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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) is the only unit of the Academy on the territory of the Vologda Oblast. The history of the Center started in 1990 from a Department of the Institute for Economic Studies of the Kola Science Centre of RAS on studying the problems of socio-economic development of the Vologda Oblast. Since then the Center has undergone manifold transformations. In 1993 it became an independent subdivision – the Vologda Scientific Coordinating Center of RAS. In 2009 it transformed into the Institute of Socio-Economic Development of Territories of RAS (ISEDT RAS).

In 2017 the socio-economic research was supplemented by agricultural issues. ISEDT RAS was joined by the Northwestern Dairy and Grassland Farming Research Institute, and was reorganized into the Vologda Research Center of the Russian Academy of Sciences.

In 2019 the Center continued expanding having launched the Laboratory of Bioeconomics and Sustainable Development within the framework of the national project "Science". The Laboratory is engaged in scientific research aimed at introducing biotechnologies into the practice of agriculture.

The VolRC RAS Director is Aleksandra A. Shabunova (Doctor of Economics). The Academic Leader of the Center is Vladimir A. Ilyin (RAS Corresponding Member, Doctor of Economics, Professor, Honored Worker of Science of the Russian Federation).

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- 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;
- development of scientifically based systems of dairy cattle breeding in the conditions of the North-Western region of Russia;
- development of new breeding methods, methods and programs for improving breeding work with cattle;
- development of scientifically based feed production systems, norms, rations and feeding systems for cattle in the conditions of the North-Western region of Russia;

- development of zonal technologies for the cultivation of agricultural crops;
- development of technologies for the creation, improvement and rational use of hayfields and pastures in the conditions of the North-Western region of Russia;
- development of technologies and technical means for agricultural production in the North-Western region of Russia;
- assessment of biodiversity in the North-Western region of Russia;
- development and implementation of biotechnologies in agricultural production;
- improvement of breeding methods and creation of new varieties of forage crops.

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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 the Institute of Economics of the National Academy of Sciences of Belarus (Minsk, Belarus, 2010).

2011 – Cooperation agreements are signed with National Institute of Oriental Languages and Civilizations (Paris, France, 2011), Institute of Business Economy at Eszterhazy Karoly College (Hungary, 2011), Republican research and production unitary enterprise "Energy Institute of NAS" (Belarus, 2011). Memoranda of understanding 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 – Memorandum of understanding is signed with Jiangxi Academy of Social Sciences (China, 2013). July 2013 – The application for research performance by international consortium involving ISEDT RAS within the 7th Framework Programme of European Community.

2014 – Cooperation agreement is signed with Center for System Analysis and Strategic Research of the National Academy of Sciences of Belarus (Belarus, 2014). Memoranda of understanding are signed with Jiangxi Academy of Social Sciences (Mao Zhiyong, China, 2014), National Institute for Oriental Studies INALCO (Julien Vercueil, France, 2014).

2015 – Memorandum of understanding is signed with Jiangxi Academy of Social Sciences (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 the Center for the Study of Industrialization Modes of the School of Advanced Studies in the Social Sciences (EHESS) (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). Memoranda of understanding are signed with Jiangxi Academy of Social Sciences (China, 2016).

2018 – Cooperation agreements are signed with the Department of Agrarian Sciences of the National Academy of Sciences of Belarus (Belarus, 2018); the Republican Unitary Enterprise "Scientific and Practical Center of the National Academy of Sciences of Belarus for Agricultural Mechanization" (Belarus, 2018). Memorandum of understanding is signed with the European School of Social Innovation (ESSI) (Germany, 2018).

2019 – Memorandum of understanding is signed with Jiangxi Academy of Social Sciences (China, 2019).

2020 – Memorandum of understanding is signed with Jiangxi Academy of Social Sciences (China, 2020).

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EDITORIAL

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Unusual Clarity. Russia Is No Longer the West

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Abstract. On March 31, 2023, Russian President Vladimir Putin signed a decree "On approving the Foreign Policy Concept of the Russian Federation", which outlines key goals and objectives of national policy in the field of international relations. The Concept for the first time indicates the status of Russia as a "unique country-civilization"; emphasizes the hostility of the anti-Russian policy implemented by the Collective West and its leader, the United States; and names friendly countries that are becoming the main focus of interaction for the Russian Federation in the coming years. The authors of the Concept and many experts note that the firm and resolute wording, in which the guidelines of Russia's foreign policy are set out, accurately reflects the objective tenseness of the geopolitical situation that has developed in recent years (especially after the start of the SMO). The Russian Federation, in fact, is in the avant-garde

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of the struggle for a multipolar world and for the independence of all national states fighting to preserve and strengthen their national sovereignty against the hegemony of the United States and its satellites. At the same time, making things clear regarding Russia's foreign policy guidelines allows the President to further improve domestic policy, bring it in line with the status of Russia as a country-civilization in terms of strengthening the foundations of public administration, achieving full national sovereignty and social justice. The article analyzes the adoption of a new Foreign Policy Concept as the President's next step in the implementation of the general course of national development that he has been in charge of for the past 23 years. We present the relevant expert assessments and the dynamics of public opinion regarding the activities of the head of state. We also look into objective historical prerequisites that determined the specifics of a new Foreign Policy Concept of the Russian Federation, as well as some key tasks that are coming to the fore in domestic policy after the adoption of the Concept.

Key words: Foreign Policy Concept of the Russian Federation, friendly and non-friendly countries, President, public administration system, elites, public opinion.

March 31, 2023, Russian President Vladimir Putin approved a new Foreign Policy Concept, which, as Foreign Minister Sergei Lavrov pointed out, "reflects **revolutionary advances** in the international sphere which have received a considerable boost with the start of the special military operation"[1].

The wording of the concept is firm and resolute, and it determines Russia's place in the international space, its historical mission and relations with foreign states very clearly. In the document, it is the first time ever that Russia is called a "unique country-civilization", "the core of the civilizational community of the Russian world". The Concept clearly defines the role of the Collective West as "the source of major risks to the security of the Russian Federation" and the United States as "the main inspirer, organizer and performer of the aggressive anti-Russian policy of the Collective West" *(Insert 1)*.

Many experts (Russian and foreign) point out that, while describing Russia's situation and the overall geopolitical situation, the authors of the Concept call things by their proper names *(Tab. 1)*.

Vladimir Putin: **"Radical changes in international affairs have forced us to seriously revise our main documents on strategic planning, including the Foreign Policy Concept of the Russian Federation,** which sets out the principles, tasks and priorities of our diplomacy.

The Foreign Ministry, working together with the Presidential Executive Office, the Security Council Staff, the Government and many ministries and departments, has completed a large-scale and meticulous job to update **and adjust the concept to modern geopolitical realities"**[2].

[1] Sergei Lavrov's speech at the meeting with permanent members of the Security Council, March 31, 2023. Available at: http://www.kremlin.ru/events/president/news/70810

[2] Meeting with members of the Security Council, March 31, 2023. Available at: http://www.kremlin.ru/events/president/news/70810

Insert 1

MAIN PROVISIONS OF RUSSIA'S FOREIGN POLICY CONCEPT, MARCH 31, 2023

(Presidential Decree 229 "On approving the Concept of the Foreign Policy of the Russian Federation", dated March 31, 2023)

Item 4. "More than a thousand years of independent statehood, the cultural heritage of the preceding era, deep historical ties with the traditional European culture and other Eurasian cultures, and the ability to ensure harmonious coexistence of different peoples, ethnic, religious and linguistic groups on one common territory, which has been developed over many centuries, determine ***Russia's special position as a unique country-civilization and a vast Eurasian and Euro-Pacific power that brings together the Russian people and other peoples belonging to the cultural and civilizational community of the Russian world****".*
Item 5. "...Russia, taking into account its decisive contribution to the victory in World War II and its active role in shaping the contemporary system of international relations and eliminating the global system of colonialism, ***is one of the sovereign centers of global development…"***
Item 13. "...the United States of America (USA) and their satellites used the measures taken by the Russian Federation as regards Ukraine to protect its vital interests ***as a pretext to aggravate the longstanding anti-Russian policy and unleashed a new type of hybrid war. It is aimed at weakening Russia in every possible way, including at undermining its constructive civilizational role, power, economic and technological capabilities, limiting its sovereignty in foreign and domestic policy, violating its territorial integrity. This Western policy has become comprehensive and is now enshrined at the doctrinal level. This was not the choice of the Russian Federation. Russia does not consider itself to be an enemy of the West,*** *is not isolating itself from the West and has no hostile intentions with regard to it..."*
Item 15. "In view of the long-term trends in the world development, the national interests of the Russian Federation in the foreign policy domain are as follows:... ***to promote traditional Russian moral and spiritual values, preserve cultural and historical heritage of the multi-ethnic people of the Russian Federation…"***
Item 16. "Building on its national interests and strategic national priorities, the Russian Federation focuses its foreign policy activities on achieving the following goals: *1) to ensure security of the Russian Federation,* ***its sovereignty in all domains, and territorial integrity****;* *2) to create favorable external environment for sustainable development of Russia;* *3) to consolidate Russia's position* ***as one of the responsible, powerful and independent centers of the modern world****".*
*Item 19. "The Russian Federation intends to make it a priority to...****eliminate the vestiges of domination by the US and other unfriendly states in global affairs, create conditions to enable any state to renounce neo-colonial or hegemonic ambitions".***
Item 25. "...The use of the Armed Forces of the Russian Federation can address, in particular, the tasks of repelling ***and preventing an armed attack on Russia and (or) its allies…"***
Item 26. "In the event of unfriendly acts by foreign states or their associations ***threatening the sovereignty and territorial integrity of the Russian Federation****, including those involving restrictive measures (sanctions) of a political or economic nature or the use of modern information and communication technologies, the Russian Federation considers it lawful to take the symmetrical and asymmetrical measures necessary to suppress such unfriendly acts and also to prevent them from recurring in future".*

End of Insert 1

Items 39–49. "…The Russian Federation intends to give priority to: ✓ ***reducing the dependence of the Russian economy on the unfriendly actions of foreign states…;*** ✓ *monitoring and making public the real situation regarding the observance of human rights and freedoms in the world,* ***primarily in states claiming their exclusive position*** *in human rights issues and in setting international standards in this area…;* ✓ ***preventing the instigation of "color revolutions" and other attempts to interfere in the internal affairs of Russia's allies and partners…;*** ✓ ***countering deployment or reinforcement of military infrastructure of unfriendly states and other threats to Russia's security in the near abroad".***
Item 51. "Eurasian continent. The People's Republic of China, the Republic of India. A comprehensive deepening of ties and enhancement of coordination with friendly sovereign global centers of power and development, which are located on the Eurasian continent and committed to approaches ***which coincide in principle with the Russian approaches to a future world order and solutions for key problems of the world politics,*** *is particularly important for achieving strategic goals and major objectives of the foreign policy of the Russian Federation."*
Item 59. "Most European states pursue an aggressive policy toward Russia... In this connection, the Russian Federation intends to consistently defend its national interests by giving priority attention to: *1)* ***reducing and neutralizing threats to security, territorial integrity, sovereignty, traditional spiritual and moral values, and socio-economic development of Russia, its allies and partners*** *from unfriendly European states, the North Atlantic Treaty Organization, the European Union and the Council of Europe;* *2) creating conditions for the cessation of unfriendly actions by European states and their associations, for a* ***complete rejection of the anti-Russian course (including interference in Russia's internal affairs)…****;* *3) the formation of* ***a new model of coexistence by European states*** *to ensure the safe, sovereign and progressive development of Russia, its allies and partners..."*
Item 62. "Russia's course towards the U.S. has a combined character, taking into account the role of this state as one of the influential sovereign centers of world development and at the same time ***the main inspirer, organizer and executor of the aggressive anti-Russian policy of the collective West, the source of major risks to the security of the Russian Federation, international peace, a balanced, equitable and progressive development of humanity****".*
Items 63–64. "The Russian Federation is interested in maintaining strategic parity, peaceful coexistence with the United States... The prospects of forming such a model of U.S.-Russian relations depend ***on the extent to which the United States is ready to abandon its policy of power-domination and revise its anti-Russian course in favor of interaction with Russia on the basis of the principles of sovereign equality, mutual benefit, and respect for each other's interests.*** *The Russian Federation intends to build relations with other Anglo-Saxon states* ***depending on the degree of their willingness to abandon their unfriendly course toward Russia*** *and to respect its legitimate interests".*
Item 66. ***"The President of the Russian Federation, acting in accordance with the Constitution of the Russian Federation and federal laws, defines the main lines of the foreign policy, directs the county's foreign policy and, as the head of State, represents the Russian Federation in international relations".***

Table 1. Russian and foreign experts on the Foreign Policy Concept of the Russian Federation dated March 31, 2023

Russian experts:
"…In the previous decades, Russia, with various degrees of zeal and success, was guided by the fact that it should integrate into different communities like the European and global. ***Now it's over, because civilization does not have to fit in anywhere – it is self-sufficient"***[3]*.*
"If we consider things from a broader perspective, if we look at the Constitution of the Russian Federation, take into account the fundamentals of state policy for the preservation and protection of traditional values and a number of other documents, then we see that ***all this is connected, it is a consistent picture****, which, in fact, declares an important direction for Russia.* ***Definitely, it is the protection of sovereignty for the preservation of the people****… As for Russia's mission, it has remained unchanged for centuries.* ***The mission is to fight injustice****. So it has been for centuries and so it will be in the future..."*[4]
"The foreign policy concept turned out to be a document ***corresponding to its time****... the key message is that Russia is ready to defend its interests, defend its sovereignty,* ***including, if necessary, the use of tough measures*** *in relations with its counterparties in the international arena"*[5]*.*
Foreign mass media:
Bloomberg (USA): *"President Vladimir Putin approved a new Russian foreign policy concept that set out to confront the U.S. and its allies, claiming* ***an "era of revolutionary changes" was under way in international relations****…"*
Daily Mail (UK): "*The 42-page document outlines changes in Russia's views on the world. In particular,* ***the confrontation that has been brewing in recent years and repeatedly voiced by Putin in relations with the West has finally been consolidated"***[6]*.*
China Radio International (CRI, China): "*The new edition of Russia's Foreign Policy Concept* ***is based on the results of an assessment of the international situation, as well as its own security***"[7]*.*

The above excerpts from the new RF Foreign Policy Concept prove the unambiguity and firmness of its main provisions. Perhaps the main statement is that Russia is no longer the West. And it is quite consistent with the following points:

first, "modern geopolitical realities, transitional nature of the era, noticeable aggravation of threats to international security[8]**";** experts note that "the bell tolls for the existing world system"[9], Russia is involved in an "almost real war"[10], and this is "not a clash between Moscow and Kiev, but a military confrontation between NATO, primarily the United States and UK, and Russia"[11].

[3] The state-civilizational view of things. Opinion of F. Lukyanov, scientific director of the Valdai Club, editor-in-chief of the journal *Rossiya v global'noi politike*. Available at: https://www.rbc.ru/newspaper/2023/04/03/6426da9c9a79475863b4452d

[4] Political scientist pointed out that the mission of the Russian Federation remained the same in the updated Foreign Policy Concept. An opinion of political scientist A. Asafov. Available at: https://life.ru/p/1569436

[5] The foreign policy concept has shown the readiness of the Russian Federation to firmly defend its interests. An opinion of I. Timofeev, director general of the Russian International Affairs Council (RIAC). Available at: https://russiancouncil.ru/analytics-and-comments/comments/kontseptsiya-vneshney-politiki-pokazala-gotovnost-rf-zhestko-otstaivat-interesy/

[6] With its new foreign policy concept, Russia is looking for a "balance of interests" with the United States and intends to counter "existential threats". Available at: https://inosmi.ru/20230331/kontseptsiya-261852162.html

[7] "A civilization that protects the Russian-speaking people": World media on the new Foreign Policy Concept of Russia. Available at: https://tass.ru/obschestvo/17433819

[8] The new foreign policy concept of Russia invites non-Arctic states to develop the Northern Sea Route. An opinion of A. Krivorotov, member of the Expert Council of the Project Office for Arctic Development, Doctor of Sciences (Economics), associate professor at the Odintsovo branch of MGIMO University. Available at: https://porarctic.ru/ru/events/andrey-krivorotov-novaya-kontseptsiya-vneshney-politiki-rossii-priglashaet-nearkticheskie-gosudarstv/

[9] Fursov A. The end of the world system. Will the world's population decrease by 90%? Available at: https://denliteraturi.ru/article/7319

[10] Sergei Lavrov's speech at a joint press conference with South African Foreign Minister N. Pandor. Available at: https://www.rbc.ru/politics/23/01/2023/63ce6ceb9a794775412d1081

[11] An interview with N. Patrushev, Secretary of the Security Council of the Russian Federation, for *Argumenty i fakty* newspaper. Available at: https://aif.ru/politics/world/nikolay_patrushev_sobytiya_na_ukraine_eto_protivostoyanie_nato_s_rossiey

"When Vladimir Putin first came to power, he tried to establish good relations with the West. He held out his hand, but his gesture was completely ignored... Putin has not changed, he has always remained true to himself, regardless of external events"[12].

"The Hill" newspaper opinion contributor Harlan Ullman notes that Western countries ignored the main call of President Vladimir Putin in his 2007 Munich speech – to abandon the idea of a unipolar world. The Russian president considered the reaction of Western leaders disrespectful; it was their mistake.

In addition, the West did not realize the seriousness of what was happening, rejecting the draft agreements on security guarantees proposed by Moscow in December 2021"[13].

Second, the leadership style of Vladimir Putin himself, who in the course of 23 years of presidency has changed from a national leader who is quite loyal to the Collective West to a head of state who actually challenges it.

At the same time, as the President himself notes, he is guided by a **"healthy conservatism"**, which presupposes **"a realistic assessment of oneself and others, a precise alignment of priorities, a correlation of necessity and possibility, a prudent formulation of goals..."**[14]

We recall that it was the actual assessment of the situation and threats to national security that forced the President to start the special military operation on February 24, 2022 due to the following reasons: transformation of Ukraine into an "Anti-Russia"; ongoing shelling of Donbass residents; NATO countries ignoring the basic requirements of security guarantees officially presented by Russia in December 2021[15] and serving as a last opportunity for a diplomatic settlement of issues related to Russia's defense of its sovereignty and preventing the advance of NATO's military infrastructure to Russian borders; that is, for a peaceful dialogue with the West, which Russia has been conducting since Vladimir Putin's 2007 Munich speech, in fact for 14 years.

In March 2023, the very appearance and firmness of the wording of Russia's new Foreign Policy Concept were also largely dictated by the objective geopolitical conditions; "realistic assessment of oneself and others", and "correlation of necessity and possibility".

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[12] *Der Spiegel*, Germany: Putin's true face. Available at: https://www.putin-today.ru/archives/127724

[13] Tsvetaev L. "Putin believed that the United States and NATO did not respect him". How neglecting the Munich speech became a mistake of the West. Available at: https://www.gazeta.ru/politics/2022/05/14/14853590.shtml

[14] Vladimir Putin's speech at the meeting of the Valdai International Discussion Club, October 21, 2021. Available at: http://www.kremlin.ru/events/president/transcripts/66975

[15] December 15, 2021, the draft agreement between the Russian Federation and the United States of America on security guarantees and the draft agreement on measures to ensure the security of the Russian Federation and the member States of the North Atlantic Treaty Organization were handed over to the American side. They are published on the official website of the Russian Foreign Ministry (https://www.mid.ru/ru/foreign_policy/news/1790809/).

The agreement included Russia's demand that NATO member States "shall not deploy military forces and weaponry on the territory of any of the other States in Europe in addition to the forces stationed on that territory as of 27 May 1997; "commit themselves to refrain from any further enlargement of NATO, including the accession of Ukraine"; "shall not conduct any military activity on the territory of Ukraine as well as other States in the Eastern Europe, in the South Caucasus and in Central Asia", etc.

All these demands were ignored, as U.S. Secretary of State A. Blinken and NATO Secretary General J. Stoltenberg stated on January 26, 2022.

For example, Russia, in fact, was able to declare itself a "unique country-civilization" opposing the West only after the whole world was in motion and the leaders of different countries (China, India, Brazil, etc.) began to publicly declare the threat of hegemony and despotism, the need and the inevitability of a multipolar world, and the importance of national sovereignty.

India's Prime Minister Narendra Modi: "Both India and Russia dream of a multipolar world. This is what the world needs today. We have moved from a bipolar world to a unipolar one, but now we are gradually moving toward a multipolar world... India and Russia share the same point of view on this issue"[16].

Iranian President Ebrahim Raisi: "The construction of a multipolar world cannot be stopped. There are already many centers of power outside the Western world"[17].

Chinese President Xi Jinping: "Hegemony, despotism and harassment cause serious harm to the world... No country is superior to all others. There is no universal model of public administration and there is no world order where the decisive word belongs to a single country"[18].

Brazilian President Lula da Silva: "Why should all countries base their trade on the dollar? Who decided that our currencies are weak, that they have no value in other countries? Who decided that the dollar became the [main international] currency after the disappearance of the gold standard?"[19]

And it is not just words. First, it is an indicator of the real change of forces in geopolitical competition; this, in particular is proved by official statistics: over the period from 1990 to 2021, the U.S. share in world GDP decreased from 20 to 16%, and that of China increased from 4 to 19% *(Fig. 1)*. Moreover, this trend has been observed over the past 30 years. Since 2017, China has topped the world economy, which in fact reflects the thesis expressed by Vladimir Putin on July 20, 2022 at the "Strong Ideas for a New Time" Forum: "No matter how much the West and the supranational elite strive to preserve the existing order, **a new era and a new stage in world history are coming. Only genuinely sovereign states are in a position to ensure a high growth dynamic** and become a role model for others in terms of standards of living and quality of life, the protection of traditional values and high humanistic ideals, and development models where an individual is not a means, but the ultimate goal"[20].

Second, the struggle of many countries for their national sovereignty against the global hegemony of the United States is their natural reaction to the U.S. colonialist policy, which is conducted openly and which is legislatively enshrined in official strategic documents. According to the U.S. National Security Strategy 2015, "the question is never whether America should lead"; moreover, according to the Interim National Security Strategic Guidance 2021, the U.S provides itself with a right "to shape the future of international politics to advance our interests".

[16] An interview with India's Prime Minister Narendra Modi for *Rossiiskaya gazeta* newspaper and TASS. Available at: https://rg.ru/2019/09/03/premer-indii-rasskazal-ob-osobennyh-otnosheniiah-s-putinym-i-planah-na-vef.html

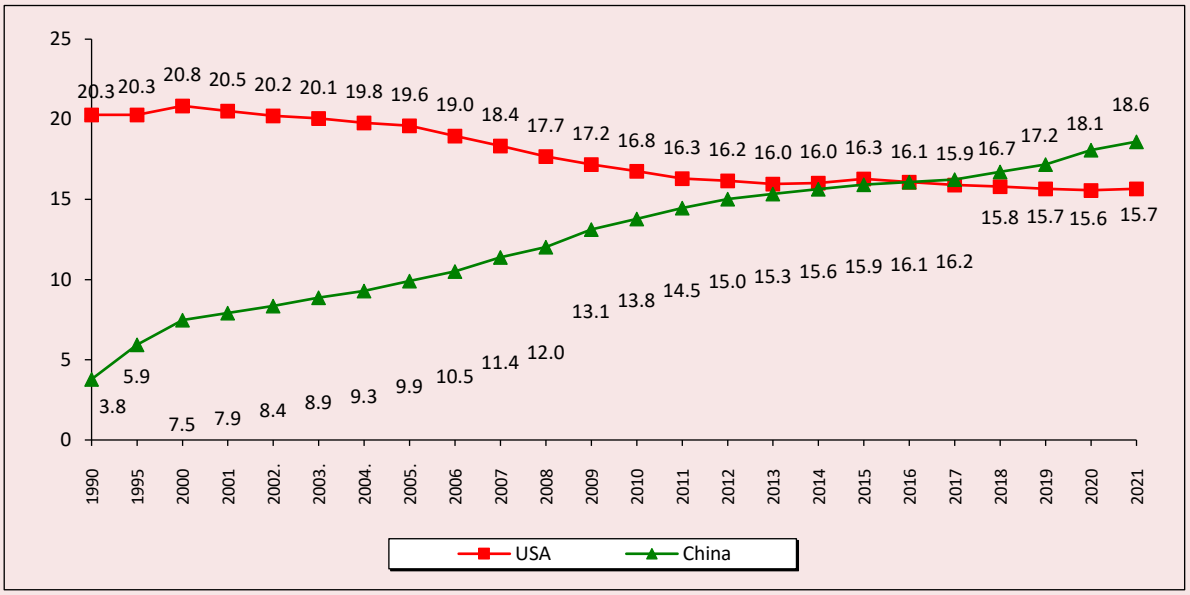
[17] Iranian President Ebrahim Raisi's speech at the General Assembly of the Organization of Asia-Pacific News Agencies (OANA). Available at: https://ria.ru/20221025/iran-1826440160.html

[18] Xi Jinping: "Persistently move toward new prospects of friendship, cooperation and joint development of China and Russia" (author's article for Russian media). Available at: https://rg.ru/2023/03/20/uporno-dvigatsia-vpered-k-novym-perspektivam-druzhby-sotrudnichestva-i-sovmestnogo-razvitiia-kitaia-i-rossii.html

[19] Speech by Brazilian President Lula da Silva during his visit to China. Available at: https://www.rbc.ru/rbcfreenews/643830249a7947b9dc7bf3bd

[20] Vladimir Putin's speech at the "Strong Ideas for a New Time" Forum, July 20, 2022. Available at: http://www.kremlin.ru/events/president/news/69039

Figure 1. Share of the U.S. and China in world GDP (by PPP) in 1990–2021, % of the total



Source: World Bank.

Excerpt from the U.S. National Security Strategy of February 13, 2015 (signed by U.S. President B. Obama): "**...the question is not whether America will lead, but how we will lead** into the future... American leadership is a global force for good, **but it is grounded in our enduring national interests...**"[21]

Excerpts from the U.S. Interim National Security Strategic Guidance published on March 3, 2021 (two months after J. Biden came to power):

"We must prove that **our model** isn't a relic of history; **it's the single best way to realize the promise of our future...**

...We must also contend with the reality that the distribution of power across the world is changing, creating new threats.

...The United States' enduring advantages – across all forms and dimensions of our power – **enable us to shape the future of international politics to advance our interests** and values, and create a freer, safer, and more prosperous world.

...We will reinvigorate and modernize our alliances and partnerships around the world... They (allies) are a tremendous source of strength and a unique American advantage, helping to shoulder the responsibilities required to keep **our nation** safe and **our people** prosperous"[22].

[21] U.S. National Security Strategy, February 2015. Available at: https://www.hse.ru/data/2015/09/07/1090125957/%D0%A1%D1%82%D1%80%D0%B0%D1%82%D0%B5%D0%B3%D0%B8%D1%8F%20%D0%9D%D0%91%20%D0%A1%D0%A8%D0%90.docx

[22] The White House has presented an interim U.S. national security strategy. Available at: https://tass.ru/mezhdunarodnaya-panorama/10829651

To achieve these goals (as history already shows), the "hegemon" is ready to use any means to maintain leadership: from the policy of "double standards", ignoring the norms of international law and destroying the economy of its own satellites (as it did to Germany, for example) to the military invasion of other countries, active interference in the internal affairs of other nation-states in order to incite intra-ethnic conflicts and organize coups d'etat, "fighting Russia down to the last Ukrainian", and terrorist attacks.

Thus, by designating itself as a unique "country-civilization", Russia not only assumes the function of protecting the entire Russian world, but also declares that such a status is possible, that there are many such nation-states, and that Russia will continue to "eliminate the vestiges of domination by the U.S. in global affairs"[23] as long as the West does not recognize this fact and take it into account.

A sober assessment of the situation has ultimately proved the West to be "the source of the main risks to the security of the Russian Federation"[24]. We are talking **about a direct involvement of NATO member States in the conflict with Russia on the side of the "Kiev regime":** through an unprecedented scale of sanctions pressure on the Russian economy, military assistance to the Armed Forces of Ukraine (pumping the country with weapons, intelligence support, military personnel training, etc.), terrorist attacks, which American experts called "a criminal act of war committed contrary to the U.S. Constitution"[25], not to mention terrorist attacks on the territory of Russia[26].

The RF President called the explosions of the Nord Stream and Nord Stream-2 gas pipelines, which occurred on September 26, 2022, "a terrorist act committed at the state level"[27], and some experts have directly pointed out that **"undermining the strategic infrastructure of a country... may well serve as "casus belli" (reason to start a war)"**[28].

At the same time, an investigation[29] by American journalist, Pulitzer Prize winner S. Hersh who "specializes in investigations of the most carefully kept secrets of the CIA, the Pentagon and other U.S. government structures"[30] has revealed that **"the operation was prepared and carried out by the American military and special services with the help of colleagues from Norway"**[31].

In other words, everything confirms what experts are saying: **"In the eyes of the West we are the ones who challenged it... It is ready to destroy us because we are its existential enemy"**[32]. **This idea is also reflected in the Foreign Policy Concept in the**

[23] Presidential Decree "On approving the Concept of the Foreign Policy of the Russian Federation". Available at: http://www.kremlin.ru/events/president/news/70811

[24] Ibidem.

[25] Napolitano A.P. What is Biden's goal in Russia-Ukraine war? *The Washington Times*. Wednesday, February 15, 2023. Available at: https://www.washingtontimes.com/news/2023/feb/15/what-is-bidens-goal-in-russia-ukraine-war/

[26] The murder of D. Dugina on August 20, 2022, the explosion in a cafe in the center of Saint Petersburg on April 2, 2023, as a result of which the Russian war correspondent Vladlen Tatarsky was killed.

[27] An interview with Vladimir Putin for Rossiya-24 channel (VGTRK) on March 14, 2023. Available at: https://www.interfax.ru/russia/891027

[28] An opinion of retired KGB colonel I. Prelin. The KGB colonel told how Russia can repay Norway for the Nord Stream pipelines. Available at: https://tsargrad.tv/news/polkovnik-kgb-rasskazal-kak-rossija-mozhet-otplatit-norvegii-za-severnye-potoki_720913

[29] Hersh S. How America took out the Nord Stream pipeline. Available at: https://seymourhersh.substack.com/p/how-america-took-out-the-nord-stream?r=5mz1&utm_campaign=post&utm_medium=web

[30] Baranov A. The United States began planning an explosion on the Nord Stream pipelines before the start of the SMO: The full scandalous investigation of an American journalist. Available at: https://www.kp.ru/daily/27463/4718398/

[31] Ibidem.

[32] A. Dugin's opinion voiced at "Bolshaya igra" TV show on April 3, 2023. Available at: https://www.1tv.ru/shows/big-game/vypuski/bolshaya-igra-chast-3-vypusk-ot-03-04-2023

form of the provision that "the United States and its satellites" consider the "strengthening of Russia" and its "independent foreign policy" a "threat to Western hegemony".

It is appropriate to recall that the Collective West has been pursuing an overt anti-Russian policy and has been doing it quite openly and publicly for **more than 70 years.** We confirm this by providing excerpts from official strategic documents *(Inserts 2 and 3)*: the NSC 20/1 – US Objectives with Respect to Russia, August 18, 1948, and the Concept for the "Decolonization of Russia" 2022 (as an example of what the Collective West is planning for Russia at the present stage).

The gap between these two documents is almost 75 years, during which many similar projects containing plans to eliminate Russia as a nation-state have been published[33]. However, judging by the nature of the goals put forward in the sources that we are reviewing in *Inserts 2–3*, it is quite obvious what kind of "future" awaited Russia (or rather, what kind of future was in store for Russia) if it continued moving toward integration with the West. And while the plans nurtured by its leader (USA) in the middle of the 20th century can already be called a fait accompli (after the liquidation of the USSR, the task of "reducing the power and influence of Moscow" can be considered fulfilled; Insert 2), the goals publicly declared by the Collective West in the post-Soviet period (in particular, the "decolonization of Russia") remain unachieved mainly due to the SMO and the general course of foreign policy pursued by the RF President.

Thus, having analyzed the President's key decisions, expert assessments, global trends, and officially published strategic documents of Russia and the United States, we can draw two conclusions.

1. In many respects, the President acts like he has no other choice, but such actions are necessary.

2. The decisions taken by the head of state after the start of the SMO are becoming more clear and resolute. According to the requirements of the real assessment of threats to national security, and as the whole world is changing along with the development of a civilizational conflict between Russia and NATO members, the contours of a multipolar world are finally taking shape.

The adoption of a new Foreign Policy Concept is another step taken by the President to determine Russia's place in this new future world that, in fact, has already arrived; moreover, Russia's place should be worthy of its history, culture, historical territory, human and intellectual potential, as well as the possibilities of the country's participation in addressing modern global issues.

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[33] For example (sources: Newslab.ru. April 14, 2013; "Yedinenie" popular movement, December 12, 2002 Available at: http://old.kpe.ru/press/special/1/147/):

1. 1959 – Public Law 86–90: Captive Nations, according to which the peoples recognized as enslaved should be "helped to gain independence".

2. The early 1980s – the Harvard Project, consisting of three volumes ("Perestroika", "Reform" and "Completion"), which assumed the gradual liquidation of Russia as a state for the period from 1985 to 2000.

3. 1989 – Liberation Doctrine. Developed by the Heritage Foundation think tank and commissioned by the U.S. President George W. Bush Administration. Its purpose was to devise technologies to facilitate the collapse of the USSR and subsequently manage the processes taking place in Russia.

4. 1991 – the doctrine of the geopolitical pluralism in the post-Soviet space, implying forceful dismemberment of the Soviet Union and then Russia, with subsequent colonization of the post-Soviet space.

5. 1992 – U.S. Department of Defense Directive 13. According to the document, in the near future the United States will become the indisputable military and political leader in the world; therefore, if necessary, the United States has the right to refrain from collective action within the framework of the UN and can take unilateral military action, as well as carry out preventive strikes at its discretion. It is noted that the goal of NATO in the future is to introduce peacekeeping forces in the regions of ethnic conflicts and border disputes on the territory from the Atlantic to the Urals. Siberia and Russia's Baltic States were designated as separate potential objects.

6. 2000 – CIA report "Global Trends 2015", according to which a drop in the birth rate in Russia will inevitably lead to the depopulation of the country and a decrease in the population from 146 to 130 million people by 2015, and the country itself will break up into eight small States.

Insert 2

NSC 20/1 – US OBJECTIVES WITH RESPECT TO RUSSIA, AUGUST 18, 1948

*1. "…**There is deep dissatisfaction and concern in this country over the aims and methods of the Soviet leaders.** The policies of this Government are therefore determined in considerable measure by our desire to modify Soviet policies and to alter the international situation to which they have already led…"*

*2. "Our basic objectives with respect to Russia are really only two: **a. To reduce the power and influence of Moscow…; and b. To bring about a basic change in the theory and practice of international relations observed by the government in power in Russia".***

*3. **"We are entirely within our own rights, and need feel no sense of guilt, in working for the destruction of concepts inconsistent with world peace and stability and for their replacement by ones of tolerance and international collaboration. It is not our business to calculate the internal developments to which the adoption of such concepts might lead in another country, nor need we feel that we have any responsibility for those developments. If the Soviet leaders find the growing prevalence of a more enlightened concept of international relations to be inconsistent with the maintenance of their internal power in Russia, that is their responsibility, not ours".***

*4. "Once a state of war had arisen between this country and the Soviet Union, **this Government would be at liberty to pursue the achievement of its basic objectives by whatever means it might choose and by whatever terms it might wish to impose upon a Russian authority or Russian authorities in the event of a successful issue of military operations".***

*5. "The pursuit of our basic objectives in time of war... First of all, we may accept it as a foregone conclusion that we would not be prepared to conclude a full-fledged peace settlement and/or resume regular diplomatic relations **with any regime in Russia dominated by any of the present Soviet leaders or persons sharing their cast of thought… The smaller the territory left at the disposal of such a regime, the easier the task of imposing terms satisfactory to our interests".***

*6. "We must make a determined effort to avoid taking responsibility for deciding who would rule Russia in the wake of a disintegration of the Soviet regime**. Our best course would be to permit all the exiled elements to return to Russia as rapidly as possible and to see to it, in so far as this depends on us, that they are all given roughly equal opportunity to establish their bids for power".***

*7. "The Ukrainians are the most advanced of the peoples who have been under Russian rule in modern times. They have generally resented Russian domination; and their nationalistic organizations have been active and vocal abroad... Our policy in the first instance should be to maintain an outward neutrality, as long as our own interests—military or otherwise—were not immediately affected. **And only if it became clear that an undesirable deadlock was developing, we would encourage a composing of the differences along the lines of a reasonable federalism. The same would apply to any other efforts at the achievement of an independent status on the part of other Russian minorities. It is not likely that any of the other minorities could successfully maintain real independence for any length of time. However, should they attempt it (and it is quite possible that the Caucasian minorities would do this), our attitude should be the same as in the case of the Ukraine".***

Insert 3

BRIEFING AND CONCEPT "DECOLONIZATION OF RUSSIA" (2022)

June 23, 2022, a U.S. government agency – the Commission on Security and Cooperation in Europe (CSCE) – held a briefing in Congress entitled "Decolonizing Russia: A Moral and Strategic Imperative".

The preamble to the briefing states: "*Russia's barbaric war on Ukraine – and before that on Syria, Libya, Georgia, and Chechnya – has exposed the Russian Federation's viciously imperial character to the entire world. Its aggression also is catalyzing* ***a long-overdue conversation about Russia's interior empire…*** *Serious and contradictory discussions are currently underway on how to reckon with Russia's fundamental imperialism and* ***the need to "decolonize" Russia*** *so that it becomes a real interested party in European security and stability"*[34]**.**

The full text of the "Decolonization of Russia" concept was presented at the Second Forum of Free Peoples of Russia, meeting in Prague on July 23 and 24, 2022. Here are some excerpts from the document:

"We, representatives of indigenous peoples and colonial regions of the Russian Federation, are starting the process of ***Complete and General Decolonization of Russia.*** *We call on all citizens of indigenous peoples and colonial regions* ***to immediately begin active actions for peaceful decolonization,*** *liberation, and the proclamation/restoration of the sovereignty and independence of their own countries****…. To implement*** *the Declaration on the Decolonization of Russia* ***in practice****:*

1. We appeal to the national and regional elites ***to immediately begin the creation of National Transitional Governments / Administrations****...*

2. We ***appeal to the UN Member States to provide maximum assistance*** *to the National Transitional Governments / Administrations to achieve the goals of decolonization and peace...*

3. We call for the preparation of ***the Constitutions of the Republics****, securing their state independence and sovereignty...*

4. We call on all representatives of indigenous peoples and colonial regions to join peaceful ***systematic resistance****. Possible forms of such resistance are strikes, demonstrations, pickets, acts of sabotage of the orders of the imperial center, refusal to serve in the armed forces of the Russian Federation, etc....*

5. We call on all members of ***the military and law enforcement agencies…*** *to ensure* ***a peaceful and democratic transition of power.***

6. We initiate ***the formation of national legions*** *(Self Defense Forces) to protect the sovereignty and the rights of our peoples and to ensure peace.*

7. We are starting the process of consultations on the establishment of ***the United Transitional Administration****... This body will have the following tasks: • Coordination of activities* ***to eliminate the colonial regime****...; Assistance in organizing* ***the transfer of power*** *to democratically elected authorities...; maximum assistance to the competent international bodies* ***in taking control of all, without exception, nuclear weapons and other weapons of mass destruction…"***

Then there is Part II: "Separatist Sentiments in Russia's Regions", which begins with the recognition of *"the rather* ***low*** *severity of the problem of the spread of separatist sentiments in Russia".* **It also indicates that** *"the separatists in their discourse suggest* ***waiting for socio-economic shocks comparable to the situation in the early 1990s.*** *Against the background of current events in Ukraine, the separatists expect* ***the weakening of the central government of Russia due to the deterioration of the socio-economic state of the country, the growth of public discontent and a decrease in the capabilities and resources of law enforcement agencies…*** *A certain part of the separatists view this as a* ***"window of opportunity"*** *for intensifying their own efforts aimed at actualizing separatist ideas in the discourse of the revival of separatist movements"*[35].

[34] Decolonizing Russia. A Moral and Strategic Imperative. Available at: https://www.csce.gov/international-impact/events/decolonizing-russia

[35] Ovchinsky V. Decolonization of Russia 2.0. Available at: https://zavtra.ru/blogs/dekolonizatciya_rossii_2_0

However, foreign policy is always connected with domestic policy; and the fact that Russia has finally turned its back on any attempts of integrating into the modern Western world, which is outlined in the new Concept, requires significant changes within the country: if Russia has the opportunity to declare a sovereign foreign policy, then it must do the same in domestic policy, and this goal still has to be achieved.

"The establishment of Russia as a country-civilization is of great and decisive importance for domestic policy. After all, it is impossible to act as a country-civilization in foreign policy, and remain, albeit sovereign, but still part of a liberal Western-centric system, sharing its approaches, values and principles in domestic policy"[36].

It is worth mentioning that for many years a significant part of experts have characterized Vladimir Putin's policy as contradictory and ambiguous.

For example, back in 2012, I. Bunin, president of the Center for Political Technologies Foundation, said that Vladimir Putin's policy is *"two steps forward – one step back, or even: step forward – step back"*[37].

In 2016, the writer A. Prokhanov, analyzing the current situation in the country, wrote the following: "There is a feeling that there are **two Russias**: the first one is deeply embedded in the Western world, Western consciousness, Western way of life... The second Russia, which forms a new growing branch of the state, is in a very complex interaction with the first... These two Russias reveal themselves in today's ideological and political battle... This explains **the apparent inconsistency of Russian policy, the half-way, inaccurate rhetoric**"[38].

In 2021, when reviewing one of the key documents defining the vector of development of the Russian Federation – the National Security Strategy[39], philosopher A. Dugin noted: "The positive core of the national security doctrine is brilliant, and it enjoys full support and solidarity. Nevertheless, we cannot but note some inherent contradictions it contains. **The sovereign patriotic realist document is mined with liberal inclusions**"[40].

Yu. Vorotnikov (Chairman of the Political Technologies Committee for the Russian Association of Public Relations) on the 2022 National Security Strategy of the Russian Federation: "The absence of a unifying concept indicates that a unified idea of the future of Russia has not yet been developed"[41]

[36] Dugin A. The concept of foreign policy as the apotheosis of multipolarity and the catechism of sovereignty. Available at: https://izborsk-club.ru/24125

[37] Expert: "Putin lives by the Leninist principle" (opinion of I. Bunin, president of the Center for Political Technologies Foundation). Available at: https://aif.ru/politics/world/35309

[38] Prokhanov A.A. "The State of the Polar Star". Available at: https://izborsk-club.ru/8623

[39] On the National Security Strategy of the Russian Federation: Presidential Decree dated July 2, 2021. Available at: http://www.kremlin.ru/acts/bank/47046

[40] Dugin A. New peaks and inertia of bipolar disorder. Available at: https://zavtra.ru/blogs/novie_vershini_i_inertciya_bipolyarnogo_rasstrojstva

[41] Skorobogatyi P. (2021). Self-reliance strategy, *Ekspert*, 29, p. 54.

It is also worth noting that even today, in 2023, i.e. after the start of the SMO, some experts say that "Putin's ideological project has some kind of **internal duality, incompleteness**, which is a huge deterrent to launching a nationwide mobilization project in Russia"[43].

> **"A mature Russia under Vladimir Putin has not been formed yet as a full-fledged and consistent state. She is at a crossroads.** Although it would seem that a number of Rubicons have already been crossed – some were crossed after the events at Bolotnaya Square in 2011–2012, others – in 2014, and some very important events – in 2022...
>
> **The format of "Putin's stability" still dominates us, even now, after a whole year of hot fighting.** Why is this so? First of all, because the powerful clusters of the old order, the order before the SMO and even before the Crimean triumph, continue to live, rule each in their own sphere, do their own thing..."[42]

Perhaps we can agree with experts that the duality and inconsistency in the policy of the head of state is largely due to the fact that "he relies on the people, but the elites just don't understand him"[44].

Let us provide some facts to prove the point. According to the monitoring sociological measurements, broad social strata support the President's activities – both in general and in relation to the course of independent foreign policy pursued by Russia.

✓ Thus, according to VCIOM, the overwhelming number of Russians believe that Russia must pursue an independent foreign policy. Moreover, in the past 15 years (from 2008 to 2023), the proportion of those who share this point of view has increased from 54 to 67% *(Tab. 2)*.

Table 2. Russians' attitude toward Russia's foreign policy goals, % of respondents

Answer option	2008	2023	Dynamics (+/-)
Russia should pursue an independent foreign policy, but not seek to dictate its terms to other countries	54	67	+13
Russia should behave like a great power, dictate its will to other countries	24	18	-6
Russia's foreign policy may not be independent if it does not contradict the interests of its citizens	8	7	-1
Russia's foreign policy should be subordinated to global interests, even if national interests are affected	2	2	0
I find it difficult to answer	11	6	-5

Source: VCIOM data. Russia's foreign policy course: Fighting for sovereignty. Analytical review. April 10, 2023. Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/vneshnepoliticheskii-kurs-rossii-v-borbe-za-suverenitet
Wording of the question: "In the modern world, some States dictate their conditions to other countries, some conduct an independent foreign policy without imposing their views on anyone, and many States do not conduct an independent foreign policy. What do you think Russia's foreign policy should be?". Ranked according to the data for 2023.

[42] Averyanov V. The Russian bear was woken up a little earlier than it should have been. Available at: https://izborsk-club.ru/24112

[43] Russia. The front is everywhere. Round table "The Russian Dream: The situation at the fronts". Available at: https://zavtra.ru/blogs/rossiya_vsyudu_front

[44] A. Dugin's opinion voiced at "Bolshaya igra" TV show on April 3, 2023. Available at: https://www.1tv.ru/shows/big-game/vypuski/bolshaya-igra-chast-3-vypusk-ot-03-04-2023

✓ More than 80% of Russians note that this is exactly the policy pursued by Russian President Vladimir Putin. Over the period from 2008 to 2023, the share of those who hold this opinion has increased nationwide from 79 to 87% *(Tab. 3)*.

✓ According to VolRC RAS, the share of people who believe that the President is preoccupied mainly with the country's international standing has increased almost twofold[45] during all of Vladimir Putin's presidential terms (from 2000 to 2022; by 32 percentage points, from 26 to 58%; *Tab. 4; Insert 4*).

✓ The share of those who consider the President's actions to strengthen Russia's international positions to be successful has exceeded the share of those who share the opposite opinion over the past 23 years (by 15–20 percentage points; *Tab. 4; Insert 4*). Although we should note that the share of negative assessments regarding the course of the President's foreign policy for the period from 2000 to 2022 has not changed significantly (31–32%[46]).

