a number of significant changes to the Constitution of the Russian Federation[2], which will cause changes of the country's political system, and it has already led to the appointment of a new Government.

According to VCIOM studies, 60–90% of Russians support Presidential amendments to the Main law[3]. According to the results of studies conducted by VolRC RAS in the Vologda Oblast, 50% of the Oblast's residents followed V. Putin's address on air, read the full text of the Address, or studied the comments of experts (another 12% plan to do so in the near future). The Address made a positive impression on 46% of respondents; 40–43% of residents believe that V. Putin's proposals will contribute to the improvement of the country's political system and to the increase of the level and quality of life of entire Russian society (for comparison: only 19% of residents of the region expressed the opposite opinion).

According to population's estimates, it is still difficult to describe activities of the new Cabinet of Ministers and the new Prime Minister of the Russian Federation Mikhail Mishustin. He has just begun his new work, and he remains unknown as a political figure to many people: therefore, 32% of respondents (the most common answer) said that "they are not yet familiar with his activities".

However, the opinion of the region's residents on the resignation of the previous Government headed by Dmitry Medvedev was quite evident: more than half of respondents (51%) reacted positively to this event (for comparison: only 13% of residents of the region gave the opposite assessment).

The events that took place in the political life of the country in January 2020 largely determine the nature of public opinion on a variety of issues related not only to the assessment of the activities of federal authorities, but also to the prospects of the development of the Russian economy and own financial situation. In general, we could say that society is in a state of expectation, and this expectation is hardly alarming. On the contrary, people are optimistic about the prospects of the new Cabinet of Ministers to fulfill the targets and promises of the President and to do what the government of D. Medvedev had failed to do for many years.

It caused the corresponding dynamics of public opinion assessments: over the past two months, there have been no significant changes, which is rather a positive result, if we take into account negative trends in the long-term retrospective (over the past year). It is also relevant for assessments of the President's work, people's attitude to how well he copes with the problem of economic recovery and the growth of citizens' welfare, and self-estimation of own financial situation.

At the same time, the absence of significant changes in the dynamics of public opinion can only be described positively in relation to long-term trends. Let us remind that, in his public speeches,

[2] Among them: the constitutional provisions on regular indexation of pensions, and that minimum salaries cannot be below the subsistence level; the priority of the Constitution over international law; the inability to have foreign nationality for people holding positions "critical to ensuring the security and sovereignty of the country"; the approval of the members of the Government of the Russian Federation by the State Duma; the inclusion of the municipal level into a single system of public authorities, etc.

[3] Amendments to the Constitution: Meaning and Relation. VCIOM press-issue, no. 4160, Feb. 3, 2020. Available at: https://wciom.ru/index.php?id=236&uid=10146 (In Russian).

the President sets the task of a breakthrough development and the significant improvement of the level and quality of life, which, first of all, should be appreciable for general population (in particular, he spoke about this in his Addresses to the Federal Assembly in 2018 and 2019). From this point of view, the monitoring results do not yet clearly indicate that this goal has been achieved, or it is even close to being achieved.

Of course, the President and the new head of the Cabinet of Ministers understand what general population expects from them, and that there is no time for the build-up. It gives the optimism, but this optimism is extremely restrained, because, in the current situation (the "stalling" of national projects and the lack of tangible positive changes in the dynamics of the level and quality of life), the understanding is clearly not enough…

Basically, it has been shown by negative changes in the estimations of social mood over the last two months. The decrease of the share of people who positively characterize their emotional state and the decrease of their stock of patience do not seem to be that significant (only by 3%), but it happened for the first time in the last 12 months. Besides, in some socio-demographic groups, the decrease of the share of positive judgments is much more noticeable (by 5–10%). Most likely, this means that people are tired of broken promises and prospects of "real changes for the better in the near future" [4], and, the more specific these promises in public speeches of the country's governing bodies are, the stronger people's expectations and, of course, the deeper the disappointment from their failures are.

In these circumstances, we can only hope that the new Government will find new tools and mechanisms to implement the President's truly ambitious assignments. Moreover, it will do so without harming the population and without unnecessary risks to exacerbate already "shaken" sense of social justice after the pension reform in 2018.

The materials were prepared by M.V. Morev, I.M. Bakhvalova, O.A. Sverkunova.

[4] The Presidential Address to the Federal Assembly of the Russian Federation on February 20, 2019. The Russian President's official website. Available at: http://www.kremlin.ru/events/president/news/59863 (In Russian).

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Right – 1 cm, others – 2 cm.

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The abstract contains from 200 to 250 words. The abstract states the purpose of the research, points out its undoubted scientific novelty and its differences from similar works of other scientists; contains the methods used by the author and the main results of the work performed; identifies areas of application of the results of the study; briefly formulates the prospects for further research in this area.

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There should be not more than eight words or word combinations. Key words should reflect the content of the manuscript to the fullest extent. The number of words within a phrase should not exceed three.

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[1] Information about the modified Harvard standard is given in the book: Kirillova O.V. *Redaktsionnaya podgotovka nauchnykh zhurnalov po mezhdunarodnym standartam: rekomendatsii eksperta BD Scopus* [Editorial Preparation of Scientific Journals according to International Standards: Recommendations of a Scopus Expert]. Moscow, 2013. Part 1. 90 p.

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