Table 3. Russians' attitude toward Russia's current foreign policy, % of respondents

Answer option	2008	2023	Dynamics (+/-)
Russia defends its national interests regardless of whether the governments of other countries like it or not	33	59	+26
Russia is trying to defend its national interests, but it does not always succeed in doing so	46	28	-18
Russia practically fails to defend its national interests; it does the bidding of the governments of other countries	8	5	-3
I find it difficult to answer	13	8	-5
Source: VCIOM data. Russia's foreign policy course: Fighting for sovereignty. Analytical review. April 10, 2023. Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/vneshnepoliticheskii-kurs-rossii-v-borbe-za-suverenitet Wording of the question: "How would you describe the foreign policy that Russia is pursuing today?". Ranked according to the data for 2023.			

Table 4. Attitude of Vologda Oblast residents toward the President's work on the implementation of Russia's foreign policy course, % of respondents

Answer option	2000	2022	Dynamics (+/-)
Proportion of those who believe that the President is preoccupied mainly with the country's international position*	25.9	58.2	+32
Proportion of those who consider the President's actions to strengthen Russia's international position successful**	42.3	47.7	+5
Proportion of those who consider the President's actions to strengthen Russia's international position unsuccessful**	30.9	32.1	+1
VolRC RAS data for the Vologda Oblast. * Wording of the question: "What do you think is the major concern of the RF President?". ** Wording of the question: "How successfully, in your opinion, is the President coping with the problem of strengthening Russia's international position?". More details are provided in *Insert 4*.			

[45] The source of sociological data for RAS Vologda Research Center is the monitoring of public opinion, carried out since 1996 on the territory of the Vologda Oblast.

Monitoring is carried out once every two months; 1,500 respondents over the age of 18 are interviewed in the cities of Vologda and Cherepovets, and in Babaevsky, Velikoustyugsky, Vozhegodsky, Gryazovetsky, Tarnogsky municipal okrugs and in Kirillovsky, Nikolsky, Sheksninsky municipal districts. The representativeness of the sample is ensured by observing the proportions between urban and rural population; between residents of settlements of various types (rural settlements, small and medium-sized cities); gender and age structure of the adult population of the Oblast. Survey method is questionnaire poll at the place of residence of respondents. Sampling error does not exceed 3%.

More detailed information about the survey results is available at the official website of VolRC RAS: http:// www.vscc.ac.ru/.

[46] Such a share of negative judgments is typical of most socio-demographic groups. Slightly more negative assessments were noted among low-income groups and residents of Vologda, among whom the proportion of those who consider the President's actions to strengthen Russia's international position unsuccessful is 40–41% (for more information, see *Insert 5*).

✓ We should also note that when Russia is living through hard times and amid escalating threats to national security, all the strata of Russian society show increasing support for the political course implemented by Vladimir Putin. This is evidenced by the results of the year that has passed since the beginning of the SMO (in 2022, compared with 2021, support for the head of state increased by 5–6 percentage points in all major socio-demographic groups; *Tab. 5*).

And this becomes even more evident when we look at the results of Vladimir Putin's first presidential term, against the background of the "historical catastrophe" that the country went through in the late 1990s. Support for Vladimir Putin during his first presidency (2000–2003) exceeded than that of Boris Yeltsin in the last years of his presidency (1998–1999) by 50–60 percentage points, and in almost all population groups *(Tab. 5)*.

> "The concentration of power in the hands of Yeltsin and his clique led to a **historic catastrophe.** It manifested itself **in the death of about 10 million people** who simply had not survived the "reforms" of the 1990s; **in the collapse of most of the industry and agriculture; in the loss of all foreign policy positions.** This is, in fact, **an external governance regime,** when American advisers were sitting in the offices of Russian ministries and dictating what to do and how to do it"[47]

Table 5. Dynamics of the level of approval of the President's activities in various socio-demographic groups, % of respondents

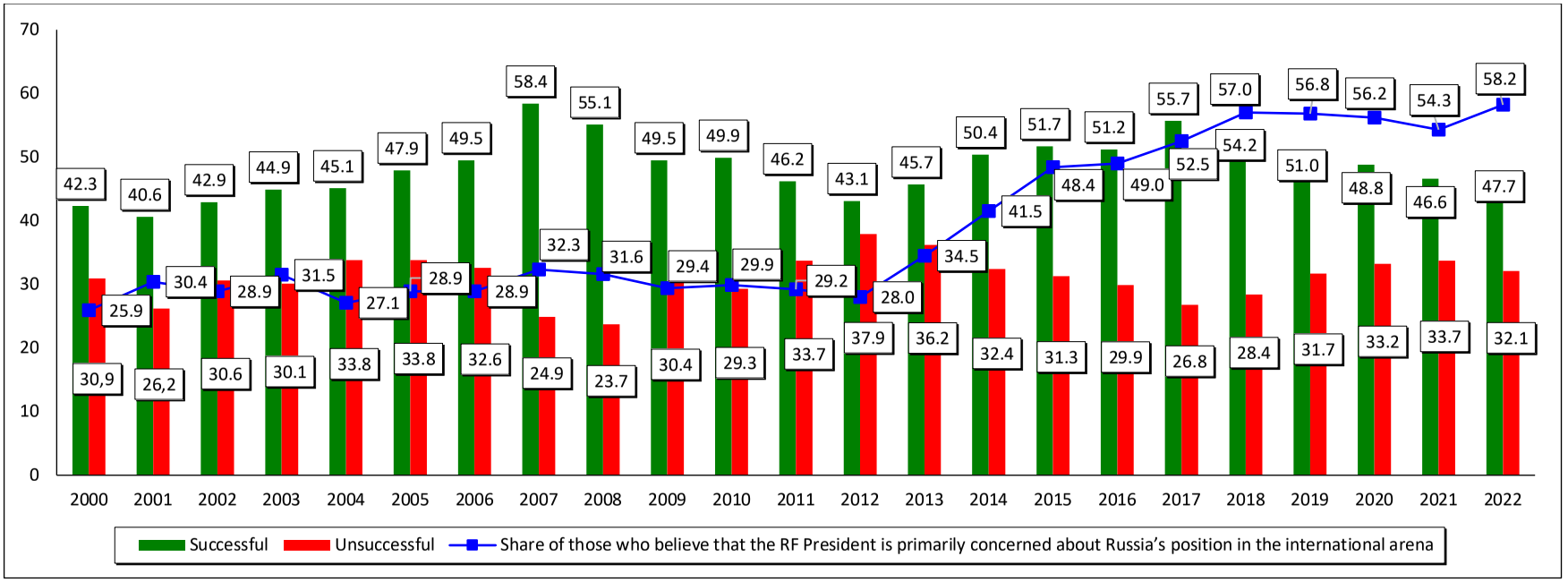
Population group	Average annual data		Dynamics (+/-)	Average annual data		Dynamics (+ /-)
	1998–1999 (last years of Boris Yeltsin's presidency)	2000–2003 (Vladimir Putin's first presidential term)		2021 (year before SMO)	2022 (year when SMO was launched)	
Sex						
Men	12.7	65.8	+53	48.7	54.3	+6
Women	9.9	66.0	+56	53.7	59.2	+6
Age						
Under 30	10.4	68.8	+58	46.7	51.4	+5
30–55	11.0	65.2	+54	49.3	54.9	+6
Over 55	12.3	64.4	+52	55.8	61.6	+6
Education						
Secondary and incomplete secondary	11.9	61.9	+50	46.0	51.4	+5
Secondary vocational	10.5	66.6	+56	52.0	58.1	+6
Higher and incomplete higher	10.9	70.1	+59	56.4	62.4	+6
Income group						
Bottom 20%	9.5	55.4	+46	38.4	40.8	+2
Middle 60%	11.1	68.3	+57	53.9	59.8	+6
Top 20%	15.2	73.2	+58	62.6	64.0	+1
Territory						
Vologda	10.4	66.2	+56	45.1	48.0	+3
Cherepovets	10.4	64.6	+54	57.3	63.8	+7
Districts	11.9	66.5	+55	51.7	58.1	+6
Oblast	***11.2***	***65.9***	+55	***51.4***	***57.0***	+6
TOTAL number of positive and negative changes in all groups			**14 / 0**			**14 / 0**

Source: VoIRC RAS public opinion monitoring.
Wording of the question: "How do you assess the current work of the RF President?".

[47] Afonin Yu. Yeltsin is a traitor and the personification of catastrophes. Available at: https://kprfrzn.ru/analitika/jurij-afonin-elcin-predatel-i-olicetvorenie-katastrof

Insert 4

Assessment of the President's success in addressing the problem of strengthening Russia's international position,
% of respondents*



* Wording of the question: "What do you think is the major concern of the RF President?" (answer option is "the position of the country in the international arena"). VolRC RAS data for the Vologda Oblast.

Over the period from 2000 to 2022, the share of people who believe that the RF President is primarily concerned about Russia's position in the international arena increased by 32 percentage points (from 26 to 58%).

The proportion of those who consider the actions of the head of state to strengthen Russia's international standing successful annually exceeds the proportion of people who share the opposite point of view. At the same time, during all of Vladimir Putin's presidential terms, the share of positive judgments increased by 5 percentage points (from 42 to 47%).

Insert 5

Assessment of the President's success in addressing the issue of strengthening Russia's international position, % of respondents*

Population group	SUCCESSFUL			UNSUCCESSFUL		
	Average annual data for...		Dynamics (+/-)	Average annual data for...		Dynamics (+/-)
	Vladimir Putin's first presidential term (2000–2003)	Vladimir Putin's fourth presidential term (2018–2022)		Vladimir Putin's first presidential term (2000–2003)	Vladimir Putin's fourth presidential term (2018–2022)	
Sex						
Men	43.4	47.7	+4	34.6	34.0	-1
Women	42.2	51.2	+9	28.1	30.0	+2
Age						
Under 30	47.2	47.7	+1	27.3	31.0	+4
30–55	43.2	48.3	+5	31.2	33.1	+2
Over 55	36.4	52.2	+16	33.9	30.5	-3
Education						
Secondary and incomplete secondary	37.9	43.1	+5	31.9	34.5	+3
Secondary vocational	41.4	51.0	+10	30.3	29.9	0
Higher and incomplete higher	49.8	55.1	+5	30.5	31.4	+1
Income group						
Bottom 20%	32.4	32.9	+1	36.2	41.2	+5
Middle 60%	43.5	51.0	+8	31.1	31.7	+1
Top 20%	53.0	61.3	+8	27.1	27.0	0
Territory						
Vologda	47.6	46.9	-1	29.9	39.7	+10
Cherepovets	43.9	60.8	+17	32.7	25.2	-7
Districts	39.6	44.8	+5	30.3	31.1	+1
Oblast	***42.7***	***49.7***	+7	***30.8***	***31.8***	***+1***
TOTAL number of positive and negative changes in all groups			**13 / 1**			**3 / 9**

* VolRC RAS public opinion monitoring. The question is asked since 2000. Wording of the question: "In your opinion, how successful is Vladimir Putin in addressing the problem of strengthening Russia's international position?"

On average, over the five years of Vladimir Putin's fourth presidential term (2018–2022), compared with the average annual data for his first presidential term (2000–2003), the share of people who positively assess the actions of the head of state aimed at strengthening Russia's international position has increased in almost all major population groups (except residents of Vologda, whose estimates have not changed significantly). The proportion of positive judgments increased especially among people over 55 years of age (by 16 percentage points, from 36 to 52%) and residents of Cherepovets (by 17 percentage points, from 44 to 61%); and in the Vologda Oblast as a whole – by 7 percentage points (from 43 to 50%).

The share of those who believe that the President is failing in his efforts to strengthen Russia's international position has increased in 9 out of 14 socio-demographic groups over the same period, especially among residents of Vologda (by 10 percentage points, from 30 to 40%). In the Vologda Oblast as a whole, the proportion of negative judgments has not changed significantly (31–32%).

Thus, public opinion trends (registered by various research organizations) provide an answer to the question why Vladimir Putin throughout his presidential terms has the opportunity to rely on the support of the majority of Russians, including in the implementation of his foreign policy course.

However, the same cannot be said in relation to a significant part of the elites, because "many of the carriers of Westernism are still in Putin's entourage, but they do not oppose him openly; rather, they pretend to be his friends (the so-called sixth column)..."[48]

Currently, amid the ongoing SMO, some of the representatives of big business engage in quite a "legitimate" and public propaganda, which, although subtly, but persistently pushes forward the idea that Russia's struggle for its national sovereignty is the wrong course and that it is necessary at all costs to "make it up" with the West, starting with the termination of the SMO on any conditions dictated by the Kiev (or NATO) regime. In particular, on March 2, 2023, at the Krasnoyarsk Economic Forum, businessman O. Deripaska said that "the state apparatus and state capitalism are a dead-end track"; and according to experts, this is a "subtle manipulation" leading to the fact that "the most reasonable thing would be to sell our army, population and territory to the enemy" *(Insert 6)*.

In addition, throughout virtually the entire period of the SMO, there still emerge concrete examples (facts) of the conduct and managerial decisions of officials that contradict the position taken by the head of state and the opinion of the majority of Russians (we give such examples in virtually every article[49]). This includes ostentatious disregard for state symbols and for the President personally; discrediting the Russian army and patronizing pro-Ukrainian propaganda actions, etc. *(Insert 7)*.

The facts given in Inserts 6–7 clearly explain why the war that our country is currently forced to engage in is "not only against the direct enemy – Ukrainian Nazism and the globalist liberal West supporting it, **but also against the injustice that sometimes happens inside Russia itself**"[50].

And although there are many factors that currently do not allow the President to carry out a personnel revolution "from above" (for example, the lack of personnel replacements due to the fact that in Russia the process of genesis of the elites is stalling"[51]; the emerging internal vulnerabilities in the system of public administration, which in the context of the SMO can be used by external enemies, etc.), the head of state acts in accordance with his "ideology of healthy conservatism", i.e. he solves problems methodically, consistently, proceeding from **"a realistic assessment of oneself and others, a precise alignment of priorities, a correlation of necessity and possibility"** (*Insert 8* presents the RF President's key decisions, which we have been monitoring since April 2022).

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[48] Korovin V. Where are you, Putin's commissars? Available at: https://izborsk-club.ru/23998

[49] See, for example:

lyin V.A., Morev M.V. The President called on the officials of all levels to "stop fooling around". *Economic and Social Changes: Facts, Trends, Forecast*, 16(1), 9–34.

Ilyin V.A., Morev M.V. (2022). A framework for a new Social Contract is being formed in Russia. *Economic and Social Changes: Facts, Trends, Forecast*, 15(6), 9–34.

[50] Dugin A. The Wagner factor and the thesis of justice. Available at: http://www.zdravrussia.ru/politika/organizaci-i/?nnew=10139&sview=3

[51] Khaldey A. What the nationalization of the elite is. Available at: https://regnum.ru/news/polit/2606896.html

Insert 6

Excerpts from the speech of businessman O. Deripaska at the Krasnoyarsk Economic Forum on March 2, 2023:

1. "State capitalism and all this, as it is sometimes called "StateGasMeat" – of course, is ***a dead-end track.*** *I am horrified to see the resources that have already been spent, well, obviously in vain, even over the past year. If earlier I thought there were billions, now I already see that there are trillions.* ***No doubt, our economy should be based on the market and nothing else.*** *Issues should be regulated by the competitive environment".*

2. "Of course, the talks are going on about the decriminalization of entrepreneurial activity. In general, it is necessary to do away with this outdated practice and stop incarcerating everyone and his dog for no one knows why. ***It happens that someone commits an economic offense, they compensate for it; well, let them go back to work".***

3. ***"The reduction of officials, I don't know, by 2–3 times, the reduction of law enforcement officers probably by a couple of times****... And it seems to me that this is also an overdue question, that* ***there is too much of this state apparatus and state capitalism.*** *And we need more freedom; more freedom and competition, indeed".*

Comments by an expert[52]:

"At the Krasnoyarsk Economic Forum, O. Deripaska is trying to convince everyone that state capitalism is ineffective, there will only be enough money for a little over a year, and then there will be a terrible end. His supporters repeat: the militarization of the economy will sink any state. Shells are unprofitable, they destroy houses and apartments, but they are very profitable for manufacturers. ***These are guiding arguments, and the readers should make the conclusion for themselves: the Russian economy will not survive the war, the war must be stopped this year.*** *How to stop it? You know full well. Just go and stop it. Stop what? Stop everything. Without going into detail. It will be enough for those who understand. This is how liberal propaganda works, this is its technology, regardless of the ideological content...* ***This is manipulation, but it is subtle****.* ***Guns instead of oil are worse than oil instead of guns… It remains only to add: long live captivity, the most cost-effective system!***

I don't blame Deripaska and his comrades – he would never have gotten so rich under state capitalism and would not have lived such an adventurous and exciting life on a yacht with interesting female companions…. Deripaska voices the opinion of 3/4 of the Russian business and administrative offshore elite.

Talking about the unprofitability of the military economy is talking about the unprofitability of the battle for the Motherland… The market and the war are two incompatible things, like genius and villainy. The market will sell the victory rather than win it – this is the logic and nature of the market. Only state capitalism wins the war. State capitalism controlled by the harsh hand of a tough leader*.*

The trouble is when merchants start trying to lead the war. War is madness for them. For them, the most reasonable thing is to sell their army, population and territory to the enemy. Where else will you find such profitability? What then? And they don't think that far".

[52] Khaldey A. "Why Deripaska teaches Putin how to fight". Available at: https://zavtra.ru/blogs/pochemu_deripaska_uchit_putina_voevat_

Insert 7

Some examples of actions of officials and deputies, which contradict the public attitudes of the head of state and trends of public opinion

1. February 20, 2023, A. Lependin, deputy of the district assembly of Maloyaroslavetsky District of the Kaluga Oblast, did not stand up during the performance of the national anthem of Russia. The local commission on deputy ethics was engaged in investigating the case. In accordance with Article 7 of Federal Constitutional Law 3 "On the national anthem of the Russian Federation", during rendition of the national anthem, those present should stand. Violation of the procedure for the official use of state symbols of the Russian Federation entails a fine of 2 thousand to 150 thousand rubles. V. Parfenov, head of the Maloyaroslavetsky District Administration, said that he did not believe in the deputy's excuse for remaining seated due to having problems with his legs ("After all, he came to the meeting on foot, he was able to come"). G. Novoseltsev, chairman of the Legislative Assembly of the Kaluga Oblast, noted: "The act is disgusting. The explanation is stupid. If there is an offense, it must be punished". The Magistrate's Court fined Lependin five thousand rubles under Article 17.10 of the Administrative Code of the Russian Federation "Violation of the procedure for the official use of state symbols of the Russian Federation".
2. February 21, 2023, M. Abdalkin, deputy of the Samara Provincial Duma for the Communist Party, posted a video online in which he is sitting in front of his PC with noodles on his ears and listening to the President with great attention. The video is accompanied by a sarcastic comment: "I fully support, I completely agree, great speech. I haven't heard anything like this in the last 23 years. I'm excited". Attention to the video was attracted by A. Khinshtein, State Duma deputy for the United Russia party. On February 28, the deputies approved the conclusion of the regulatory committee, which recommended "naming and shaming" the communist and sending materials about his behavior to law enforcement agencies and the prosecutor's office[53].
3. February 27, 2023, in the main building of the Peoples' Friendship University of Russia, the association of fellow countrymen of students from Ukraine held an action sanctioned by the university administration – it was allegedly an exhibition, but in fact a propaganda campaign. The story had a wide public response[54]. As a result, vice-rector of the Peoples' Friendship University of Russia Sergey Bazavluk was dismissed; he not only approved the anti-Russian, anti-state propaganda campaign of the Ukrainian association of fellow countrymen, but, according to students, it was he who banned the organization of a Russian association of fellow countrymen in the university[55].
4. March 28, 2023, the prosecutor's office approved the indictment in the case of ex-mayor of Yekaterinburg Ye. Roizman*[56]. He is accused of public actions aimed at discrediting the army during a live broadcast on July 1, 2022 on one of the video hosting sites. The ex-mayor posted a video clip on his social medias with footage shaming the Russian army and soldiers[57]. Previously, he had already been prosecuted for a similar violation of the Code of Administrative Offenses, fined three times for discrediting the army for a total of 150 thousand rubles and once for disrespect for the authorities for 85 thousand rubles[58].

* Included in the register of foreign agents.

[53] Prakh A. Noodles and a fine to boot. Available at: https://www.kommersant.ru/doc/5845163

[54] Ivanov A. Continuation of the scandalous story of ukrophilia (and the absence of a Russian association of fellow countrymen) in the RUDN. Available at: https://zavtra.ru/events/prodolzhenie_istorii_s_ukrofiliej_(i_otsutstviem_russkogo_zemlyachestva)_v_rudn

[55] Ivanov A. The vice-rector of RUDN, who actually sanctioned the infamous "Ukrop" sabbath, was dismissed. Available at: https://narodsobor.ru/2023/03/18/uvolen-prorektor-rudn-kotoryj-fakticheski-sankcznioniroval-nashumevshij-ukropskij-shabash/

[56] The Ministry of Justice of Russia recognized Yevgeny Roizman as an individual performing the functions of a foreign agent. Available at: https://www.rbc.ru/politics/25/11/2022/638105af9a79476935eec6e1

[57] Ex-mayor pleaded not guilty to discrediting the Armed Forces of the Russian Federation. Available at: https://versia.ru/yeks-gradonachalnik-ne-priznal-vinu-v-diskreditacii-vs-rf

[58] https://360tv.ru/news/crime/rojzmanu-utverdili-obvinenie-po-ugolovnoj-state-o-diskreditatsii-armii/

Insert 8

Overview of key decisions made by the President of the Russian Federation (February 22 – April 18, 2023)[59]

February 28, 2023 – Federal Law "On suspension by the Russian Federation of the Treaty between the Russian Federation and the United States of America on Measures for the Further Reduction and Limitation of Strategic Offensive Arms". According to the note of the State Legal Department, "the American party purposefully fails to fulfill its obligations under the Agreement in this field of activity. In this regard, the Federal Law suspends the operation of the Treaty" (we are talking about the agreement between Russia and the United States on measures for the further reduction and limitation of strategic offensive arms, signed on April 8, 2010).
February 28, 2023 – Federal Law "On denunciation by the Russian Federation of the Criminal Law Convention on Corruption". The Russian Federation denounces the Convention and terminates participation in GRECO (Group of States against Corruption), since the Council of Europe decided to terminate Russia's full membership in GRECO and deprive Russia of the right to participate in the discussion or adoption of reports, as well as the right to vote.
February 28, 2023 – Federal Law "On termination of international treaties related to the Council of Europe with respect to the Russian Federation". On March 16, 2022, the Committee of Ministers of the Council of Europe, grossly violating the Charter of the Council of Europe, adopted a resolution on the termination of Russia's membership in the Council of Europe from the same date. The Russian Federation proceeds from the fact that the Convention for the Protection of Human Rights and Fundamental Freedoms and other international treaties of the Council of Europe have ceased to be valid for Russia as of March 16, 2022.
February 28, 2023 – Federal Law "On amendments to the Federal Law "On the state language of the Russian Federation". Amendments are being made to improve the mechanisms for ensuring the use of the Russian language as the state language of the Russian Federation throughout the Russian Federation, expanding and specifying the areas in which the use of the state language of the Russian Federation is mandatory, clarifying the powers of federal government bodies aimed at protecting and supporting the state language of the Russian Federation.
March 18, 2023 – Federal Law "On amendments to Articles 13.15 and 20.33 of the Code of Administrative Offences of the Russian Federation". Public actions aimed at discrediting the provision of assistance by volunteer formations, organizations or persons in the performance of tasks assigned to the Armed Forces of the Russian Federation, if these actions do not contain signs of a criminal offense, are subject to administrative liability: a fine for citizens in the amount of 30 thousand to 50 thousand rubles; for officials – from 100 thousand to 200 thousand rubles; for legal entities – from 300 thousand to 500 thousand rubles.

[59] The Insert is a continuation of the monitoring of management decisions of the authorities, which we have been conducting since June 2022.
All the issues of the monitoring are presented in the articles:
1. Ilyin V.A., Morev M.V. (2022). A difficult road after the Rubicon. *Economic and Social Changes: Facts, Trends, Forecast*, 15(3), 9–41.
2. lyin V.A., Morev M.V. (2022). On the way toward crossing the inner Rubicon. *Economic and Social Changes: Facts, Trends, Forecast*, 15(4), 9–31.
3. Ilyin V.A., Morev M.V. (2022). The special military operation reveals new features of civil society. *Economic and Social Changes: Facts, Trends, Forecast*, 15(5), 9–32.
4. Ilyin V.A., Morev M.V. (2022). A framework for a new Social Contract is being formed in Russia. *Economic and Social Changes: Facts, Trends, Forecast*, 15(6), 9–34.
5. Ilyin V.A., Morev M.V. (2023). The President called on the officials of all levels to "stop fooling around". *Economic and Social Changes: Facts, Trends, Forecast*, 16(1), 9–34.

Continuation of Insert 8

March 31, 2023 – Decree "On approving the Concept of Foreign Policy of the Russian Federation". The main provisions are presented in Insert 1 *(pp. 11–20)*.
April 3, 2023 – Decree "On establishing the state fund "Defenders of the Fatherland" for the support of participants of the Special Military Operation. The fund was established "in order to create conditions that ensure a decent life and activity of participants of the special military operation, other persons and their family members". The founder is the Government of the Russian Federation. First deputy head of the Presidential Administration S.V. Kiriyenko was appointed chairman of the Supervisory Board of the fund; A.E. Tsivilev was appointed chairman of the fund. The fund and its branches carry out their activities in each constituent entity of the Russian Federation. The fund's activities are aimed at organizing and providing assistance to combat veterans who participated (assisted in the performance of tasks) in the special military operation; persons who participated in combat operations as part of the Armed Forces of the DPR, the People's Militia of the LPR, military formations and bodies of the DPR and LPR; members of their families.
April 3, 2023 – Laws on the integration of the DPR, LPR, Zaporozhye and Kherson oblasts into the judicial system of the Russian Federation.
April 3, 2023 – Federal Law "On amendments to certain legislative acts of the Russian Federation". The Investigative Committee of the Russian Federation and individual federal executive authorities, in accordance with the procedure determined by the Government of the Russian Federation, organize annual monitoring of the socio-economic and legal status of employees serving in these bodies, citizens dismissed from service in these bodies, their family members and persons who are (were) dependent on them, as well as consideration of the results of this annual monitoring.
April 3, 2023 – Federal Law "On amendments to the Federal Law "On state support of cinematography of the Russian Federation". The concept of "film for children and youth" is introduced, which means a film intended for viewing by children under the age of 18, aimed at educating the younger generation, created on the basis of a script and corresponding in subject matter, content and artistic and stylistic solution to the physical, mental, spiritual and moral development of children. It provides for the possibility of full state financing of the production and rental of national films for children and youth, which are feature films.
April 5, 2023 – Decree "On amendments to Presidential Decree 723, dated October 7, 2022 "On the application of additional special economic measures in the fuel and energy sector in connection with the unfriendly actions of some foreign states and international organizations".

End of Insert 8

April 14, 2023 – Federal Law "On amendments to certain legislative acts of the Russian Federation". The law establishes the procedure for military registration and conscription. Military registration, removal from military registration and amendments to military registration documents will be carried out without appearance of citizens in person. It established the obligation of citizens to receive summonses sent to them in writing and duplicated in electronic form. A citizen who has received a summons is obliged to inform about it personally within two weeks by appearing at the military commissariat, or through the State and Municipal Services Portal. Citizens who are subject to conscription for military service and who have not received a summons must appear in person at the military commissariat within two weeks from the date of the beginning of the next period of conscription for military service. Measures have been established in case of non-appearance for insufficient excuse:

- ✓ foreign travel ban,
- ✓ ban on the state registration of individuals as individual entrepreneurs,
- ✓ ban on the registration with the tax authority of an individual as a taxpayer applying the special tax regime "Tax on professional income",
- ✓ suspension of the registration of immovable property for state cadastral registration and (or) state registration of rights,
- ✓ restriction on the use of the right to drive vehicles,
- ✓ ban on the state registration of vehicles and the provision of loans.

April 18, 2023 – RF State Duma approved a new draft law "On citizenship". It provides for the possibility of deprivation of acquired Russian citizenship:

- ✓ for terrorist crimes, grave crimes against the state, as well as crimes in the sphere of trafficking in narcotic drugs and psychotropic substances, forgery of documents or at the voluntary request of a citizen;
- ✓ for public calls to action against the territorial integrity of the Russian Federation, discrediting its Armed Forces and participating in an undesirable foreign or international nongovernmental organization;
- ✓ for public calls to extremism, encroaching on the life of a statesperson and for organizing an armed rebellion in order to forcibly change the constitutional order of Russia and for committing actions that pose a threat to the national security of the Russian Federation;
- ✓ for the promotion of sabotage activities and training for the purposes of sabotage activities, as well as for the organization of sabotage communities.

The draft law provides for a reduction in the number of requirements for more than 20 categories of persons when they are admitted to Russian citizenship, as well as expanding the powers of the head of state to determine the category of persons who are entitled to simplified acquisition of citizenship of the Russian Federation.

Thus, the "ideology of healthy conservatism", which Vladimir Putin has been guided by throughout his presidential terms, on the one hand, causes some discontent among experts and society as a whole for the reason that **many internal problems are becoming stagnant and lingering, and the measures to neutralize them are "long overdue"**[60].

On the other hand, we cannot but admit that such a strategy has allowed the President over the past 20 years **to change the status of Russia from a country defeated by the Collective West in the Cold War (with all the ensuing consequences such as the collapse of the USSR and the 30-year hegemony of the victors), to the opportunity to publicly, at the legislative level, declare itself as a "country-civilization", the "core of the Russian world" that protects the right to exist and represents not only its own interests, but the interests of virtually all nation-states who openly and actively declare the inadmissibility of a unipolar world and the importance of national sovereignty.**

The new Foreign Policy Concept firmly states that Russia is no longer a modern liberal West. However, now this clear fact, which is still quite hard to believe, requires an equally clear continuation in domestic policy, based on a simple principle formulated by the head of state: "We had to do it ourselves. And we did it. And we did it better. And if we didn't have to, we wouldn't have done it"[61].

To declare the status and goals for the coming years is one thing; to defend these statements in the face of external threats is another; but no less important is the internal situation in the country – **the fact that the majority of representatives of all social strata support the general course implemented by the President. After all, "if Russia remains part of this world mentally, economically and socially in such a wobbly condition, then the bell will toll for it, too"**[62].

Public opinion trends indicate that time is ripe for Russia to have a domestic policy concept, which, as clearly and firmly as the Foreign Policy Concept, would set out the guidelines and algorithm to overcome its "mentally, economically and socially wobbly" state and strive toward a welfare state that ensures and protects the priority of traditional moral values, the possibility of implementing an independent foreign policy and social justice for the majority of its population.

[60] Presidential Address, March 1, 2018. Available at: http://www.kremlin.ru/acts/bank/42902

[61] Vladimir Putin's visit to the Tula Railway Engineering Plant on April 4, 2023. Available at: http://www.kremlin.ru/events/president/news/70859

[62] Fursov A. The end of the world system. Will the world's population decrease by 90%? Available at: https://denliteraturi.ru/article/7319

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Scenario Modeling of Tourism Services Consumption in Russia

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Abstract. Given the unstable geopolitical situation associated with the impact of economic sanctions imposed by Western countries, it is extremely important for Russia to ensure its own steady development pace. Saturating the domestic market with Russian-made high-quality goods and services, and promoting consumption that has declined because people significantly reduced spending due to rising prices, are becoming relevant goals. The task of stimulating domestic consumer demand determines the framework of development of the Russian economy in the near future. To address the issue, Russia possesses a great potential for the formation of new growth points. One of them is tourism, whose high multiplicative effect allows us to consider it as an economic driver. The main priorities for the development of the Russian tourism industry by 2030 are reflected in the national project "Tourism and the hospitality industry". In the context of economic uncertainty, there is an increasing need to improve the quality of management decisions in the tourism sector. In this regard, the purpose of the work is to develop forecasting tools for scenario modeling and assessment of economic effects obtained due to changes in the volume of domestic tourist consumption. Scientific novelty of the research lies in the development of input-

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output modeling methodology to determine the economic effects provided by the growth of demand for domestic tourism services. The results of the study have shown that active development of tourism under the optimistic scenario will provide an almost twofold increase in the volume of gross output annually in comparison with the existing rates of tourist services consumption. We use general scientific methods of analysis, synthesis, comparison, generalization, and tools based on input-output methodology. The information base includes the works of domestic and foreign scientists involved in stimulating domestic tourist consumption, scenario modeling and forecasting of the economy, as well as information from state statistics bodies and World Bank data.

Key words: domestic tourist consumption, tourism, domestic tourism, scenario modeling, final consumption, domestic demand.

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Introduction

The rapid worsening of the geopolitical situation in 2022, which caused increased sanctions pressure from Western countries, has exacerbated a long-standing problem of the Russian economy – insufficient demand for domestic goods and services due to a narrow domestic market. The focus over the past decades on the export of raw materials, dominated by low-added-value goods, has not contributed to its development, which hampered the investment and innovation activity of enterprises. Under current conditions, the question of modernizing the Russian economy in order to complicate its structure and improve the quality of growth has become urgent. The strategy of domestic consumption development, reducing risks and dependence on external demand, dictates the need for high rates of accumulation and consumption in the gross domestic product of the country with low values of imports and exports. This economic model is implemented in the USA, Japan and, recently, in China[1].

In May 2022, it became clear that the Russian economy in its development will be based on the domestic market, as stated in the report of the Bank of Russia on monetary policy[2]. The content of a new model of economic growth based on domestic consumption, supported by industrial and consumer demand, is currently being worked out. Ministry of Economic Development of the RF connects special prospects with the active development of the market of housing construction and the sphere of housing and communal services, agricultural sector, people's expenditures of the population on cultural services, sports and domestic tourism[3]. These areas are considered to be the main drivers of the domestic market. As noted in the academic environment, current developments provide new opportunities for producers by occupying freed up market niches (Kuvalin, 2022). However, the

[1] According to the World Bank, in the USA in the third quarter of 2022 the household share of GDP was 68.2%, savings rate – 17.8%, export – 11.9%, import – 15.4%, in Japan in 2021 – 56.1%, 25%, 20%, 19%, in China – 54.3%, 42.6%, 20% and 17% respectively.

[2] Report on Monetary Policy. Bank of Russia. May 11, 2022. Available at: https://www.cbr.ru/Collection/Collection/File/40972/2022_02_ddcp.pdf

[3] Maxim Reshetnikov presented a medium-term forecast of socio-economic development of the country in the Government of the RF. Available at: https://www.economy.gov.ru/material/news/maksim_reshetnikov_o_prognoze_socialno_ekonomicheskogo_razvitiya_strany_do_2025_goda.html

structural transformation of the economy in the direction of increasing supply within the country requires not only restructuring production processes and creating conditions for import substitution, but also ensuring the growth of citizens' incomes. Without solving this problem, it will not be possible to effectively use the consumer potential of households, whose contribution to the country's economy was almost 50% in 2021. According to the scientists' calculations, "the level of real incomes at the beginning of 2022 was 9% lower than their maximum level for 30 years of the new Russia, achieved in 2012–2013" (Aganbegyan, 2022).

In recent years, notable steps have been made with regard to the growth of citizens' spending on domestic tourism. Since 2020, as a direction of support for domestic consumer demand during the pandemic coronavirus infection, the Russian government has actively stimulated the consumption of tourist services by the population through the introduction of tourist cashback – a program for subsidizing travel in Russia. Its effect was extended for the years 2021–2022 in the framework of the national project "Tourism and hospitality industry", launched in 2021 and designed until 2030. In total, over the two-year period, 4.5 million people took advantage of the offer, receiving a total of 18 billion rubles[4]. In 2021–2022, thanks to the realization of the children's cashback, 1.2 million children were sent to recreation camps, and 14.2 billion rubles were returned to their parents' bank cards. The implementation of a pilot project since 2022 on the popularization of travel within the region for schoolchildren of 5th–9th grades by issuing free certificates, in which 18 constituent entities of the country took part, was a continuation of the policy related to the support of domestic tourism consumption[5]. According to estimates, about 100,000 children used the certificates.

The effect of tourist cashback has been positively evaluated by the authorities, noting its total effect on the economy in more than 100 billion rubles[6], by representatives of the tourism business, stating that the action has attracted at least 50% of tourists who had decided to travel around the country only through this program[7], and by the scientific community. Scientists have calculated, that the stimulation of domestic tourism consumption by citizens of the country in 2020 increased the volume of gross output in the economy as a whole, caused an increase in the wage fund and the number of employees (Leonidova, 2021).

At the end of 2022 there were changes in the management structure of Russian tourism: Rostourism was eliminated, and the industry itself was transferred to the direct subordination of the RF Ministry of Economic Development for a more efficient solution of issues, related to the goals of the national project in tourism, primarily the implementation of large infrastructure tourism projects. At the time of writing, the decision to extend the program of subsidizing tourist travel around the country has not been made. Experts associate the uncertainty on this issue with changes in the conditions for tourist cashback, taking into account the introduction of need criteria[8], and a shift in tourism policy priorities in the direction of increasing not demand, but supply by providing funds for infrastructure development[9].

[4] Data from the web portal "National projects. RF". Available at: https://xn--80aapampemcchfmo7a3c9ehj.xn--p1ai/

[5] Ibidem.

[6] Dmitry Chernyshenko: Most indicators of the national project for tourism overfulfilled by the end of the year. Available at: http://government.ru/news/45422/

[7] A new promotion with a cashback for tours in Russia will start in January 2022. Available at: https://www.atorus.ru/news/press-centre/new/58041.html

[8] The government wants to target tourist cashback to low-income people. Available at: https://www.vedomosti.ru/economics/articles/2022/10/17/945818-turisticheskii-keshbek-maloobespechennih

[9] Minister of Economic Development chose the strategy to reduce prices for domestic tourism. Available at: https://profi.travel/news/56519/details

Scholars emphasize the importance of drafting socio-economic development scenarios and justifying economic policy measures, aimed at harnessing its domestic potential (Shirov et al., 2022). The results of the scientific publications analysis show, that the consequences forecast for the economy from the management decisions made in the tourism industry, is not given enough attention. In addition, there is no official methodology for calculating the contribution of domestic tourism to the economy in Russia. In this regard, the purpose of our study is to conduct scenario modeling and assess the economic effects of changes in the volume of domestic tourism consumption. To achieve it, it is necessary to generalize theoretical approaches to the study of the features of the tourism impact on the economy, to identify the dynamics of domestic tourism development in Russia, to test a methodological approach for assessing the effects and modeling the changes in economic parameters of government stimulation of domestic tours purchase and to develop proposals on the results of calculations.

Despite the fact that in the Tourism Satellite Account (TSA)[10] the volume of domestic tourism consumption includes not only tourist expenditures of the country's resident, but also expenditures of non-residents, that is inbound tourists, in our study we consider only domestic tourist consumption, because inbound tourism in Russia is poorly developed.

It should be noted that Rosstat does not consider separately the impact of domestic tourism on the country's economy, it makes it difficult to assess the economic effect of its development. Currently the gross value added (GVA) of the entire tourism industry by country and region, its share in GDP and GRP, approved by Rosstat in 2022, is calculated. This indicator does not take into account the entire output of tourism goods and services, representing the difference between its value and intermediate consumption. It is measured by the set of production units classified as "Tourism" in the OKVED-2 classifier[11]. According to experts[12], in addition to the types of economic activity directly related to tourism (hotels, travel agencies, museums, etc.), it also includes those types of economic activity, whose goods and services are consumed not only by tourists. This leads to overestimation of indicators, and also affects the quality of industry management. Thus, the actual scientific problem is the lack of methodological tools that allow us to adequately assess the volume of domestic tourism consumption, generated by residents of the country, in the economy and to forecast its dynamics. In the framework of the analysis and generalization of methodological approaches to the above problems, it was revealed that the method of input-output balance will help to give an objective assessment of the change in the volume of domestic tourism consumption; in this regard, we need to develop our methodology to solve this problem in the Russian context.

The information base was the works of Russian and foreign scientists engaged in the study of domestic tourism consumption, scenario modeling and economic forecasting, and information from state statistics, the World Bank data.

The scientific novelty of the study lies in the development of the methodology of input-output model in order to determine the effects on the country's economy as a result of the growth of public demand for domestic tourism services.

[10] Satellite tourism account is a popular method for measuring the direct contribution of tourism consumption to the national economy, which is connected to the system of national accounts. The basis for TSA data is the survey's results of households, tourism organizations and tourists. At present, TSAs are regularly compiled in Canada, the USA, Spain, the Netherlands and other states. Source: Tourism Satellite Account: Recommended Methodological Framework, 2008. Department of Economic and Social Affairs. Statistical Division. Luxembourg, Madrid, New York, Paris, 2010.

[11] Available at: https://rosstat.gov.ru/storage/mediabank/met%2036_25.01.2022.pdf (accessed: September 12, 2022).

[12] Point of view: tourism statistics in Russia is still destined to be "exaggerated". Available at: https://www.tourdom.ru/news/tochka-zreniya-statistike-turizma-v-rossii-po-prezhnemu-suzhdeno-byt-dutoy.html (accessed: September 12, 2022).

Theoretical aspects of the study

The relationship between tourism and the economy has been proven in the scientific literature for quite a long time, empirically confirmed by the TLG (Tourism-Led Growth hypothesis), according to which there is a strong correlation between GDP growth and the development of tourism in the country. Tourism is seen as part of exports because it serves as a source of foreign exchange earnings and increases consumption in the country hosting tourists (McKinnon, 1964). Scholars have introduced the economic category of "tourist consumption", which includes all expenses of the tourist for goods and services consumed during his/her stay, and also for goods and services produced by various sectors which directly contribute to increasing tourism consumption (Baretje, Defert, 1973).

Subsequently, the positive impact of the sector on the emergence of new infrastructure (Balaguer, Cantavella-Jordá, 2002), employment, human capital growth, technology diffusion (Schubert et al., 2011) has been proven. Currently, the research focus has shifted to the study of the relationship between tourism growth and income inequality. Thus, on the example of ten leading tourist destinations of the world, using quantile regression, a negative relationship between tourism growth and income inequality was revealed in China, France, Spain, Italy, Russia and the USA (Raza et al., 2023). This means that industry development minimizes income inequality. On the other hand, there is a strong positive relationship between the two variables in Germany, Turkey, Mexico and the United Kingdom, meaning that tourism growth increases income inequality.

In general, many scholars emphasize that the impact of international tourism on a country's economic growth is the most widely studied, while the number of studies related to domestic tourism is limited (Lee, 2021; Nguyen et al., 2021). A surge of interest in domestic tourism was noted after the COVID-19 pandemic, in which it became not only a catalyst for the recovery of the tourism sector in many countries (Rogerson, Rogerson, 2021), being more resistant to COVID-19 effects than international tourism (Duro et al., 2022), but also acted as a crucial element of economic recovery in general (Arbulú et al., 2021; Gossling et al., 2021; Kreiner, Ram, 2021; Woyo, 2021). Some papers point out that domestic tourism is characterized by domestic demand and domestic supply, relatively independent of international shocks, which, along with its benefits for the economy (job creation, contribution to investment and production) is a factor in reducing economic vulnerability (Canh, Thanh, 2020).

In Russia, recent interest in the study of domestic tourism and its economic evaluation is also increasing. The authors raise the problem of finding new strategic vectors of its development in the changed geopolitical conditions and the effect of the coronavirus pandemic on it (Simonyan, Saryan, 2022). It is stated that without increasing the incomes of citizens it would not be possible to achieve the goal of the national project "Tourism and hospitality industry" – a 2-fold increase in the number of travels in the country by 2030. Scientists conclude that due to the low level of citizens' income so far there is no reason to increase the demand for tourism, and the fulfillment of the declared indicators is possible only by increasing the frequency of solvent population's trips. The decline in purchasing power remains a constraint for the development of domestic tourism (Donskova et al., 2022). There is also an uneven distribution of tourist demand between territories (Leonidova, 2022), the presence of intraregional disproportions between the size of the tourist flow and the development of tourism infrastructure (Ivanov et al., 2022).

The problems of domestic tourism impact on the economy, including the tools of its quantitative assessment, are most developed in the works of foreign authors. Modeling domestic tourism using correlation and regression analysis is popular in the scientific literature (Zulyaev, 2017; Nikolenko,

Terekhov, 2022), although such forecasts usually characterize the impact of any factors on the industry, without considering industry effects, and "in some cases prove to be inaccurate" (Athanasopoulos et al., 2011).

A summary of the findings (Kronenberg et al., 2018; Tohmo, 2018; Li et al., 2019; Patandianan, Shibusawa, 2020; Liu, 2022) shows that foreign researchers have recently been increasingly interested in input-output analysis as a tool to determine the contribution of domestic tourism to the economy. With the help of this method it is possible to investigate the structural relationships both in the economy as a whole and on the example of individual industries; in addition, to forecast how the total output will change with an increase in final consumption in the sector under consideration (Artal-Tur et al., 2020), to assess its multiplier effect (Loban, Shepelevich, 2015). Noteworthy is the study on measuring the economic impact of domestic tourism in the COVID-19 pandemic, with the example of China's most populous province of Guangdong[13] (Wu et al., 2022). The authors have attempted to develop a regional tourism satellite account, using a "bottom-up" approach, based on data from sociological surveys on the expenditures of area visitors, input-output tables. The results of the calculations allowed us to estimate the direct contribution of domestic tourism to the economy of Guangdong province in the pre- and post-pandemic period.

It should be noted that the measurement of domestic tourism consumption in Russia is complicated by imperfect statistical information (Krivosheeva, 2020), because the tourism satellite account is not developed, and the data of input-output tables are published with a long delay, significantly limiting research activities. Nevertheless, let us name a number of works (Lukin et al., 2018; Leonidova; 2021; Leonidova et al., 2022), in which, based on the author's methods, their suitability for solving this kind of problems is proved. Thus, due to the wide analytical capabilities of the toolkit and the need for its development in the Russian context, it seems appropriate to use it to assess the economic dynamics of the changes in the policy conducted in the field of tourism.

Research methodology

General scientific methods of analysis, synthesis, comparison and generalization were used to identify trends in domestic tourism consumption in Russia and to develop proposals for its further increase. The development of forecast scenarios for changes in its volume is based on the application of statistical analysis methods, taking into account the trends characterizing the dynamics of domestic tourist trips, determined by the number of Russians staying in collective accommodation facilities.

The following scenarios were used in the implementation of the variable forecasting.

1. The optimistic scenario based on the value of the target indicator of the national project "Tourism and hospitality industry" of 140 million trips by 2030, which is 2.1-fold above the level of 2019. It was determined that the exponential trend function has the highest R^2 for this scenario.

2. The realistic scenario, the implementation of which involves maintaining the average growth rate of 7.3% over the years 2010–2021.

3. The pessimistic scenario based on a growth rate with a decrease of 3.78% each year, demonstrated in 2020, to take into account the effects of the decline from the coronavirus pandemic in the modeling. The study of 2020 crisis parameters makes it possible to model more accurately the worst-case scenario of changes in the volume of domestic tourist consumption. The method of input-output balance was used during the estimation of the effect on the economy, which gives an opportunity to conduct a scenario input-output modeling. As a forecasting tool, we used an input-output model

[13] According to the census, there were 126.012 million people in Guangdong province in 2020.

based on the main equation of the input-output balance, which in matrix form is as follows:

$$x = Ax + y, \quad (1)$$

where x – vector of total output of production; A – matrix of direct cost coefficients; y – final product vector.

As part of the modeling, we used the following equation:

$$(E - A)^{-1} \cdot y = x, \quad (2)$$

where E – unit matrix; $(E - A)^{-1}$ – matrix of total cost coefficients.

The calculation of the final output volume of tourism generated by domestic consumption is based on the tools proposed in the studies (Leonidova, Sidorov, 2019; Leonidova, 2021; Leonidova et al., 2022, Leonidova, Sidorov, 2023), extended by specifying statistical data. The volume growth forecast is based on the use of an input-output model of the Russian economy. The study assumes that the structure of leisure spending by domestic tourists of the Republic of Kazakhstan and the RF is similar due to the socio-economic, cultural and mental proximity of these countries. It is based on information from sociological surveys and the Tourism Satellite Account of Kazakhstan, according to which Russian and Kazakh tourists when traveling within the country spend approximately the same amount of money on the main items of recreation spending. The following information was used to estimate the volume of tourist output in the Russian Federation:

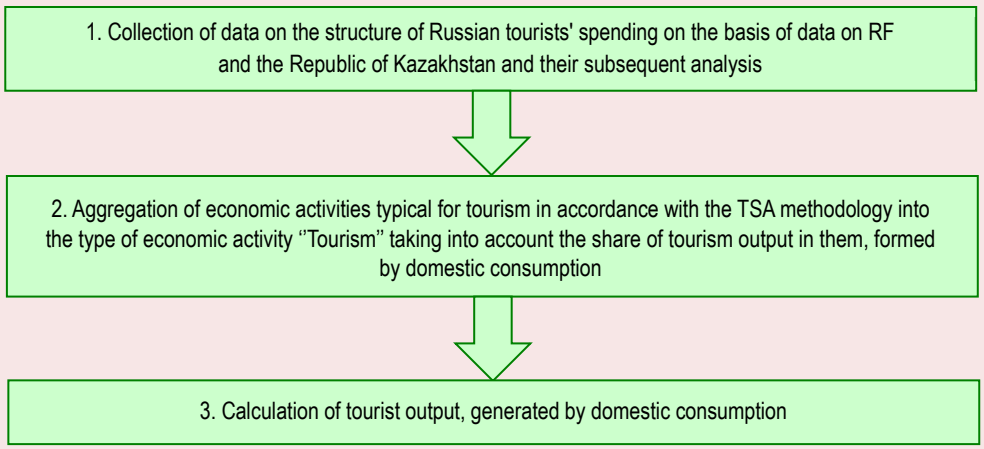
– data from a sociological survey[14] of tourists on the amount of spending by Russians on one trip and its distribution;

– data from the Tourism Satellite Account of the Republic of Kazakhstan on the cost structure of domestic tourists traveling for personal and business purposes;

– EMISS data characterizing the production and shipment of goods, works and services.

Determining the volume of tourist output in the Russian Federation is based on an algorithm shown in *Figure 1.*

Figure 1. Scheme of determining the volume of domestic tourism output in the Russian Federation economy



Source: own compilation.

[14] A sociological survey of the travel service Tutu.ru. Available at: https://travelvesti.ru/news/skolko-rossiyane-tratyat-na-puteshestviya-i-kak-raspredelyayut-byudzhet-poezdki.html (accessed: September 12, 2022).

Thus, in accordance with the algorithm, the volume of domestic tourism output in the RF is calculated by isolating from the types of economic activities, presented in the Russian qualifiers, the share that is caused by the consumption of domestic tourists, and their subsequent aggregation in the type of economic activity "Tourism". The volume of domestic tourism output is determined in constant prices.

Main results of the research

Trends in the consumption of tourism services by the population in the Russian Federation

According to the World Tourism Organization, in the pre-pandemic period in the world there were about 9 billion domestic tourist trips, which was 6-fold higher than the number of international trips[15]. According to researchers' estimates, about 85% of tourist trips in the world came from the domestic market (Hall, 2015). Residents' expenditures on domestic vacations are much higher than those of international tourists, which allows us to say that the contribution of tourism to the economy is ensured by the domestic tourism development *(Fig. 2)*.

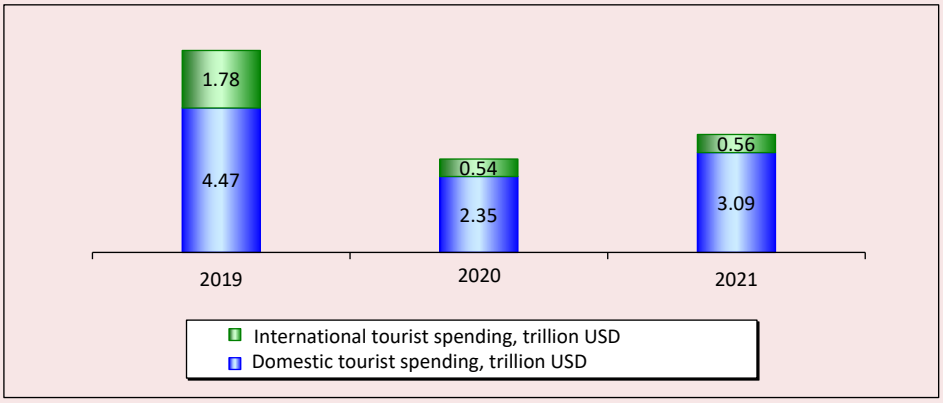
It is worth noting that, globally, total travel spending in 2021 increased by 26% after a sharp decline in 2020 due to the coronavirus pandemic, amounting to $3.65 trillion. However, the indicator value remained below the pre-pandemic level.

Among the world's largest domestic tourism markets in terms of the number of tourist trips are China, the USA and India, mainly because of their large population and area. The USA, China and Germany are the world leaders in terms of domestic tourist spending *(Table)*.

It is worth noting that in Russia, the assessment of domestic tourism flow, determined by the number of trips, is carried out by Rosstat only since 2022, which makes international comparisons for an earlier period difficult.

The volume of domestic tourist spending in Russia is much lower than the global average, which reduces the contribution of the tourism industry to its economy. At the same time, the country has a high potential for increasing domestic tourism consumption, the realization of which is constrained by a lack of both demand and supply. This explains the fact that for a long time there has been a steady tendency for Russians to spend their holidays not on trips, but at home or at their dacha (in 2015 – 63%, in 2022 – 61%; *Fig. 3*).

Figure 2. Total global travel and tourism expenditures from 2019 to 2021 by type of tourism (in 2021 prices)



Source: WTTC, Oxford Economics, Statista. Available at: https://www.statista.com/statistics/1337656/travel-and-tourism-spending-worldwide-by-tourist-type/ (accessed: February 10, 2023).

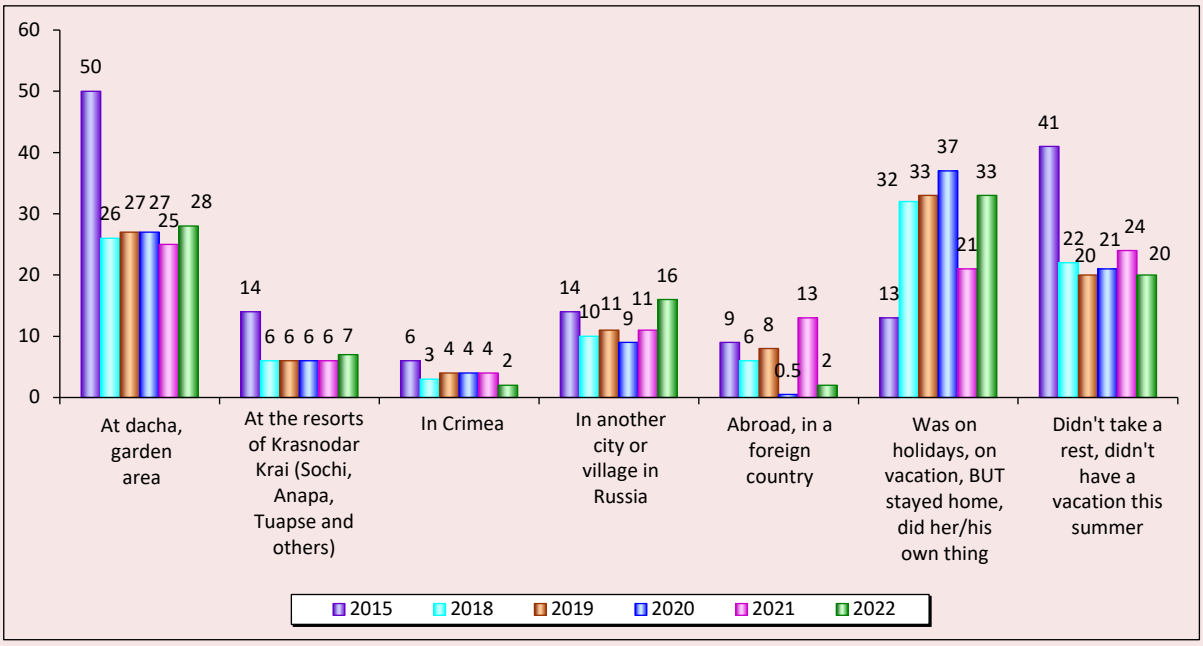
[15] UNWTO Briefing Note – Tourism and COVID-19, Issue 3. Understanding Domestic Tourism and Seizing its Opportunities. Available at: https://doi.org/10.18111/9789284422111

Indicators of tourism development in the countries of the world (in prices of 2021)

No.	Country	Expenditures of domestic tourists, billion USD			Expenditures of inbound tourists, billion USD			Number of domestic tourist trips, million units		
		2019	2020	2021	2019	2020	2021	2019	2020	2021
1.	USA	1085.5	571.7	731.5	190.9	39.8	40.3	2318.0	1580.0	2040.0
2.	China	931.8	365.6	458.7	147.4	19.4	14.1	6005.0	2879.0	3246.0
3.	Germany	321.3	200.4	212.2	52.6	22.0	24.6	1609	85.6	85.1
4.	India	155.8	97.0	151.1	34.3	14.5	8.8	2321.9	610.0	677.6
5.	Japan	214.4	95.5	134.0	47.3	10.6	1.0	587.1	293.4	268.2
6.	Mexico	149.6	108.0	130.4	27.1	12.9	20.4	101.7	48.0	no data
7.	United Kingdom	186.5	75.1	118.2	43.6	9.1	4.7	1.775	no data	no data
8.	Italy	116.8	66.8	117.9	50.7	19.1	22.9	132.8	74.6	73.0
9.	France	128.4	67.7	102.6	66.3	32.9	43.9	260.5	212.0	251.6
10.	Brazil	80.9	53.4	694	5.1	3.2	2.9	no data	13.3	12.2
For reference: Russia		44.1	26.7	39.6	16.5	5.3	6.0	no data	no data	no data

Sources: OECD (2022), OECD Tourism Trends and Policies 2022, OECD Publishing, Paris. Available at: https://doi.org/10.1787/a8dd3019-en, Available at: https://www.oecd-ilibrary.org/sites/a8dd3019-en/1/1/index.html?itemId=/content/publication/a8dd3019-en&_csp_=dd10a6327bf40b05da33e7fa1f979e3e&itemIGO=oecd&itemContentType=book; World Tourism Organization. Available at: https://www.unwto.org/tourism-statistics/key-tourism-statistics; World Travel and Tourism Council. Available at: https://wttc.org/research/economic-impact

Figure 3. Distribution of Russians' answers regarding vacations (VCIOM poll, any number of answers), % of respondents



Source: The results of summer vacation – 2022. VCIOM. Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/dacha-ili-kurort-gde-otdykhali-rossijane-ehtim-letom (accessed: January 10, 2023).

However, in 2022 there is quite a noticeable increase in travelers in Russia (+6 p.p. compared to 2018 and +5 p.p. compared to 2021). It is noteworthy that among all those who spent a vacation in 2022, the most numerous category is young people from 18–24 years old – their share is almost 30%. This was facilitated by an active policy for the development of domestic tourism in recent years, one of the most notable measures of which was the introduction of the tourist cashback program. According to opinion polls, the population is well aware of it. Thus, the number of Russians who know about this offer has significantly increased, from 56% in 2020 to 72% in 2022[16]. Also, according to VCIOM surveys, the population is informed about the implementation of the national project "Tourism and the hospitality industry". At the end of 2022, 64% of respondents were familiar with it, and awareness of it has increased since last year (by 5 p.p. by 2021), which made it one of the five national projects with the highest increase in recognition among the population[17]. According to 63% of respondents, the government's efforts to develop this sphere are very noticeable. Among the most notable improvements in the implementation of the national project, Russians especially noted an increase in the variety of recreation offerings (77%) and improved awareness of attractive areas to visit (76%).

The growth of domestic tourism in recent years is confirmed by official statistics *(Fig. 4)*. For example, in 2021, the highest number of Russians sent by travel agencies to vacation in Russia in the last decade was recorded – almost 6 million people, which is higher than the pre-pandemic value (2019) by 36%.

The growth in the number of visitors to hotels and other accommodations in 2021 is almost close to the pre-pandemic level of 2019 *(Fig. 5)*.

Increased interest in domestic vacations is also registered in the segment of river cruises. Thus, according to estimates of the Ministry of Transport of Russia, the volume of river transportation in 2022 increased by 35% to the level of 2019 and 2021[18]. According to the forecasts of Rostourism, the flow of cruise tourists, represented mainly by Russian travelers, by the end of 2022 should be at least 700 thousand people[19]. Among the popularity factors of river cruises among population in 2022 experts named action of tourist cashback program which caused demand for river cruises by 25–30%[20]. On the whole the river cruise market turnover at the end of the year increased by 30% and amounted to 25 billion rubles[21].

Thus, all of the above allows us to say that the tourist cashback program stimulates domestic consumption in the country. Achieving the indicators of domestic tourism development, set in the strategic documents, requires the elaboration of forecast scenarios of changes in the volume of domestic tourist consumption and assessment of the impact of these processes on the country's economy.

[16] Superjob.ru research center. Sociological survey. Location of the survey: Russia, all districts. Number of settlements: 360. Time of the survey: August 29–31, 2022. Target population: the economically active population of Russia over 18 years old. Sample size: 1,600 respondents. Available at: https://dzerzhinskiy.superjob.ru/research/articles/113645/osvedomlennost-rossiyan-o-programme-turisticheskogo-keshbeka-vyrosla/

[17] National projects – 2022: Plans and results. VCIOM. Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/nacionalnye-proekty-2022-plany-i-rezultaty

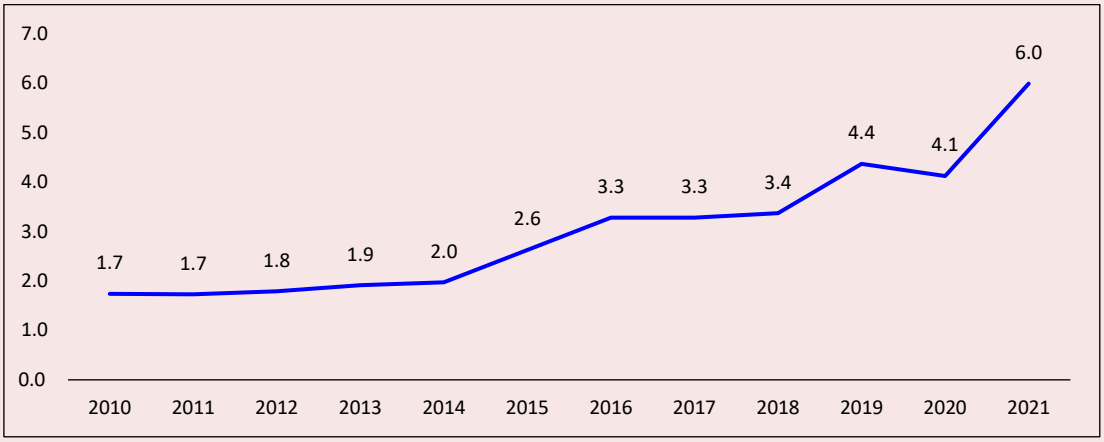
[18] Sidorikhina I. "We don't need the Turkish coast". Available at: https://expert.ru/2023/01/25/ne-nuzhen-nam-bereg-turetskiy/

[19] Rostourism: 700 thousand tourists are going to go on river cruises in 2022. Available at: https://www.atorus.ru/news/press-centre/new/59671.html

[20] Cashback on river cruises may end early, too. Available at: https://www.atorus.ru/news/press-centre/new/59350.html

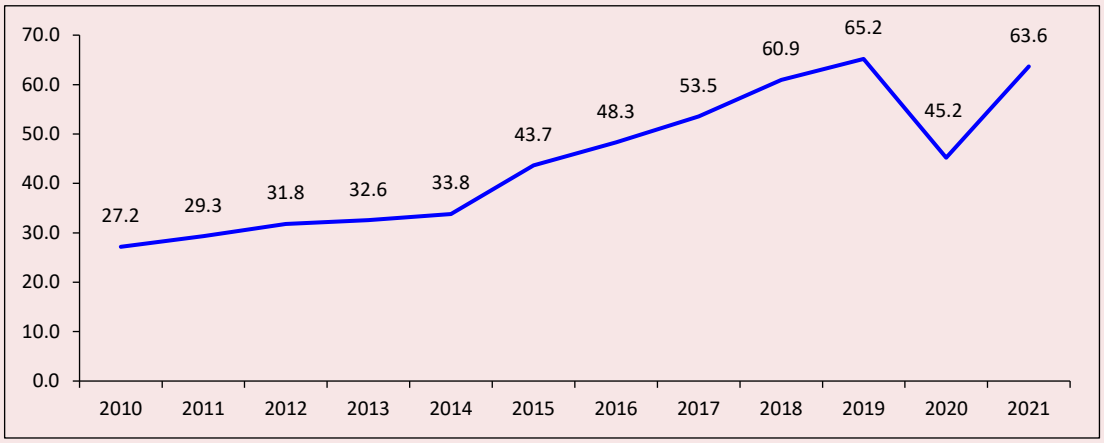
[21] Turnover of Russian river cruise market in 2022 increased by 30% – up to 25 billion rubles. Available at: https://portnews.ru/news/341680/

Figure 4. Dynamics of the number of Russians sent on tours in Russia, million people



Source: Rosstat.

Figure 5. Dynamics of the number of Russians placed in collective accommodation facilities, thousand people



Source: EMISS.

Assessing the effects of stimulating domestic tourism consumption

Comparative results of forecasting the volume of domestic tourism consumption according to the three proposed scenarios are shown in *Figure 6*.

The optimistic scenario takes into account the guidelines laid down in the national project "Tourism and the hospitality industry" and suggests an increase in the indicator by 2.1-fold from the level of 2019, caused by the growth of demand for travel due to the implementation of infrastructure projects, increasing incomes of citizens, improving the transport accessibility of tourist routes, etc.

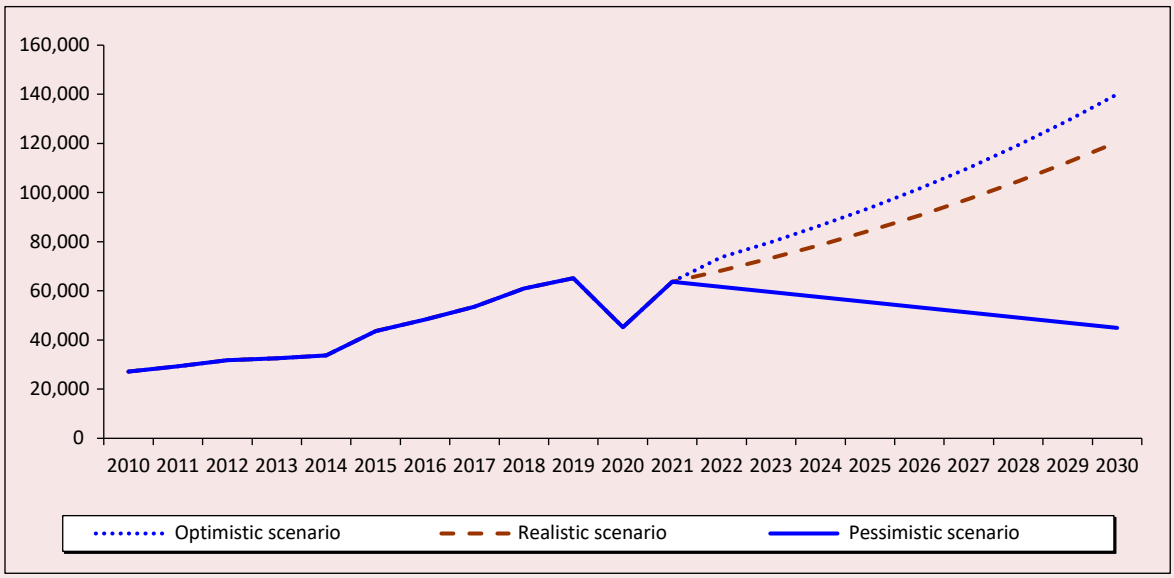
The realistic scenario is based on the fact that the frequency of trips will remain at the level demonstrated in 2010–2021. This option does not involve active stimulation of domestic tourist consumption. It characterizes the slow development of the tourism industry and the lack of additional financial opportunities for the population to increase spending on recreation.

The implementation of the pessimistic scenario provides for a decline in tourist activity, noted in 2020. It illustrates the "survival" of the industry, stagnation or further decrease in incomes of Russians, reduction of tourism financing due to reorientation of the state to other, more significant projects.

The use of input-output modeling made it possible to calculate the effect on the economy of the country under three different scenarios of change in the volume of domestic tourism consumption *(Fig. 7)*.

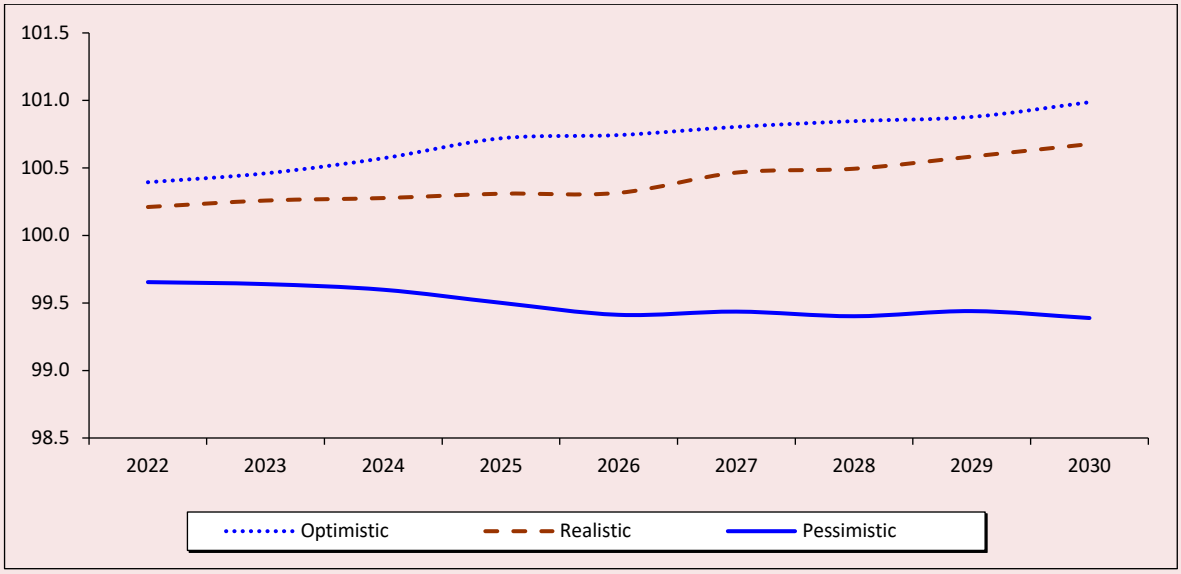
Calculations based on the formed input-output model of the Russian economy, taking into account the multiplier effects generated by the tourism industry, allowed us to determine the importance of stimulating travels of citizens around the country. If the conditions for implementation of the pessimistic scenario occur, the gross output will be reduced by an average of 0.5% annually.

Figure 6. Forecast of the number of domestic tourist trips from 2022 to 2030 depending on the development scenario, thousand people



Source: own calculations.

Figure 7. Forecast of the change rate of output volume in the Russian economy depending on the change in the volume of domestic tourism consumption, % to the previous year



Source: own calculations.

At the same time, the active development of tourism within the framework of the optimistic scenario will give the economy an additional increase in gross output by 0.7% per year. This is almost twice as much as if the existing consumption rates are maintained in the framework of the realistic scenario.

Thus, the use of the methodology of input-output balance has helped us to perform scenario modeling of changes in the volume of domestic tourism consumption and assess its impact on the Russian economy. The results of the calculations prove the importance of the policy to increase public spending on recreation, providing positive economic dynamics.

The importance of continuing to stimulate domestic tourism consumption is pointed out by representatives of the tourism business. Thus, according to experts, the cancellation of the stimulating subsidy program for tours around the country will lead to a decrease in the volume of tourist traffic in the off-season by 10–15%, hitting Krasnodar Krai and the Moscow Oblast the hardest[22]. According to the Association of Tour Operators of Russia, in 2023, the rise in prices for recreation in Russia will be between 5 and 20%, mainly due to an increase in the cost of transport services[23]. According to a sociological study by Ipsos, in 2023, of the total number of respondents who refuse to travel, the share of those who do not plan a trip because of the high cost was 59% (for comparison: in 2022 it was 47%, and in 2020 – 37%)[24]. Thus, the contribution of domestic tourism to the country's economy may decrease in the near future, which requires the development of additional measures to support the demand for tours in Russia.

[22] Here we go: Tourist and children's cashbacks will not return in 2023. Available at: https://iz.ru/1470720/anastasiia-platonova/dokatalis-turisticheskii-i-detskii-keshbeki-ne-vernutsia-v-2023-godu

[23] ATOR: In 2023 Russians began to spend more on tours. Available at: https://tourism.interfax.ru/ru/news/articles/96330/

[24] Research: Beach holidays as a form of tourism in 2023 is most popular among Muscovites. Available at: https://www.atorus.ru/node/51753

Conclusion

Based on the results of the study, we made the following conclusions.

1. The obtained values of the effects on the economy from the growth of domestic consumption of tourist services determine the importance of increasing the tourist flow within the country.

2. Prospective is the continuation of the subsidy policy for tourist travel within the country, ensuring the growth of domestic tourism consumption.

3. To achieve a 2-fold increase in the number of tourist trips across the country by 2030, significant government efforts are required to stimulate domestic tourism. Analysis has shown that more than half of Russians have not traveled in recent years, mostly due to lack of money for this purpose. It seems that currently ongoing efforts to activate domestic tourist travel on the demand side (cashback, subsidizing programs of domestic commercial air passenger charters), although contributing to an increase in sales of tours around the country and the opening of new destinations for tourists, but largely serve to support the industry in times of crisis. They attract the part of the population that has made tourist trips before, including abroad, to travel within the country. In this regard, it is advisable to expand measures to stimulate tourist travel within the country, aimed primarily at increasing the share of those who travel among low-income groups of the population. Thus, "the gap in spending on recreation between the tenth and the first decile groups is 35-fold" (Shirov, Potapenko, 2020), which significantly limits the ability of part of the population to consume tourist services. A significant reduction in the level of income differentiation is required. If favorable conditions for the development of outbound tourism occur, the volume of consumption of tourist services within the country may decrease due to the reorientation of the wealthier part of the population to outbound destinations, previously replaced by recreation in Russia.

It is also necessary to revise the method of calculating the domestic tourist flow volume, which currently characterizes the frequency of hotel services use. The unorganized tourist flow remains unaccounted for.

In this regard, it is possible to adapt the tourism satellite account methodology to Russian conditions or conduct large-scale statistical studies of households' consumption of tourist services, to clarify the structure of their expenditure on tourism, to account for domestic tourist flows, to determine the output generated by domestic tourism without reference to the place of enterprises' registration. Alternatively, Big Data can be used to analyze tourist activity within the country, reflecting a "portrait" of a tourist on the basis of bank card transactions or SIM card geodata. Currently, such services are already used in some Russian regions and have proved themselves positively, helping to assess the popularity of areas, the number and spending of their residents and guests.

The implementation of these areas will allow us to clarify the volume of sales of tourist services consumed by residents within the country, which contributes to the growth of profitability of the industry and, given its multiplier effect, the economy as a whole.

The research significance of the study is to develop a methodology for input-output modeling of the effects on the economy of growth in demand for goods and services of domestic tourism, and the justification of its development ways, taking into account the ongoing modern socio-economic processes. The practical significance lies in the possibility of using the results obtained by the authorities for a better understanding of the current situation in the tourism sector and the development of its strategic priorities. The next stage of work will include a study of the impact on domestic tourism consumption of infrastructure tourism projects and the identification of factors contributing to its increase.

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Strengthening Fiscal Decentralization to Reduce the Heterogeneity of Russia's Economic Space

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Abstract. According to a number of strategic documents, Russia's economic space is characterized by high heterogeneity. To reduce it, Russian and foreign researchers propose to strengthen fiscal decentralization. The study aims to find out whether using this method in Russia will allow achieving the desired result. An answer can be obtained by conducting a regression analysis of the dependence of the scale of heterogeneity of the economic space on the degree of concentration of budget revenues and expenditures at the federal level. In the course of the research, we develop a new method for quantifying the level of heterogeneity of the economic space of a territory; the method requires constructing a figure in a rectangular coordinate system and finding its area. The advantage of this method for assessing the scale of heterogeneity of Russia's economic space is that it allows us to take into account both major indicators – the volume of GRP and the volume of GRP per capita, since so far it has not been

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determined which of them is a numerical indicator of a region's economic development level. Having assessed the scale of heterogeneity of Russia's economic space for the period from 2000 to 2021 with the help of the above method, we conclude that strengthening fiscal decentralization will reduce the heterogeneity of Russia's economic space. In particular, a 1% decrease in the concentration of budget expenditures at the federal level may lead to a 12.6% decrease in heterogeneity. Proceeding from this conclusion, we put forward some ways to reduce the share of federal budget expenditures in the total volume of the expenditure part of the consolidated budget.

Key words: heterogeneity of economic space, geometric method of estimation, concentration of budget expenditures, federal level, fiscal decentralization.

Introduction

According to Paragraph 20 of the National Security Strategy of the Russian Federation, approved by Presidential Decree 400, dated July 2, 2021, the socio-economic problems in Russia cause unfriendly countries to impose various sanctions against it. In accordance with Item 24 Paragraph 12 of the Economic Security Strategy of the RF for the period through to 2030, approved by Presidential Decree 208, dated May 13, 2017, one of such problems is a high heterogeneity of the economic space, which explains the relevance of the research topic.

The purpose of the work is to identify, if the strengthening of fiscal decentralization weakens the heterogeneity of Russia's economic space. To achieve it, we should solve the following tasks:

a) to consider the scientists' opinion concerning the heterogeneity of Russia's economic space in general and the strengthening fiscal decentralization as a way to reduce its scale in particular;

b) to analyze the dependence of the extent of heterogeneity scales on the degree of concentration of budget revenues and expenditures at the federal level;

c) to suggest possible directions for strengthening fiscal decentralization in the country.

The working hypothesis for the research is the hypothesis that weakening the heterogeneity of Russia's economic space is possible by strengthening of fiscal decentralization, i.e. decreasing the share of revenues and expenditures of the federal budget in the total volume of revenues and expenditures of the consolidated budget.

Literature review

Heterogeneity of economic space is understood as an inherit feature of any economic system (country, region, etc.), which consists in the fact that each constituent administrative territorial unit (hereinafter – ATU) is characterized by an individual economic development level. This feature has been studied by scientists for almost 200 years. The scientists can be divided into three groups: a) considering the reasons why the economic space of each country and its regions is heterogeneous; b) studying the impact of this factor on the economic development of the country (region); c) reviewing the relationship between the federal, regional and local authorities of a country in a heterogeneous economic space.

The main representative of the first group is the German economist J. von Thünen. Using the example of the so-called "isolated state", which economy is an absolutely unified closed-type economy and is represented by agriculture, he showed that the ATU of a country and its regions are differentiated by the economic development level due to the fact that the most profitable economic specialization for each of them is individual. For instance, for one, horticulture can bring the maximum profit, for another – forestry, for a third – dairy cattle breeding, etc. (Thünen, 1910). (Thünen, 1910).

One of the first economists who considered the effects of the heterogeneity of the economic space of a country and its regions for the state of the corresponding economic system was the Swedish scientist G. Myrdal. According to his conclusions, the heterogeneity of economic space increases over time, as ATUs, initially more developed, act as attractors for resources of less developed ATUs (Myrdal, 1957). As a result, the integrity and unity of the country's (region's) economic space is violated, which slows down the development of the economic system. A somewhat different opinion was expressed by A. Hirschman. Being interested in such economic category as competition, he has defined that each lagging ATU has potential reserves, mobilizing which they enter the competition with more successful ATU contributing to the economic development of the corresponding country and its regions (Hirshman, 1958). Such a competitive struggle took place, for example, in the United States in the 20th and early 21st century. For example, in 1930, when the U.S. economy was in deep crisis, the share of its geographical regions such as the Northeast and Midwest in the GDP volume was 39.4 and 31.3% respectively, while the South and West accounted for 17.1 and 11, 2%, respectively, and by 2018, when the country gained global economic power status, the shares of the latter two regions increased to 33.2 and 25.3%, respectively, bringing the shares of the Northeast and the Midwest down to 20.7 and 19.7%, respectively (Khan, Siddique, 2021).

A logical continuation of the theory of A. Hirschman's becomes a theory of growth poles. Its authors include French economists F. Perroux and P. Pottier. According to this theory, one of the key potential reserves of lagging ATUs is the development of transport infrastructure, since the movement of goods between developed ATUs, referred to in this theory as growth poles, takes place through their territory (Perroux, 1961; Pottier, 1963). According to recent studies, an increase in cargo traffic by road transport in particular Russia's region by 1 million tons leads to an increase in GRP volume by an average of 47.6 million rubles (Kataeva, 2013).

In order for lagging ATUs to successfully realize all their potential reserves, a competent construction of relations between federal, regional and local authorities, which is the object of attention of representatives of the third group of scientists, is required. One type of such relationship is fiscal decentralization, the advantages and disadvantages of which are actively discussed in academic circles.

The advantages of fiscal decentralization are mentioned, for example, by Ch. Tiebout, J. Bruckner, N. Akai, M. Sakata, D. Cantarero, P.P. Gonzalez, A.O. Yushkov, N.Y. Oding, L.I. Savulkin, M.A. Pechenskaya-Polishchuk. We also note them in our studies. Ch. Tiebout, in particular, stated a wealth of practical experience in the use of fiscal decentralization, emphasizing that the expenditures of regional and local budgets are often higher than the federal budget, and their structure is determined by the people's desire of the respective ATU. In addition, many of the benefits that attract population, such as schools, roads, parking lots, etc., are created at the expense of regional and local budgets. Consequently, a region or municipality's lack of funds for creating benefits, which can occur if fiscal decentralization is abandoned, will lead to an outflow of population from it (Tiebout, 1956).

H. Akai, M. Sakata, D. Cantarero, P.P. Gonzalez, and J. Bruckner conduct studies aimed at establishing the presence and nature of the impact of fiscal decentralization on the economic growth of the country and its ATU. For instance, N. Akai and M. Sakata conclude on the positive impact of fiscal decentralization on the economic growth of the U.S. states (Akai, Sakata, 2002), D. Cantarero and P. P. Gonzalez on the economic growth of Spanish regions (Cantarero, Gonzalez, 2009), and J. Brueckner – on the economic growth of a hypothetical country where the entire population is divided into two generations – young and old

people, and the latter should receive public good at a higher level (Brueckner, 2006). We have found that the strengthening of fiscal decentralization in Russia will increase the GRP of its constituent regions and the country's real GDP volume (Pyankova, Kombarov, 2023), the dynamics of which are nothing other than the economic growth rate.

A.O. Yushkov, N.Yu. Oding and L.I. Savulkin review three possible levels of fiscal decentralization strengthening in Russia: conservative, moderate and optimal. At the conservative level, they propose to transfer to the regional budgets tax revenues from excise taxes on tobacco products at a rate of 50% and on alcohol products with a volume fraction of ethyl alcohol over 9% at a rate of 100%, at the moderate level – in addition to these excises revenues from corporate income tax calculated at the rate of 3%, i.e. the federal component of this tax, at 100% rate, and at the optimal level – taxes transferred at the moderate level and also 30% of mineral oil tax, except for the budget of Khanty-Mansi Autonomous Okrug – Ugra. According to the calculations carried out by the researchers, when fiscal decentralization is strengthened to the optimal level, the additional revenues volume of regional budgets will exceed the volume of drop-out funds from the federal budget by more than 2.5 times (Yushkov et al., 2017).

According to M.A. Pechenskaya-Polishchuk, the strengthening of fiscal decentralization in Russia will eliminate the current negative trend associated with the enormous outflow of tax revenues collected from the budgets of regional and local levels and, consequently, increase the interest of regional and local authorities in the economic development of the relevant ATU. As an example of this trend, the researcher cites the situation in one of the cities of the Leningrad Oblast, Pikalyovo, which has only 9% of the total amount of taxes collected remaining in its budget (Pechenskaya-Polishchuk, 2021).

J. Martinez-Vazquez and R. McNab consider the disadvantages of increasing fiscal decentralization. The researchers conclude that the application of this method of support to lagging ATUs creates a favorable environment for the development of corruption (Martinez-Vazquez, McNab, 1997).

Summarizing the scientists' opinions, we can state that the heterogeneity of the economic space of a country and its regions can have both positive and negative impact on the development of the corresponding economic system depending on the severity of this factor. For instance, at a low level of heterogeneity, when all lagging ATUs have mobilized their potential reserves, this influence is positive, and at a high level, typical of Russia – negative. One of the ways to reduce the scale of the heterogeneity in economic space is to strengthen fiscal decentralization. Below, we will discuss the feasibility and possible directions of its use in Russia.

Materials and methods

The first stage of the study requires a quantitative assessment of the heterogeneity of Russia's economic space. Currently, scientists use several different indicators to make such an assessment. The most common include the polarity gap coefficient (Lavrikova, Suvorova, 2020; Manshin, Moiseeva, 2022), the Theil index (Moroshkina, 2018; Khan, Siddique, 2021) and the coefficient of variation (Turovskii, Dzhavatova, 2019). Having noted their shortcomings in a previous paper, we have assessed the heterogeneity of Russia's economic space using another indicator, called the Svetunkov index (Piankova, Kombarov, 2022). Its application requires information about the number of ATUs forming the economic system and the economic development rate of each of them. If the first parameter is very simple, then the second one may cause certain difficulties, as there are active discussions in scientific circles as to which indicator is its numerical indicator – the nominal GRP volume or the GRP volume per capita. For example, A.K. Gubanova believes that it is the nominal GRP volume because the GRP volume per capita may not reflect the true situation due to the small number of individual ATU (Gubanova,

2019). P.A. Bulochnikov and K.B. Smirnov hold a similar position (Bulochnikov, Smirnov, 2019). According to other researchers, in particular, A.G. Granberg[1], N.V. Zubarevich (Zubarevich, 2009), T.V. Uskova (Uskova, 2018), etc., the GRP volume per capita indicates the economic development rate of a particular ATU. In this regard, it seems very appropriate to assess the heterogeneity of Russia's economic space using methods that allow taking into account both parameters simultaneously.

In the course of the research, we will carry out the assessment using a method, which can be called a geometric method of assessing the heterogeneity of the economic space of a country and its regions, which we have developed. At the first stage, it is necessary to construct in a rectangular coordinate system a point diagram of the economic development rate of ATUs, forming an economic system, the heterogeneity of which space is assessed by plotting on the abscissa axis the values of the indicator, which is a valid measure of this level, in nominal terms, and on the ordinate axis – its values per capita. At the second stage, the outermost points of the diagram should be used to construct a figure so that all other points are inside it. At the third and final stage we have to find an area of the figure (heterogeneity figure) which will be a quantitative measure of heterogeneity of the evaluated economic space. If the obtained figure turns out to be different from the basic geometrical figures, in order to find the area, it is necessary to divide it into several such figures. For example, if the heterogeneity figure is divided into several triangles, the formula for determining its area will look as follows:

$$S_{hg} = \sum S_{\Delta}, \quad (1)$$

where:

S_{hg} – area of heterogeneity figure;

S_{Δ} – area of the triangles forming heterogeneity figure.

In turn, the area of the triangle placed in a rectangular coordinate system is calculated as follows:

$$S_{\Delta} = \frac{|(x_2-x_1)(y_3-y_1)-(x_3-x_1)(y_2-y_1)|}{2}, \quad (2)$$

where:

x_1, y_1; x_2, y_2; x_3, y_3 – coordinates of the vertices of the triangle.

The disadvantage of the geometric method of assessing the heterogeneity of the economic space of the country and its regions is that it cannot be used when the indicators change strictly proportionally, as in this case the diagram described above will represent a straight line. However, due to the fact that such a situation is unlikely in practice, this drawback cannot be considered essential and detract from the main advantage of the method, which consists in taking into account both indicators used by representatives of scientific circles as numerical indicators of the level of economic development of ATUs, which form a particular economic system.

The information, necessary to assess the heterogeneity of Russia's economic space using the geometric method, is available on the official website of the Federal State Statistics Service[2]. After assessing the heterogeneity of the space for the period from 2000 to 2021[3], it is possible to conduct a regression analysis of the dependence of this value on the degree of concentration of budget revenues and expenditures at the federal level, which is a quantitative measure of the current level of fiscal decentralization; it means that its decrease indicates an increase in fiscal decentralization and vice versa. This degree is calculated as a share of federal budget revenues and expenditures in the total amount of the consolidated budget expenditures (hereinafter – $d_{rev.\ fed.}$ and $d_{exp.\ fed.}$ respectively) on the basis of the information presented on the official website of the Ministry of Finance of the Russian

[1] Granberg A.G. (2004). *Fundamentals of Regional Economics: Study Aid for Universities. 4th Edition*. Moscow: Izd. dom GU VShE.

[2] National accounts. Federal State Statistics Service. Available at: https://rosstat.gov.ru/statistics/accounts (accessed: March 14, 2023).

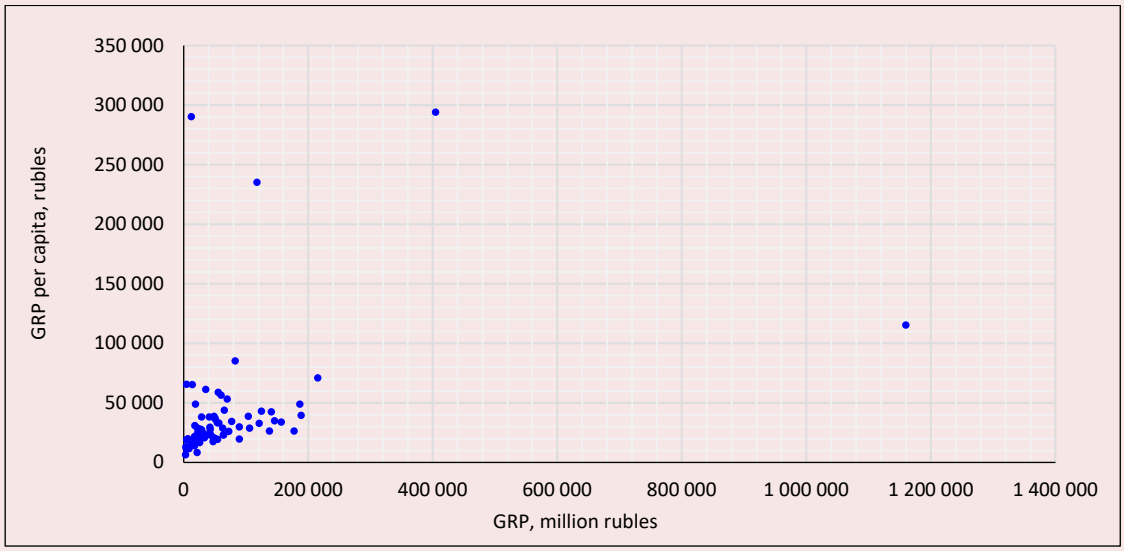
[3] No data for 2021 and 2022 available as of today.

Federation[4]. After the completion of the analysis, in case its results show the need to strengthen fiscal decentralization in Russia, i.e. the need to reduce $d_{rev.\ fed.}$ and $d_{exp.\ fed}$, we will say about the possible directions of implementation of such a policy.

Results

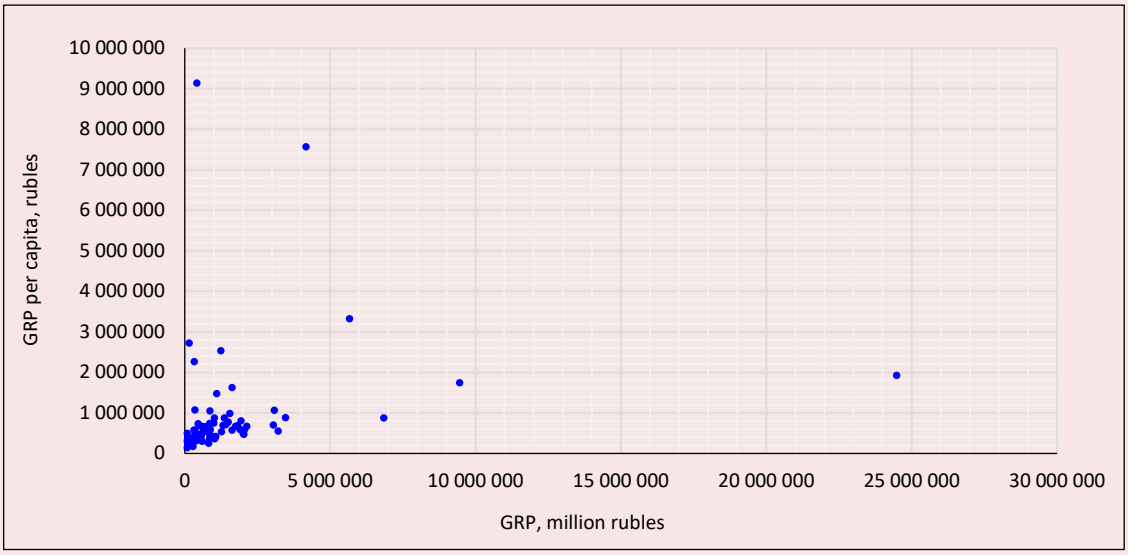
Figures 1 and 2 present point diagrams of the economic development rate of Russian regions, based on data on GRP and GRP per capita for 2000 and 2021.

Figure 1. Point diagram of economic development rate of Russian regions in 2000



Source: own compilation.

Figure 2. Point diagram of economic development rate of Russian regions in 2021



Source: own compilation.

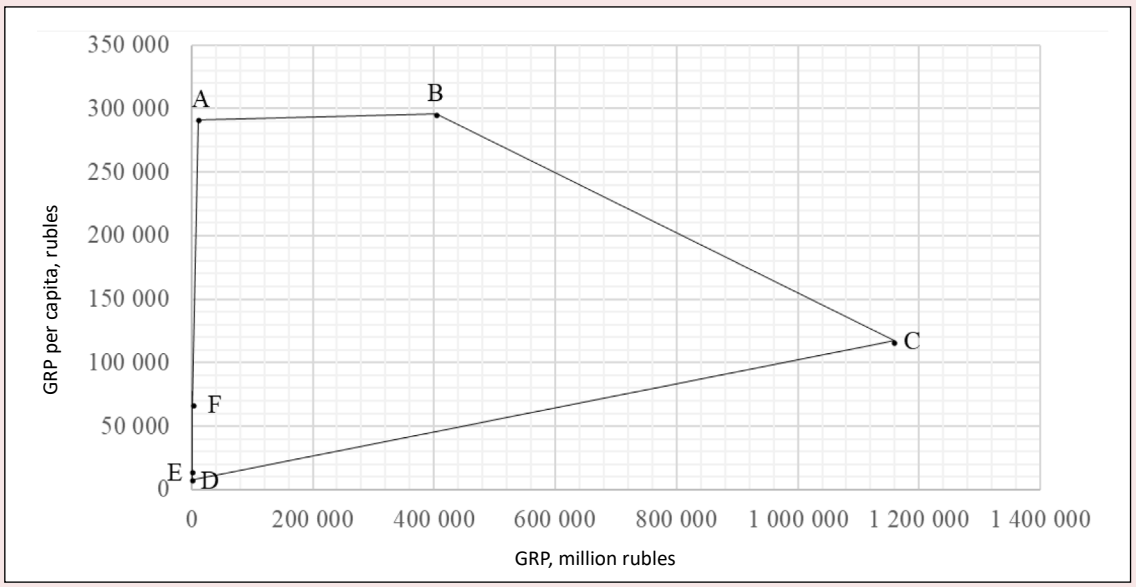
[4] Ministry of Finance of Russia. Statistics. Available at: https://minfin.gov.ru/ru/statistics/ (accessed: March 14, 2023).

The extreme points of the point diagram of the economic development rate of Russian regions in 2000 are such constitute entities as KhMAD – Yugra (it has the highest GRP per capita), Moscow (it has the highest GRP) and the Republic of Ingushetia (it has the lowest values of both indicators). Besides them, the vertices of the figure of heterogeneity of Russia's economic space in 2000 are the points denoting Nenets Autonomous Okrug, Chukotka Autonomous Okrug and the Republic of Altai, as they are outside the plane bounded by the lines connecting the extreme points of the diagram. After 21 years, Nenets Autonomous Okrug became the constitute entity with the highest GRP volume per capita, Moscow retained its position, and the Republic of Ingushetia, retaining the lowest GRP volume per capita, gave way to the lowest position in the rating of Russian regions by the GRP volume to the Republic of Altai. Also, the top of the figure of heterogeneity of Russia's economic space for 2021 is the point denoting Chukotka Autonomous Okrug.

Comparing the diagram in Figure 1 with the diagram in Figure 2, we can hypothesize that the heterogeneity of Russia's economic space has grown rapidly over the entire period under consideration. For instance, whereas the ordinate of the upper-most point of the diagram for 2000 does not reach 300,000 and the abscissa of the rightmost point does not reach 1.2 million, the coordinates of the diagram for 2021 exceed 9 million and 24 million, respectively, whereas the positions of the lowermost and leftmost points have not changed much. Based on these diagrams, let us plot the figures of heterogeneity of Russia's economic space for 2000 and 2021 *(Fig. 3, 4)*.

The figures of heterogeneity of Russia's economic space for 2000 and 2021 are polygons, which are divided into several triangles. The figures for the other years of the period under consideration have a similar appearance. This means that the calculation of the level of heterogeneity of the Russian economic space for 2000–2021 can be performed using formulas (1) and (2). The results of the calculation are presented in *Table 1*, where we also give the information necessary for the regression analysis on the concentration degree of budgetary revenues and expenditures at the federal level.

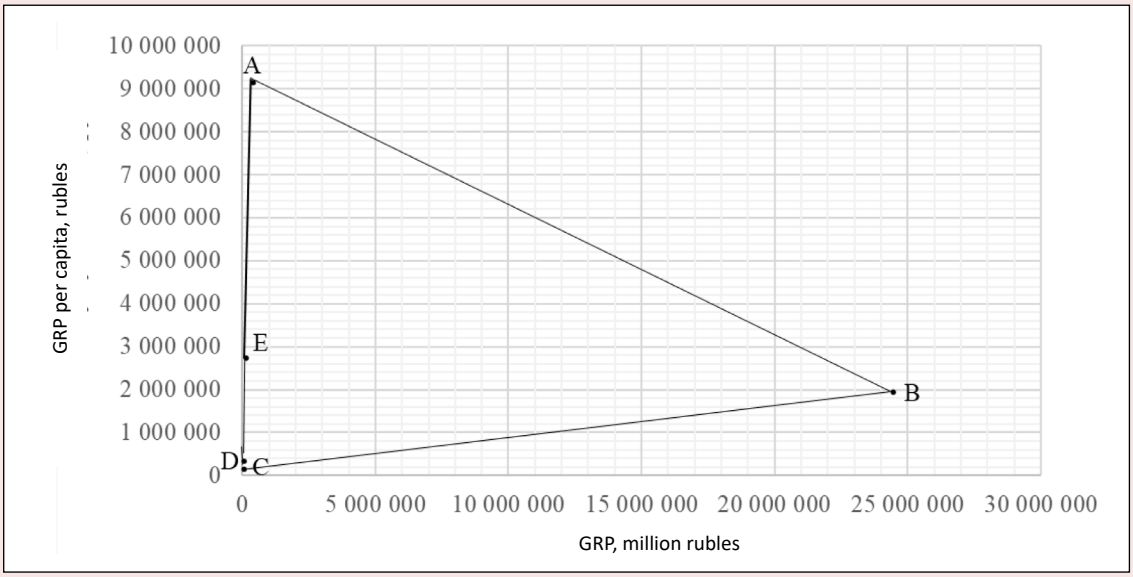
Figure 3. Figure of the heterogeneity of Russia's economic space for 2000



Note: A – Nenets Autonomous Okrug, B – KhMAO – Yugra, C – Moscow, D – Republic of Ingushetia, E – Republic of Altai, F – Chukotka Autonomous Okrug.

Source: own compilation.

Figure 4. Figure of heterogeneity of Russia's economic space for 2021



Note: A – Nenets Autonomous Okrug, B – Moscow, C – Republic of Ingushetia, D – Republic of Altai, E – Chukotka Autonomous Okrug.

Source: own compilation.

Table 1. Heterogeneity of Russia's economic space in 2000–2021 and concentration of budget revenues and expenditures at the federal level

Year	Area of heterogeneity figure, c.u.	$d_{rev.\ fed.}$	$d_{exp.\ fed.}$
2000	200 207 472 785,6	-	-
2001	286 195 545 481,9	-	-
2002	391 926 242 783,4	-	-
2003	663 874 223 570,2	-	-
2004	1 321 832 924 232,2	-	-
2005	2 157 664 354 703,9	-	-
2006	4 138 520 591 900,4	72.64	65.81
2007	7 642 343 349 126,6	70.94	65.56
2008	8 746 822 350 350,4	71.82	67.29
2009	10 810 636 983 849,5	74.80	77.52
2010	14 159 318 223 785,5	76.50	79.25
2011	19 073 420 372 919,5	75.60	74.79
2012	19 190 279 411 460,4	80.61	79.30
2013	23 244 909 026 881,4	79.64	77.14
2014	27 047 402 986 242,6	77.17	75.65
2015	34 383 655 760 012,3	77.26	78.81
2016	43 993 857 597 305,5	73.62	77.29
2017	48 757 126 799 077,8	74.12	75.49
2018	66 956 692 764 222,0	73.64	72.15
2019	72 770 619 359 658,8	72.56	70.52
2020	53 361 858 096 803,4	75.00	76.77
2021	109 664 682 849 975,0	73.80	74.90

Source: own compilation.

The data in Table 1 testify that the heterogeneity of Russia's economic space during 2000–2021 showed rapid and almost monotonous growth. They confirm the hypothesis we put forward and agrees with positions of normative-legal acts, in particular, Strategies of economic security of the Russian Federation for the period through to 2030. Considering dynamics of this indicator in details, it is easy to notice, that its fastest growth has come to 2003–2007 and it has been noted by results of 2021. This state of affairs may indicate that the Russian economy growth observed during almost the entire first decade of the 21st century and in 2021 took place only in some regions: Nenets Autonomous Okrug, Khanty-Mansi Autonomous Okrug – Yugra, YNAO, Moscow, as well as the Moscow Oblast and Saint Petersburg. A slight de-heterogenization of Russia's economic space at the end of 2020 is an effect of circumstances such as the COVID-19 pandemic and oil production decline. The six above-mentioned constitute entities suffered the greatest damage from these circumstances; in addition, anticoroncrisis measures taken by the authorities had a noticeable positive impact on the economic situation of the lagging regions (Freihe et al., 2023).

Table 1 also shows that during the regression analysis of the dependence of the scale of heterogeneity of Russia's economic space on the concentration degree of budget revenues and expenditures at the federal level it is possible to cover only the period from 2006 to 2021, as the amount of information presented on the official website of the RF Ministry of Finance does not allow calculating the above value for earlier years. *Table 2* presents the results of this analytical procedure.

According to the data in Table 2, the dependence of the scale of heterogeneity of Russia's economic space on the concentration degree of budget revenues and expenditures at the federal level takes place because the coefficient of determination R^2 turned out to be statistically significant. As for the coefficients on exogenous variables, among them, only the coefficient on the variable $d_{exp.\ fed.}$ turned out to be statistically significant. Consequently, the scale of heterogeneity of the Russian economic space may be absolutely inelastic to changes in the degree of concentration of budget revenues at the federal level, while a 1% change in the degree of concentration degree of budget expenditures at that level may entail a similarly directed change in the given scale by about 12.6%. One of the most favorable circumstances leading to the weakening of the concentration of budget expenditures at the federal level is the faster growth in expenditures of regional and local budgets, as compared with the growth in the expenditure volume of the federal budget. On the basis of the fact that to ensure such growth they need additional revenue sources, we can say that Russia really needs to strengthen fiscal decentralization.

Table 2. Regression analysis results of the dependence of the scale of heterogeneity of Russia's economic space on $d_{exp.\ fed.}$ $d_{exp.\ fed.}$

Dependent variable	Coeffiient (standard error)			R^2	Regression equation
	a	**b**	**c**		
Area of heterogeneity figure	$8.8063*10^{17}$ ($5.1187*10^{11}$)	-14.9942 (9.3421)	12.5988** (5.1838)	0.3196*	$Y = 8.8063*10^{17}*X_1^{-14.9942}*X_2^{12.5988}$

Note: a) *, ** – significance levels of 10% and 5%, respectively (the absence of asterisks indicates that the coefficient is statistically insignificant)); b) X_1 and X_2 in the regression equation – $d_{rev.\ fed.}$ and $d_{exp.\ fed.}$ respectively.
Source: own compilation.

Discussion

The main feature of measures to strengthen fiscal decentralization in Russia should be their selective nature. In other words, such measures should not be applied to the regions, due to the successful development of which the scale of heterogeneity of the Russian economic space is rapidly growing and which are clearly distinguished in the point diagrams presented in Figures 1 and 2, namely Moscow, the Moscow Oblast, Saint Petersburg, Nenets, Khanty-Mansi and Yamalo-Nenets Autonomous okrugs. The points indicating the other regions are concentrated in the bottom left corner of the diagrams, which corresponds to an extremely low GRP and GRP volume per capita compared to the indicators of the aforementioned regions. Measures to strengthen fiscal decentralization should be aimed at these regions. As for the specific ways of carrying out such a policy, it is important to agree with the above mentioned opinion of A.O. Yushkov, N.Y. Oding and L.I. Savulkin that tax revenues from excise taxes on tobacco products according to the norm 50%, on alcohol products with a volume fraction of ethyl alcohol over 9% except for the products listed in Paragraph 9 of Article 50 of the Budget Code, according to the norm 100% can be transferred to the regional level, the federal component of corporate income tax and mineral extraction tax in the form of oil according to the norm 30% (Yushkov et al, 2017). At the same time, scenarios of fiscal decentralization strengthening should be individual for each of the regions. For example, with respect to some entities they should be limited to a conservative one, while for others it is worth applying the optimal scenario.

It is possible to identify which scenario of strengthening fiscal decentralization should be implemented in this or that constitute entity by determining the economic orientation degree of the regional budget and comparing it with this parameter of the federal budget. The economic orientation degree of the budget should be understood as the amount of spending on the national economy, directed on average from one ruble of its revenues. The importance of this indicator lies in the fact that in the current economic realities, when Russia is experiencing enormous sanctions pressure, the expenditures on the national economy are the priority expenditures of its budget of the expanded government, as they will allow implementing the import substitution policy and, therefore, ensuring the country's resistance to the sanctions pressure. This parameter can be defined as a coefficient with the exogenous variable X in the linear regression equation, describing the dependence of the specified expenditures of this or that budget on the volume of its revenue part. *Table 3* presents the results of the regression analysis of such dependence, carried out on the basis of the data from 2006 to 2021.

Table 3. Regression analysis results of the dependence of expenditures on the national economy of the federal budget and regional budgets on their revenues volume

Dependent (endogenous) variable	Coefficient (standard error)		R^2	Regression equation
	a	b		
Federal budget expenditures on the national economy	-307102311.0487 (306771348.6658)	0.1786*** (0.0212)	0.8354***	Y = -307102311.0487 + 0.1786X
Expenditures on the national economy budget:				
Altai Krai	2363979.7665* (1324310.4191)	0.1523*** (0.0156)	0.8716***	Y = 2363979.7665 + 0.1523X
Amur Oblast	-4018616.2082** (1443152.2486)	0.2813*** (0.0261)	0.8922***	Y = -4018616.2082 + 0.2813X

Continuation of Table 3

Dependent (endogenous) variable	Coefficient (standard error)		R^2	Regression equation
	a	b		
Archangelsk Oblast	580502.9064 (966733.2461)	0.1390*** (0.0141)	0.8822***	Y = 580502.9064 + 0.139X
Astrakhan Oblast	-350384.1852 (510045.6042)	0.1477*** (0.0140)	0.8883***	Y = -350384.1852 + 0.1477X
Belgorod Oblast	12136508.7941*** (3805052.8991)	0.1458** (0.0493)	0.3849**	Y = 12136508.7941 + 0.1458X
Bryansk Oblast	-2055061.6750 (1275824.5719)	0.3188*** (0.0265)	0.9177***	Y = -2055061.6750 + 0.3188X
Vladimir Oblast	1980052.2607* (1000750.2001)	0.1201*** (0.0196)	0.7583***	Y = 1980052.2607 + 0.1201X
Volgograd Oblast	-375062.2726 (1092120.1176)	0.1959*** (0.0130)	0.9458***	Y = -375062.2726 + 0.1959X
Vologda Oblast	-1358817.3659 (1261623.4185)	0.2136*** (0.0192)	0.9053***	Y = -1358817.3659 + 0.2136X
Voronezh Oblast	201803.8866 (1543820.4031)	0.2120*** (0.0175)	0.9131***	Y = 201803.8866 + 0.2120X
Jewish Autonomous Oblast	711948.1183*** (181725.2011)	0.0781*** (0.0160)	0.6638***	Y = 711948.1183 + 0.0781X
Zabaykalsky Krai	-1491427.2463** (658102.5514)	0.1803*** (0.0125)	0.9371***	Y = -1491427.2463 + 0.1803X
Ivanovo Oblast	-1421034.4136*** (467498.0363)	0.1865*** (0.0135)	0.9320***	Y = -1421034.4136 + 0.1865X
Irkustk Oblast	-968898.0057 (1094261.7446)	0.1364*** (0.0084)	0.9494***	Y = -968898.0057 + 0.1364X
Kabardino-Balkar Republic	732336.6841 (462205.4780)	0.1497*** (0.0162)	0.8597***	Y = 732336.6841 + 0.1497X
Kalinigrad Oblast	-14723467.2060*** (3295842.9922)	0.7170*** (0.0432)	0.9582***	Y = -14723467.2060 + 0.717X
Kaluga Oblast	-116101.9470 (1025964.2282)	0.2624*** (0.0210)	0.9181***	Y = -116101.9470 + 0.2624X
Kamchatka Krai	-3485341.5617*** (646121.1963)	0.3026*** (0.0109)	0.9822***	Y = -3485341.5617 + 0.3026X
Karachay-Cherkess Republic	-194938.5100 (223679.3350)	0.2029*** (0.0110)	0.9602***	Y = -194938.5100 + 0.2029X
Kemerovo Oblast	760251.8903 (1988860.4783)	0.1161*** (0.0164)	0.7820***	Y = 760251.8903 + 0.1161X
Kirov Oblast	613877.8142 (665663.1032)	0.1703*** (0.0144)	0.9090***	Y = 613877.8142 + 0.1703X
Kostroma Oblast	-1213560.0320*** (282365.2705)	0.2345*** (0.0114)	0.9679***	Y = -1213560.0320 + 0.2345X
Krasnodar Krai	-2262777.5905 (2676391.7553)	0.1786*** (0.0127)	0.9427***	Y = -2262777.5905 + 0.1786X
Krasnoyarsk Krai	12825336.8133*** (3137196.5472)	0.0748*** (0.0158)	0.6168***	Y = 12825336.8133 + 0.0748X
Kurgan Oblast	-702719.0311 (554373.4005)	0.1901*** (0.0161)	0.9082***	Y = -702719.0311 + 0.1901X
Kursk Oblast	1864039.2197** (757931.6306)	0.1897*** (0.0159)	0.9104***	Y = 1864039.2197 + 0.1897X
Leningrad Oblast	2288796.8781 (1336479.3326)	0.1660*** (0.0134)	0.9161***	Y = 2288796.8781 + 0.166X
Lipetsk Oblast	3163114.7851** (1381441.3816)	0.1519*** (0.0265)	0.7009***	Y = 3163114.7851 + 0.1519X

Continuation of Table 3

Dependent (endogenous) variable	Coefficient (standard error)		R^2	Regression equation
	a	b		
Magadan Oblast	533088.0501 (361540.2961)	0.1048*** (0.0128)	0.8275***	Y = 533088.0501 + 0.1048X
Mumansk Oblast	1529207.4369** (536232.8537)	0.0687*** (0.0091)	0.8017***	Y = 1529207.4369 + 0.0687X
Nizhny Novgorod Oblast	-166505.5191 (1751630.0926)	0.1774*** (0.0128)	0.9365***	Y = -166505.5191 + 0.1774X
Novgorod Oblast	-1023580.8748 (650569.6408)	0.2627*** (0.0229)	0.9098***	Y = -1023580.8748 + 0.2627X
Novosibirsk Oblast	-1543234.6828 (1759161.1551)	0.1875*** (0.0145)	0.9230***	Y = -1543234.6828 + 0.1875X
Omsk Oblast	-1232372.1515 (1120982.7284)	0.1830*** (0.0154)	0.9102***	Y = -1232372.1515 + 0.183X
Orenburg Oblast	495117.5133 (1020525.0848)	0.1780*** (0.0133)	0.9277***	Y = 495117.5133 + 0.178X
Orlov Oblast	146055.7130 (540578.1326)	0.2057*** (0.0197)	0.8864***	Y = 146055.713 + 0.2057X
Penza Oblast	-210654.3044 (565313.2737)	0.1931*** (0.0123)	0.9460***	Y = -210654.3044 + 0.1931X
Perm Krai	-2455986.4119 (2090346.4525)	0.1841*** (0.0189)	0.8718***	Y = -2455986.4119 + 0.1841X
Primorsky Krai	948650.3515 (3052947.3271)	0.1919*** (0.0317)	0.7242***	Y = 948650.3515 + 0.1919X
Pskov Oblast	-1591596.8373*** (487427.7215)	0.3149*** (0.0180)	0.9564***	Y = -1591596.8373 + 0.3149X
Republic of Adygeya	-1867603.7489*** (370824.7400)	0.3249*** (0.0207)	0.9499***	Y = -1867603.7489 + 0.3249X
Republic of Altai	-420349.2266 (545524.6959)	0.2530*** (0.0328)	0.8094***	Y = -420349.2266 + 0.253X
Republic of Bashkortostan	2984272.3004 (2098158.1437)	0.1662*** (0.0140)	0.9097***	Y = 2984272.3004 + 0.1662X
Republic of Buryatia	632453.0846 (756938.9848)	0.1337*** (0.0142)	0.8715***	Y = 632453.0846 + 0.1337X
Republic of Dagestan	3399471.5871** (1427436.6641)	0.0948*** (0.0150)	0.7415***	Y = 3399471.5871 + 0.0948X
Republic of Ingushetia	1721677.6287** (681384.0695)	0.0467 (0.0304)	0.1438	Y = 1721677.6287 + 0.0467X
Republic of Kalmykia	-363543.9571 (215947.1734)	0.2365*** (0.0189)	0.9180***	Y = -363543.9571 + 0.2365X
Republic of Karelia	-1791490.9899** (742054.5636)	0.2343*** (0.0202)	0.9060***	Y = -1791490.9899 + 0.2343X
Komi Republic	2130166.1525** (961491.7727)	0.0980*** (0.0156)	0.7384***	Y = 2130166.1525 + 0.098X
Mari El Republic	-584670.3603 (344896.0445)	0.2216*** (0.0135)	0.9505***	Y = -584670.3603 + 0.2216X
Republic of Mordovia	3904043.9066*** (1270268.2830)	0.1453*** (0.0362)	0.5355***	Y = 3904043.9066 + 0.1453X
Republic of Sakha (Yakutia)	-143139.3628 (1792801.8855)	0.1582*** (0.0107)	0.9400***	Y = -143139.3628 + 0.1582X
Republic of North Ossetia – Alania	-586853.3778 (375662.9981)	0.1546*** (0.0147)	0.8945***	Y = -586853.3778 + 0.1546X
Republic of Tatarstan	7989322.3203* (3978657.6574)	0.2802*** (0.0189)	0.9399***	Y = 7989322.3203 + 0.2802X

End of Table 3

Dependent (endogenous) variable	Coefficient (standard error)		R^2	Regression equation
	a	b		
Republic of Tyva	-1889930.6150*** (448524.2064)	0.2415*** (0.0173)	0.9420***	Y = -1889930.615 + 0.2415X
Republic of Khakassia	717294.4294* (356855.5933)	0.0979*** (0.0148)	0.7576***	Y = 717294.4294 + 0.0979X
Rostov Oblast	-595760.0670 (2218715.5636)	0.1527*** (0.0156)	0.8720***	Y =-595760.067 + 0.1527X
Ryazan Oblast	-1371147.1153* (732278.3991)	0.2426*** (0.0161)	0.9458***	Y = -1371147.1153 + 0.2426X
Samara Oblast	-7540348.9718*** (2328442.6541)	0.2525*** (0.0164)	0.9440***	Y = -7540348.9718 + 0.2525X
Saratov Oblast	993106.2146 (909095.1309)	0.1399*** (0.0114)	0.9146***	Y = 993106.2146 + 0.1399X
Sakhalin Oblast	709952.0295 (2526909.7882)	0.2104*** (0.0230)	0.8655***	Y = 709952.0295 + 0.2104X
Sverdlovsk Oblast	2035012.6124 (1850725.8884)	0.1296*** (0.0095)	0.9353***	Y = 2035012.6124 + 0.1296X
Smolensk Oblast	-864001.0156* (431876.7832)	0.2159*** (0.0122)	0.9569***	Y = -864001.0156 + 0.2159X
Stavropol Krai	1047553.7873 (1333256.9653)	0.1590*** (0.0153)	0.8853***	Y = 1047553.7873 + 0.159X
Tambov Oblast	-5328.2871 (1595194.2370)	0.2497*** (0.0413)	0.7229***	Y = -5328.2871 + 0.2497X
Tver Oblast	-4081692.7832*** (992754.0218)	0.2683*** (0.0192)	0.9330***	Y = -4081692.7832 + 0.2683X
Tomsk Oblast	336590.7747 (862807.9947)	0.1511*** (0.0168)	0.8522***	Y = 336590.7747 + 0.1511X
Tula Oblast	1041711.6824 (944862.8811)	0.1505*** (0.0155)	0.8712***	Y = 1041711.6824 + 0.1505X
Tyumen Oblast	34795338.4308*** (6591616.2275)	0.0341 (0.0417)	0.0457	Y = 34795338.4308 + 0.0341X
Udmurt Republic	-1004779.3146 (969692.9204)	0.1936*** (0.0164)	0.9090***	Y = -1004779.3146 + 0.1936X
Ulyanovsk Oblast	718010.8529 (1250990.0176)	0.1655*** (0.0262)	0.7539***	Y = 718010.8529 + 0.1655X
Khabarovsk Krai	6060345.4726* (2945269.3362)	0.0071 (0.0401)	0.0026	Y = 6060345.4726 + 0.0071X
Chelyabinsk Oblast	1618138.8062 (1494076.5960)	0.1272*** (0.0109)	0.9132***	Y = 1618138.8062 + 0.1272X
Chechen Republic	5033681.5708** (1694723.3918)	0.0475** (0.0210)	0.3182**	Y = 5033681.5708 + 0.0475X
Chuvash Republic	2536590.2286*** (669922.9634)	0.1249*** (0.0156)	0.8209***	Y = 2536590.2286 + 0.1249X
Chukotka Autonomous Okrug	474810.5380 (1227159.3172)	0.2528*** (0.0413)	0.7276***	Y = 474810.5380 + 0.2528X
Yaroslavl Oblast	969258.6824 (662428.3556)	0.1421*** (0.0122)	0.9068***	Y = 969258.6824 + 0.1421X

Note: *, **, *** – significance levels of 10%, 5% and 1%, respectively (the absence of asterisks indicates that the coefficient is statistically insignificant).
Source: own compilation.

The economic orientation degree of the federal budget is 0.1786 points, i.e. from each ruble of its income about 18 kopecks is directed to the national economy. On this basis, we can say that fiscal decentralization should be strengthened according to the conservative scenario with regard to regions, where the degree of economic orientation of their budget does not exceed 0.1686 points or where this coefficient is statistically insignificant, according to the moderate scenario – with regard to regions, for which this parameter is in the range of 0.1687 to 0.1885 points, and according to the optimal scenario – with regard to regions, whose budget is characterized by economic orientation, which is at least 0.1886 points.

To assess the effectiveness of the proposed measures, it is necessary to conduct a regression analysis of the dependence of $d_{exp.\ fed.}$ on the value of oil and gas revenues of the budget of the expanded government, which include revenues from MET as oil, on its tax revenues from excise taxes and corporate income tax. *Table 4* demostrates the results of the analysis.

As the data show, an increase in revenues of the enlarged government budget from excises entails an increase in $d_{exp.\ fed.}$ and from the tax on profit of organizations – a decrease, as the first of these taxes is almost entirely credited to the federal budget, and most of the second – to the budgets of the RF entities. Consequently, the transfer of part of revenues from excises to the regional level will allow, at least, reducing the elasticity of dependence of the federal budget on them and the federal component of corporate income tax – to make more pronounced the positive effect of increased budget revenues of the expanded government from this tax, which consists in reducing the concentration of budget expenditures at the federal level. Based on the mentioned above, as well as on the fact that MET in the form of oil, the dynamics of revenues of the enlarged government budget from which can have no effect on the federal budget, is proposed to be transferred only under the best scenario of fiscal decentralization strengthening, we can state that the adoption of the recommended measures by the authorities will reduce the heterogeneity of the Russian economic space.

The implementation of the measures proposed in the study to weaken the heterogeneity of the Russian economic space will entail a loss of funds from the federal budget. Some changes in legislation on taxes and fees, which came into force on January 1, 2023, will help to compensate the lost revenues. First of all, they include increasing the tax burden on Gazprom and other enterprises engaged in coal, oil and gas production, which will bring the federal budget more than 1 trillion rubles in 2023–2025.

Conclusion

Russia's highly heterogeneous economic space is one of the factors slowing down the national economy development and, therefore, attracting the authorities' focus. The aim of the research

Table 4. Regression analysis results of the dependence of $d_{exp.\ fed.}$ on the value of some revenues of the expanded government budget

Dependent variable	Coefficient (standard error)				R^2	Regression equation
	a	b	c	d		
$d_{exp.\ fed.}$	137.7892*** (1.4297)	0.0033 (0.0552)	0.1339*** (0.0348)	-0.1967*** (0.0473)	0.6749***	$Y = 137.7892 * X_1^{0.0033} * X_2^{0.1339} * X_3^{-0.1967}$

Note: a) *, **, *** – significance at 10%, 5% and 1% respectively (the lack of asterisks indicates the statistical insignificance of the coefficient); b) X_1, X_2 and X_3 in the regression equation – oil and gas revenues, excise taxes and corporate income tax respectively.
Source: own compilation.

is to determine whether the strengthening of fiscal decentralization will allow weakening the heterogeneity of the country's economic space. With the help of calculation and analytical procedures, we have revealed the statistically significant dependence of the scale of heterogeneity of the Russian economic space on the concentration degree of budget revenues and expenditures at the federal level, i.e. on $d_{rev.\ fed.}$ and $d_{exp.\ fed.}$, the weakening of which acts as an indicator of fiscal decentralization strengthening; and we have found that the reduction of $d_{rev.\ fed.}$ by 1% can reduce the scale of heterogeneity of the Russian economic space by about 12.6%.

The conducted research is significant both from theoretical and practical points of view. Its theoretical significance consists in the fact that it includes the development and approbation of a new approach to assessing the heterogeneity of Russia's economic space, requiring the construction of a figure in a rectangular coordinate system, called a figure of heterogeneity, finding its area and taking into account both the most important economic indicators of its regions simultaneously; and practical significance is explained by the fact that its results can be taken into account by authorities in implementing strategic documents such as the Economic Security Strategy of the Russian Federation for the period through to 2030, etc.

The regression analysis of the dependence of the scale of heterogeneity of the Russian economic space on the concentration degree of budget revenues and expenditures at the federal level covered the time interval beginning in 2006. This limitation was imposed on the authors by the fact that the amount of information available on the official website of the RF Ministry of Finance does not allow calculating the values of exogenous variables for earlier years. The elimination of this drawback by the departments of the above body responsible for the preparation of information will significantly improve the quality of future research in this area.

The geometric method we propose to use when assessing the heterogeneity level of the economic space of the country and its regions can also be applied to evaluate the specified parameter of each Russia's entity in the context of its constituent municipalities. One of the future studies should be devoted to such an assessment.

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Innovation Potential of Regions within the Arctic Zone of the Russian Federation: Assessment Methodology, Comparative Analysis, Development Prospects

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Abstract. Innovation potential, which determines economic competitiveness of a region (country) is an important indicator of sustainable development and growth of territories. Many existing approaches to measuring this indicator require further discussion within the academic community. It is necessary to supplement and expand the tools to improve the assessment of the quality of the indicator under consideration. The Arctic zone of the Russian Federation is in the scope of Russia's strategic interests due to the geopolitical and geo-economic positions of this territory in the modern world (12–15% of the country's GDP is created here, and 25% of exports is provided). Eight RF constituent entities belonging to the Arctic territories are the object of our study. Methodological basis includes analysis of documents that define strategic development of territories within the framework of the innovation direction, and

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review of existing approaches to assessing innovation potential level. Regional statistical data serve as the information base. The aim of the research is to develop a methodology for assessing innovation potential using objective indicators grouped into blocks and calculated using the integral method. The results are visualized on a radar chart that contains indicators for the regions included in the RF Arctic zone. This makes it possible to compare RF constituent entities according to the degree of innovation potential and determine their position. We suggest clustering regions, identifying leaders and outsiders so as to substantiate proposals to stimulate key areas in innovation activity. We provide an interpretation of the values of innovation potential level. The findings of the research indicate the necessity to design programs for regional development of territories with the involvement of large business as a potential investor.

Key words: innovation, innovation potential, resource approach, integral method, index method, cluster analysis, assessment methodology, regions of the Arctic zone of the Russian Federation.

Introduction

In the contemporary context of economic functioning, an important development factor of a country (region) is an increasing of innovation potential, which becomes one of the main indicators, allowing effectively competing at the national economy level. To raise the innovation activity, it is necessary to orient to regions' innovative opportunities. Thus, synergetic effect is demonstrated, ensuring sustainable socio-economic development of a country.

The aim of the research is to work out a methodology for assessing innovation potential of a territory and its testing on statistical data of the regions, included in the Arctic zone of the Russian Federation.

To solve the purpose, we have defined the following tasks:

– to summarize theoretical aspects of problem (comparison and clarification of the conceptual framework, analysis of approaches and methods for assessing innovation potential level with an emphasis on their strength and weaknesses) on the basis of a review of literature resources;

– to justify an algorithm for calculating the indicator under consideration in the framework of the proposed methodology;

– to conduct a comparative analysis of the results by ranking regions by innovative potential level and reveal leaders and outsiders;

– to assess the development prospects of the entities from the perspective of innovation activity.

The research object are the territories of the Arctic zone of the Russian Federation, which are of strategic interest for Russia, based on geopolitical, geo-economic position of the region in the modern world.

The RF Arctic zone includes eight regions. Three territories (the Murmansk Oblast, Chukotka AO, Yamalo-Nenets AO) are fully part of the RF Arctic zone; the Arkhangelsk Oblast and Nenets Autonomous Okrug (NAO), Republic of Karelia, Republic of Komi, Krasnoyarsk Krai, and Republic of Sakha (Yakutia) are partially included[1].

The regions' geography is vast, the territories are included in different federal districts of the RF. The Northwestern Federal District includes the Murmansk Oblast, the Arkhangelsk Oblast and NAO, Republic of Karelia, Republic of Komi; the Siberian Federal District – Krasnoyarsk Krai; the Far Eastern Federal District – Chukotka AO, Republic of Sakha (Yakutia). The Ural Federal District includes Yamalo-Nenets AO. The population of the Arctic zone is 2.6 million people, and the total area of the Arctic territories is 5 million square kilometers.

[1] On the land territories of the Arctic zone of the Russian Federation: Presidential Decree 296, dated May 2, 2014 (amended March 5, 2020). Available at: https://base.garant.ru/70647984/ (accessed: April 16, 2022).

Table 1. Comparative characteristics of the regions of the RF Arctic zone

RF constituent entity	Area of Arctic territories, thousand km^2	Population living in the Arctic territories, thousand people	Average population density, people per km^2	Composite innovation index*	Rank by innovation index
Republic of Karelia	71.4	109.0	3.3	0.325	47
Republic of Komi	127.4	152.0	1.9	0.333	42
Arkhangelsk Oblast	222.9	627.0	1.9	0.347	34
Murmansk Oblast	144.9	724.5	5.0	0.335	41
Yamalo-Nenets AO	769.3	552.1	0.7	0.293	61
Krasnoyarsk Krai	1094	237.0	1.2	0.427	8
Chukotka AO	721.5	50.0	0.1	0.13	85
Republic of Sakha (Yakutia)	1608.8	68.0	0.3	0.309	56

Note: data on the composite innovation index are given for Russia's constituent entities without distinguishing the territories included in the Arctic zone of RF (such information is missing).
**Rating of Innovative Development of the Constituent Entities of the Russian Federation. Issue 7*. Moscow: National Research University "Higher School of Economics", 2020. 274 p. (accessed: January 16, 2023).
Source: Available at: https://arctic-council-russia.ru/useful/ (accessed: March 3, 2023).

Table 1 gives a characteristic of the regions of the RF Arctic zone.

The RF Arctic zone is characterized by unfavorable climatic living conditions, low population density (from 0.1 to 5.0 people per square kilometer; in general in Russia the population density is 8.6 persons per square kilometer)[2], local character of territory development and industrial and economic activity, orientation of the economy on the extraction of hydrocarbons and export of resources to other Russia's constituent entities and abroad, dependence on supplies of vital goods.

The Arctic territory of the Arkhangelsk Oblast occupies 222.9 thousand square kilometers (4th place), the population is 627.0 thousand people (2nd place). The population density index is presented taking into account the NAO (in the NAO the population density is 0.23 people per 1 sq. km). Composite innovation index of the territory is 0,347 (without NAO; in NAO this value is equal to 0,155 (rank 84)).

Functioning of territories is impossible without innovation activity, which contributes to the effective development of a constituent entity. The costs of innovation activities of organizations in the RF Arctic zone amounted to 0.63% in 2019, in 2020 – 0.62% of the total amount of these costs in the Russian Federation[3].

Given the importance of the Arctic at the federal level, a number of documents defining the RF state policy on the time lag until 2035[4] and the strategic development of the territory within the framework of an innovative approach were developed[5].

The development strategy for the Arctic zone includes three stages. Currently, the first stage (2020–2024) is being implemented; it consists of the formation of approaches to the economic and social development of the territories and elaboration of the regulatory and legal framework, taking into account their specifics.

[2] Available at: http://www.gis.gks.ru/StatGis2015/Viewer/?05285969-ec60-e911-8f04-c52edb349072# (accessed: January 16, 2022).

[3] Available at: https://rosstat.gov.ru/storage/mediabank/Calendar1-2021.htm (accessed: April 16, 2022).

[4] On the fundamentals of state policy of the Russian Federation in the Arctic until 2035: Presidential Decree 164, dated March 5, 2020. Available at: https://www.garant.ru/products/ipo/prime/doc/73606526/ (accessed: January16, 2022).

[5] On the strategy for the development of the Arctic zone of the Russian Federation and national security for the period through to 2035: Presidential Decree 645, dated October 26, 2020 (amended November 12, 2021). Available at: https://www.garant.ru/products/ipo/prime/doc/74710556/ (accessed: April 16, 2022).

Within the framework of the strategy, the state program "Social and economic development of the Arctic zone of the Russian Federation"[6] is being implemented. The document gives target indicators of the development of the RF Arctic zone and the provision of national security through to 2035. The target values of the indicators are established for the periods through to 2024, 2030 and 2035 by the Presidential Decree[7].

Each constituent entity of the Russian Federation belonging to the Arctic zone develops documents at the mesolevel, taking into account the features of the region.

Many Russian and foreign scientists refer to the issues of innovation development, assessment of innovation potential of territories, differentiation of strategies of innovation development of the subjects of the regional economy *(Tab. 2)*.

Table 2. Theoretical foundations of the research

Authors	Research content
L.S. Arkhipova, G.Yu. Gagarina (Arkhipova, Gagarina, 2014)	The authors consider approaches to assessment of innovation economy development in Russia's constituent entities, analyze qualitative and quantitative methods of calculation of innovation potential of territories, and offer methods of assessment of innovation development using index and rating methods
A.R. Bakhtizin, E.M. Bukhvald, A.V. Kolchugina (Bakhtizin et al., 2016)	Rating method of assessment of the indicator, ranking Russia's constituent entities on innovation, investment and social potential
A.B. Gusev (Gusev, 2009)	The author raises the question about the development of a methodology for determining the rating of regions by level of innovation development with their subsequent differentiation
Yu.A. Gadzhiev, M.M. Styrov, D.V. Kolechkov, N.V. Shlyakhtina (Gadzhiev et al., 2016), N.V. Kuznetsova (Kuznetsova, 2017)	The authors discuss the problem of assessment and analysis of innovation potential on the basis of the cluster method using statistical data
E.S. Gubanova, O.S. Moskvina (Gubanova, Moskvina, 2020), I.G. Ershova, L.N. Guselnikova (Ershova, Guselnikova, 2020), O.F. Kotikhina (Kotikhina, 2007), N.A. Perevozchikova, D.G. Bagdasarova (Perevozchikova, Bagdasarova, 2020)	The authors consider methodological aspects of the investment and innovation potential of the region based on the resource approach with the use of matrix and integral methods
L.N. Guselnikova (Guselnikova 2020), O.A. Donichev, D.Yu. Fraimovich, S.A. Grachev (Donichev et al., 2018), V.N. Ovchinnikov (Ovchinnikov, 2016)	The authors study the factors promoting innovation activity of the region, for the assessment of innovation potential they propose to use a mathematical apparatus based on the resource approach with the use of the correlation and regression method
A. Bramanti, S. Tarantola (Bramanti, Tarantola, 2012)	The authors consider methodology of innovation rating
G. Carlino, W.R. Kerr (Carlino et al., 2014), E. Calik, F. Calisir, B. Cetinguc (Calik et al., 2017), M. Fraas (Fraas, 2004), M. Fritsch, R. Lukas (Fritsch, Lukas, 1991), M. Fritch (Fritch, 2002), Yu.S. Toktamysheva (Toktamysheva, 2015), T.F. Slaper, K.M. Harmon, B.M. Rubin (Slaper et al., 2018)	The authors investigate the problem of assessing innovation potential at the regional level with an emphasis on the rating method of calculating the indicator
L. Lesáková (Lesáková, 2011)	The author discloses the process of forming a regional innovation strategy and assessing the level of innovation potential using the SWOT-analysis
D.H.C. Chen, C.J. Dahlman (Chen, Dahlman 2006), J-M. Zabala-Iturriagagoitia, P. Voigt, F. Gutiérrez-Gracia, A. Jiménez-Sáez, (Zabala-Iturriagagoitia et al., 2007)	The authors propose models of innovation systems that allow determining the degree of their effectiveness by evaluating the level of innovation using different methods within the framework of the resource approach
Source: own compilation.	

[6] On approving the state program of the Russian Federation "Social and economic development of the Arctic zone of the Russian Federation": RF Government Resolution 484, dated March 30, 2021 (amended October 30, 2021). Available at: http://www.consultant.ru/document/cons_doc_LAW_381261/ (accessed: April 16, 2022).

[7] On national goals and strategic objectives of the development of the Russian Federation for the period through to 2024: Presidential Decree 204, dated May 7, 2018. Available at: https://base.garant.ru/71937200/(accessed: April 18, 2022).

Based on the data in Table 2, we can conclude that the topic is relevant and discussed in the scientific community. The researchers emphasize the analysis of existing and the search for new methods for assessing innovation potential in the framework of the developed approaches. Let us turn to the research subject and consider the methodological basis for assessing the level of innovation potential.

Innovation potential: essence, approaches to assessment, methods

In the conditions of contemporary trends of the development of territories, innovation potential is important, as it is determinant when assessing the effectiveness of the selected territory, level of its competitiveness (Porter, 1985, p. 134; Armstrong, 1993, p. 245).

Currently, many scientists focus on the problem of the assessment of innovation potential at the microlevel (enterprise), mesolevel (region), macrolevel (state). Realizing the essence of the question, let us considering methodological aspects (the concept "innovation potential", approaches, methods for its assessment).

Table 3 presents approaches to the concept "innovation potential".

Table 3. Approaches to the concept "innovation potential"

Source	Definition of "innovation potential"	Approach to assessment
GOST R 54147–2010	"A set of different types of resources, including material, financial, intellectual, information, scientific, technical, and other resources necessary for the implementation of innovative activity"	Resource
(Berdnikova, 2015, p. 69)	"A set of resources, reserves, and capabilities that enable innovative activities, achieve innovative goals, and improve performance"	Resorce-resulting
(Gadzhiev et al., 2016, p. 238)	"The ability of the territory to create, perceive and implement innovations in the course of socio-economic development"	Resource, resulting
(Zhits, 2000, p.164)	"The amount of economic resources that at any given moment can be used by society for its development. These resources are distributed between three main sectors (segments, directions) of the macrosystem: science and technology, education, investment. The aggregate of these segments forms the innovation potential of the macrosystem"	Resource
(Izjumova, 2011, p. 169)	"A set of interrelated conditions and resources that ensure the reproduction of scientific, technical and technological innovations, possibility of innovation as the most competitive strategy for sustainable development of the regional economy system"	Resorce-resulting
(Kravchenko, Kladchenko, 2003, p. 89)	"A set of different types of resources required to carry out innovative activities"	Resource
(Mitrofanova, Bend', 2006, p. 186)	"A set of resource capabilities, technological, commercial, managerial competencies for the generation, distribution and use of innovations to modernize the economy of a region"	Resource
(Perevozchikova, Bagdasarova, 2020, p. 93).	"A set of potentials (human, financial and economic, industrial, scientific and technical), which gives the opportunity to carry out intense activities aimed at the economic development of the territory"	Resource
(Prokofiev, 2011, p. 13).	"The ability and readiness of the territory to provide a continuous innovation process through resources and efficiency"	Resorce-resulting
(Tatarkin, Novikova, 2015, p. 280)	An integral set of natural-geographical, financial-economic, socio-psychological, socio-political, scientific and educational resources and opportunities to create and use innovations in a particular territory"	Resource
Source: own compilation.		

We can see that the concept of *"innovation potential"* has various interpretations; there is no common approach to the assessment of this indicator in the scientific environment. Let us comment on the different points of view, since this category is the basis for further research.

Based on the normative-legislative framework (national standard in the field of strategic and innovation management, GOST R 54147–2010), we propose to consider innovation potential through the prism of the resource approach, thereby involving different types of resources (factors) as structural elements. Many authors (Zhits, 2000; Kravchenko, Kladchenko, 2003; Mitrofanova, Bend', 2006; Prokofiev, 2011; Tatarkin, Novikova, 2015; Perevozchikova, Bagdasarova, 2020) hold such an interpretation. It is worth emphasizing that among them only N.A. Perevozchikova, D.G. Bagdasarova propose to use not a "set of resources" but a "set of potentials" in terminology. In this context, *innovation potential* is a comprehensive characteristic, focused on the assessment of individual components (potentials), allowing the implementation of opportunities for the active development of innovation in the activities of territories.

According to the researchers (Berdnikova, 2015; Izjumova, 2011; Prokofiev, 2011) the term *"innovation potential"* is based not only on the set of resources, but also on the assessment of the degree of effectiveness of innovation activities. This statement means that the studied definition is considered from the perspective of the resource-result approach, which takes into account both factors and the final outcome of functioning.

According to Y.A. Gadzhiev, M.M. Styrov, D.V. Kolechkov, N.V. Shlyakhtina, innovation potential is the ability to create, perceive and implement innovations in practical activities (Gadzhiev et al., 2016). The authors do not emphasize the set of resources and efficiency, but imply that the basis for calculating the indicator is the performance and resource blocks, which include a certain list of factors.

Based on the analysis we can conclude that there is no consensus on the multidimensionality of the concept of *"innovation potential"*. We propose to consider innovation potential as a set of resources used by an entity for effective socio-economic development of the territory, capable of implementing innovations in practice.

The researchers distinguish three main approaches to the assessment of innovation potential: resource, resulting, resource-resulting, which further form the information base for calculating its level *(Tab. 4)*.

Table 4. Characteristics of the main approaches to assessing innovation potential

Approach	Essence	Advantages	Disadvantages
Resource	It is popular in the scientific community, as in the lexical meaning of the word "potential" it is initially laid down that this is a set of certain resources aimed at the development of an object	The opportunity to study the strengths and weaknesses of innovation processes, identify further growth prospects	The use of a costly mechanism in the assessment of innovation potential; does not allow assessing the effect of innovation
Resulting	It is focused on determining a specific result from the use of available resources	It makes it possible to quantify the result of innovative activity	It is impossible to determine and compare the degree of effectiveness of innovation activities due to the lack of information about the necessary resources
Resource-resulting	It represents a synthesis of resource and performance approaches	It provides an opportunity to assess the effectiveness of innovation activity; determines the structure of potential in the context of two directions (resources and results)	It requires the collection of information on two blocks: resource and effective
Source: own compilation.			

Within the framework of these approaches, the authors use different methods of assessment: integral, rating, factor, matrix, cluster. Let us dwell on their features.

We can carry out integral assessment of innovation potential using the following methods: expert, normative, index, correlation and regression. They both have advantages and disadvantages *(Tab. 5)*.

To evaluate the innovation development level, the application of the integral method can be complemented by the rating method. The articles (Arkhipova, Gagarina, 2014, p. 12; Bakhtizin et al., 2016, p. 14; Gusev, 2009, p. 165) describe foreign and Russian methods for assessing innovation potential, which have a rating character. We should emphasize that there is no universally accepted approach to ranking. The advantage of such methods is the determination of the integral index with the use of a specific set of indicators (the list depends on the chosen methodology). However, there are problems associated with the lack of statistical data or comparability of indicators, which leads to the impossibility of differentiating the territories by the studied integral index.

Recently, the cluster method of assessing the innovation potential level based on the k-means method has gained popularity (Gadzhiev et al., 2016, p. 240; Kormishkina, Koloskov, 2017, p. 222; Kuznetsova, 2017, p. 163). Indicators grouped by blocks are used for calculation. The authors form the list of indicators by themselves. It is proposed to allocate clusters according to different criteria, for example with high, increased, average, low innovation activity (Gadzhiev et al., 2016, p. 245; Kuznetsova, 2017, p. 167) or according to the value of the "index of knowledge economy of the region" (Kormishkina, Koloskov, 2017, p. 228). However, the scientists do not specify the gradation by which they carry out the positioning of territories.

The matrix method usually focuses on two indicators. In the article (Gubanova, Moskvina, 2020, p. 49), innovation potential is considered as a result component, investment potential – as a resource component (resource-resulting approach). Each structural element includes partial potentials

Table 5. Methods of integral assessment of innovation potential

Method	Essence	Advantages	Disadvantages
Expert	It is based on the subjective opinion, experience, intuition, knowledge, specialists in particular sphere and determination of the values of private indicators through point estimates	It is easy to use	Subjectivity in the assessment of indicators
Normative	It assumes the application of standards in calculating indicators	It does not require complex calculations	Norms should be justified, otherwise there is no objectivity of calculated data
Index	Quantitative method based on the calculation of relative values (indices). It allows calculating individual indices for private factors and an integral index of innovation potential	It allows making a comparative analysis of regions	It requires relevant, reliable statistical information on the individual indicators under consideration
Correlation- regression	Quantitative method to determine the closeness of the relationship between innovation potential and factors affecting its value, to build a regression model, which establishes a causal relationship	A mathematical apparatus has been developed to calculate the parameters of the model	The amount of data studied should be sufficient and their values comparable to ensure practical relevance of the chosen regression models
Source: own compilation.			

containing a number of indicators. The calculated values of the potentials allow dividing the regions into groups with high, medium, and low potential according to two criteria. As a result, "leaders", "mediocre", "problem", "crisis" territories are distinguished. The presented methodology allows grouping the regions, to rank them, to identify the dynamics of their positions.

The analysis of methods for assessing the innovation potential level shows that there is no single approach to solving this complex problem. The issue is debatable, requiring deep reflection. When developing a methodology for assessing innovation potential, most often researchers focus on the resource approach, using different combinations of methods (integral and rating, integral and cluster, integral and matrix, factor and rating) in its framework.

The author's methodology for assessing innovation potential is focused on the use of a combination of integral and rating methods as part of the resource approach. This solution is considered to be appropriate. First, the integral method provides a comprehensive assessment of the innovation potential level. At the same time, it is important to take into account the list of included indicators influencing the value under consideration, the features of the tools used. The study proposes using the index method, which gives an objective assessment of factors, allows making a comparative analysis of relative indicators. Second, the rating method is used to rank the regions, which provides a quantitative assessment of the level of innovation activity in a particular territory.

Methodological foundations of the research

The mentioned problem and the subject of the research lead to the conclusion that it is necessary to complement and expand the tools to assess the level of innovation potential of the region.

The developed methodology for assessing innovation potential is based on the *resource approach*, as during the review of the conceptual apparatus, we have determined that *innovation potential* is a set of resources, which are used by a subject for effective socio-economic development of the territory.

The algorithm for assessing the innovation potential level includes the following stages: preparatory, calculation and analytical, and final.

The preparatory stage is aimed at selecting and substantiating the indicators necessary for calculating private potentials. Our methodology assumes that the innovation potential level is estimated with the help of factors (private potentials), included in the following blocks: personnel-educational potential, scientific potential, information potential, and economic potential. Each block contains a certain list of indicators *(Tab. 6)*, formed taking into account the selected resource. The personnel-educational block contains indicators that take into account the level of development of higher education, the degree of specialists' training in the region and their demand, the scientific potential – the level of research and development results, the information potential – the degree of digitalization of the territory, and the economic potential – the ability to function effectively in market conditions.

The selection of these very indicators in each block makes it possible to evaluate private potentials and ensure calculation of innovation potential of the territory. The information base for the assessment and analysis of the innovation potential level is statistical information[8].

At the second stage *(calculation and analytical)*, we calculate individual indices *(i)* for each block; as the basis we take the maximum values from the array of data on a particular indicator. The exception is the indicator "degree of fixed assets depreciation"

[8] Indicators of innovation activity (2021): Statistical collection. Moscow: Natsional'nyi issledovatel'skii universitet "Vysshaya shkola ekonomiki". 280 p.; Russian Statistical Collection (2020). Moscow: Rosstat. 700 p.; Regions of Russia. Socio-economic indicators (2021): Statistical collection. Moscow: Rosstat. 1112 p.

Table 6. List of indicators of innovation potential by blocks

Block	Indicators
1. Personnel-educational potential (*S1*)	Change in the average annual number of employees, i_{11}
	Employment rate, i_{12}
	Number of academic staff of organizations carrying out educational activities on bachelor's, specialist's and master's degree programs, i_{13}
	Number of students enrolled in bachelor's, specialist's and master's degree programs per 10 thousand people, i_{14}
2. Scientific potential (*S2*)	Granting patents for inventions, i_{21}
	Internal expenses on research and development, i_{22}
	Number of organizations which performed research and development, i_{23}
	Number of personnel engaged in research and development, i_{24}
	Level of innovation activity of organizations, i_{25}
	Expenditures on innovation activities, i_{26}
3. Information potential (*S3*)	Use of digital technologies in organizations, i_{31}
	Number of personnel computers per 100 employees, i_{32}
	Use of the Internet by population, i_{33}
4. Economic potential (*S4*)	Investment volumes in fixed capital, i_{41}
	GRP per capita, i_{42}
	Population change, i_{43}
	Indices of industrial production, i_{44}
	Degree of fixed assets deprecation, i_{45}
Source: own compilation.	

from the block "Economic potential". In this case, the numerator of the index considers the lowest value of the proposed data on this indicator, and the denominator uses the value of the indicator of a particular territory. This is explained by the fact that the growth of the parameter "degree of fixed assets depreciation" has a negative assessment in contrast to the rest of the considered indicators.

The weights of the indicators in the blocks are taken equal. Such a decision means that the parameters presented in Table 6 are equivalent in assessing the innovation potential level and the list does not include insignificant indicators. Thus, the subindices *(S)* (personnel-educational potential, scientific potential, information potential, economic potential) represent the arithmetic average of individual indices. To visualize the obtained results, we use a petal diagram, which contains the subindices by region.

The integral indicator of innovation potential (*I*) is a weighted average of the four subindices *(S1, S2, S3, S4)*. The significance (weight) of the subindices is calculated as the ratio of the number of indicators included in a particular block to the total number of indicators for all blocks (formula 1). The personnel-educational potential includes 4 indicators, the scientific potential – 6 indicators, the informational potential – 3 indicators, the economic potential – 5 indicators. The total number of indicators is 18.

$$I = \frac{4}{18} \times S1 + \frac{6}{18} * S2 + \frac{3}{18} * S3 + \frac{5}{18} \times S4. \quad (1)$$

Subindex *S2* (scientific potential) has the greatest importance in formula (1), the least is *S3* (informational potential). Subindices *S1* (personnel-educational potential) and *S4* (economic potential) are intermediate values. It can be explained by the fact that when calculating the individual subindices, a different number of indicators are used, the list of which was determined by taking into account the importance and materiality.

At the third stage (final stage), we form an array of calculated data of the indicators of innovation potential of the studied entities of Russia, included in the Arctic zone. It makes it possible to rank and compare the territories by the degree of innovation potential. The interpretation of the values of the innovation potential level in the author's methodology has 5 levels: critical (unacceptable) ($I < 0.3$), low ($0.3 \le I < 0.5$), medium ($0.5 \le I < 0.8$), increased ($0.8 \le I < 0.9$), and high ($0.9 \le I$).

The methodology introduces the concept of "quality indicator of the innovation potential level". The indicator is the ratio of the value of the innovation potential level of a particular region to the value of the innovation potential level of the leading region. The proposed indicator varies in the range from 0 to 1 inclusive. The value equal to 1 indicates the leading position by the presented indicator. The value less than 1 indicates the degree of lagging behind the region.

The proposed indicator makes it possible to assess the gap between the leading region and the evaluated region, but this requires the formation of an array of data on the constituent entities.

We propose to cluster the regions using four private potentials, to group the territories by level of innovation potential, to identify leaders and outsiders in order to substantiate proposals to stimulate key areas in innovation activity. The use of k-means method excludes the weighting of private potentials for the calculation of innovation potential, as we propose in our methodology. The calculations use individual indices that have the same degree of significance. Comparison of the results obtained by our method and the method of k-means will allow estimating the degree of divergence of the results and the practical significance of the model.

Research results

Based on the described methodology, we assess the innovation potential of the regions included in the RF Arctic zone, in order to carry out a comparative analysis and further ranking of the territories.

Table 7 summarizes the information by block including data for 2020, necessary to assess the innovation potential level.

Table 7. Indicators of innovation potential by blocks in the regions, in the RF Arctic zone

Indicators	Murmansk Oblast	Chukotka AO	Yamalo-Nenets AO	Arkhangelsk Oblast and NAO	Republic of Karelia	Republic of Komi	Krasnoyarsk Krai	Republic of Sakha (Yakutia)
1. Personnel-educational potential								
Change in the average annual number of employees, % to the previous year	96.1	100.2	98.6	97.5	97.7	95.6	97.1	97.5
Employment rate, %	61.5	76.2	72.1	53.7	53.5	57.0	58.9	62.7
Number of academic staff of organizations carrying out educational activities on bachelor's, specialist's and master's degree programs, persons	358	4	12	987	736	547	4486	1532

End of Table 7

Indicators	Murmansk Oblast	Chukotka AO	Yamalo-Nenets AO	Arkhangelsk Oblast and NAO	Republic of Karelia	Republic of Komi	Krasnoyarsk Krai	Republic of Sakha (Yakutia)
Number of students enrolled in bachelor's, specialist's and master's degree programs, per 10 thousand people	90	28	7	153	177	170	233	242
2. Scientific potential								
Issuance of patents for invention, units	23	0	27	56	38	32	326	54
Internal expenditures on research and development, million rubles	2837.4	-*	224.8	1574.6	1062.1	2097.7	26588.1	3076.2
Number of organizations which performed research and development, units	35	7	7	34	19	25	71	31
Number of personnel engaged in research and development, people	1988	-*	135	999	1113	1468	8334	2140
Level of innovation activity of organizations, %	9.4	6.7	5.9	4.4	7.0	8.0	6.7	8.6
Expenditures on innovation activities, million rubles	3438.5	70.0	1419.6	1930.0	4748.6	5423.3	53845.9	6544.3
3. Information potential								
Use of digital technology in organizations (organizations that use personal computers), %	79.4	87.1	80.1	84.6	87.4	79.2	80.1	80.2
Number of personal computers per 100 employees, units	53	54	41	50	62	53	53	51
Use of the Internet by population, % of the total population of the entities	90.7	93.1	95.3	83.7	86.5	84.0	83.8	94.3
4. Economic potential								
Investment volume in fixed capital, billion rubles	191.1	31.6	1075.3	198.8	56.9	140.4	478.8	221.7
GRP per capita, thousand rubles	828.4	1898.6	5710.5	780.6	527.8	873.1	938.0	1258.7
Population growth rate, %	98.8	98.5	100.5	99.2	99.7	99.2	99.6	101
Indices of industrial production, %	101.0	101.0	100.5	93.2	105.5	91.2	91.2	95.3
Depreciation degree of fixed assets, %	42.7	48.9	57.3	54.8	53.8	55.1	46.7	57.3

* Data are not published in order to ensure the confidentiality of primary statistical data received from organizations in accordance with Federal Law 282-FZ, dated November 29, 2007 "On official statistical records and the state statistical system in the Russian Federation" (Paragraph 5 of Article 4, Part 1 of Article 9).
Source: Federal State Statistics Service. Available at: https://rosstat.gov.ru/

It is worth noting that there are no data for Chukotka AO on the indicators "Internal expenditures on research and development", "Number of personnel engaged in research and development" in the section "Scientific potential". As a consequence, the calculation of the innovation potential level in this Russia's entity is limited and can affect the results of the final calculations.

Table 8 shows the calculation of individual indices, subindices and the integral index of innovation potential by regions using our methodology (formula 1).

According to the data in Table 8, the integral index of innovation potential in the regions does not exceed 1. The interpretation of the values of the innovation potential level in our methodology indicates that the Arctic territories are regions with

Table 8. Individual indices, subindices and integral index of innovation potential in the regions of the RF Arctic zone

Index	Murmansk Oblast	Chukotka AO	Yamalo-Nenets AO	Arkhangelsk Oblast and NAO	Republic of Karelia	Republic of Komi	Krasnoyarsk Krai	Republic of Sakha (Yakutia)
1. Personnel-educational potential								
i_{11}	0.959	1.000	0.984	0.973	0.975	0.954	0.969	0.973
i_{12}	0.807	1.000	0.946	0.705	0.702	0.748	0.773	0.823
i_{13}	0.080	0.001	0.003	0.220	0.164	0.122	1.000	0.342
i_{14}	0.372	0.116	0.029	0.632	0.731	0.702	0.963	1.000
S1	0.093	0.029	0.007	0.158	0.183	0.176	0.241	0.250
2. Scientific potential								
i_{21}	0.071	0.000	0.083	0.172	0.117	0.098	1.000	0.166
i_{22}	0.107	0.000	0.008	0.059	0.040	0.079	1.000	0.116
i_{23}	0.493	0.099	0.099	0.479	0.268	0.352	1.000	0.437
i_{24}	0.239	0.000	0.016	0.120	0.134	0.176	1.000	0.257
i_{25}	1.000	0.713	0.628	0.468	0.745	0.851	0.713	0.915
i_{26}	0.064	0.001	0.026	0.036	0.088	0.101	1.000	0.122
S2	0.329	0.135	0.143	0.222	0.232	0.276	0.952	0.335
3. Information potential								
i_{31}	0.908	0.997	0.916	0.968	1.000	0.906	0.916	0.918
i_{32}	0.855	0.871	0.661	0.806	1.000	0.855	0.855	0.823
i_{33}	0.952	0.977	1.000	0.878	0.908	0.881	0.879	0.990
S3	0.905	0.948	0.859	0.884	0.969	0.881	0.884	0.910
4. Economic potential								
i_{41}	0.178	0.029	1.000	0.185	0.053	0.131	0.445	0.206
i_{42}	0.145	0.332	1.000	0.137	0.092	0.153	0.164	0.220
i_{43}	0.983	0.980	1.000	0.987	0.992	0.987	0.991	1.005
i_{44}	0.957	0.957	0.953	0.883	1.000	0.864	0.864	0.903
i_{45}	1.000	0.873	0.745	0.779	0.794	0.775	0.914	0.745
S4	0.653	0.635	0.940	0.594	0.586	0.582	0.676	0.616
Integral indicator of innovation potential, *I*	0.462	0.386	0.454	0.422	0.442	0.440	0.706	0.490

Source: own compilation.

a low level of innovation activity. The values fall within the interval ($0.3 \le I < 0.5$). The exception is Krasnoyarsk Krai, which has an average innovation potential level equal to 0.706 ($0.5 \le I < 0.8$).

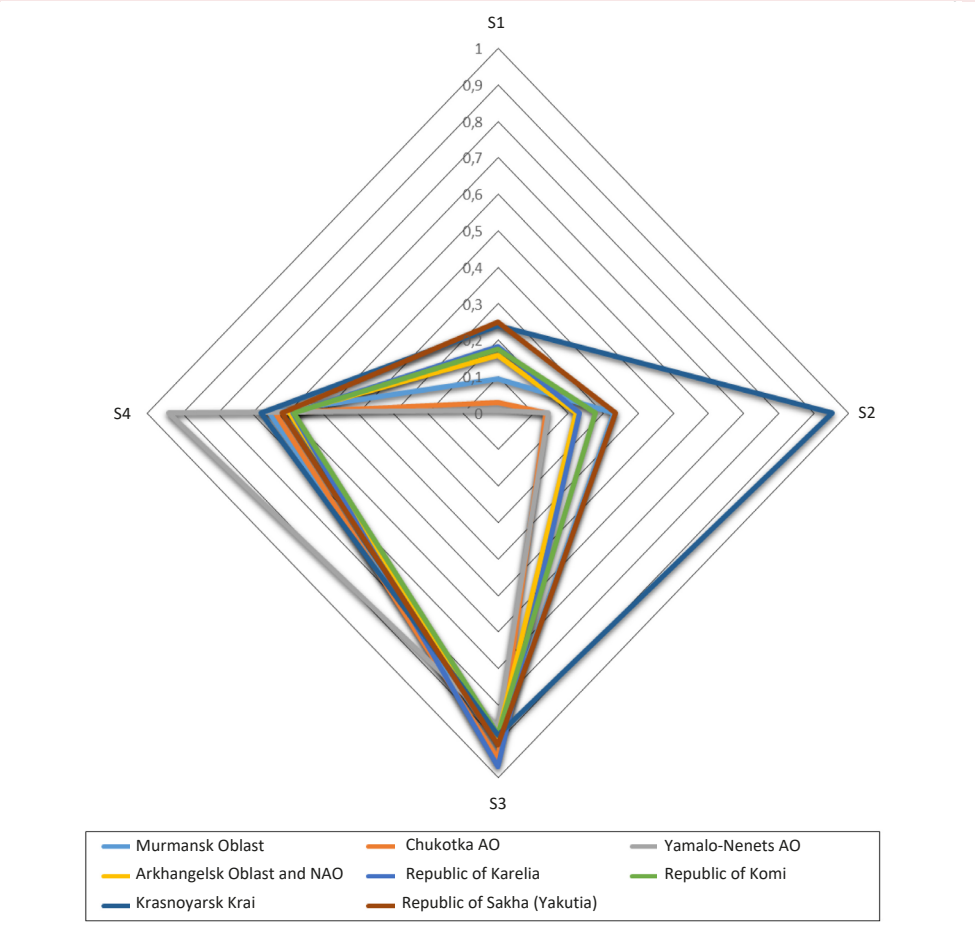
To visualize the results, we use a radar chart containing subindices (private potentials) by region *(Fig.)*.

We can see that the values of the subindices for the blocks of personnel and educational potential (*S1*), scientific potential (*S2*), and economic potential (*S4*) do not exceed 0.5 or slightly deviate from this level. The exceptions are Krasnoyarsk Krai ($S2 = 0.952$), Yamalo-Nenets AO ($S4 = 0.940$). The information potential (*S3*) in all the regions tends to unity.

Table 9 presents the ranking of the regions included in the RF Arctic zone, according to the innovation potential level and gives the values of the quality indicator of the innovation potential level.

The leading region by the innovation potential level is Krasnoyarsk Krai. The last and penultimate places in the rating are occupied by Chukotka AO and the Arkhangelsk Oblast and NAO. The results of the calculations for Chukotka AO require commenting, as there is no information on individual indicators of the block "Scientific potential", which leads to an underestimation of the S2 subindex and a decrease in the innovation potential level.

Subindices of innovation potential of the regions included in in the RF Arctic zone



Source: own compilation based on Rosstat data.

Table 9. Ranking of regions in the Arctic zone of RF according to the innovation potential level

Entity	Quality indicator of innovation potential level	Rating regions
Krasnoyarsk Krai	1.000	1
Republic of Sakha (Yakutia)	0.694	2
Murmansk Oblast	0.655	3
Yamalo-Nenets AO	0.643	4
Republic of Karelia	0.627	5
Republic of Komi	0.623	6
Arkhangelsk Oblast and NAO	0.597	7
Chukotka AO	0.547	8
Source: own compilation based on Rosstat data.		

We should emphasize that the territories considered in the work by the quality indicator of the innovation potential level insignificantly differ from each other, there is a scatter of values from 0.547 to 0.694 (see Tab. 9). Consequently, the development of the regions is in general even. The exception is Krasnoyarsk Krai, which occupies the leading position.

Let us refer to the k-means method to assess the practical significance of our methodology. Within the framework of the use of the cluster method by private potentials: personnel-educational potential *(S1)*, scientific potential *(S2)*, information potential *(S3)*, economic potential *(S4)*, we allocate two clusters. The first cluster includes the Murmansk Oblast, the Arkhangelsk Oblast and NAO, the Republic of Karelia, the Republic of Komi, Krasnoyarsk Krai, the Republic of Sakha (Yakutia), the second cluster is Chukotka AO, Yamalo-Nenets AO.

The application of the cluster method has led to the conclusion that the outsiders are Chukotka AO and Yamalo-Nenets AO. According to our method with the cluster method, we record differences in the calculations for two entities: the Arkhangelsk Oblast and NAO and Yamalo-Nenets AO, as in our method the significance of the block "Economic potential" is high (formula 1), and in the cluster method the weights of all indicators are of equal value.

As a result, in our methodology the subindex *(S4)* significantly influenced the integral index of innovation potential and brought Yamalo-Nenets AO to the 4th place in the rating, and the Arkhangelsk Oblast and NAO – to the 7th place. The discrepancy in the results cannot negatively affect the expediency of the application of the methodology. It is possible to expand the list of indicators included in the blocks "Personnel-educational potential" *(S1)* and "Information potential" *(S3)*.

Thus, the proposed methodology makes it possible to assess the innovation potential using integral and rating methods in the framework of the resource approach. The methodology has the following advantages: easy to use, provides accessibility in obtaining relevant, reliable statistical information on the studied particular indicators, makes it possible to rank the regions and conduct a comparative analysis of territories in order to identify problems associated with innovation development.

Innovative activities in the RF Arctic zone

According to the research results, the regions of the RF Arctic zone are referred to the territories with low innovation activity. Using the numerical material obtained in the course of testing the methodology, we present a qualitative assessment of the innovation potential level of the Arctic territories of Russia's entities *(Tab. 10)*.

Table 10. Qualitative assessment of innovation potential level of the regions of the RF Arctic zone

RF constituent entity	Qualitative assessment of innovation potential level
Krasnoyarsk Krai	It is an innovatively developed region. High level of personnel-educational, scientific and digital potentials. However, it is worth noting that the innovation structure is concentrated in large cities and its impact on the growth of peripheral Arctic territories is insignificant. Innovation structure includes a cluster, business incubators, innovation and technology centers, territories of advanced socio-economic development, innovation centers, information centers, centers of collective use and other facilities. The region is a leader in terms of investment needs. Innovation activity is associated with the mining industry.
Republic of Sakha (Yakutia)	There is an average level of innovation activity, but at the expense of territories outside the RF Arctic zone. Particular attention is paid to diamond and gold mining, electric power industry, fuel industry. The entity has a high level of economic potential. Innovation structure includes a cluster, business incubator, innovation center, territories of advanced socio-economic development.
Murmansk Oblast	It has positive trends in the region's development, high level of scientific and digital potential. The region has well-developed transport infrastructure (ports, airports, an extensive network of rail and road transport), industrial enterprises. Innovative development is carried out in the following sectors: energy, transport, extraction and transportation of hydrocarbon raw materials. Innovation structure includes a cluster, business incubator, innovation center, territories of advanced socio-economic development.
Yamalo-Nenets AO	The region has low human resources and educational and scientific potential. It is worth noting that the Sabetta sea port, railway transport corridors and airports have been actively developed recently. Innovative development is aimed at the growth of the fuel-industrial complex, processing and transportation of hydrocarbons. Innovation structure is represented by technoparks, innovation and technology center, and funds.
Republic of Karelia	The region has the average level of personnel-educational, scientific potentials. Active development of timber, woodworking, mining industry, fishery, fur farming. Innovation structure includes a cluster, business incubator, innovation center, territories of advanced socio-economic development.
Republic of Komi	The region has a low level of scientific, personnel-educational potential. Remoteness of the Arctic territories from the center. Development of fuel and energy complex (oil production, oil refining, gas, coal and electricity industries), reindeer breeding. Innovation structure consists of a cluster, business incubator, innovation center, territory of advanced socio-economic development, technology transfer centers.
Arkhangelsk Oblast and NAO	The Arkhangelsk Oblast is considered together with NAO, as a result, the indicators of innovation activity are not high. Innovation infrastructure consists of scientific-educational and technological complexes with the participation of the Northern (Arctic) Federal University, technoparks and business incubators. There is a low scientific-educational potential in Nenets AO, poorly developed transport logistics. Innovative development and modernization of the economy of the region is carried out in the following sectors: agriculture, energy, housing and communal services, transport, extraction and transportation of hydrocarbons. Particular attention is paid to the implementation of innovations at the enterprises of timber and agro-industrial complexes, shipbuilding.
Chukotka AO	It is the lowest level of personnel-educational and scientific potential (harsh climatic conditions, low population density, mono-industrial character of industry development: mining industry). The main areas of agriculture in the region are reindeer breeding and hunting. Innovative structure consists of the territory of advanced socio-economic development.
Source: own compilation.	

To summarize, we should emphasize that in the Arctic regions there is an innovative development of the following industries: energy, transport, extraction and transportation of hydrocarbon raw materials. This is due to the features of the territories: rich mineral deposits, orientation of the economy on hydrocarbon production, export of resources to other Russia's entities and abroad, dependence on supplies of vital goods and food, underdeveloped transport network, focal nature of territory development and conducting industrial and economic activity. Therefore, the main directions of innovation policy can include the improvement of mining technology, search for alternative energy sources, development of transport system (timely modernization and expansion of port, railway infrastructure, regional aviation, application of digital technologies in transport logistics), intensification of agriculture to improve food security. It is important to carry out systematic work not only in the regional centers, but also on the periphery ensuring the integrated development of territories.

Sustainable and stable growth of the regions requires dynamic and purposeful work consisting in the preparation and implementation of programs related to innovation and investment activities. Regional government should set achievable targets in the state programs aimed at innovative development and modernization of the economy. The main thing is to improve the quality of planning targets taking into account the current and future situation.

This approach will make it possible to introduce the latest technology, create additional jobs, reduce unemployment, increase tax revenues to regional budgets, improve the socio-economic condition of the entities, increase the attractiveness of the Arctic territories and the quality of life, thereby reducing migration outflows to other Russian regions.

The effective innovative development of territories requires not only qualitative normative-legislative base, but also the presence of innovative structures in the regions. Particular attention should be paid to the production and technological component: clusters, technology parks, innovation and information centers, business incubators and other significant objects.

Conclusions

In conclusion, we should highlight that in modern conditions of functioning of the regional economy special attention should be paid to the issue of innovative development of territories. This approach gives a powerful impetus to the creation of favorable conditions for sustainable growth and improvement of socio-economic systems (regions), makes it possible to carry out forecasting, analysis, monitoring of the functioning of entities, to develop measures to increase their innovation activity.

The theoretical foundations of the study consist in the consideration of the methodological aspects of assessing the region's innovation potential. We analyze the term "innovation potential" and confirme the existence of a variety of interpretations and ambiguity of judgments about it. It allows substantiating the relevance of the research, identifying the main approaches to assessing the innovation potential level, analyzing the existing methods used in the resource, performance and resource-result approaches, and proposing a methodology to assess innovation potential.

We have carried out the testing on the statistical data of the regions included in the RF Arctic zone. The methodology makes it possible to obtain a ranked array including the assessment of the innovation potential level by entities, and to make their rating by the studied indicator.

The spatial analysis of the innovation potential level of the territories of the RF Arctic zone reveals the following:

– generally equal innovative development of the regions; the exceptions are Chukotka AO (the outsider – 8th position in the rating) and Krasnoyarsk Krai (the leader – 1st position in the rating);

– low level of the studied indicator due to the features of regional development: low degree of development, uneven location of settlements and production facilities, remoteness of facilities from the main transport routes (large areas and hard-to-reach places);

– focus on a single-sector nature of the economy;

– emphasis on the intensification of innovations in energy, transport, production and transportation of hydrocarbons (the Northern Sea Route currently determines the trajectory of the national economy);

– disproportions in the spatial dislocation of the innovation structure (absence in the peripheral Arctic territories and concentration in the regional centers).

The results of the study can be used in the process of making managerial decisions related to the development of the regional economy. The prospective direction of work consists in expanding the list of evaluated factors and testing the methodology on the statistical indicators of other Russia's federal districts.

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Forecasting the Impact of Investments on Spatial Heterogeneity in the Development of the Livestock Industry

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Abstract. The article investigates uneven spatial development of livestock industry in Russia's regions. It is caused by many factors, including the volume of attracted investments, human resources; and it endangers the food security of territories. The purpose of the study is to assess spatial heterogeneity in the development of the livestock industry in the Sverdlovsk Oblast. To achieve the goal, we set the following tasks: to conduct a spatial autocorrelation analysis of the development of the livestock industry in Sverdlovsk Oblast municipal entities, investigate the impact of human resources investments and costs on the development of spatial heterogeneity in the region's livestock industry, assess the spatial effects of livestock industry development in territorial systems, design forecast scenarios for its development in the region's municipal entities up to 2025. Having reviewed theoretical and methodological approaches

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to assessing spatial heterogeneity at the regional and municipal levels we find out that Russian and foreign researchers use a variety of methods. Their application does not contribute to the comprehensive assessment of spatial heterogeneity in the development of the livestock industry. To solve the problem, we propose a methodological approach, whose novelty consists in the comprehensive application of spatial autocorrelation analysis methods using various matrices of spatial weights, regression analysis using panel data and ARIMA modeling which, when combined, make it possible to determine the impact of investments and other factors on heterogeneity in the development of the livestock industry in the region's municipalities and design a system of various forecast scenarios. The regression models we constructed have confirmed the differentiated impact of investments and human resources on spatial heterogeneity in the livestock sector in the Sverdlovsk Oblast and outlined the prospects for its development.

Key words: investments, livestock industry, spatial heterogeneity, Cobb – Douglas production function, spatial autocorrelation, scenario forecasting, ARIMA modeling.

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Introduction

Problems associated with the spatial heterogeneity of the livestock industry development at the regional and municipal levels are relevant at the present time and typical for all countries, regardless of the level of economic development. Spatial heterogeneity of the livestock industry development, in our opinion, is manifested in the excessive concentration of production in certain territorial systems and lack of their development in others, which forms a threat to food security of the economic space at the municipal, regional and macroeconomic levels. Heterogeneity in the activities of the entities of agro-industrial production is expressed by the existing differences in the volume and structure of resources used, the geographical location specifics of the region, the quality of the obtained products and their competitiveness in domestic and foreign markets, proximity to distribution channels, etc. (Gorbatovskaya, 2017). According to V.F. Pechenevsky and O.I. Snegirev, among the many factors influencing the location and development of individual branches of animal industry, the most important are the natural potential of regional agriculture, zones and degrees of its use, land availability, zonal combinations of branches, level and structure of local food consumption, distance and means of transportation of certain types of products and raw materials for their production from the place of production to the place of consumption, which determines the transportation costs (Pechenevsky, Snegirev, 2018). As S.S. Patrakova notes, in order to reduce spatial heterogeneity and asymmetry, to increase the balance of development of the region's municipal entities, it is necessary to form new local centers and growth poles, to increase the intensity of spatial interactions between territories (Patrakova, 2022).

In foreign studies, the approach of finding optimal options to reduce the negative effects of spatial heterogeneity also prevails, for example, in the study devoted to the factors affecting food security in China, large-scale differences and spatial heterogeneity of food security, and the factors determining it are considered (Lv et al., 2022).

At present, the dynamics of change in the spatial heterogeneity in the livestock industry development in the territorial systems of different levels and the development of mechanisms for its smoothing are relevant. An important aspect is the assessment of the formation and development of the spatial heterogeneity factors. On this basis, the main purpose of the presented work was to assess the spatial heterogeneity in the livestock industry development in the Sverdlovsk Oblast. The object of the study are the municipal entities of the Sverdlovsk Oblast, the subject is socio-economic relations arising in the process of livestock production.

To achieve the goal, the following tasks were set: to conduct a theoretical review of the methods used to assess the spatial heterogeneity of economic activities of economic entities, scenario modeling, forecasting their development in the future and forming a systematic approach, taking into account advantages and disadvantages of these methods; to evaluate the spatial heterogeneity of livestock industry development in the municipal entities of the Sverdlovsk Oblast and to search for the main centers (growth poles) of the industry development, similar by the level of industry development of municipal entities that can be combined into spatial clusters, and their influence zones; to model the spatial effects in livestock industry development in these territorial systems; to form a Cobb – Douglas regression model using panel data on municipal entities of the Sverdlovsk Oblast for assessing the impact of attracted investment in fixed capital and wages on livestock production volume in the region's municipal entities; to build regression models on the time series to assess the degree of influence of these factors on livestock industry development; to carry out ARIMA modeling of the dynamics of the evaluated factors to form the most likely forecast scenarios of the industry development until 2025: inertial, taking into account the currently observed trends, optimistic and pessimistic.

The solution of these problems will allow us to consider not only the spatial heterogeneity of the livestock industry in the Sverdlovsk Oblast, but also the differentiation of its formation factors; and the regression models will help to develop mechanisms for its smoothing.

Review of theoretical and methodological approaches to the assessment of spatial heterogeneity

Evaluation of the spatial heterogeneity phenomenon has been extensively developed in the works of Russian and foreign scientists. Thus, K.T. Sibhatu, L. Steinhubel, H. Siregar, M. Kaim and M. Volney studied the spatial heterogeneity of palm oil production activities in a sample of Jambi households in Indonesia, using structured additive regression models with nonlinear spatial effects in order to visualize spatial clusters (Sibhatu et al., 2021). B. Yang, H. Gia and others examined spatial heterogeneity in food consumption of rural households based on food and consumer habits on the example of typical transitional pastures of Inner Mongolia and China, using one-way analysis of variance (Yang et al., 2022). A team of authors (T.J. Chikuvire, S. Mpepereki et al.) used descriptive and non-parametric statistics to investigate the impact of spatial heterogeneity on food security in the Mutoko Municipal District (MD), a typical arid zone in Zimbabwe (Chikuvire et al., 2006). M.Yu. Arkhipova and A.I. Smirnov used linear and nonlinear regression models to statistically evaluate the indicators used for crop yield forecasting (Arkhipova, Smirnov, 2020).

To study the spatial heterogeneity of socio-economic development at the regional and municipal levels, statistical methods are often used: integral coefficients, the Herfindahl – Hirschman and Theil indices, statistical characteristics (mean value, median, standard deviation, skewness coefficient, kurtosis coefficient, coefficient of variation, etc.). The differentiation indicator, the Theil index, was used by A.V. Brovkova to analyze

socio-economic inequality and convergence of Russian regions, and to identify problem areas of spatial development and growth poles (Brovkova, 2014). Y. Zhang and B. Li applied the Theil index and geographically weighted regression to explain the spatial and temporal characteristics of wheat production distribution in the Huang-Huai-Hai region (Zhang, Li, 2022). G.Yu. Gagarina and R.O. Bolotov carried out decomposition of interregional inequality using the Theil index and proved that differences within federal districts are only a small part of spatial heterogeneity, while interregional differences within districts account for over 80% of all regional variation (Gagarina, Bolotov, 2021). The study of A.F. Zimin and V.M. Timiryanova assesses the spatial heterogeneity of the consumer goods market based on indicators of territorial specialization and localization of individual processes in the regions of Russia (Zimin, Timiryanova, 2016).

The concentration coefficient and the Herfindahl – Hirschman index were used by M.N. Tolmachev to study the level of concentration of agricultural production and production factors in RF regions for the period from 2000 to 2008 (Tolmachev, 2010), and by L. Piet to assess the degree of economic and production potential concentration of farms in EU countries (Piet, 2017). Statistical methods (including the Gini coefficient, variation coefficients, the Atkinson and Theil indices) are used by Russian scientists to assess regional differentiation by various indicators, such as gross regional product and population income (Glazyrina et al., 2010), wages (Zubarevich, 2013), the level of distribution of investment, poverty and unemployment (Zubarevich, Safronov, 2013), tax revenues (Malkina, Balakin, 2014), budget revenues before and after their distribution (Postnikova, Shiltsin, 2009).

The Cobb – Douglas production function and geographically weighted regression (GWR) method are actively used by Russian and foreign researchers to model spatial heterogeneity. In particular, A.A. Koç and co-authors identified spatial differences in agricultural production based on GWR and the Cobb – Douglas function to estimate the impact of agriculture on gross income in Turkey (Koç et al., 2017). In this study we used not the standard Cobb – Douglas production function, but a geographically weighted modification of it, in the construction of which the fixed effects of regions with dummy variables, a vector of variables for regional dummy variables and a vector of parameters to describe the relationship between the factors and the regional dummy variable in the model were taken into account.

T.P.S. Wagle applied the Cobb – Douglas production function to investigate the logical relationship between production and labor costs using the example of Nepal's agricultural industry (Wagle, 2016). N.V. Suvorov and his colleagues used the Cobb – Douglas production function with static and dynamic parameters on the example of the industrial complex of the Republic of Bashkortostan for 2006–2016 (Suvorov et al., 2020).

M. Wenbo, T. Weiteng, J. Kian and M. Kiankian used geographically weighted regression based on temporal and geospatial characteristics to offset the shortcomings of traditional spatial data analysis, which considers only spatial heterogeneity and ignores the temporal variable. The authors identified the key factors affecting urbanization (socio-economic factors, education, secondary industry, habitat) in the spatial and temporal dimension by constructing a GWR model using 110 cities in the Yangtze River economic belt as an example (Wenbo et al., 2021).

A.G. Bille, S. Salvioni and R. Benedetti used an iterative geographically weighted regression (IGWR) method to overcome spatial heterogeneity in order to identify clusters of spatial technologies, that is groups of firms using a common technology, using the Italian olive production market as an example (Bille et al., 2015). B. Fang, H. Huang, B. Yang and Q. Hu studied the factors causing geographical heterogeneity of grain production levels in Guangdong Province of China in terms of land, labor and capital. The GWR method was used to eliminate the effect of spatial attenuation of influencing factors (Fang et al., 2021). At the same time, geographically weighted regression methods do not allow us to estimate the dynamics of spatial heterogeneity of the studied processes, because they rely exclusively on spatial data and estimate the influence of factors using the geographic coordinates of the research objects (latitude and longitude).

In addition, Russian and foreign scientists used methods of spatial autocorrelation to study spatial heterogeneity at the regional and municipal levels. A.A. Khan constructed spatial models of the livestock industry development in regions of Turkey in order to identify growth poles and potential clusters based on the method of spatial autocorrelation, taking into account the global and local Moran's indices (Khan, 2020). A team of authors (S. Han, J. Wang et al.) applied spatial autocorrelation analysis to study spatial structural changes in the livestock industry in China for the period 1980–2017. The results of the study showed that the production capacity of the land, along with the increase in income and living standards of the population played an important role in the livestock industry development (Han et al., 2020). T.A. Dubrova used multivariate statistical and cluster analysis to form groups of countries by meat production for the period 2000–2011 (Dubrova, 2014). A similar toolkit was applied by Y. Shouying and F. Qiaoxi in investigating spatial dependencies and identifying spatial heterogeneity of crop production in Sichuan Province from 2000 to 2016 (Shouying, Qiaoxi, 2018), and D.J. Augustine, D.T. Booth, S.E. Cox and J.J. Derner applied it to analyze spatial heterogeneity of vegetation in grasslands (Augustine et al., 2012).

To consider the spatial effects of the development of certain processes in foreign studies, we used various tools of spatial regression modeling, such as models with spatial lag (SAR), spatial error (SEM), their combination (SAC), and spatial Durbin models, which estimated the spatial lag of factor features (SDM-model). Thus, a team of authors (N. Atikah, B. Vidodo et al.) used the Spatial Durbin Model (SDM) for mapping the area to assess and optimize the level of tax revenues from advertising in Malang city (Atikah et al., 2021). Other researchers have performed a spatial distribution of China's elite hospitals and evaluated the factors influencing it based on geographically weighted regression (GWR), multiscale geographically weighted regression (MGWR), GWR and MGWR with spatial autocorrelation (GWR-SAR and MGWR-SAR), spatial lag model (SLM) and spatial error model (SEM) (Shi et al., 2021). City level, number of medical colleges, level of urbanization, resident population and GDP per capita were identified as the most significant factors. J. Bulteau, T. Follet, and R. Le Bonec using spatial econometric models (SAR and GWR) revealed spatial heterogeneity and spatial interactions between the transport infrastructure of Nantes (northwestern France) and the pricing policies for home sales in urban and suburban (rural) areas (Bulteau et al., 2018).

A review of theoretical and methodological approaches to the assessment of spatial heterogeneity in the development of animal industry at the regional and municipal levels showed a variety of methods used by researchers. All methods mentioned above have their advantages, disadvantages, peculiarities and limitations. Statistical methods allow us to make a quick assessment of spatial heterogeneity, but do not provide an opportunity to identify the factors causing it. Regression analysis helps to solve this problem, but it does not fully take into account the influence of spatial effects in the study of heterogeneity, and the formed panel models can complicate the forecasting process. Geographically weighted regression models are used to analyze the spatial heterogeneity factors, they allow us to take into account the distance between territories, but do not take into account the time factor, which makes the process of assessing changes in spatial heterogeneity in dynamics much more difficult. Spatial models (SAR, SEM, SAC, SDM and others) make it possible to establish the influence of neighboring areas, take into account the time factor, but are difficult to apply for multivariate forecasting of the studied processes, because regression coefficients relevant to spatial lag and error in them cannot be interpreted directly, as in traditional regression models.

Spatial autocorrelation analysis allows us to carry out a cluster analysis of territories, to identify the existing direct and inverse relationships between them, to determine the main centers of resource concentration and thus confirm the spatial heterogeneity of their distribution. At the same time, only the distance between territorial systems is considered as a heterogeneity factor. It is necessary to have a methodological approach for spatial heterogeneity of cattle breeding branch development research, which integrates methods of spatial autocorrelation analysis, regression modeling and ARIMA modeling and helps to reveal factors, which cause spatial heterogeneity, and also to take into account the influence of spatial effects.

Methodological foundations of scenario modeling and forecasting of the livestock industry spatial heterogeneity

For studying and scenario forecasting of spatial heterogeneity of the livestock industry development in the region, an approach was proposed, which is based on methods of spatial autocorrelation analysis, regression modeling using panel data and autoregressive integrated moving average (ARIMA). At the initial stage, spatial autocorrelation analysis by a modified method of P. Moran was used to assess the location of the main centers of the livestock industry production. Its modification consisted in using not one, but a whole system of spatial weights matrices to calculate the global and local spatial autocorrelation indices and form the Moran scatter plot (standardized and traditional inverse distance matrices for roads, linear distances and contiguous boundaries). The need for their use is due to the importance of obtaining reasonable results of spatial analysis, their generalization by various matrices.

Global (1) and local Moran's spatial autocorrelation indices (2) calculated on their basis in the dynamics for the 2017–2020 period, the assessment of their statistical significance of Z, P-value (3) will allow us to confirm the spatial heterogeneity of the livestock industry in the Sverdlovsk Oblast in case of negative values and identify trends in its development, and the formed Moran scatter plot will allow us to establish spatial centers (growth poles) of development of this industry, municipal entities with similar

characteristics and a high level of spatial mutual influence, which can form spatial interterritorial clusters in the livestock industry, and their zones of strong and weak influence.

$$I_G = \frac{\sum_i \sum_j w_{ij}(x_i - \overline{x})(x_j - \overline{x})}{\frac{1}{n}\sum_i (x_i - \overline{x})^2 \sum_i \sum_j w_{ij}}, \quad (1)$$

where I_G – Moran's global spatial autocorrelation index; w_{ij} – element of the weight matrix W; x_i – studied indicator of the municipal entity (ME) (i); x_j – analyzed indicator of another municipal entity (j); $\bar{x}$ – average value of the indicator; n – total number of municipal entities.

$$I_{Li} = n * \frac{(x_i - \overline{x}) \sum_i w_{ij}(x_j - \overline{x})}{\sum_i (x_i - \overline{x})^2}, \quad (2)$$

where I_{Li} – Moran's local spatial autocorrelation index.

$$Z = \frac{I_G - E(I_G)}{SD\ (I_G)}, \quad (3)$$

where Z – z-score value, which allows us to determine by how many standard deviations the actual value of the spatial autocorrelation index is removed from the expected mean value; $E(I_G)$ – the expected average value of Moran's global index; $SD(I_G)$ – the standard deviation of Moran's global index.

The modification of this methodology consisted in highlighting municipal entities with different levels of spatial mutual influence (with local indices of spatial autocorrelation above and below the average) in each quadrant of the Moran plot. Their allocation in the HL quadrant will allow us to establish the territories that are really the centers of livestock development in the region (growth poles), and identify only the emerging growth poles, and in the HH quadrant – formed and emerging spatial clusters of interconnected territories in the industry. The division of territories in the LH quadrant by the strength of spatial mutual influence will help to establish the municipal entities, experiencing a strong and weak influence of growth poles and spatial clusters in the livestock industry of the Sverdlovsk Oblast. Their impact on the surrounding areas can be confirmed by forming a matrix of local indices of spatial autocorrelation LISA between municipal entities and highlight the territories in it with an index greater than the average, calculated from the positive and negative values of the index. The analysis carried out by different matrices of spatial weights will make it possible to identify sustainable direct and inverse spatial interactions between the main centers of cattle breeding and the surrounding areas in the Sverdlovsk Oblast. In addition to the spatial autocorrelation analysis by Moran's method for assessing the spatial heterogeneity of the livestock industry development, the traditional statistical approach to grouping municipal entities will be used. The first group includes municipal entities with the highest livestock industry production volume, exceeding the standard deviation from the average for the Sverdlovsk Oblast; the second group includes territories with average production volume; the third group includes municipal entities with production volume below the average.

The second stage of the study is to assess the spatial heterogeneity factors in the development of the livestock industry in the Sverdlovsk Oblast using the classical Cobb – Douglas regression model on panel data from municipal entities of the region for the period from 2010 to 2020. This model is traditional in the study of production organization efficiency in various industries, and it allows us to estimate the impact of the volume of attracted investments in fixed capital and funds, forming the wage fund of employees, on the volume of production; arising additional effects from the scale of production activities (decreasing, constant

and increasing returns). Elasticity coefficients for these factors in the model will help to establish the degree of their impact on the livestock production volume in the municipal entities of the region, to form the basis for the most likely forecast scenarios of industry development until 2025. When constructing the model, traditional factors were used, control variables were not included due to the limited statistical data on municipal entities characterizing the development of the livestock industry.

For assessing the impact of key production factors on the dynamics of livestock production produced in the municipal entities of the Sverdlovsk Oblast, it is proposed to use a regression model on the panel data with fixed and random effects (4):

$$Ln(V_{it}) = \alpha + \mu_t + \gamma_t + \beta_1 Ln(C_{it}) + \\ + \beta_2 Ln(L_{it}) + \varepsilon_{it}, \quad (4)$$

where V_{it} – livestock production volume, thousand rubles; C_{it} – volume of attracted investments in fixed capital by livestock enterprises located in the territory of the municipal entity, thousand rubles; L_{it} – resources allocated by livestock enterprises for the development of human resources (wage fund of all employees of organizations), thousand rubles; α – constant, the total of other factors influencing livestock production volume; β_1 – elasticity coefficient for the attracted investments volume; β_2 – elasticity coefficient on the cost of human resource development; μ_t – the individual effect of municipal entity i, time-independent t; γ_t – temporal effects for municipal entity i at time t; ε_{it}– normally distributed random variables for time t and territory i (model errors).

To construct the model, it is proposed to use the data for 69 municipal entities of the Sverdlovsk Oblast for the period from 2010 to 2020 in comparable prices (2010). Due to limited statistical data, the sample did not include municipal districts with a very low population size. To assess the impact of not only production factors on the livestock production dynamics in the municipal entities of the Sverdlovsk Oblast, but also the spatial effects of the surrounding areas, we propose to form a Cobb – Douglas model with spatial lag – SAR (5), model with spatial dependence in errors – SEM (6) and an integrated model with spatial lag and error – SAC at the next stage of research (7):

$$Ln(V_{it}) = \alpha + \beta_1 Ln(C_{it}) + \beta_2 Ln(L_{it}) + \\ + \rho\, Ln(WV_{it}) + \varepsilon_{it}, \quad (5)$$

$$Ln(V_{it}) = \alpha + \beta_1 Ln(C_{it}) + \beta_2 Ln(L_{it}) + \\ + \lambda W u_{it} + \gamma_t + \mu_i + \varepsilon_{it}, \quad (6)$$

$$Ln(V_{it}) = \alpha + \beta_1 Ln(C_{it}) + \beta_2 Ln(L_{it}) + \\ + \rho\, Ln(WV_{it}) + \lambda W u_{it} + \gamma_t + \mu_i + \varepsilon_{it}, \quad (7)$$

where V_{it} – livestock production volume, thousand rubles; C_{it} – volume of attracted investments in fixed capital by livestock enterprises located in the territory of the municipal entity, thousand rubles; L_{it} – resources allocated by livestock enterprises for the development of human resources (wage fund of all employees of organizations), thousand rubles; WV_{it} – spatially weighted values of livestock production volume; ρ – spatial autoregressive coefficient; Wu_{it} – spatial autocorrelation matrix of the error; λ – vector of time-independent individual spatially dependent specific effects; α – constant, the totality of other factors influencing livestock production volume; β_1 – elasticity coefficient for the volume of attracted investments; β_2 – coefficient of elasticity of costs for human resource development; μ_t – the individual effect of municipal entity i, time-independent t; γ_t – temporal effects for municipal entity i at time t; ε_{it} – normally distributed random variables in time t and in territories i (model errors).

This model can be build using the Panel Generalized Method of Moments and the weighted White matrix tool to control for heteroscedasticity in the model, and data transformation with the help of orthogonal deviations, introducing dummy variables for each spatial unit and each time period. To obtain the coefficient of spatial autoregression, reflecting the impact of livestock production in neighboring municipal entities, spatial weighting of its volume on the matrix of spatial weights by linear distances between municipal entities is proposed. The use of panel data on municipal entities for 11 years will establish not short-term, but long-term spatial effects. The formation of an integrated model with spatial lag and error will help to correct the coefficient of spatial autoregression and assess the influence of spatial features on its errors, thereby confirming the importance of spatial location of municipal entities for the development of the livestock industry in the region.

In order to substantiate the significant influence of the factors under consideration on the dynamics of spatial heterogeneity of the livestock industry development in the region and the construction of forecast scenarios for its development in the next stage of the study it is proposed to build regression models using time series for municipal entities of the Sverdlovsk Oblast for the period from 2010 to 2020. These models will assess the degree of investment and cost impact on the development of human resources capacity of livestock enterprises in the municipal entities belonging to the already formed and emerging growth poles, spatial clusters and zones of their strong and weak influence, on the production volume of enterprises in the industry.

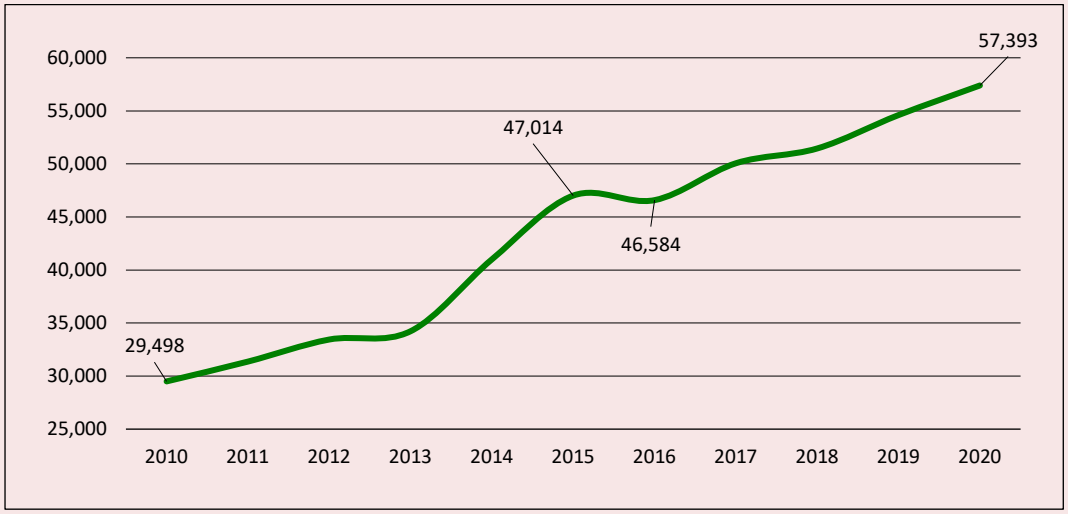
Basic, most likely forecast scenarios of changes in the livestock production dynamics in the municipal entities of the Sverdlovsk Oblast can be constructed with the help of the ARIMA modeling of the dynamics of the factors included in the Cobb – Douglas regression model. Autoregressive modeling using a moving average will build an inertial forecast of these factors' dynamics up to 2025, taking into account the trend observed in the past, and establish a corridor of possible fluctuations in their forecast values. The reliability of the ARIMA models will be assessed using the coefficient of determination, the Schwartz, Akaike and Hennan – Quinn information criteria, standard errors and P-values of the main model parameters.

Forecast values of the investment dynamics in fixed capital and costs of enterprises to develop human resources, obtained in the course of ARIMA modeling, at the next stage will be used to form the three most likely scenarios of change in livestock production dynamics in the municipal entities of the Sverdlovsk Oblast until 2025: inertial, assuming the preservation of the marked trends in the dynamics of indicators for the period from 2010 to 2020, pessimistic and optimistic. The Cobb – Douglas Regression models formed in the second stage of the presented methodological approach will be used for the construction of scenarios. Thus, for modeling and forecasting the spatial heterogeneity of the livestock industry development in the Sverdlovsk Oblast it is expected to implement a systems approach based on the application of statistical research methods, spatial autocorrelation analysis, regression modeling on panel data and time series, and also ARIMA modeling to form the most probable forecast scenarios.

Results of the study

The Sverdlovsk Oblast is the largest industrial center of Russia, and livestock industry is not the main branch of its specialization. However, in the context of achieving and maintaining food security in the region and reducing its dependence on imports of livestock products from other countries, this sector of agriculture, in our opinion, should be

Figure 1. Dynamics of livestock production in the Sverdlovsk Oblast from 2010 to 2020 in actual prices, million rubles



Source: Federal State Statistics Service.

actively developed. If we look at the dynamics of the production volume of the industry enterprises *(Fig. 1)*, we can note that over the past 10 years (from 2010 to 2020) the indicator has almost doubled.

Despite the significant development of the livestock industry in the region, the problem of spatial heterogeneity of its location still remains acute. Currently, almost 50% of livestock production in the Sverdlovsk Oblast is produced in six municipal entities: Reftinsky Urban Okrug (UO) (10.5%), Irbitskoye Municipal Entity (ME) (9.8%), Bogdanovich UO (7.8%), Kamyshlovsky Municipal District (MD) (7.6%), the city of Yekaterinburg (7.5%) and Verkhny Tagil UO (4.2%). In 2010, they produced 37.6% of all livestock products in the region and their production volume exceeded one standard deviation from the average, calculated for all municipal entities of the oblast. Statistical analysis of the data showed that from 2010 to 2020, the level of production concentration of this agricultural industry in some of them significantly increased. For example, the share of livestock products in Bogdanovich UO in relation to the total volume of output production in the region increased from 3.3 to 7.8% and in Kamyshlovsky MD – from 2.6 to 7.6% *(Tab. 1)*.

A slight increase in the production concentration was also observed in Reftinsky UO and Irbitskoye ME. The group of municipal entities with a level of the livestock industry production concentration above the average for the Sverdlovsk Oblast according to 2020 included Talitsky UO (3.3%), Sukhoy Log UO (3.1%), Pervouralsk UO (3%), Gornouralsky UO (2.9%), Kamensky UO (2.8%), Beloyarsky UO (2.4%), Sredneuralsk UO (2.4%), Sysertsky UO (2.3%) and others. Sixteen municipal entities of this group account for 38.7% of all livestock production in the region, while in 2010 it was 40.7%. In some municipal entities, the level of production concentration decreased significantly, for example, in Pervouralsk UO (from 3.8% to 3.0%), Gornouralsky UO (from 4.6% to 2.9%) and Sredneuralsk UO (from 3.9% to 2.4%).

Table 1. Dynamics of livestock production and the level of its concentration in municipal entities in 2010 and 2020

		2010		2020	
		million rubles	%	million rubles	%
Main production centers	Reftinsky UO	2,892	9.8	6,033	10.5
	Irbitskoye ME	2,401	8.1	5,610	9.8
	Bogdanovich UO	983	3.3	4,477	7.8
	Kamyshlovsky MD	776	2.6	4,351	7.6
	ME city of Yekaterinburg	2,363	8.0	4,329	7.5
	Verkhny Tagil UO	1,676	5.7	2,403	4.2
Municipal entities with a concentration level higher than the regional average	Talitsky UO	909	3.1	1,889	3.3
	Sukhoy Log UO	591	2.0	1,797	3.1
	Pervouralsk UO	1,108	3.8	1,727	3.0
	Gornouralsky UO	1,362	4.6	1,638	2.9
	Kamensky UO	785	2.7	1,595	2.8
	Sredneuralsk UO	1,146	3.9	1,358	2.4
	Beloyarsky UO	607	2.1	1,388	2.4
	Baikalovsky MD	574	1.9	1,325	2.3
	Nizhny Tagil	60	0.2	1,306	2.3
	Sysertsky UO	696	2.4	1,343	2.3
	Pyshminsky UO	801	2.7	1,250	2.2
	Artinsky UO	860	2.9	1,218	2.1
	Alapaevskoe ME	625	2.1	1,208	2.1
	Turinsky UO	545	1.8	1,086	1.9
	Krasnoufimsky ME	733	2.5	1,044	1.8
	Artemovsky UO	613	2.1	1,050	1.8
Average level in the Sverdlovsk Oblast		427.5	1.4	831.8	1.4
Standard deviation by oblast		624.7	2.1	1,319.1	2.3
Source: Federal State Statistics Service.					

Table 2. Global Moran's index of livestock production in the Sverdlovsk Oblast's municipal entities in 2020 and indicators, characterizing its statistical significance

	Distance matrix by roads (normalized)	Distance matrix by roads	Linear distance matrix (normalized)	Linear distance matrix
Global Moran's index	-0.0491	-0.0624	-0.1505	-0.1558
sd(Ii)	0.0008	0.0009	0.0012	0.0012
E(Ii)	-0.0000103	-0.0000131	-0.0000316	-0.0000327
Z-score	-58.4	-71.4	-128.0	-131.4
P-value	0.00000	0.00000	0.00000	0.00000
Source: own compilation.				

Thus, currently there is a high degree of spatial heterogeneity in the development of the livestock industry in the Sverdlovsk Oblast, its level is increasing every year, and this negatively affects the food security of the territories. To assess the degree of spatial heterogeneity of the industry development we used spatial autocorrelation analysis by a modified method of Moran. During the analysis we used four matrices of spatial weights between municipal entities of the region: standard matrices for roads and linear distances and their standardized versions. The global Moran's spatial autocorrelation index and Z-score calculated on their basis had negative values, which indicates a significant heterogeneity of territories by the livestock production volume in the region in 2020 *(Tab. 2)*.

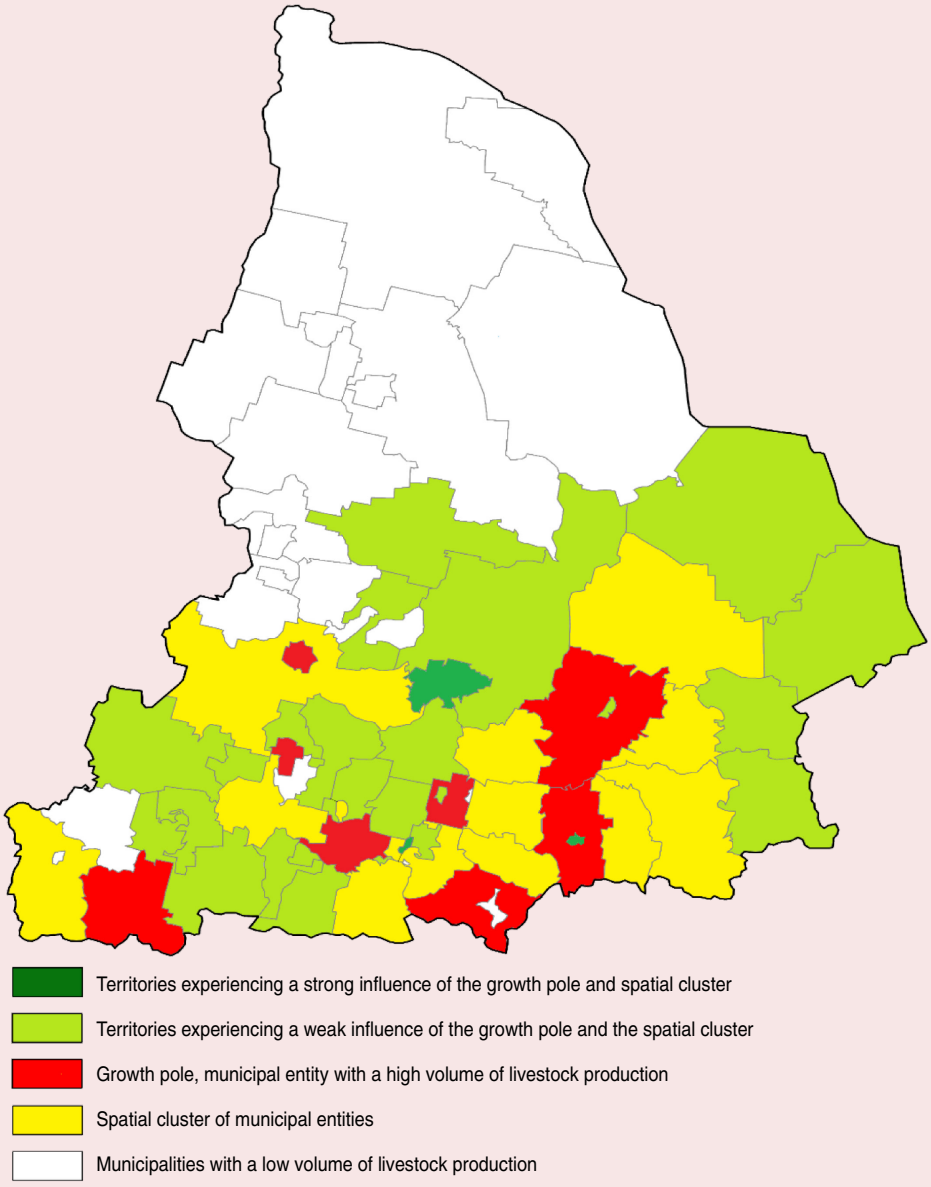
Calculated values of Moran's indices according to these spatial weight matrices are statistically significant, P-values of Moran's coefficients do not exceed the acceptable level of 5% (0.05). The results of the spatial autocorrelation analysis, reflected in the Moran scatter plots for the four spatial weight matrices, were summarized and systematized. As a result, in the HL quadrant of territories, that are growth poles (the main centers of cattle breeding in the region), were included Irbitskoye ME, Kamensky UO and Kamyshlovsky MD, that is, the municipal entities whose local spatial autocorrelation index in 2020 exceeded the average level of negative values. This category also included other municipal entities: the city of Yekaterinburg, the city of Nizhny Tagil, Artinsky UO, Verkhny Tagil UO and Reftinsky UO. However, their local autocorrelation index was significantly lower than the regional average, indicating a low level of their spatial interinfluence with other municipal entities. Since these municipal entities are surrounded by territories with a lower volume of livestock production, we referred them to potential growth poles, which in the future may become the centers of development of this agricultural sector.

The HH quadrant of the Moran local spatial autocorrelation scatter plot includes Bogdanovich UO, Sukhoy Log UO and Turinsky UO, which, with the development of close cooperative relationships, can form a spatial cluster, since they have similar characteristics and a high volume of livestock production. Their local autocorrelation indices exceed the average level for municipal entities of the Sverdlovsk Oblast, calculated on the basis of positive values. Areas with similar characteristics, but with a low level of spatial interinfluence (below average) were identified: Artemovsky, Beloyarsky, Gornouralsky, Sredneuralsky, Talitsky and other urban okrugs. Their close location to the main centers of production in the livestock industry (to the HL quadrant) forms an advantage for the progressive development of the industry. Most likely, these municipal entities will form a spatial cluster of interconnected territories or become new growth poles in the future. Spatial autocorrelation analysis using Moran's methodology, allowed us to establish zones of strong and weak influence of growth poles and spatial clusters in the livestock industry *(Fig. 2)*.

Their strong influence in 2020 was experienced by Verkhnee Dubrovo UO and Kamyshlovsky MD and municipal entity the town of Alapaevsk.

Growth poles and spatial clusters of similar regions with a high volume of livestock production influenced Aramilsky, Asbestovsky, Berezovsky, Verkhnesaldinsky, Verkhne-Neyvinsky, Verkhne-Pyshminsky, Verkhotursky, Degtyarsky, Zarechny, Revdinsky, Staroutkinsky, Kirovgradsky, Malyshevsky, Nevyansky, Polevskoy, Rezhevskoy, Tavdinsky, Tugulymsky and Shalinsky urban okrugs. They

Figure 2. Growth poles, spatial clusters of interconnected municipal entities and zones of their strong and weak influence in the livestock industry of the Sverdlovsk Oblast in 2020



Source: own compilation.

are surrounded by growth poles and spatial clusters. The white spots in Figure 2 correspond to municipal entities with low volumes of livestock production. Their predominance also confirms the high spatial heterogeneity of industry development in the region.

The zones of influence of growth poles and spatial clusters established by the Moran scatter plot were confirmed by the distribution matrix of local Moran's spatial autocorrelation indices. The matrix reveals the strength and direction of spatial interactions between territorial systems on

the indicator under consideration. Positive local autocorrelation indices, exceeding the average value, in this matrix characterize direct, close spatial interactions. Such interactions on the four considered matrices of spatial weights were observed between Reftinsky UO and such municipal entities as the city of Yekaterinburg, Bogdanovich UO, Sukhoy Log UO, Irbitskoye UO, Kamyshlovsky MD; between Bogdanovich UO and the city of Yekaterinburg, Sukhoy Log UO, Kamyshlovsky MD, Irbitskoye ME. Close direct autocorrelation relationships were recorded between Krasnoufimsky Okrug and Turinsky UO, between Verkhnee Dubrovo UO and Kamensk-Uralsky UO, between Verkhotursky UO and Krasnoufimsk UO. The high tightness of established spatial interactions is explained by their close proximity and similarity in the volume of livestock production. The formation and expansion of close cooperative relationships between livestock enterprises of these municipal entities will contribute to the expansion of the influence zone of growth poles and spatial clusters and, in general, the active development of the industry in the region.

Inverse close spatial interactions were noted between Verkhnee Dubrovo UO and Kamensky UO, between Kamyshlovsky MD and Kamyshlovsky UO, between Irbitskoye ME and the town of Irbit, that is, between the municipal entities located next to each other. They differ significantly from each other, and, as a rule, the development of the livestock industry in one of them occurs at the expense of the resources of the other municipal entity. Migration of labor resources, proximity of financial and banking infrastructure, and transport and engineering infrastructure contribute to the development of such interactions. Strengthening of inverse spatial interactions between municipal entities will have a negative impact on the livestock industry development in the region, contribute to an already high level of its spatial heterogeneity.

To predict the spatial heterogeneity of the livestock industry development and evaluate its formation and development factors, we used the classical regression Cobb – Douglas model, which allows us to establish the emerging effects of the scale of production activities (increasing, constant and decreasing returns) and assess the influence degree of the main production factors on the livestock industry development in the municipal entities of the Sverdlovsk Oblast: investments attracted by enterprises in fixed capital and resources, allocated for the development of their human resources. When forming the model, we used panel data on 69 municipal entities of the region from 2010 to 2020 (759 observations). Before constructing the model, the time series data were tested for stationarity using the Dickey – Fuller test and for some municipal entities were transformed to a stationary form using the method of analytical smoothing of time series. The calculation of descriptive statistics was carried out and in order to increase the homogeneity of the data, the Cobb – Douglas model with the elasticity coefficients by production factors was constructed, the original data were transformed by extracting the natural logarithm.

Panel diagnostics of the regression analysis results, carried out with the help of the Breusch – Pagan and Hausman tests, and evaluation of the Schwartz, Akaike and Hennan – Quinn information criteria showed that the optimal model is a panel regression model with fixed effects (8):

$$Ln(V) = 8.724 + 0.021 * Ln(C) + 0.231 * Ln(L), \quad (8)$$

where V – livestock production volume (in comparable prices of 2010), thousand rubles; C – volume of attracted investments in fixed capital, carried out by organizations located in the territory of the municipal entity, thousand rubles; L – resources, allocated by the livestock industry enterprises for human resource development (wage fund of all employees of organizations), thousand rubles.

Table 3. Results of the regression analysis of livestock production volume dependence in the municipal entities of the Sverdlovsk Oblast on the attracted investments in fixed capital and the payroll of business entities (with fixed effects)

	Coefficient	Standard error	t-statistics	P-value	
Const	8.724	0.736	11.849	< 0.0001	***
C	0.021	0.014	1.025	0.096	*
L	0.231	0.047	4.874	< 0.0001	***
Average dependent variables		11.652	Standard deviation of dependent variables	1.751	
Residual sum of squares		94.785	Standard model error	0.371	
LSDV R-square		0.959	Within R-square	0.036	
LSDV F (70, 688)		231.082	P-value (F)	0.00000	
Logarithmic plausibility		-287.467	Akaike criterion	716.934	
Schwarz criterion		1045.806	Hannan – Quinn criterion	843.585	
Rho parameter		0.541	Durbin – Watson statistic	1.561	
Breusch – Pagan test statistics: LM = 3361.75; p-value = prob(chi-square(1) > 3361.75) = 0					
Hausman test statistics: H = 4.73; p-value = prob(chi-square(2) > 4.73) = 0.093					
Pesaran test for cross-sectional dependence (null hypothesis: no cross-sectional dependence): asymptotic test statistic: z = 23.086; p-value = 6.39E-118					
Note: hereinafter * – statistical significance at 10% level, ** – statistical significance at 5% level, *** – statistical significance at 1% level. Source: own compilation.					

The results of testing the main parameters of this model are shown in *Table 3*. Regression coefficients, corresponding to the factors presented in the model, were statistically significant, as evidenced by low values of standard errors and P-values of the parameters. The model is characterized by a high level of approximation to the original data, since the coefficient of determination is very close to one ($R^2 = 0.96$). In general, the model is statistically significant and reliable (F-significance has a value below 0.05), its accuracy is also confirmed by the Pesaran test for cross-sectional dependence in panel data. The constructed regression model showed that investments in fixed capital, attracted by enterprises, did not have a significant impact on livestock production volume in the municipal entities of the Sverdlovsk Oblast. However, a significant impact on this industry development in the municipal entities of the oblast had a significant impact on the cost of enterprises to develop their human resources.

According to this model, a 1% increase in investment in fixed capital attracted by enterprises contributes to the growth of livestock production in the region's municipal entities by only 0.02%, while the same increase in resources allocated to the development of human resources, leads to an increase in production by 0.23%. This may be due to the fact that the wage fund formed by enterprises, has a significant impact on the attraction of employees to the industry, as the main centers of its development are small urban okrugs. Enterprises of this industry may already have significantly worn-out fixed capital assets, their renewal and modernization are required, but in the current conditions the resources, allocated by the enterprises to the development of human resources, are more important.

To assess the observed spatial effects in the dynamics of livestock production, not only from production factors on the territory of certain

Table 4. Spatial models of livestock production volume dependence on the volume of attracted investments by enterprises in the fixed capital and the cost of human resources development by the linear distance matrix by multistage GMM method

	Spatial Lag Model (SAR)	Spatial Error Model (SEM)	Spatial Lag and Error Model (SAC)
Variables	Coefficient	Coefficient	Coefficient
V (-1)	0.099 (0.005)***	0.067 (0.006)***	0.057 (0.005)***
C	0.007 (0.002)***	0.072 (0.004)***	0.071 (0.006)***
L	0.255 (0.028)***	0.174 (0.025)***	0.454 (0.052)***
WV	**0.533 (0.006)*** **		**0.935 (0.125)*** **
WE		**0.751 (0.007)*** **	**1.686 (0.128)*** **
Correlation square between (V; Vmod) *	0.845	0.797	0.868
Standard model error	0.144	0.199	0.161
Residual sum of squares	12.56	24.22	15.82
Sargan – Hansen test (J-statistic)	49.45	46.93	43.56
P-value (J-statistic)	0.172	0.242	0.323
Jarque – Bera statistic	68632.7***	230076.9***	19492.3***
P-value (Arellano – Bond test): 1st order autoregressive 2nd order autoregressive	 0.0005 0.3888	 0.0481 0.7053	 0.117 0.6393
Schwarz criterion	-3.859	-3.203	-3.629
Akaike criterion	-3.888	-3.231	-3.657
Durbin – Watson statistic	1.416	1.54	1.43
Source: own compilation.			

municipal entities, but also the development of this industry in neighboring territorial systems, we formed models of spatial lag (SAR), spatial error (SEM) and their integrated model (SAC) using the generalized method of moments by panel data (multistage GMM). The results of the modeling are presented in *Table 4*.

To confirm the reliability of the models, we conducted the Sargan – Hansen test (J-statistic), which checks the null hypothesis about the fact that the model is correct and all regression parameters are valid. The high P-value of the test allows us to accept the null hypothesis and conclude that the constructed models are valid. The Wald test confirmed the statistical significance of the regression coefficients, the Jarque – Bera test established the normality of the distribution of random errors in the model, and the Arellano – Bond test confirmed the absence of autocorrelation between them. The low level of the model's standard error and the near-zero value of the constant, which characterizes the influence of other factors on the dependent variable, prove the importance of including the spatial lag in the regression model. The constructed models established the presence of positive spatial effects in the livestock industry development in the region, confirmed that the municipal entities that are surrounded by territories with active livestock industry development, will develop faster. Since this model contains a spatial lag of the dependent variable, the regression coefficients cannot be interpreted directly, they are not marginal effects, which in the usual model allow us to estimate the change in the dependent variable when the explanatory variable changes by one. We can only

note, that the spatial effect established as a result of modeling, shows that the change in the volume of costs allocated by enterprises for the development of human resources, investment in fixed capital, directly affects the change in the volume of shipped livestock products in the municipal entity and indirectly on its change in neighboring municipal entities. The growth in the volume of shipped livestock products in a single municipal entity will contribute to the growth of this indicator in the surrounding territorial systems.

In this regard, for the formation of forecast scenarios for the livestock industry development, time series models were built from 2010 to 2020 for each municipal entity of the Sverdlovsk Oblast. They showed an even greater importance of the costs allocated by enterprises to the development of human resources in the industry development *(Tab. 5)*.

Table 5. Results of the regression analysis of livestock production volume dependence in some municipal entities of the Sverdlovsk Oblast on attracted investments in fixed capital and wage fund of economic entities

		Municipal entity	Constant	Volume of investments in fixed capital	Wage fund for employees
Main production centers		Reftinsky UO	-7.772**	-0.006	1.559***
		Irbitskoye ME	-4.313	0.302	1.055**
		Bogdanovich UO	-6.727	0.314	1.133**
		Kamyshlovsky MD	-13.97***	0.076	2.007***
		ME city of Yekaterinburg	2.563	-0.212	0.854***
		Verkhny Tagil UO	18.456	-0.066	1.107***
Municipal entities with concentration level of livestock production	above the average regional level	Talitsky UO	-1.167	-0.121	1.155***
		Sukhoy Log UO	-11.085***	0.117	1.535***
		Pervouralsk UO	1.223	-0.007	0.798***
		Gornouralsky UO	5.314	0.027	1.014***
		Kamensky UO	-0.019	-0.126*	1.124***
		Sredneuralsk UO	7.761	0.011	0.976***
		Beloyarsky UO	-2.979	0.041	1.118***
		Baikalovsky MD	-0.357	0.003	1.024***
		Nizhny Tagil	-31.444**	2.628***	-1.465
		Sysertsky UO	1.995	-0.061	0.831***
		Pyshminsky UO	2.119	-0.089	0.932***
		Artinsky UO	6.251***	-0.002	0.544***
		Alapaevskoe ME	-0.954	-0.035	1.056***
		Turinsky UO	5.378*	-0.077**	0.461**
		Krasnoufimsky ME	-15.722*	-0.322	2.361***
		Artemovsky UO	0.493	-0.033	0.903***
	below the average regional level	Asbestovsky UO	-44.895**	1.078**	2.624**
		Volchansky UO	13.486	0.429***	0.439***
		Nizhnyaya Salda UO	-1.535	0.225**	0.568***
		Aramilsky UO	9.417***	0.088**	0.055
		Pelym UO	-6.643**	0.106*	1.074***
		Staroutkinsk UO	0.286	0.325*	0.511***
		Revda UO	9.132	0.242*	0.471*

Source: own compilation.

In the main centers of this industry development, in Reftinsky UO, Irbitskoye UO, Bogdanovich UO, Verkhny Tagil UO, Kamyshlovsky MD and in the city of Yekaterinburg, as regression models show, the factor such as attracted investments in fixed capital by enterprises was statistically insignificant and had no effect on livestock production volume.

In addition, the regression coefficients characterizing the effectiveness of funds attracted by enterprises for the development of human resources are much higher than the value established by the panel model built for all municipal entities of the Sverdlovsk Oblast. In accordance with the models constructed, a 1% increase in the wage fund of employees in this industry in Reftinsky UO will contribute to livestock production growth by 1.56%, in Bogdanovich UO – by 1.13%, in Kamyshlovsky MD – by 2%.

A greater influence of this factor was also found in municipal entities with a level of livestock production concentration above the average for the Sverdlovsk Oblast, in particular in Sukhoy Log UO, Talitsky UO, Gornouralsky UO, Kamensky UO, Sredneuralsk UO, Beloyarsky UO, Krasnoufimsky ME. The exception in this group of municipal entities is Nizhny Tagil, where the factor, characterizing the volume of resources, attracted by enterprises for human resource development, had no impact on the livestock industry development, a significant impact had investments in fixed capital, attracted by enterprises.

In municipal entities with a low livestock production volume (below the regional average), investments in fixed capital attracted by enterprises had a more serious impact. If in the panel regression model, constructed for all municipal entities of the Sverdlovsk Oblast, the increase in investment in fixed capital by 1% contributed to livestock production growth by only 0.021%, then in the models constructed for the time series, in particular, for the Asbestovsky UO contributed to production volume growth by 1.1%, in the Volchansky UO by 0.43%, in Staroutkinsk UO by 0.33%, in Revda UO by 0.24% and in Nizhnaya Salda UO by 0.23%.

Thus, the regression analysis helped to establish a significant impact of resources, directed by enterprises to develop their human resources, on livestock production volume in the main centers (growth poles) of its development, and in municipal entities, which are able to form spatial clusters due to the build-up of close cooperative ties. Investments in fixed capital, as regression analysis on time series showed, is a key factor in the development of the industry in municipal entities with low production volume, which are located in the environment of growth poles and spatial clusters, are their zone of influence. The constructed Cobb – Douglas regression models and autoregressive modeling of the changes in the dynamics of the main factors in these models using the moving average (ARIMA) allowed us to form the most likely forecast scenarios of livestock production dynamics in the municipal entities of the region: inertial, assuming the preservation of the noted trends in the development of the industry in the future, optimistic and pessimistic *(Tab. 6)*.

The inertial scenario forecasts a further moderate increase in livestock production volume in all municipal entities of the region, which has been observed over the past 10 years. In the first group of municipal entities, in the main centers of the livestock industry development in the region, by 2025, it is possible to increase production from 27,203 to 33,238 billion rubles, in the second group of municipal entities that differ in the production level above the average in the region, a more significant increase in production is possible: from

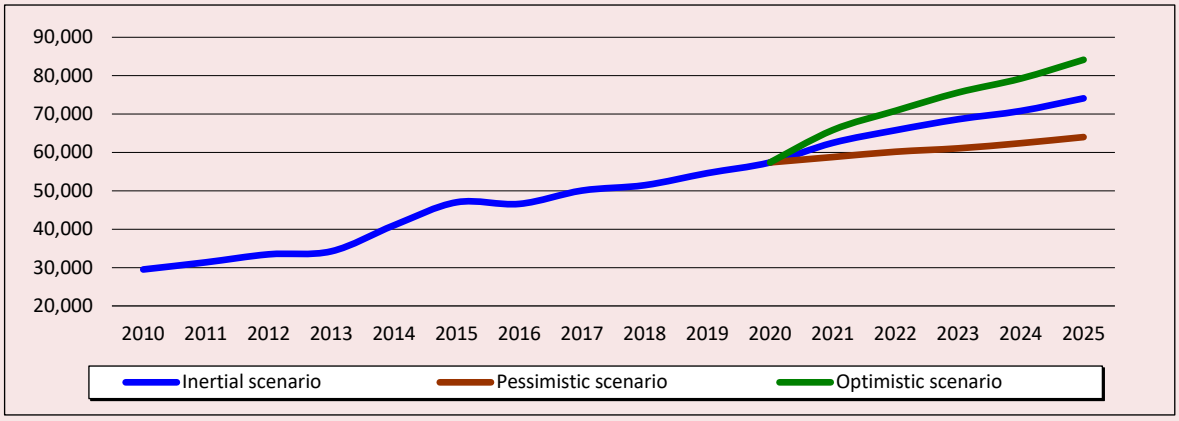
Table 6. Forecast scenarios of changes in the livestock industry production volume in the municipal entities of the Sverdlovsk Oblast by 2025 and the share of this product in the total volume of production in the region

Municipal entity	Production volume in 2020		Inertial forecast scenario		Pessimistic forecast scenario		Optimistic forecast scenario	
	million rubles	% of total volume in the region	million rubles	% of total volume in the region	million rubles	% of total volume in the region	million rubles	% of total volume in the region
Reftinsky UO	6,033	10.5	6,680	9.0	5,191	8.1	8,301	9.9
Irbitskoye ME	5,610	9.8	6,202	8.4	4,910	7.7	7,501	8.9
Bogdanovich UO	4,477	7.8	4,739	6.4	3,621	5.7	5,748	6.8
Kamyshlovsky MD	4,351	7.6	8,399	11.3	7,829	12.2	8,989	10.7
ME city of Yekaterinburg	4,329	7.5	5,265	7.1	5,237	8.2	5,292	6.3
Verkhny Tagil UO	2,403	4.2	1,953	2.6	1,855	2.9	2,051	2.4
Total for the first group of MEs	**27,203**	**47.4**	**33,238**	**44.9**	**28,644**	**44.8**	**37,882**	**45.0**
Talitsky UO	1,889	3.3	2,145	2.9	2,068	3.2	2,221	2.6
Sukhoy Log UO	1,797	3.1	2,507	3.4	2,350	3.7	2,669	3.2
Pervouralsk UO	1,727	3.0	2,123	2.9	1,987	3.1	2,212	2.6
Gornouralsky UO	1,638	2.9	2,713	3.7	2,438	3.8	2,955	3.5
Kamensky UO	1,595	2.8	3,140	4.2	2,416	3.8	3,775	4.5
Beloyarsky UO	1,388	2.4	1,516	2.0	1,327	2.1	1,657	2.0
Sredneuralsk UO	1,358	2.4	1,970	2.7	1,790	2.8	2,115	2.5
Sysertsky UO	1,343	2.3	2,286	3.1	1,847	2.9	2,716	3.2
Baikalovsky MD	1,325	2.3	1,763	2.4	1,617	2.5	1,909	2.3
Nizhny Tagil	1,306	2.3	2,098	2.8	652	1.0	3,839	4.6
Pyshminsky UO	1,250	2.2	1,464	2.0	1,378	2.2	1,550	1.8
Artinsky UO	1,218	2.1	1,540	2.1	1,441	2.3	1,605	1.9
Alapaevskoe ME	1,208	2.1	1,580	2.1	1,406	2.2	1,753	2.1
Turinsky UO	1,086	1.9	966	1.3	910	1.4	1,022	1.2
Artemovsky UO	1,050	1.8	1,266	1.7	1,211	1.9	1,321	1.6
Krasnoufimsky ME	1,044	1.8	1,737	2.3	1,682	2.6	1,792	2.1
Total for the second group of MEs	**22,222**	**38.7**	**30,815**	**41.6**	**26,523**	**41.4**	**35,111**	**41.7**
Total for the rest of MEs	**7,968**	**13.9**	**10,038**	**13.5**	**8,827**	**13.8**	**11,146**	**13.2**
Total for the Sverdlovsk Oblast	**57,393**	**100**	**74,090**	**100**	**63,993**	**100**	**84,139**	**100**
Source: own compilation.								

22,222 to 30,815 billion rubles. Less significant growth is expected in the third group of municipal entities, which are characterized by low rates of industry development: from 7,968 to 10,038 billion rubles. In general, in the Sverdlovsk Oblast, this scenario assumes the preservation of the established trend of growth in production *(Fig. 3)*.

Even with the implementation of the pessimistic forecast scenario, due to a decrease in the volume of investments attracted by enterprises in fixed capital and the wage fund of employees in this industry in the municipal entities of the region, a slight increase in livestock production volume is expected (from 57,393 to 63,993 billion rubles by 2025). When

Figure 3. Forecast scenarios for changes in livestock production volume in the Sverdlovsk Oblast until 2025, million rubles



Source: own compilation.

constructing forecast scenarios, we did not take into account the dynamics of changes in inflation in the municipal entities of the region due to the unavailability of such data in official statistics. When taking it into account, it is more likely that more negative forecast scenarios for the livestock industry development in the municipal entities of the Sverdlovsk Oblast will be formed.

According to the pessimistic scenario, a decrease in livestock production volume by 2025 is expected in Reftinsky UO, Irbitskoye UO, Bogdanovich UO, Verkhny Tagil UO, that is, in the main centers of development of this industry. Only in two municipal entities of the first group, despite a possible reduction in investments attracted to the industry and funds for the development of human resources in enterprises, an increase in livestock production is expected: in the city of Yekaterinburg and in Kamyshlovsky MD. In these large municipal entities, a decrease in the amount of funds attracted by livestock enterprises for the development of human resources is least likely, and this factor, as shown by regression modeling, is the main factor in the development of the industry in these territorial systems.

A more significant increase in livestock production volume in the municipal entities of the second group compared to the first, which was established during the formation of the inertial forecast scenario, will have a positive impact on the dynamics of spatial heterogeneity of this industry development in the region. According to this scenario, the concentration level of livestock products produced in municipal entities of the first group may decrease from 47.4 to 44.9% of the total volume of output products in the region by 2025, and in the second group of municipal entities it may increase from 38.7 to 41.6%. The most likely decrease in the concentration of livestock products is in Reftinsky UO (from 10.5 to 9.0%), Bogdanovich UO (from 7.8 to 6.4%), Verkhny Tagil UO (from 4.2 to 2.6%) and Irbitskoye ME (from 9.8 to 8.4%). Among the municipal entities of the second group, an increase in the concentration of livestock products is possible in Nizhny Tagil (from 2.3 to 2.8% of the total volume of output products in the region), Gornouralsky UO (from 2.9 to 3.7%), Kamensky UO (from 2.8 to 4.2%), Sysertsky UO (from 2.3 to 3.1%) and Krasnoufimsky ME. The forecasted spatial redistribution of livestock

production by 2025 within the framework of the inertial scenario is a positive direction for the further development of the industry, since it increases the food security of municipal entities, reduces their dependence on imports of meat and meat products. At the same time, the inertial and other forecast scenarios showed the deepening of the problems of this industry development in the municipal entities of the third group, which differ in livestock production volume below the average in the Sverdlovsk Oblast. According to the inertial forecast scenario, it is possible to reduce the concentration level of output products in these municipal entities from 13.9% in 2020 to 13.5% by 2025. This group includes 47 municipal entities of the region, and such a low level of concentration of goods produced in them testifies to their strong food dependence on other territorial systems and significant risks to their food security.

Conclusion

The methodological approach presented in the research, including spatial autocorrelation analysis, regression modeling based on panel data, spatial effects modeling and ARIMA modeling, makes it possible to comprehensively assess the spatial heterogeneity of the livestock industry development in municipal entities of the Sverdlovsk Oblast, to identify the factors that determine it, to take into account the influence of spatial effects and to build forecast scenarios for its development. The use of spatial autocorrelation analysis on various matrices of spatial weights, makes it possible to establish the main poles of growth, spatial clusters and zones of their influence.

As a result of testing the methodological approach, a trend was established that was associated with an increase in spatial heterogeneity of the livestock production, an increase in the level of its concentration in six municipal entities of the Sverdlovsk Oblast (Reftinsky UO, Irbitskoye ME, Bogdanovich UO, Kamyshlovsky MD, the city of Yekaterinburg and Verkhny Tagil UO), where almost 50% of all livestock production in the region is concentrated. Moreover, the share of livestock products in these constituent entities increased 2–3-fold over the period 2010–2020 (in Bogdanovich UO from 3.3 to 7.8%, in Kamyshlovsky MD from 2.6 to 7.6%), which indicates an increase in the degree of spatial heterogeneity of the industry development and an increase in the negative impact on the food security of the Sverdlovsk Oblast.

During the construction of the Cobb – Douglas model using panel data, it was revealed that the main factor contributing to the increase in the spatial heterogeneity of the development of the livestock industry in the municipal entities of the Sverdlovsk Oblast, which act as growth poles or form spatial clusters, is enterprises' expenditures allocated to the development of human resources and employee remuneration. At the same time, the factor such as investments in fixed capital attracted by enterprises had a more serious impact on spatial heterogeneity in municipal entities whose volume of livestock production is low (below the average in the Sverdlovsk Oblast) and which are surrounded by growth poles and spatial clusters and are zones of their influence.

As a result of the study, trends in the spatial heterogeneity of the livestock industry in the municipal entities of the Sverdlovsk Oblast were established, factors that have a significant impact on it were identified, and regression models were constructed, which will help to develop mechanisms for levelling it in the future.

The results obtained can be used by public authorities to work out a policy, aimed at developing human resources and attracting investment resources for the development of the livestock industry in municipal entities of the Sverdlovsk Oblast.

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Institutional Resources to Support and Develop the Institution of Student Family: Regional Dimensions

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Abstract. The article continues the set of demographic and sociological studies whose purpose is to analyze the value orientations and institutional resources that influence actors' marital and reproductive behavior. Theoretical basis of the study is represented by a wide range of works of Russian family scientists, demographers, specialists in the field of family sociology. We continue to develop the concept of a prosperous family within the framework of which we define the concept of "student family", substantiate the tools for the research and conduct an empirical study. The main objective of the study is based on the data of a questionnaire survey of students. Moreover, it has to determine the relevance of the social policy implemented by the state and universities in relation to the development and support of the institute of student family (on the example of the Republic of Tyva). Data were obtained characterizing students' ideas about social policy measures in the interests of student families, institutional resources for the support and development of the institute of student family, and students' awareness of social support measures for young people studying in higher educational institutions. That allowed us to draw conclusions about what kind of assistance can be demanded by student families. We received the answer to the question whether students consider it necessary to support those who get married while studying at a higher educational institution. We systematize the data on the main areas of implementation of marital and reproductive behavior of Tyva students. It is revealed that social support measures will be in demand by student families. This should be taken into account when developing and implementing management decisions aimed at stabilizing the demographic situation in the region.

Key words: Republic of Tyva, demographic situation, young family, student family, support measures.

Introduction

Demographic transformations, economic crises, social and political upheavals necessitate the discussion and serve as a catalyst in identifying conditions for the full-fledged implementation of the reproductive potential and welfare of the family in the context of Russia's key national interests, which include ensuring demographic security. Practical significance of the research topic under consideration is determined by the fact that in recent years, as part of elaborating a long-term demographic policy strategy, measures are being sought and implemented to increase birth rate, including through its "rejuvenation", reduce the age of motherhood and increase the reproductive period of young generations. In particular, a one-time cash payment has been approved at the federal level for women bearing their first child at the age of 18–25 inclusive[1]; the measure is aimed at promoting the birth of a first child. At the same time, Russia, as well as many other countries, is characterized by an increase in the age of motherhood. It should be taken into account that a significant part of women of this age group who make plans for the future are attending a college or university during this period. In 2021, 32.3% of people aged 17–25 were students of higher education institutions[2]. Young age is the period when, on the one hand, a person is developing professionally, which is largely associated with obtaining a quality education that requires time and effort. On the other hand, young age is reproductive age, which is important for marriage and family; it is the time to start a family and make decisions about having children. Strategies for

[1] Provision of a one-time cash payment to women bearing their first child at the age of 18–25. Available at: https://www.gosuslugi.ru/401316/1/info (accessed: October 5, 2022).

[2] Calculated according to: Population of the Russian Federation by gender and age as of January 1, 2021: Statistics bulletin. Available at: https://rosstat.gov.ru/storage/mediabank/Bul_chislen_nasel-pv_01-01-2021.pdf (accessed: October 22, 2022); Social status and standard of living in Russia 2021. Statistics collection. Available at: https://gks.ru/bgd/regl/b21_44/Main.htm (accessed: October 22, 2022).

the implementation of professional career on the one hand and marrying and starting a family on the other hand come into conflict, which is why questions arise regarding which models of family life support and marriage career formation are attractive for Russian students to ensure family well-being.

Unfortunately, Rosstat data do not allow us to get a complete answer to the questions posed and to characterize the prevalence of student families and their situation in Russia. Some conclusions can be drawn when interpreting the following statistics indicators. First, the number of marriages in Russia in 2020 by age of the groom in the cohort under 18 years increased by 6.03%, in the cohorts of 18–24 years and 25–34 years decreased by 19.10% and 20.54%, respectively. Second, the number of marriages by age of the bride for the same period decreased in each of the three selected age groups: under the age of 18, there was an 11.13% decrease; at the age of 18–24 – by 19.35%; at the age of 18 – by 20.60%) (Rostovskaya, 2022). We can state that there is a reduction in the number of marriages at younger age.

Of course, the lack of statistical information cannot but affect the prospective estimates regarding the development of the student family, which though being one of the leading institutions of youth socialization and a significant part of young people's lives, is still not given due attention either in statistical analysis or in state and regional policy and support measures. All this requires separate research, preferably in monitoring mode. It is especially relevant to identify regional specifics due to significant regional differentiation of reproductive and marital behavior models in young people and measures to support student families. Assessing the scale and prospects of development of the institution of student family will be incomplete without taking into account the opinions of the youth themselves. Due to the fact that the socio-legal status of the student family is not defined at the federal level, regional legislative authorities take their own measures to support this type of family. Measures to support the student family in Russia are manifested in the fact that educational institutions themselves are significant subjects of the policy. Thus, the assessments and opinions of students regarding the effectiveness of measures to support student families may vary significantly depending on the region of residence and place of study.

Consequently, in order to identify students' opinions on the relevance of social policy measures in the interests of the student family and form a promising strategy to support the institution of student family, a questionnaire survey was conducted. The work defines the student family as a family in which both spouses are married and are full-time students of higher education institutions (Rostovskaya, Knyaz'kova, 2022). The empirical basis of the article includes the results of the authors' regional study conducted by the staff of the Institute for Demographic Research FCTAS RAS in 2022 on the basis of Tyva State University among bachelor's and master's degree students. The project was implemented using quantitative (selective sociological) research by means of a questionnaire survey of persons aged 18–27.

The object of the research is resources and measures to support student youth and student families. The subject of the research is ideas of students (aged 18 to 27, enrolled in bachelor's and master's programs, receiving in-person training at Tyva State University) about the demand for institutional resources to support and develop the institution of student family. Young people's opinion about possible measures to support the family is very significant in the context of a decrease in the birth rate among young people who receive professional education, including higher education.

In the course of the study, a quota sample was used. Sample size of students (starting from the 2nd year bachelor's programs) from Tyva State University was 133 people (according to official statistics, this comprises 2.6% of students of higher

education institutions in the Republic of Tyva)[3], the average age of respondents was 25 years (the share of those aged 18–21 years was 15.3%, 22–23 years – 34.3%, 24–25 years – 24.2%, aged over 25 – 26.8%). Among the respondents, 29.2% were men and 70.8% – women. According to the data of the Ministry of Science and Higher Education of the Russian Federation[4], there is a preponderance of women in the total amount of students as well. The share of female students in the Republic of Tyva is 62.5%. Sampling error in this case exceeds 5%, we can guarantee the reliability of the results obtained only with a probability of 86.6%.

The sample included intramural students (80.4% – bachelor's programs, 17.4% – master's programs, 2.2% – specialty programs), including those who combine professional education and employment (52.1% of respondents are working, another 28.3% are going to get a job in the near future); 21.2% of respondents are already married, another 4.8% live alone, outside the family. The rest of the students live with their parents. Almost all married respondents already have children (18.5%), these are students aged 23 and older. As a result of the study, data were obtained that help to determine which tools for the development of the institution of student family can increase the effectiveness of social policy and fulfill students' relevant needs. The study will reveal strategic directions for such a policy.

Review of scientific approaches on the research topic

In American and Western European scientific literature, early marriages have been studied since the mid-twentieth century. Back in the early 20th century, a marriage contracted before the partners reached the age of 23 fit into the generally accepted norm, but the expansion and consolidation of women's rights, the sexual revolution and other positive and negative social phenomena naturally led to an increase in divorce rates. In the middle of the 20th century, a pattern was revealed – early marriage increases the likelihood of divorce (Monahan, 1953; Booth, Edwards, 1985, etc.). In order to prevent early marriages and subsequent divorces, the U.S. introduced programs aimed at raising the age of first marriage (Carlson et al., Daire, 2019), which contributed to an increase in the marriageable age. As of 2008, more than a quarter of young women and more than 15% of young men still married before the age of 23 (Uecker, Stokes, 2008). Today, according to sociologists and anthropologists, people tend to get married while studying in educational institutions (Allison, 2023). There are various reasons underlying early marriages in American society: religious norms, social norms, young people's desire to appear more mature in the eyes of society.

On the other hand, studies conducted in different countries show that young people's intentions regarding the size of the family and the number of children often change as they gain experience in profession and family life. If respondents postpone having children until the age of thirty, then they are much more likely to decide on having fewer children than they would have intended to have if they had started their "childbearing career" earlier (Liefbroer, 2009). The ongoing changes in the family structure alter the structure of future families as the time goes by and generations change (Hofferth, Goldscheider, 2010).

Russian and foreign scientists consider early marriages in the context of educational strategies, although the term "student family" is not common in English-language literature. Russian sociologists and demographers use the concept of "student family", defining it as a type of young family that is

[3] Statistical form VPO-1 "Information about an organization engaged in educational activities for educational programs of higher education – bachelor's programs, specialty programs, master's programs", data for 2021. Available at: https://minobrnauki.gov.ru/action/stat/highed/ (accessed: June 28, 2022).

[4] Ibidem.

facing specific conditions, since the spouses fulfill family obligations along with studying at a college or university. However, regardless of practical problems and different methodological guidelines, foreign and Russian scientists agree that the desired model of student family, a family that has entered into an early marriage (in the United States – a Healthy Marriage and a functional family (Hawkins et al., 2013; Rostovskaya, Kuchmaeva, 2015) is in need of state support.

In the study, we proceed from the model of a functional young family developed during the preparation of the concept for state policy on the young family, adopted in 2007[5]. The model of functional young family was conceptualized by representatives of the Russian school of family studies (Klimantova, 2008; Antonov, 2010; Rostovskaya, Kuchmaeva, 2015; etc.) Scientists theoretically substantiated the model of functional family and identified its parameters: demographic (two-parent family, legitimate marriage, children, functional kinship); material (comfortable housing; satisfying the family members' demand for high-quality education, medicine, recreation, etc.); socio-psychological (absence of bad habits and illegal social practices; favorable psychological climate; involved parenthood), and value-based foundation. According to the results of the joint work of Russian scientists and government officials in 2007, the implementation of family policy by the state received a new foundation – the principle of creating conditions for the formation of sustainable family well-being as a factor promoting social and demographic security.

Elaborating the concept of functional family, including student families in its research field, studying the motivation of students to get married and the attitudes implemented in building a model of family life are based on the achievements of Russian research in the 1970s and 1980s. One of them is the work *The Student Family: State, Problems and Prospects* by a team of sociologists, which included V. Baltsevich, S. Burova, A. Vodneva, L. Gorbatenkova, I. Degtyarik, N. Zalygina, Z. Koroleva, I. Levitskaya, N. Mestovsky, S. Sidorenko. The authors highlight several features of the student family, such as homogeneity of the social status of the spouses and its temporal nature, their common moral and ideological views, similar goals, constrained material conditions due to the fact that both of them are studying (Baltsevich et al., 1991). These features are formed due to objective factors affecting the life strategies of student youth, which is reflected in the current demographic situation in Russia – an increase in the age of first childbirth, postponed marriages and births, etc. (Gurko, 2006; Vishnevskii, Yachmeneva, 2018; Kuchmaeva, 2019; Rostovskaya, 2015).

Issues regarding the barriers to and resources for the functioning of student families, students' ideas about a young family, and analysis of the value orientations of student youth are covered in a number of works (Gareeva et al., 2021; Kovalchuk et al., 2018; Monastyrskaya, Tsvetkova, 2021; Uvarova, 2012); finding answers to these questions will help to substantiate promising areas of targeted demographic and family policy. We should also note regional studies on student families (Denisov, 2012; Saralieva et al., 2022, Tatarova, Bochiktueva, 2009). Research findings prove the complexity and heterogeneity of young people's reproductive behavior. The desire to get an education, employment, their value system, etc. – all this affects the creation of a family and its functioning.

Cultural studies of family and marriage relations in student families are divided into studies of students' ideas about ideal marriage and family life, studies on the formation of students' value

[5] On the concept for state policy regarding young families: Letter AF-163/06 of the Ministry of Education and Science of Russia, dated May 8, 2007. Available at: http://www.consultant.ru/document/cons_doc_LAW_98438/ (accessed: September 5, 2022).

orientations to create a family, studies on the correlation between students' desirable ideas and actual value orientations[6] (Rusanova, 2012).

Our work is based on a survey of students of the Republic of Tyva. This Russian region still has a significant birth rate: the total fertility rate in 2020 was 2.97 children per woman of reproductive age[7]. Judging by the census data, marriage rate is quite high in young people of the Republic of Tyva (by the age of 25–29, more than 60% of young men and women are married). However, the demographic situation is complex and ambiguous. National traditions of Tyvans to a certain extent influence the fact that the average family size in the Republic is larger than the all-Russian indicators, although it is decreasing: in 2010, according to the population census, the average family size in the Republic was 3.9 people, in Russia as a whole – 3.1. Families of residents of the Republic had more children in comparison with the general situation in Russia; 70.8% of families in the Republic of Tyva had children under the age of 18 (44.1% in Russia); 42.0% (among those with children) had only one child, 33.3% – two, 24.7% – three or more children (in Russia as a whole, 65.5% had only one child)[8]. However, the average number of children in a family tends to decline. This makes it relevant to analyze the marital and reproductive behavior of young residents.

Studies of the ethno-demographic characteristics and value orientations of Tyva youth, including students (Persidskaya, 2019; Popkov, 2021), show that Tyva students are focused on preserving the culture of the peoples of the North and are family-oriented (Anayban, Balakina, 2022). On the other hand, researchers note unfavorable trends related to the increase in the number of postponed marriage registrations and the increase in out-of-wedlock birth rate (Natsak, 2022).

Of interest is how students of the region, which still retains a significant fertility potential, assess the role of social support measures for students and student families in maintaining welfare, balancing family, education and professional career. This will make it possible to determine an optimal strategy for social policy promoting the welfare of student families and preserving the birth rate.

It is necessary to identify strategies for the measures implemented so as to ensure the welfare of student families, determine their significance based on assessments given by young people and members of student families. Finding a solution to this problem requires conducting a wide range of sociological studies in Russia's regions.

Research results

A detailed analysis of the value system of young people who continue their education goes beyond the scope of the subject field of this article, but the analysis of respondents' answers to some questions aimed at determining the place of family values among value orientations is undoubtedly relevant.

The first place in the rating of respondents' life goals belongs to material ones – good housing (4.97 points on a 5-point scale) and family welfare (4.93 points). The top five goals also include the following: "to be able to spend time with family" (4.87 points, 3rd place), "confidence in the future" (4.73 points, 4th place) and "to have a loved one" (4.71 points, 5th place). The goals such as welfare and the importance of psychological communication relate indirectly to the family. At the same time, the value of a registered marriage is much lower than the significance of "having a loved one" (3.93 points, 24th place). An interesting fact is that the goal of "providing children with a good education" ranks

[6] Mikhailenko T.M. (2017). Culture of family and marriage relations in the youth (student) environment: Candidate of Sciences (Philosophy) dissertation. Rostov-on-Don

[7] Demographic yearbook of Russia 2021: Statistics collection. Available at: https://gks.ru/bgd/regl/B21_16/Main.htm

[8] Calculated according to the 2010 All-Russian Population Census. Available at: https://gks.ru/free_doc/new_site/perepis2010/croc/perepis_itogi1612.htm; 2002 All-Russian Population Census. Available at: http://www.perepis2002.ru/index.html?id=17

higher in the rating (4.69 points, 7th place) than just "raising a child" (4.32 points, 18th place). That is, young people think first of all about the future social status and well-being of their child, which depends much on education, rather than the need to simply give birth and raise a child. The value of several children is even lower: having two children ranks 25th (3.86 points), having three children – 34th out of 35 positions (2.59 points). Therefore, when having children, students are guided primarily by psychological motives (against the background of economic and social ones); and in this case, one child is enough to satisfy the desire to have children. The value of a successful career ranks 10th (4.56 points), freedom and independence – 15th (4.44 points), the opportunity to travel – 17th (4.36 points), which is ahead of the values such as registered marriage and having several children.

Only 4.8% of respondents do not want to have their own family. For the vast majority, starting a family is an important step. A separate block of questions in the questionnaire identified students' ideas about the desired model of family life *(Tab. 1)*. The closer the score value is to 5, the more the respondents agree with this or that statement.

Students mostly have modern views on the organization of family life. They believe that a man should be actively involved in the upbringing of the child, and there is nothing wrong with the fact that a woman earns more than a man in a family. Young people realize that fatherhood is a significant part of a man's life, "father is an important part in the life of a child; it is difficult for a child to grow up happy without a father". This proves the need for the father's participation in the child's life, even if the parents break up.

Table 1. Distribution of respondents' answers to the question: "How much do you agree with the following statements concerning family life?", assessment on a 5-point scale

Answer options (characterizing marriage and family life)	Score
Working on family relationships is a must for both spouses	4.82
The man should be actively involved in the upbringing of the child	4.78
There is nothing wrong with the fact that in a family the woman earns more than the man	4.65
Career and family are equally important in a man's life and in a woman's life as well	4.52
It is not shameful at all for a man to take on most of the household chores	4.48
Not only women should do household chores, men should do them as well	4.42
The mother's responsibility for the welfare of the family should be the same as that of the father	4.30
Father is an important part in the life of a child; it is difficult for a child to grow up happy without a father	4.12
Physical punishment of children is unacceptable even if applied to maintain discipline	3.82
Family can be happy without children	3.48
A woman/man must have at least one child	3.22
It is good for a family, if the man is its head	3.16
Marriage should be registered; cohabitation is not a real family	3.00
Marriage is a lifelong bond and should not be dissolved	2.82
Creating a family is more important for a woman than for a man	2.70
There should be many (three or more) children in a family	2.65
If the mother goes to work before the child is 3 years old, this will negatively affect the child	2.20
Taking care of the child is the task of a woman rather than a man	2.05
There is nothing wrong with the situation when the husband hits his wife if she deserves it	1.60
Compiled on the basis of own sociological research.	

At the same time, some respondents believe that a family can be happy without children. The lowest number of points (for those characteristics that are not so frequently considered significant) were scored by a negative attitude toward the mother's going to work before the child reaches the age of 3, as well as the statements that "taking care of the child is a task for the woman rather than man" and "there is nothing wrong with the situation when the husband hits his wife if she deserves it" (1.6 points). Much more respondents admit that physical punishment of children is unacceptable even if applied to maintain discipline (3.82 points).

The respondents' answers about the characteristics of a desired family model are supplemented by their answers about the motives (reasons) for starting a family and having a child. First of all, young men and women want to start a family in order to have "a loved one and not to feel lonely" (62.8%) and "home comfort" (58.6%). The desire to have children is important to one third of respondents (35.9%). Economic motives ("material support from the spouse"), as well as the desire to feel like an adult do not play a significant role (16.4% and 12.3% of responses, respectively). The role of traditions is minimized ("this is what my parents (relatives) want", "this is the way the things are done"); they are relevant for no more than 5% of respondents.

The average desired number of children (an answer to the question: "How many children would you like to have if you have all the necessary conditions for this?") turned out to be quite significant – 2.8 children (12% of respondents refused to answer this question, which may indicate that young people have not yet decided, they find it difficult to answer). This value is comparable to the value of the total fertility rate in the Republic of Tyva (2.72 children in 2019, 2.97 children in 2020)[9]. That is, the situation in the Republic is favorable for people to implement their reproductive intentions. At the same time, even at young ages, reproductive attitudes remain quite high. The effectiveness of support measures will determine whether young people will be able to maintain the reproductive potential of the region in the future. The clash of the traditions of having many children with significant difficulties in the life of a young family and the importance of professional success can prevent this.

Statistically significant differences (the test was carried out using the t-test, value 0.916, probability of error $p \leq 0.02$) are observed in the perceptions of the desired number of children for respondents who are married and unmarried (3.3 and 2.7, respectively). This confirms that people who intend to marry earlier have higher reproductive attitudes. The implementation of reproductive intentions is a significant direction of regional demographic policy. Studies show that even a slight increase in the total fertility rate requires significant financial expenditures on the part of the state. Thus, A.H. Gauthier and J. Hatzius (Gauthier, Hatzius, 1997) conducted an econometric analysis of the correlation between family benefits and fertility and found out that an increase in the total fertility rate by 0.07 children requires an increase in the amount of child and family allowances by 25%. Tyva has a significant reproductive potential that requires favorable conditions for its implementation.

Among those who answered the question "would you like to have a child while you are studying at a university?" 16.4% said "yes", 4.8% answered "yes, if I get married". However, the majority of students are not ready for such a step (63.0% said "no", 15.8% found it difficult to answer).

The students' answers indicate that their decision to postpone childbirth for several more years after graduation is primarily influenced by the need to acquire the necessary socio-professional and economic status first, as well as the desire to "live for myself" *(Tab. 2)*.

[9] Demographic yearbook of Russia 2021: Statistics collection. Available at: https://gks.ru/bgd/regl/B21_16/Main.htm

Table 2. Distribution of respondents' answers to the question: "If you want to postpone childbirth for a few more years after graduation, then why?", % of respondents (answer option: "affects very significantly")

Answer option	Proportion of those who chose the option "affects very significantly", %
First, it will be necessary to firmly "stand on our feet" financially	76.8
First, we will need to solve the housing issue	64.2
It will be necessary to focus much on work and professional activity	63.8
We want to live for ourselves for some time	59.5
If we have a small child, we will not be able to afford much of what we would like to have	51.2
It will be difficult to combine work and child care	49.4
I don't think about starting a family life soon after graduation	28.5
Compiled on the basis of own sociological research.	

The majority of respondents believe that it is best to enter into a registered marriage at the age of 25–29 years (68.5% of surveyed men and 63.1% of surveyed women), i.e. after they have gained professional education. Only 6.7% of young men and 16.5% of young women consider it appropriate to marry under the age of 24 that coincides with the period of obtaining professional education.

The formation of an opinion about the desired age of marriage is influenced by ideas about the following mandatory conditions for creating a family: there should be a strong feeling (68.5%); at least one of the partners (52.1%) or both partners (36.5%) should have a stable income; own housing (35.3%); at least one of the partners should complete their professional education before starting a family (31.4%). Parental approval is important only for 22.6% of respondents, and pregnancy as a factor stimulating marriage is noted by only 9.8%.

Due to the fact that the socio-legal status of the student family is not legally established at the federal level, regional legislative authorities independently take measures to support this type of family. The measures implemented are differentiated in terms of scale and quantity in the context of Russian regions. Specific features of the measures to support the student family in Russia are manifested in the fact that educational institutions themselves are important actors in the relevant policy. Higher education institutions provide various forms of support, ranging from financial assistance, provision of a separate living space within the dormitory, and assistance in finding employment and organizing free time. Informal associations of student families receive support as well. Practice shows that against the background of a very discrete policy at the regional and federal level, educational organizations are one of the most important social institutions that support student families.

However, the survey results indicate that the majority of students are skeptical about the conditions that a higher education institution provides to support family life; 54.6% do not agree with the statement that "studying at the university prepares students for starting a family and getting married", only 12.3% of respondents gave the answer "I completely agree". The situation is somewhat better with the provision of assistance from the university to students who have to combine family responsibilities and studying: 37.4% do not think that "the university provides all the necessary conditions for those students who have a family (married, have children)"; however, 21.1% fully agree that their university has such conditions; 23.4% partially agree with this statement.

Assessing the general atmosphere in the educational institution in the context of orientation toward the formation of not only professional, but also

family career, only 19.5% of respondents fully agree and 25.2% partially agree that their university holds events that develop positive family values and attitudes toward marriage, family, childbirth and parenting.

The most common support measures provided by educational organizations to students include assistance in finding a job, and financial support for students with outstanding academic performance *(Tab. 3)*. Student families, of course, also receive support intended for all students in general. There are, in fact, two specific measures aimed at helping young student families: additional payments for students with children and assistance in child care, the former being much more widespread.

Most often, students use such measures as additional scholarship payments and payments for students living in low-income families. Perhaps it is due to a lack of awareness: 28.5% of respondents found it difficult to answer the question about support measures provided by their university.

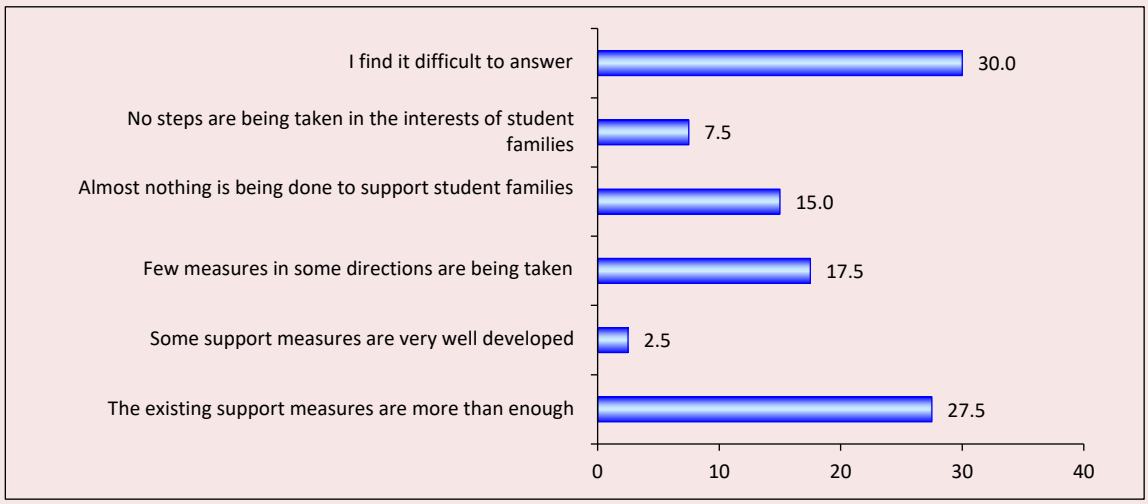
Young people's answers allowed us determine to a certain extent the prospects of the policy in the interests of student families. According to respondents, young families need special comprehensive programs (54.1%). Another 2.8% believe that such programs "are needed, but I am not sure that they will help a young family in any way". Only 9.8% gave a categorical answer that comprehensive programs are not needed. However, it is alarming that about a third of respondents (33.6%) found it difficult to answer the question. This may indicate certain information gaps in the knowledge of student youth about social policy and family support, problems in family life, as well as certain social immaturity. Apparently, some of the respondents have not yet seriously thought about this side of their present or future life.

Thirty percent of respondents found it difficult to answer the question about the current state of affairs regarding the development of the student family support system. Most respondents negatively assess the scale and effectiveness of existing measures; 30.0% assess the existing system of student family support positively, 40.0% do not consider the system complete and differentiated *(Figure)*.

Table 3. Distribution of answers to the question "Are there any student support measures in your educational organization? Do you use them? (please, mark all suitable options for each column)", % of respondents

Forms of support	Are there any student support measures in your educational organization?	Do you use or have you previously used any student support measures in your educational organization?
Assistance to students in finding employment	52.4	8.1
Additional scholarship payments for students who have achieved success in academic, scientific, methodological, informational and organizational work	40.2	28.4
Additional payments for students with children	38.2	7.2
Additional payments for students living in low-income families	33.8	32.3
Meals at reduced prices for some categories of students	31.3	12.8
Payment for medical care (medical insurance)	20.4	6.5
Assistance in finding housing and paying the rent	17.3	6.5
Assistance in organizing own business, co-working	13.0	8.7
Assistance in child care for student families	10.8	6.7
No such measures are provided	8.1	-
I find it difficult to answer	28.5	-
Source: own research findings.		

Distribution of answers to the question: "How developed is the student family support system now?", % of respondents



Compiled on the basis of own sociological research.

Significant obstacles to the development and implementation of measures to support the student family, according to respondents, are "lack of necessary information about the current state and problems of development of the institute of student family", "unwillingness of the authorities to pay attention to the problems of student families" (4.2 points on a 5-point scale), "attitude of public authorities at various levels toward the effectiveness of such measures", "poorly developed appropriate legal framework and regulations at the governmental level" (3.9 points), "attitude of teachers and staff of educational organizations toward the institute of student family" (3.7 points). However, such a possible obstacle as "absence of the need for measures according to the students themselves" scored only 2.3 points. Thus, respondents believe that poor elaboration of support measures can be due to a lack of information about real problems that student families have to deal with (which requires attention and monitoring), as well as a lack of attention of various actors of social policy implementation, including university management, to the development of targeted measures and their expected effectiveness. It is possible to express doubts about the competence of students regarding the strategy and tactics of social and family policy implemented in the region, but this is an assessment of the effectiveness of the measures implemented by the targeted group. Accordingly, we can talk about the existing gaps in the current policy, insufficient effectiveness of the measures being implemented, and shortcomings related to the dissemination of information among the target groups.

A significant support measure provided to all students is assistance in finding employment for graduates of educational institutions. However, this type of assistance is especially relevant for young parents. To a greater extent, students expect state support in the implementation of programs to promote the creation of jobs for young people (34.5%), which provides greater freedom of choice regarding future employment; 24.6% of respondents believe that the state should provide support in finding a job at the request of a graduate. This means expanding the range of advisory services,

Table 4. Assessing the possible impact of family support measures on the probability of having a child in a student family on a 5-point scale

Additional support measures	Score
Raise in scholarships (bonus to the scholarship) at the birth of a child for one of the spouses in a student family	4.44
Additional increase in state allowances for a child under the age of 1.5 years for one of the spouses in a student family	4.38
Assistance from an educational organization in the employment of spouses in a student family with the possibility of working remotely	4.30
Assistance to student families in obtaining housing	4.25
Provision of training opportunities according to an individual schedule for parents in a student family	4.20
Assistance in organizing child care	4.15
Expansion of distance education opportunities for parents in a student family	4.10
Expansion of distance employment opportunities for parents in a student family (improvement of legislation)	4.0
Assistance in organizing family vacations	3.85
Provision of additional benefits on loans, including mortgages, for a student family	3.70
Note: students answered the following question "Do you think that the probability of having a child in a student family may be slightly higher? If so, which of the possible additional measures to help families may be significant for you and to what extent? (evaluate the significance of each of these activities on a five-point scale, bearing in mind that "1" means that it practically does not matter, "5" – very significant, "0" – I find it difficult to answer).	
Compiled on the basis of own sociological research.	

measures to stimulate employers, development of special programs for employment services; 22.3% of students believe that, first of all, the state should provide graduates with their first job. In fact, the implementation of measures in this direction is close to the graduate placement scheme that was in effect in Russia until the early 1990s.

According to 67.4% of respondents, the implementation of special measures to support student families is very important and significant for changing the demographic situation in the country.

The implementation of measures to help student families may have an impact on the implementation of young people's reproductive plans, which will lead to an increase in the birth rate. Using a 5-point scale to assess the impact of possible additional support for families on the probability of having a child in a student family *(Tab. 4)*, the respondents placed an increase in the spouse's scholarship at the birth of a child on the first position (4.44 points) and an increase in the amount of benefits for a child under the age of 1.5 on the second position (4.38 points).

Besides, the respondents believe that an increase in the probability of having a child in a student family will be influenced to a greater extent by financial support, assistance in finding employment and obtaining housing (4 points or more). Young people are concerned about the economic situation of their families in case of having a child. Young parents who continue to spend a significant part of their time on education will not be able to solve many problems if their incomes do not increase.

Assistance in the organization of child care also plays a significant role (4.15 points). "Assistance in organizing family vacations" and "provision of additional benefits on loans, including mortgages, for a student family" are considered the least significant measures, although their score is also very high (about 4 points).

Conclusion

The reproductive potential of student youth in the Republic of Tyva is quite high. There still exists the influence of ethnic traditions; at the same time, a significant part of young people adheres to modern views on the organization of family life; psychological motives play an important role

in starting a family and having children. Many postpone marriage and childbirth, because they want to graduate and achieve a certain career growth, although the refusal to have children in general is rather an exception. This trend may lead to the fact that the fertility potential, supported by the traditions of having many children, will be exhausted. It is important to take this into account when developing a long-term strategy for targeted demographic policy.

Students are interested in support measures provided by the state to the family, but so far, they are quite skeptical about their effectiveness and about the strategy pursued by universities in relation to student families. From the respondents' point of view, it is necessary to develop special comprehensive programs to support a young family, improve their economic situation, ensure a combination of family and professional career. To a greater extent, student youth pays attention to the need for financial support, especially in the case of having a child. Family and demographic policy measures do not yet allow the existing reproductive intentions to be realized; and in the future, if the interests of young families are not taken into account and its welfare ensured, the birth rate will decrease.

The results of the research indicate certain information gaps in the students' knowledge about social policy and family support, about the problems of family life and ways to solve them, which requires a serious attitude toward the implementation of an information campaign in the interests of young families. The major task for institutions implementing policies in the field of motherhood, fatherhood and childhood should be to promote the institution of a prosperous young (student) family, in which a married couple is created at a young age and has children. Starting a family at a young age, on the one hand, can stimulate the growth of the birth rate, which is very important in conditions of depopulation; on the other hand, it solves a number of social and psychological problems of a young person and counteracts the spread of loneliness.

It is expedient to conduct a larger-scale study, whose sample volume will reveal the ideas about the desired model of family life of students of various age and ethnic groups, religious denominations, forms of education, differentiated by their economic status. This will help to apply a more substantiated approach to the development of recommendations for the implementation of targeted family and demographic policy. Based on the results of the research, we can conclude that the targeted demographic policy, taking into account the opinions of students about the desired assistance from various social institutions (not only educational organizations) to student families, will allow implementing the reproductive plans of young people in the Republic of Tyva, ensuring the preservation of the region's reproductive potential.

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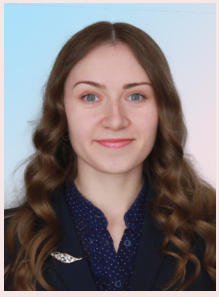
Transformation of the Resettlement System and Its Demographic Manifestations: Research Experience at the Regional and Municipal Levels



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Abstract. The global demographic trend of the 20th and early 21st century was the process of urbanization, which manifested itself, among other things, in the concentration of the population in large and super-large megacities with a rapid decline in the rural population. In Russia the transformation of resettlement was expressed in polarization and localized compression of the socio-economic space, fragmentation of the supporting framework of territories. Despite the fact that the issues of resettlement transformation at the national and regional level have been studied, there is still a need for in-depth research on its intraregional trends and patterns. The purpose of the work was to look into the peculiarities of urban and rural resettlement transformation and its demographic manifestations at the regional and municipal level. The model region was the Vologda Oblast, a typical constituent entity of the Russian Federation and northern Non-Chernozem region. The information base consisted of data from the All-Russian Population Censuses of 2002, 2010 and 2020, and the current statistical records of Rosstat and its territorial department in the Vologda Oblast. The methods of cartography, structural-dynamic analysis of resettlement characteristics and demographic indicators, the typology of municipal entities by the ratio of the components of population change, and the main indicators of the demographic situation were used. We have identified the following trends in the transformation of resettlement systems in the region: increasing polarization of urban and rural resettlement, expressed in the concentration of residents

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either in large or in small settlements; depopulation of rural areas; weakening of the supporting framework of urban resettlement (system of small towns); strengthening "focality" rural settlement. In more than half of the Vologda Oblast municipal entities the urban and rural population decrease is caused by the double effect of natural and migration losses. At the same time, the number and the share of such municipalities have grown significantly over the past 20 years. Some municipalities have the potential of migration growth or age structure, but only in Kaduysky District there is an increase in population due to the migration growth of urban residents. In the conclusion the threats and opportunities for development for different types of municipalities are outlined.

Key words: resettlement system, urban and rural resettlement, demographic situation, natural movement, migration, municipal entities, Vologda Oblast.

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Introduction

Today's most important global demographic trend is the process of urbanization, which manifests itself in a rapid increase in the number and proportion of the urban population, especially those who live in large and super-large megacities, and a rapid decrease in the rural population. Thus, according to the UN, the urban population grew from 750 million to 4.2 billion people from 1950 to 2018, and its share in the total population increased from 30 to 70%. Almost a quarter of the world's population lives in million-plus cities (23%), and 7% of them live in megacities (with a population of 10 million or more). According to the forecast, by 2035, 29% of the world's population will live in million-plus cities[1]. In the late 20th and early 21st centuries in a number of countries (USA, Germany, UK, France, Japan, Russia) the problem of "shrinking cities" characterized by significant population decrease due to various reasons – suburbanization, deindustrialization, economic crises, transition to a market economy (in the case of Russia), etc., clearly manifested itself (Efremova, 2015).

The key trends in the transformation of resettlement, according to Russian experts, are the concentration of rural and urban population in large settlements against the background of depopulation of the rest of the countryside and depopulation of most cities, which inevitably leads to the shrinkage of socio-geographical space and its polarization (Nefedova, Glezer, 2020). The stratification of Russia's inhabited space is connected with the relatively sparse network of large cities. Huge spaces outside the suburbs with a strong outflow of population become a socio-demographic "desert". Particularly strong are the processes of population polarization in the rural areas of the old-developed areas of the Non-Chernozem region with its small population[2].

[1] United Nations, Department of Economic and Social Affairs, Population Division (2018). World Urbanization Prospects: The 2018 Revision, Online Edition. Sources for Urban Population; Sources for Urban Agglomerations and Capital Cities. Cited from: Shcherbakova E.M. (2018). World urban and rural population forecast. *Demoskop Weekly*, 775–776. Available at: http://www.demoscope.ru/weekly/2018/0775/barometer775.pdf

[2] Nefedova T. Urban-rural polarization and the expansion of the Russian periphery. Available at: http://www.intelros.ru/intelros/reiting/reyting_09/material_sofiy/17837-polyarizaciya-gorodov-i-selskoy-mestnosti-i-rasshirenie-rossiyskoy-periferii.html

One of the objectives of the Spatial Development Strategy of the Russian Federation for the period until 2025 was to reduce the level of interregional differentiation in the socio-economic development of the constituent entities of RF by improving the sustainability of the resettlement system[3]. The sustainability of the resettlement system largely depends on the presence of a supporting framework of territories formed by major centers and transport highways. But the influence of such cities on the socio-economic development is gradually decreasing in the "center – periphery" direction, which leads to the formation of strong spatial gaps both between and within regions (Sobolev, 2015). As the population is moving into large settlements centers and their zones of influence in peripheral areas, the demographic and labor potential, and socio-economic well-being are significantly reduced. In the Non-Chernozem regions, the problem of polarization of resettlement, especially rural resettlement, is the most acute due to significant intraregional contrasts along the vector "center-periphery" (Egorov, 2020). This fact leads to the need for studies that deepen the understanding of the nature and consequences of the transformation of resettlement at the intraregional level. ***The purpose of our study*** was to examine the transformation of urban and rural resettlement and its demographic manifestations at the regional and municipal level.

Theoretical aspects of the research

Population resettlement is both a process of people's distribution over the territory, and its result in the form of a set (network) of settlements on a certain territory[4]. For a long time it was considered that the study of resettlement was of interest only to the geography of population and settlements, but nowadays this concept is used not only in socio-economic geography, but also in landscape studies, geoecology, and many non-geographical sciences (urban planning, regional and spatial economy, sociology, demography, history, ethnology) (Tkachenko, 2018).

The concept of "resettlement system" is widely used in Russian studies, while the corresponding English-language term is difficult to find (more often applied at the local level). In Russian science, it is understood as a group of settlements within one territory, between which there are spatial and functional relationships (Glezer et al., 2014).

Spatial transformations of population resettlement systems are considered by foreign and Russian researchers within the framework of *differential urbanization and resettlement evolution theories* (Fielding, 1989; Geyer, Kontuly, 1993; Zayonchkovskaya, 1991; City and Village..., 2001; Glezer, Weinberg, 2013; Nefedova et al., 2015), *concepts of economic space organization* (Christaller, 1933; Lösch, 1954), *the theory of regional inequality in the level of socio-economic development* (Zubarevich, 2010), *the center-periphery concept of spatial development* (Partridge et al., 2006; Polese, Shearmur, 2006; Borsdorf, Salet, 2007; Swiaczny et al., 2009; Karachurina, Mkrtchyan, 2013), *"shrinking cities" theory* (Baron et al., 2010; Pallagst et al., 2013; Haase et al., 2014; Nam, Richardson, 2014), *concepts of agglomeration processes* (Friedmann, 1966; Richardson, 1993; Krugman, 1998; Morgunov et al., 2021). Russian authors, when interpreting the drivers and consequences of the transformation of resettlements systems, more often rely on the concepts of differential urbanization and center-periphery spatial development. They focus on the evolution of the settlement structure and the accompanying changes in socio-economic and demographic processes.

[3] Spatial Development Strategy of the Russian Federation for the period up to 2025: Approved by RF Government Resolution 207-r, dated February 13, 2019. Available at: http://static.government.ru/media/files/UVAlqUtT08o60RktoOXl22JjAe7irNxc.pdf

[4] Alekseev A.I. (2013). Resettlement and Its Systems. Socio-Economic Geography: Concepts and Terms. Handbook Dictionary. Smolensk.

As features of urban and rural space changes, considered through the prism of the history of Russian territories development, their socio-economic contrasts and demographic dynamics, the deficit and low density of cities (big, large and the largest), population concentration in regional centers, depopulation and disappearance of small rural settlements, concentration of rural residents in large settlements and suburbs of large cities are noted. As a result, there is a fragmentation of the basic framework of territories and a pronounced localized shrinkage of socio-economic space (Nefedova, Glezer, 2020).

The problem of increasing polarization in resettlement systems is analyzed, in particular, for the Northwestern economic region. During the study on how the level of development and distribution of productive forces affects demographic processes and trends in the transformation of the resettlement system in the Leningrad, Novgorod and Pskov oblasts, the discrepancy of existing regional systems of resettlement to the spatial structure of the regional economy, with a negative impact on demographic processes and migration activity of residents, especially in rural settlements, which is expressed in the excessive concentration of labor resources in the largest and medium-sized cities of the regions, and also in the increase of the demographic burden on the working-age population in peripheral areas (Sobolev, 2015).

Based on the grouping of Russian municipal entities by population density and position in the center-periphery system, it was found that more than half of the country's residents (53%) live in densely populated areas close (up to 50 km) to regional centers, which occupy only 5% of RF territory. In turn, 5% of Russians live in 14% of municipal entities, located more than 300 km from the regional center and with a population density of less than 10 people/km^2, but occupy 66% of the territory of the country. There have been identified municipalities called "bear corners", which are remote from regional centers for 500 km or more and with a population density of less than 1 person/km^2, but occupy more than ½ of the area of Russia. The grouping of municipal entities simultaneously according to the population density indicator and migration parameters showed that net migration in all streams, except international, has a clearly expressed relationship with population density: the more sparse the territory, the more often it experiences an outflow of residents, and vice versa (Karachutina, Mkrtchyan, 2016).

In the development of Russia's urban settlement system, such trends have been detected as an increase in the number and share of population in million-plus cities; a decrease in the number of residents in cities with a population of 50,000 or less; an outflow of migrants, labor force and intellectual capital from small and medium-sized cities; the aging of small city population; and the increasing contrast of resettlement due to the growing gap between megacities and provincial cities (Fattakhov et al., 2019).

The key trend in the transformation of the rural resettlement structure in the country is the polarization of the network of rural settlements, expressed in the rapid growth of the smallest settlements share and a slight increase in the share of the largest, with the simultaneous washout of small and medium-sized settlements. According to the indicators of rural resettlement (average population, the share of unoccupied and small settlements, the proportion of the population of small and large settlements) N.V. Zubarevich distinguishes the following types of territories of Russia: small-settled Non-Chernozem (7% of the rural population), shredded medium-settled regions (12%), agglomerations with the most polarized settlement (5%), medium-settled regions (30%), medium-large-settled regions (26%), large-settled regions (20%) (Zubarevich, 2013). Uneven evolution of rural resettlement in RF regions is also manifested in the fact that a gradual "subsidence"

of the entire network with a slow decrease in the average population occurs in relatively prosperous regions of the forest-steppe zone, while the "collapse" of the network is typical for regions of the Non-Chernozem zone with a decrease in the average number of settlements due to their fragmentation and transfer into the category of the smallest. The constant enlargement of settlements while maintaining the overall pattern of the network is characteristic only of a small number of regions in southern Russia (Alekseev, Safronov, 2015).

The transformation of resettlement systems has become an object of research of Vologda scientists. The rural resettlement of the region for the period between the censuses of 2002 and 2010 revealed trends of increasing the number and share of empty rural settlements, reducing the share of residents of small and medium-sized rural settlements with a simultaneous increase in the number of large settlements, population concentration in the zone of influence of large cities – Vologda and Cherepovets (Soldatova, 2016; Uskova, Patrakova, 2021). At the same time, the largest share of uninhabited settlements is characteristic of the rural areas of the near periphery: Vologodsky, Ust-Kubinsky, Gryazovetsky, Velikoustyugsky and other districts (Uskova, Patrakova, 2021). A unique feature of the Vologda Oblast's rural resettlement system is its "cluster" character in the north and east of the region, where relatively small (within 200 people) settlements are grouped in treeless areas, forming a kind of "bushes", most often in river valleys (Averkieva, 2017).

Despite the fact that the issues of resettlement transformation at the national and regional level have been studied, there is still a need to study its intraregional trends and patterns in depth. Of particular importance is the consideration of long-term trends in urban and rural resettlement systems in relation to the characteristics of the demographic development of territories, which allows us to assess not only the development of territories, but also their demographic potential and the prospects for population dynamics. The relevance of studying these problems increases in connection with the release of data from the All-Russian Population Census 2020 (conducted in 2021; hereinafter – ARPC-2020). The key categories of this work are "resettlement system" and "demographic situation": the former reflects the characteristics of the population distribution in the territory, the later – the parameters of population size, its dynamics and structure. The combination of both categories in a single study allows us to assess the interdependence of population distribution across the territory with the ongoing demographic processes on it, which is extremely relevant to the search for tools to ensure a sustainable and balanced spatial development of the country and its individual regions.

Materials and methods

The Vologda Oblast, which is a typical representative of the Russian Federation and the northern regions of the Non-Chernozem region, was chosen as the object of the study. By the area occupied, the Vologda Oblast is ranked 26th out of 85 constituent entities of RF (144.5 sq. km), but by the permanent population size it takes only 43rd place (1151.0 thousand people), and by population density it is ranked 62nd (8.0 people per 1 sq. km)[5] in the bottom half of the rating. This fact indicates a low population density in the region and indirectly the focal character of resettlement. In addition, the region is steadily included in the number of RF constituent entities with descending population dynamics (Shabunova et al., 2021), which against the background of low density of resettlement creates a real threat of depopulation of most of its territories and, consequently, the growth of space polarization and socio-economic inequalities.

[5] According to the 2021 data.

The need of understanding the nature, demographic and socio-economic consequences of the resettlement transformations observed on the territory of the region, determines their consideration from the perspective of the ***normative approach***, according to which all settlements located within the boundaries of the considered territory are automatically included in the corresponding system of resettlement. Its advantages are the inseparability of the resettlement system from the administrative-territorial division of the region and the accessibility of the information required for analysis.

The information base of the study is the data of the All-Russian censuses of 2002, 2010 and 2020, and the current statistical records of the Federal State Statistics Service and its territorial department in the Vologda Oblast. The resettlement was described with the use of its key indicators: population density, average population, the amount of settlements and the number of population in each of them. Demographic manifestations of the resettlement transformation were assessed by indicators of changes in the population and its components (natural movement and migration), the age composition of the population. Among the research methods of the resettlement systems and demographic manifestations of their transformation, structural-dynamic analysis, which allows us to trace both the current state and characteristics of changes in the indicators of population distribution, cartographic and geoinformation methods, which help to reflect the spatial features of population distribution and visualize them, are generally recognized. The methods mentioned above have been used in previously reviewed works (Sobolev, 2015; Alekseev, Safronov, 2015; Karachutina, Mkrtchyan, 2016; Fattakhov, Nizamutdinov, Oreshnikov, 2019; Nefedova, Glezer, 2020; etc.). In the course of the study, in addition to the above methods, we used the typology of municipal entities by the ratio of components of population change, and by the ratio of the main indicators of the demographic situation. The advantage of this method is in the demographic classification of municipalities: in the first case by the contribution of indicators of natural movement and migration to the dynamics of urban and rural population, in the second case by the nature of the demographic situation and, among other things, the potential for its improvement in urban and rural areas. Before the mapping and typology of municipal entities, they were grouped according to the values of indicators (population density, population size, age structure of the population). Three groups of municipalities were distinguished: with low, average and high values of indicators. Municipalities with values of indicators in the range "arithmetic mean ± standard deviation" were selected in the middle group, municipalities with values below or above this range were assigned to the groups with low and high levels of indicators respectively.

In our study the resettlement systems of the Vologda Oblast at the municipal level are considered in the context of 26 municipal districts and two urban okrugs. Since January 1, 2022 in the course of the territorial organization of local self-government reform, 20 municipal districts were transformed into municipal okrugs. In view of the need to track long-term trends in the transformation of settlement at the intraregional level, this paper takes the old system of administrative-territorial organization as the basis.

Main results

Transformation of urban and rural resettlement systems in the region

The index of population density by municipalities of the Vologda Oblast demonstrates a wide range of values and indicates an uneven distribution of residents on the region's territory *(Fig. 1)*. An increased concentration of population, in addition to the territories of large cities – Vologda and Cherepovets – is characteristic of the nearby municipal entities – Sheksninsky, Vologodsky and Sokolsky districts. Municipalities with medium and

Figure 1. Population density of Vologda Oblast municipal entities, 2021, people per 1 km²

According to: Demographic Yearbook of the Vologda Oblast. 2021: Statistical Collection. Vologdastat, 2022.

high population density (excluding Velikoustyugsky District) are located in the agglomeration zone of the Vologda and Cherepovets monocentric agglomerations. The former includes Vologodsky, Gryazovetsky and Sokolsky districts and the latter includes Cherepovetsky, Sheksninsky and Kaduysky districts (Kozhevnikov, 2018). The observed features of population distribution over the region's territory may be caused by the agglomeration factor.

According to the ARPC-2020, the Vologda Oblast has 15 cities and 8 urban-type settlements (hereinafter – UTS; *Tab. 1*). 13 of the 15 cities are small (with a population of up to 50 thousand people), and 7 of them are cities with a population of 5 to 10 thousand people (Belozersk, Krasavino, Kirillov, Nikolsk, Totma, Ustyuzhna, Kharovsk). The region has two large cities (from 250 to 500 thousand people) – Vologda and Cherepovets. Among eight urban-type settlements three have a population of up to 5 thousand people (Kuzino, Khokhlovo, Sazonovo), three – from 5 to 10 thousand people (Vozhega, Vokhtoga, Chagoda) and two – from 10 to 20 thousand people (Kadui, Sheksna). At the same time, 80% of the urban population lives in large cities, 55% of the inhabitants of urban-type settlements live in UTS with a population of 10 to 20 thousand people.

The following transformations took place in the urban resettlement system of the Vologda Oblast in the period between the censuses of 2002 and 2020: the number of the smallest cities (with a population under 10 thousand people) and their population increased, while the number of small towns with a population from 10 to 50 thousand people and their population decreased, the concentration of urban population in large cities and large urban-type settlements increased. The observed changes indicate the increasing polarization of the urban resettlement system and the weakening of its supporting framework (the system of small cities).

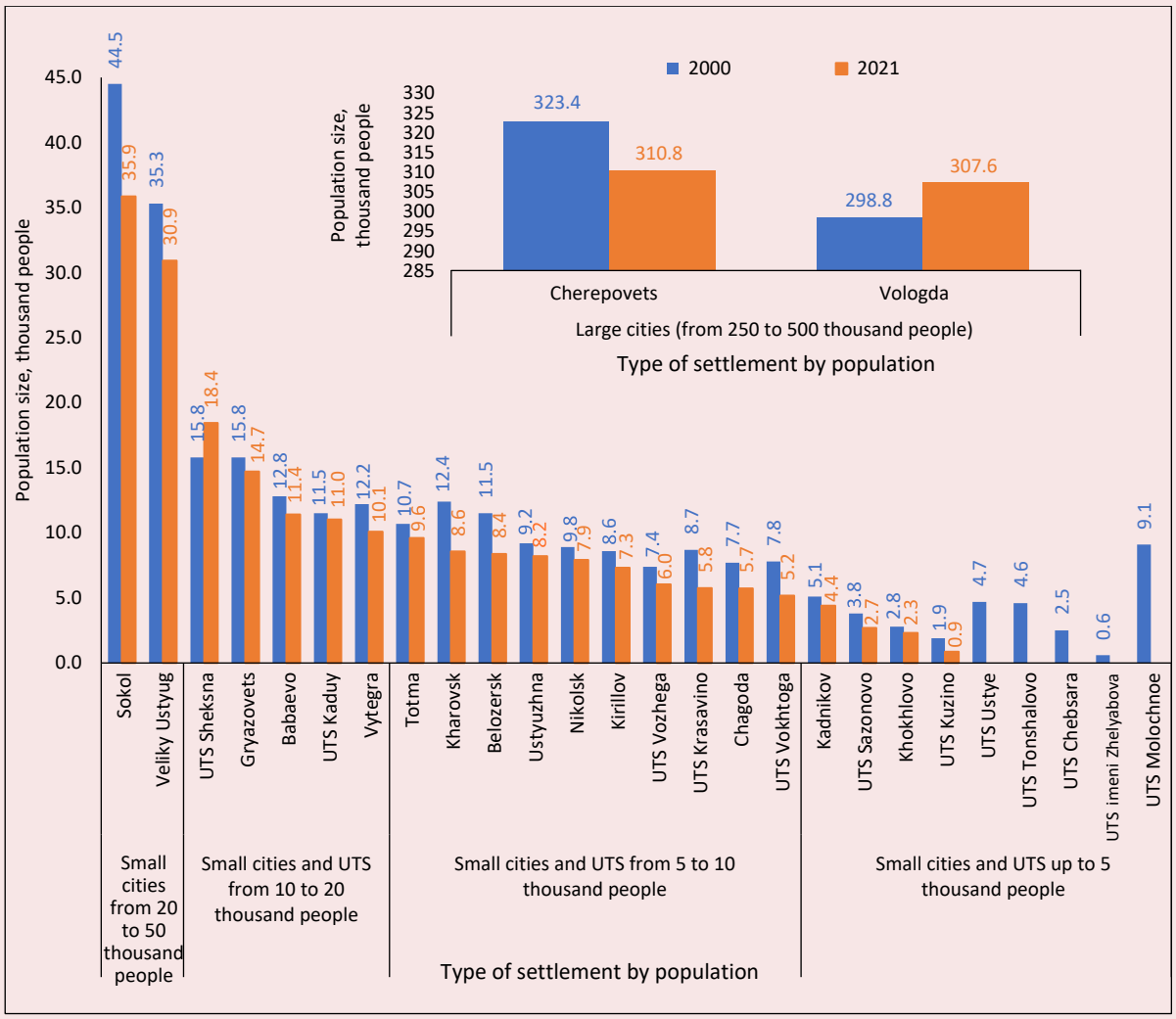
Table 1. Grouping of urban settlements of the Vologda Oblast by population

Groups by population, people	Number of settlements, units									
	2002		2010		2020		2020 to 2002 (+/-)		2020 to 2010 (+/-)	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Cities										
Total	15	100.0	15	100.0	15	100.0	0	-	0	-
up to 5000	-	-	1	6.7	1	6.7	+1	+6.7	0	0,0
5000–9999	4	26.7	6	40.0	7	46.7	+3	+20.0	+1	+6.7
10000–19999	7	46.7	4	26.7	3	20.0	-4	-26.7	-1	-6.7
20000–49999	2	13.3	2	13.3	2	13.3	0	0.0	0	0,0
50000–99999	-	-	-	-	-	-	-	-	-	-
100000–249999	-	-	-	-	-	-	-	-	-	-
250000–499999	2	13.3	2	13.3	2	13.3	0	0.0	0	0.0
Urban-type settlements (UTS)										
Total	12	100.0	9	100.0	8	100.0	-4	-	0	-
up to 5000	6	50.0	4	44.4	3	37.5	-3	-12.5	-1	-6.9
5000–9999	4	33.3	3	33.3	3	37.5	-1	+4.2	0	+4.2
10000–19999	1	8.3	1	11.1	2	25.0	+1	+16.7	+1	+13.9
20000–49999	1	8.3	1	11.1	0	0.0	-1	-8.3	-1	-11.1
Population, people										
Cities										
Total	795476	100.0	789290	100.0	776964	100.0	-18512	-	0	-
up to 5000	-	-	4796	0.6	4106	0.5	+4106	+0.5	-690	-0.1
5000–9999	30451	3.8	52144	6.6	53687	6.9	+23236	+3.1	+1543	+0.3
10000–19999	83649	10.5	48168	6.1	36630	4.7	-47019	-5.8	-11538	-1.4
20000–49999	76461	9.6	70117	8.9	63412	8.2	-13049	-1.4	-6705	-0.7
50000–99999	-	-	0	0.0	-	-	-	-	-	-
100000–249999	-	-	0	0.0	-	-	-	-	-	-
250000–499999	604915	76.0	614065	77.8	619129	79.7	+14214	+3.7	+5064	+1.9
Urban-type settlements (UTS)										
Total	81096	100.0	60563	100.0	50613	100.0	-30483	-	0	-
up to 5000	17582	21.7	8306	13.7	5699	11.3	-11883	-10.4	-2607	-2.4
5000–9999	30101	37.1	20020	33.1	17325	34.2	-12776	-2.9	-2695	+1.1
10000–19999	11798	14.5	11284	18.6	27589	54.5	+15791	+40.0	+16305	+35.9
20000–49999	21615	26.7	20953	34.6	0	0.0	-21615	-26.7	-20953	-34.6

According to: Results of the All-Russian Population Census of 2002. Available at: http://www.perepis2002.ru/index.html?id=11; Results of the All-Russian Population Census of 2010. Federal State Statistics Service. Available at: https://gks.ru/free_doc/new_site/perepis2010/croc/perepis_itogi1612.htm; Results of the All-Russian Population Census of 2020. Federal State Statistics Service. Available at: https://rosstat.gov.ru/vpn_popul

Since 2000, the population of urban-type settlements Kuzino (Velikoustyugsky District), Vokhtoga (Gryazovetsky District), Sazonovo (Chagodoshchensky District), and small cities Krasavino (Velikoustyugsky District) and Kharovsk has decreased by more than 30%, more than a quarter – UTS Chagoda and Belozersk *(Fig. 2)*. Gryazovets and the UTS Kaduy had the smallest decrease in the urban population (less than 10%). The increase in population during this period was noted only in the UTS Sheksna (by 16%) and in Vologda (by 3%). The number of Cherepovets residents decreased insignificantly (by 4%). Five urban-type settlements (Ustye, Tonshalovo, Chebsara, Imeni Zhelyabova and Molochnoe) were administratively transformed into rural settlements in the 2000s.

Figure 2. Cities and urban-type settlements in the Vologda Oblast by urban population in 2000 and 2021*, thousand people



* Cities and UTS are ranked by urban population in 2021.

According to: Demographic Yearbook of the Vologda Oblast. 2021: Statistical Collection. Vologdastat, 2022; Demographic Yearbook of the Vologda Oblast. 2000: Statistical Collection. Vologdaoblkomstat, 2001.

According to the ARPC-2020, the most common type of rural settlements by population in the Vologda Oblast are settlements with the number of inhabitants up to 10 people, or the so-called one-ward settlements (40% of the total number of rural settlements; *Tab. 2*). The second most common are rural settlements without population, they account for 30% of the total number of rural settlements. It is noteworthy that the Vologda Oblast is among the regions with the maximum share of rural settlements without population, maintaining its position since 2002 (Korolenko, 2023). Small settlements with a population of 11 to 200 people account for 27% of the total number of rural settlements. The share of medium-sized and large settlements does not exceed 5% of the total number of rural settlements. It is remarkable that the largest contribution to the total number of rural residents in the region comes from small settlements with a population of up to 200 people

Table 2. Grouping of rural settlements of the Vologda Oblast by population

Group by population, people	Number of settlements, units									
	2002		2010		2020		2020 to 2002 (+/-)		2020 to 2010 (+/-)	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Total	8041	100.0	8006	100.0	7844	100.0	-197	-	-162	-
Uninhabited	1625	20.2	2131	26.6	2313	29.5	+688	+9.3	+182	+2.9
up to 10	3046	37.9	3228	40.3	3160	40.3	+114	+2.4	-68	0.0
11–200	2971	36.9	2300	28.7	2079	26.5	-892	-10.4	-221	-2.2
201–500	266	3.3	229	2.9	186	2.4	-80	-0.9	-43	-0.5
501–1000	81	1.0	69	0.9	62	0.8	-19	-0.2	-7	-0.1
1001–2000	31	0.4	26	0.3	22	0.3	-9	-0.1	-4	0.0
2001–5000	17	0.2	17	0.2	19	0.2	+2	0.0	+2	0.0
over 5000	4	0.0	6	0.1	3	0.0	-1	0.0	-3	-0.1
	Population, people									
Total	392996	100.0	352591	100.0	315250	100.0	-77746	-	-37341	-
up to 10	14288	3.6	14207	4.0	12995	4.1	-1293	+0.5	-1212	+0.1
11–200	124590	31.7	99208	28.1	89207	28.3	-35383	-3.4	-10001	+0.2
201–500	84072	21.4	70266	19.9	57878	18.4	-26194	-3.0	-12388	-1.5
501–1000	56905	14.5	48446	13.7	44306	14.1	-12599	-0.4	-4140	+0.4
1001–2000	40014	10.2	34454	9.8	31025	9.8	-8989	-0.4	-3429	0.0
2001–5000	49936	12.7	50473	14.3	61518	19.5	+11582	+6.8	+11045	+5.2
over 5000	23191	5.9	35537	10.1	18321	5.8	-4870	-0.1	-17216	-4.3

According to: Results of the All-Russian Population Census of 2002. Available at: http://www.perepis2002.ru/index.html?id=11; Results of the All-Russian Population Census of 2010. Federal State Statistics Service. Available at: https://gks.ru/free_doc/new_site/perepis2010/croc/perepis_itogi1612.htm; Results of the All-Russian Population Census of 2020. Federal State Statistics Service. Available at: https://rosstat.gov.ru/vpn_popul

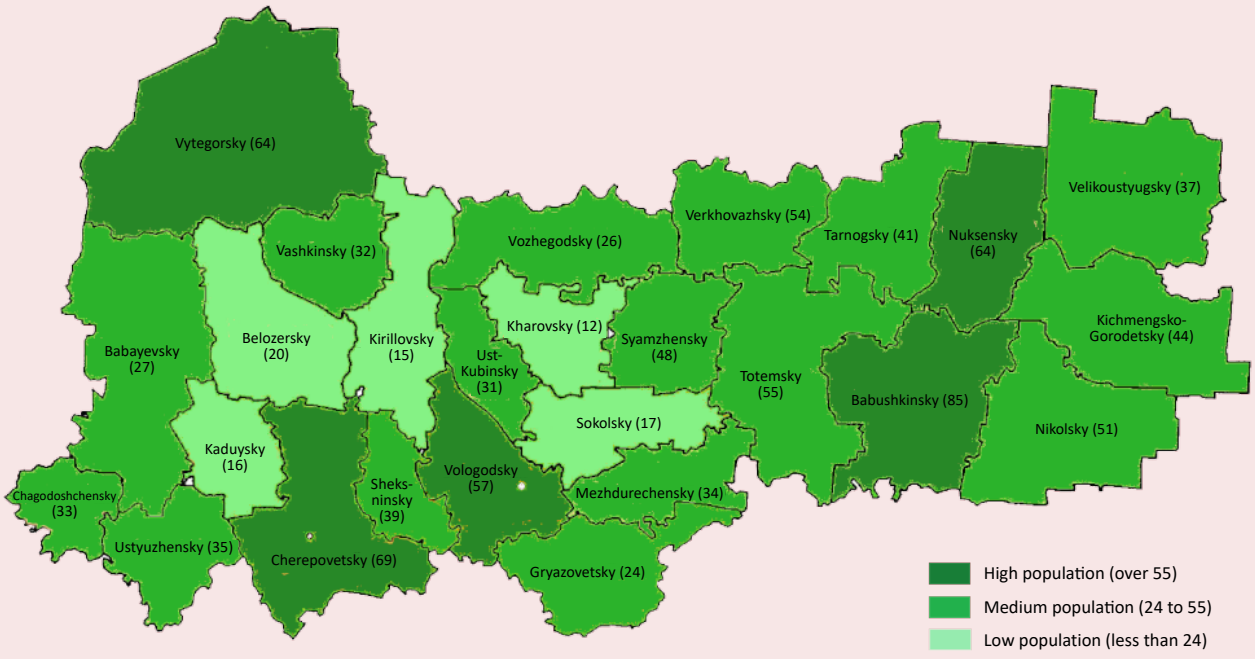
(28% of the total rural population). In turn, every fourth rural inhabitant lives in a large rural settlement with a population of 2,000 or more.

In the rural settlement system of the Vologda Oblast in the intercensal period there were trends of depopulation of territories, an increase in the number of one-ward settlements in the total number of rural settlements, an increase in the concentration of rural residents either in small settlements or in large settlements. Thus, the rural space of the region is characterized by increasing polarization and increasing "focality" of settlement.

In 2021 the average population of rural settlements in the Vologda Oblast was 40 people. A high level of average population is observed in Babushkinsky, Cherepovetsky, Nyuksensky, Vytegorsky, Vologodsky and Totemsky districts *(Fig. 3)*. In turn, the lowest indicator is characteristic of Kharovsky, Belozersky, Sokolsky, Kaduysky and Kirillovsky districts. In other municipalities there is an average value of human population. Obviously, the eastern part of the region is less characterized by the problem of low population density of rural settlements and small populations, which is associated with the later development of these territories and the valley nature of settlement in them (Soldatova, 2016).

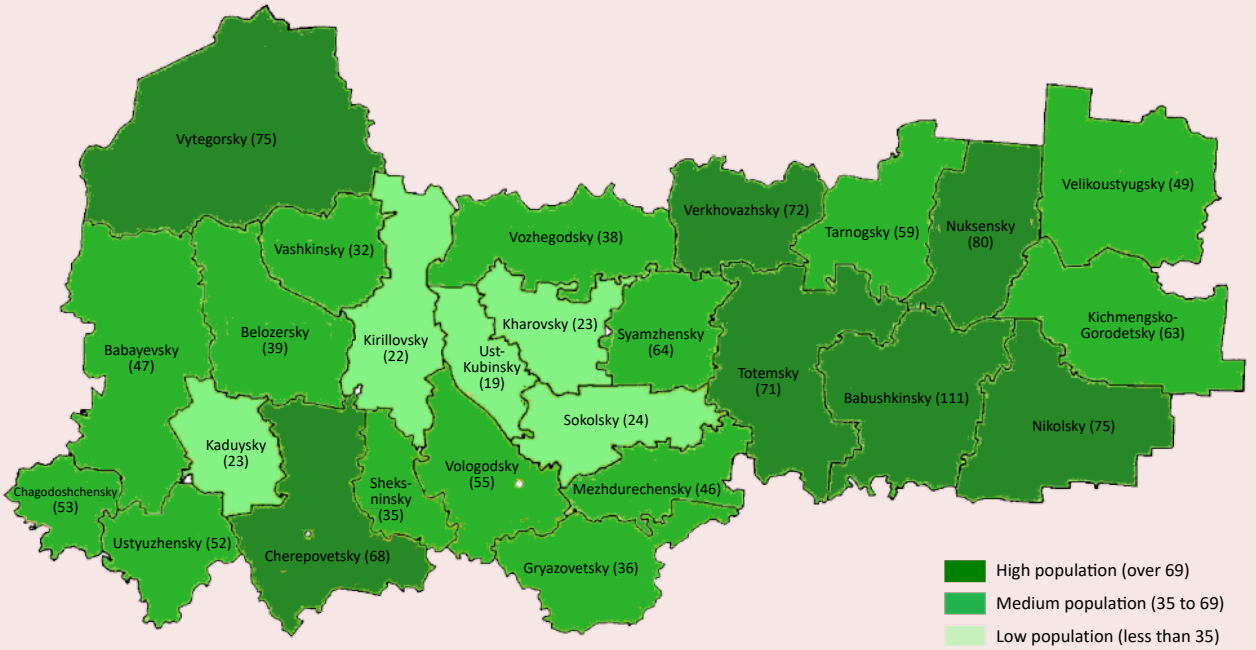
Compared to 2000, in 2021 in most municipal districts of the Vologda Oblast there was a decrease in the population of rural settlements, with the most intensive process in western districts – Belozersky, Kharovsky, Babaevsky, Vashkinsky and Chagodoshchensky *(Fig. 3, 4)*. The increase in population during this period was recorded only in four municipalities – Ust-Kubinsky, Sheksninsky, Vologodsky and Cherepovetsky, but it was due solely to administrative factors, namely the transformation of UTS into rural settlements in some areas (Ustye in Ust-Kubinsky, Chebsara in Sheksninsky, Tonshalovo in Cherepovetsky, Molochnoe in Vologodsky).

Figure 3. Average population of rural settlements in municipal districts of the Vologda Oblast in 2021, people per settlement



According to: Demographic Yearbook of the Vologda Oblast. 2021: Statistical Collection. Vologdastat, 2022.

Figure 4. Average population of rural settlements in municipal districts of the Vologda Oblast in 2000, people per settlement



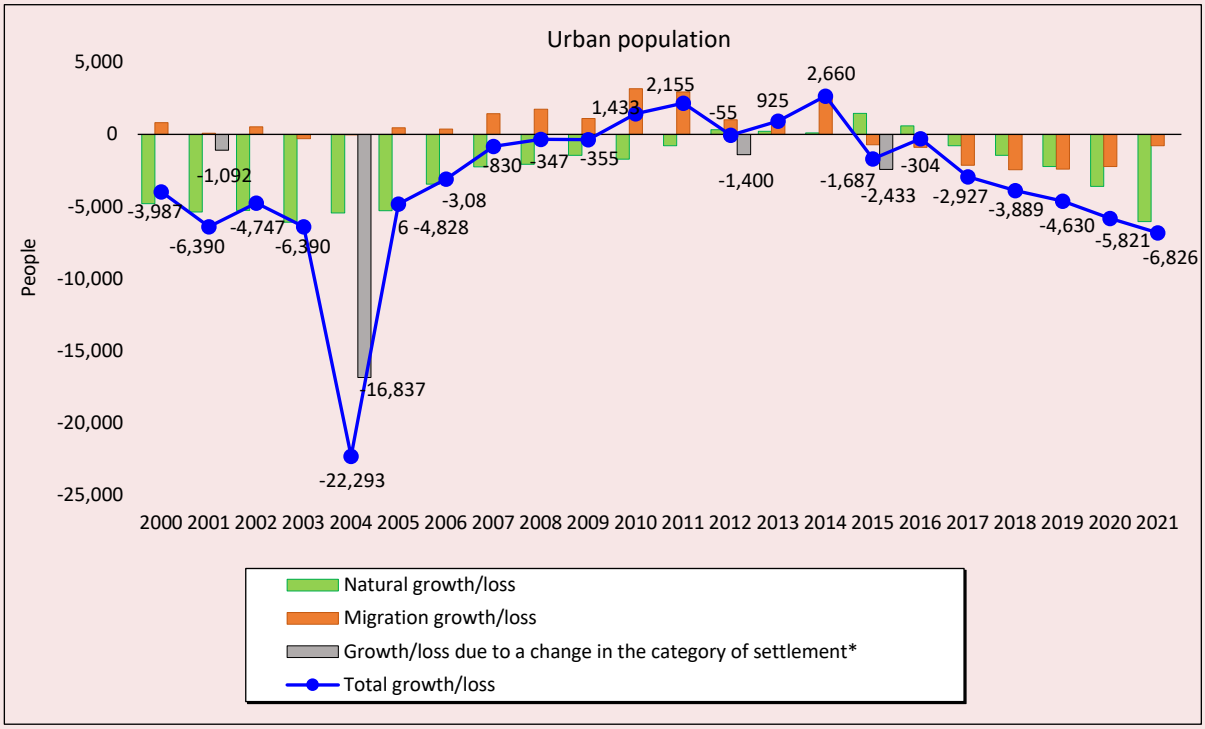
According to: Demographic Yearbook of the Vologda Oblast. 2000: Statistical Collection. Vologdastat, 2001.

In general, the observed situation allows us to talk about the existence of "centers" of rural settlement: on the one hand, in municipalities located in the zone of socio-economic influence of large cities (Vologda and Cherepovets), on the other hand, in eastern areas of the region with historically established "clusters" of resettlement, but their role in the concentration of rural residents is reduced.

Demographic manifestations of the resettlement systems transformation

In 2000–2009 and 2015–2021 in the Vologda Oblast there was a total loss of urban population: in 2000–2002, 2005–2009 – due to the excess of its natural loss over migration growth, in 2016 – due to the excess of its migration loss over natural growth, in 2003, 2017–2021 – due to the double effect of natural and migration loss *(Fig. 5)*. In some years the total loss of urban population in the region was mainly due to the administrative transformation of urban settlements into rural ones: in 2004 – the transformation of the UTS Ustye and Tonshalovo into settlements, and the UTS Molochnoe into a village, in 2012 – the transformation of the UTS Chebsara into a settlement, in 2015 – the transfer of part of the urban population of the UTS Sheksna into a rural settlement. In 2010–2011, 2013–2014 there was an increase in the number of urban residents of the region, in 2010–2011 – due to the excess of migration growth over natural loss, in 2013–2014 –

Figure 5. Components of change in the urban population of the Vologda Oblast in 2000–2021, people



* Changes in the number of urban (rural) population, which occurred as a result of the transformation of rural settlements into urban (or urban into rural) by decision of the authorities: since 2001, the UTS Imeni Zhelyabova was transformed into a settlement, since 2004 the UTS Molochnoye was transformed into a village settlement, the UTS Tonshalovo and Ustye were transformed into village settlements, since 2012 the UTS Chebsara was transformed into a village settlement, since 2015 part of the urban population of the UTS Sheksna was transferred to the Ugolskoye rural settlement.

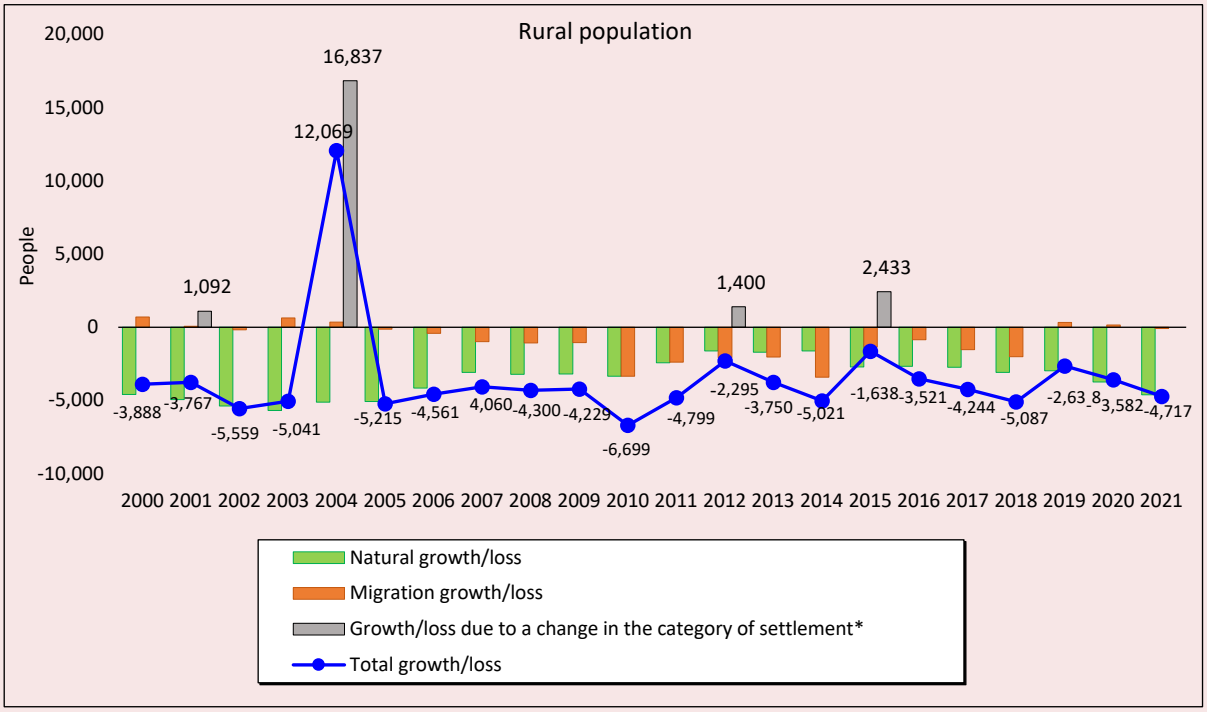
Source: Vologda Oblast Demographic Yearbook 2001–2022.

due to the double effect of migration and natural growth. In 2021 the total loss of urban population in the region reached the value of -6,826 people. At the same time 88% of it was provided by natural loss of population (-6,035 people).

Throughout practically the entire period under consideration (excluding 2004), there was a general decline in the rural population in the Vologda Oblast (*Fig. 6*). In some years, it was provided by the excess of natural loss over migration increase (2000, 2003, 2019–2020), but at other time by the double effect of both natural and migration loss. Only in 2004, the transfer of some urban settlements to rural ones (UTS Ustye, Tonsholovo and Molochnoe) covered the natural loss and provided the maximum total increase of rural residents in the region (12,069 people). In 2001, 2012 and 2015, administrative transformation could not compensate for the contribution of natural and/or migration losses to the decrease in the rural population. The total loss of rural residents reached its maximum value in 2010 (-6,699 people). In 2021 its size was -4,717 people and 98% of it was due to natural loss (-4,623 people).

The grouping of municipalities by the ratio of the components of change in the urban population showed that in 2021 65% of urban municipalities (15 of 23) had the most unfavorable situation, characterized by the total loss of residents due to the double effect of natural and migration losses *(Tab. 3)*. Among these municipalities were large cities – Vologda and Cherepovets. In six urban

Figure 6. Components of change in the rural population of the Vologda Oblast in 2000–2021, people



* Changes in the number of urban (rural) population, which occurred as a result of the transformation of rural settlements into urban (or urban into rural) by decision of the authorities: since 2001, the UTS Imeni Zhelyabova was transformed into a settlement, since 2004 the UTS Molochnoye was transformed into a village settlement, the UTS Tonshalovo and Ustye were transformed into village settlements, since 2012 the UTS Chebsara was transformed into a village settlement, since 2015 part of the urban population of the UTS Sheksna was transferred to the Ugolskoye rural settlement.

Source: Vologda Oblast Demographic Yearbook 2001–2022.

Table 3. Grouping of Vologda Oblast municipal entities by the impact of natural movement and migration indicators on the change in the number of urban population

Group	2000		2010		2021	
	Number	Municipal entities (cities and UTS)	Number	Municipal entities (cities and UTS)	Number	Municipal entities (cities and UTS)
NL, ML, TL	10 (36%)	Vologda, Velikii Ustyug, Sokol, Belozersk, Vytegra, Nikolsk, Ustyuzhna, Kadui, Molochnoe**, Khokhlovo	13 (54%)	Sokol, Babaevo, Belozersk, Vytegra, Ustyuzhna, Kharovsk, Vozhega, Vokhtoga, Kuzino, Sazonovo, Chagoda, Chebsara***, Sheksna	15 (65%)	Vologda, Velikii Ustyug, Cherepovets, Belozersk, Gryazovets, Kadnikov, Kirillov, Krasavino, Nikolsk, Totma, Ustyuzhna, Kharovsk, Vokhtoga, Kuzino, Sheksna
NL, MG, TL	15 (54%)	Cherepovets, Babaevo, Gryazovets, Kadnikov, Kirillov, Krasavino, Totma, Kharovsk, Imeni Zhelyabova*, Kuzino, Sazonovo, Ustye**, Chagoda, Chebsara***, Sheksna	3 (12%)	Krasavino, Kadui, Khokhlovo	6 (26%)	Sokol, Babaevo, Vytegra, Vozhega, Sazonovo, Chagoda
NG, ML, TL	-	-	4 (17%)	Gryazovets, Kadnikov, Kirillov, Nikolsk	-	-
NL, MG, TG	2 (7%)	Vozhega, Vokhtoga	4 (17%)	Vologda, Velikii Ustyug, Cherepovets, Totma	2 (9%)	Kadui, Khokhlovo
NG, ML, TG	-	-	-	-	-	-
NG, MG, TG	1 (3%)	Tonshalovo**	-	-	-	-
Total	28		24		23	

Hereinafter: NL, ML, TL – natural, migration, total loss of population; NG, MG, TG – natural, migration, total growth of population. In green color are marked the municipal entities that have improved their position in 2021 in comparison to 2000, in red – those that have worsened their position, and in black – those that have not changed their position.
* Since 2001, the UTS Imeni Zhelyabova transformed into a settlement.
** In 2004, the UTS Molochnoe was transformed into a village, and the UTS Tonshalovo and Ustye were transformed into settlements.
*** Since 2012, the UTS Chebsara was transformed into a settlement.
According to: Demographic Yearbook of the Vologda Oblast. 2000: Statistical Collection. Vologdastat, 2001; Demographic Yearbook of the Vologda Oblast. 2010: Statistical Collection. Vologdastat, 2011; Demographic Yearbook of the Vologda Oblast. 2021: Statistical Collection. Vologdastat, 2022.

municipalities (Sokol, Babaevo, Vytegra, UTS Vozhega, Sazonovo, Chagoda) the migration growth did not compensate the natural population loss, as a result of which there was an overall population loss. Only in two municipalities – the urban-type settlements Kaduy and Khokhlovo of Kaduysky District – there was an increase in the population due to migration growth.

Compared to 2000, in 2021 there were negative trends in the grouping of urban municipalities by the ratio of population change components: the share of the most disadvantaged cities and UTS increased from 36% to 65%, and cities and UTS with a general decline, but migration growth – decreased from 54% to 26%. Over the observation period, 10 urban settlements worsened their position in terms of the ratio of population components, most significantly – the UTS Vozhega (Vozhegodsky District) and Vokhtoga (Gryazovetsky District), nine have not changed it and only four have improved their positions (most significantly – the UTS Kadui and Khokhlovo). The positive dynamics of the population size of the UTS Kadui and Khokhlovo can be explained by the functioning of developed industrial enterprises that create jobs. For example, Kaduysky District holds leading positions in the Vologda Oblast in the production of electricity (Cherepovets State District Power Plant) and the

production of food sturgeon caviar (fish processing firm "Diana"), and is among the leaders in the production of plywood and furniture components (LLC "Kaduysky plywood mill", OJSC "Sivets", etc.)[6].

In 2021 in 59% of municipal entities (16 of 27) rural population decreased due to both natural and migration losses, in 41% (11 of 27) due to the excess of natural loss over migration gain *(Tab. 4)*. The overall increase in the rural population was not

Table 4. Grouping of municipal entities of the Vologda Oblast by the impact of natural movement indicators and migration on the change in the number of rural population

Type	2000		2010		2021	
	Number	Municipal entities. (districts, urban okrugs)	Number	Municipal entities. (districts, urban okrugs)	Number	Municipal entities. (districts, urban okrugs)
NL, ML, TL	8 (31%)	Babushkinsky, Vologodsky, Gryazovetsky, Kaduysky, Kichmengsko-Gorodetsky, Nikolsky, Sokolsky, Tarnogsky	24 (89%)	Babayevsky, Babushkinsky, Belozersky, Vashkinsky, Velikoustyugsky, Verkhovazhsky, Vozhegodsky, Vytegorsky, Gryazovetsky, Kirillovsky, Kichmengsko-Gorodetsky, Mezhdurechensky, Nikolsky, Nuksensky, Sokolsky, Syamzhensky, Tarnogsky, Totemsky, Ust-Kubinsky, Ustyuzhensky, Kharovsky, Chagodoshchensky, Cherepovetsky, Sheksninsky	16 (59%)	Babayevsky, Babushkinsky, Belozersky, Vashkinsky, Verkhovazhsky, Vozhegodsky, Vytegorsky, Gryazovetsky, Mezhdurechensky, Nikolsky, Sokolsky, Ustyuzhensky, Kharovsky, Chagodoshchensky, Sheksninsky
NL, MG, TL	16 (61%)	Babayevsky, Belozersky, Vashkinsky, Verkhovazhsky, Vozhegodsky, Vytegorsky, Kirillovsky, Mezhdurechensky, Nyuksensky, Syamzhensky, Ust-Kubinsky, Ustyuzhensky, Kharovsky, Chagodoshchensky, Cherepovetsky, Sheksninsky	2 (7%)	Vologodsky, Kaduysky	11 (41%)	Velikoustyugsky, Vologodsky, Kaduysky, Kirillovsky, Kichmengsko-Gorodetsky, Syamzhensky, Tarnogsky, Totemsky, Ust-Kubinsky, Cherepovetsky, Molochnoe village (Urban Okrug of Vologda)*
NG, ML, TL	-	-	-	-	-	-
NL, MG, TG	2 (8%)	Velikoustyugsky, Totemsky	1 (4%)	Molochnoe village (Urban Okrug of Vologda)*	-	-
NG, ML, TG	-	-	-	-	-	-
NG, MG, TG	-	-	-	-	-	-
Total	26		27		27	

* Since 2004, the UTS Molochnoe was transformed into a village.
According to: Demographic Yearbook of the Vologda Oblast. 2000: Statistical Collection. Vologdastat, 2001; Demographic Yearbook of the Vologda Oblast. 2010: Statistical Collection. Vologdastat, 2011; Demographic Yearbook of the Vologda Oblast. 2021: Statistical Collection. Vologdastat, 2022.

[6] Strategy for socio-economic development of Kaduisky Municipal District of the Vologda Oblast for the period up to 2030. Available at: https://vologda-oblast.ru/upload/iblock/8fb/11.%20%D0%A1%D1%82%D1%80%D0%B0%D1%82%D0%B5%D0%B3%D0%B8%D1%8F%20%D0%9A%D0%B0%D0%B4%D1%83%D0%B9%D1%81%D0%BA%D0%BE%D0%B3%D0%BE%20%D0%BC%D1%83%D0%BD%D0%B8%D1%86%D0%B8%D0%BF%D0%B0%D0%BB%D1%8C%D0%BD%D0%BE%D0%B3%D0%BE%20%D1%80%D0%B0%D0%B9%D0%BE%D0%BD%D0%B0.pdf

recorded in any municipality. From 2000 to 2021 the share of municipal districts with the most unfavorable ratio of the components of change in the rural population almost doubled, which confirms the trend of deterioration of the demographic situation in rural areas of the region. Over the period under consideration, 14 municipalities worsened their positions in terms of the components ratio of changes in the number of rural population, most significantly – Velikoustyugsky and Totemsky districts, which moved from the category of municipalities with growth of rural residents due to migration inflows to the group of municipalities with loss of rural population under the double pressure of natural and migration losses. Four districts of the Vologda Oblast, on the contrary, improved the situation (Vologodsky, Kaduysky, Kichmengsko-Gorodetsky, Tarnogsky districts) due to the replacement of migration outflow with population growth, which, however, could not cover its natural loss. Positive trends in the Vologodsky and Kaduysky municipal districts may be related to the high socio-economic development potential of their rural areas due to their proximity to large cities (Voroshilov, 2021). In eight municipal entities of the region the ratio of the contribution of natural movement and migration to the dynamics of the population remained at the same level (consistently unfavorable situation).

Table 5 presents the Vologda Oblast municipalities by main demographic indicators in the context of urban and rural population. The most unfavorable situation is observed in Belozersky and Kharovsky districts, where both urban and rural population decrease under the dual influence of natural and migration losses, and also there are markers of population aging: a high share of population aged 65 and older, a low share of population aged 15–64 and children under 14 (in rural areas). In 10 municipalities (Babushkinsky, Vashkinsky, Verkhovazhsky, Gryazovetsky, Mezhdurechensky, Nikolsky, Nyuksensky, Ustyuzhensky, Sheksninsky districts and Cherepovets) the number of urban and/or rural residents is also decreasing due to natural and migration losses.

Some municipalities (16 of 28) have the potential to improve the demographic situation associated with the migration population growth. Six districts have a migration inflow of urban population (Chagodoshchensky, Babaevsky, Vozhegodsky, Sokolsky, Vytegorsky, Kaduysky), but only in one of them – in Kaduysky District – it compensates the natural loss and leads to an increase in the number of urban residents. In 11 municipalities there is a migratory increase in the rural population, but in none of them it compensates the natural loss.

It is noteworthy that in some municipalities the migration loss of urban population is accompanied by an increase in the rural population (Kirillovsky, Velikoustyugsky and Totemsky districts, Urban Okrug of Vologda, Vologodsky and Cherepovetsky districts – at the expense of the cities of Vologda and Cherepovets), which indirectly may indicate the deurbanization processes within them. In other municipalities (Babayevsky, Vytegorsky, Sokolsky, Chagodoshchensky and Vozhegodsky), on the contrary, against the background of the migration outflow of rural residents there is a migration growth of the urban population, which indicates the trend of urbanization.

The most favorable parameters of the age composition of urban residents due to the high proportion of children have Babayevsky, Vytegorsky, Nikolsky districts, due to the high share of the population aged 15–64 – Sheksninsky and Ustyuzhensky districts. The most favorable age characteristics of the rural population are in Nikolsky District (a high share of children and

Table 5. Vologda Oblast municipal entities by main demographic indicators in terms of urban and rural population, 2021

ME	Number of ME	Urban population						Rural population						Whole population
		NG/L	MG/L	TG/L	Age composition*			NG/L	MG/L	TG/L	Age composition**			TG/L
					0–14	15–64	65+				0–14	15–64	65+	
Kaduysky District	1	NL	MG	TG	Low	Aver.	High	NL	MG	TL	Low	Low	High	TG
Babayevsky District	1	NL	MG	TL	High	Low	Aver.	NL	ML	TL	High	Aver.	Aver.	TL
Vytegorsky District	1	NL	MG	TL	High	Low	Aver.	NL	ML	TL	Aver.	High	Low	TL
Sokolsky District	1	NL	MG	TL	Aver.	Aver.	Aver.	NL	ML	TL	Aver.	Aver.	Aver.	TL
Chagodoshchensky District	1	NL	MG	TL	Aver.	Aver.	High	NL	ML	TL	Aver.	Low	High	TL
Vozhegodsky District	1	NL	MG	TL	Low	Aver.	Aver.	NL	ML	TL	Low	Aver.	Aver.	TL
Kirillovsky District	1	NL	ML	TL	Aver.	Aver.	Aver.	NL	MG	TL	Aver.	Low	High	TL
Velikoustyugsky District	1	NL	ML	TL	Aver.	Aver.	Aver.	NL	MG	TL	Aver.	Aver.	Aver.	TL
Urban Okrug of Vologda	1	NL	ML	TL	Aver.	Aver.	Low	NL	MG	TL	Low	High	Low	TL
Totemsky District	1	NL	ML	TL	Aver.	Aver.	Low	NL	MG	TL	Aver.	Aver.	Aver.	TL
Vologdsky District	1	-	-	-	-	-	-	NL	MG	TL	Aver.	High	Low	TL
Kichm.-Gorodetsky, Tarnogsky districts	2	-	-	-	-	-	-	NL	MG	TL	High	Aver.	Aver.	TL
Syamzhensky, Ust-Kubinsky, Cherepovetsky districts	3	-	-	-	-	-	-	NL	MG	TL	Aver.	Aver.	Aver.	TL
Nikolsky District	1	NL	ML	TL	High	Aver.	Low	NL	ML	TL	High	High	Low	TL
Sheksninsky District	1	NL	ML	TL	Low	High	Low	NL	ML	TL	Aver.	Aver.	Aver.	TL
Babushkinsky District	1	-	-	-	-	-	-	NL	ML	TL	High	Aver.	Low	TL
Verkhovazhsky, Nyuksensky districts	2	-	-	-	-	-	-	NL	ML	TL	High	Aver.	Aver.	TL
Ustyuzhensky District	1	NL	ML	TL	Low	High	Aver.	NL	ML	TL	Aver.	Low	High	TL
Gryazovetsky District	1	NL	ML	TL	Aver.	Aver.	Aver.	NL	ML	TL	Aver.	Aver.	Aver.	TL
Cherepovets	1	NL	ML	TL	Aver.	Aver.	Aver.	-	-	TL	-	-	-	TL
Mezhdurechensky District	1	-	-	-	-	-	-	NL	ML	TL	Aver.	Aver.	Aver.	TL
Vashkinsky District	1	-	-	-	-	-	-	NL	ML	TL	Aver.	Low	Aver.	TL
Belozersky, Kharovsky districts	2	NL	ML	TL	Cp	Low	High	NL	ML	TL	Low	Low	High	TL

* Share of population 0–14 years: low (Low) 17.6% or less, average (Aver) 17.7–20.1%, high (High) 20.2% or more; 15–64 years: low (Low) 63.1% or less, average (Aver) 63.2–67.0%, high (High) 67.1% or more; 65 years and older: low (Low) 14.4% or less, average (Aver) 14.5–17.5%, high (High) 17.6% or more.

** Share of population 0–14 years old: low (Low) – 13.9% or less, average (Aver) – 14.0-18.2%, high (High) – 18.3% or more; 15–64 years old: low (Low) – 59.3% or less, average (Aver) – 59.4–65.8%, high (High) – 65.9% or more; 65 years and older: low (Low) – 17.1% or less, average (Aver) – 17.2–25.4%, high (High) – 25.5% or more.

In colors are highlighted: – MEs with the most unfavorable demographic situation (natural and migration losses, unfavorable parameters of the age structure); – MEs with an unfavorable demographic situation (natural and migration losses or unfavorable parameters of the age structure); – MEs with a favorable demographic situation (natural or migration growth and/or favorable parameters of the age structure); – MEs with the most favorable demographic situation (natural or migration growth, total population growth and/or favorable age structure parameters).

Source: own compilation.

the population aged 15–64 and a low share of the elderly). The rural population of Vytegorsky and Vologodsky Districts, and the Urban Okrug of Vologda is characterized by a high share of the population of the middle age group and a low share of the elderly. The high share of children is characteristic of the rural areas of Babayevsky, Kichmengsko-Gorodetsky, Tarnogsky, Nikolsky, Babushkinsky, Verkhovazhsky and Nyuksensky districts.

The markers of population aging (high share of the elderly and low share of children) are in urban and rural areas of Kaduysky, Chagodoshchensky, Belozersky and Kharovsky districts, in rural areas of Kirillovsky and Ustyuzhinsky districts. In a number of municipalities there is a low share of the population aged 15–64: in the urban areas of Babayevsky, Vytegorsky, Belozersky and Kharovsky districts, in the rural areas of Kaduysky, Chagodoshchensky, Kirillovsky, Ustyuzhensky, Vashkinsky, Belozersky and Kharovsky districts.

Discussion of the results, and conclusions

Thus, the conducted study on the example of the Vologda Oblast revealed the following trends in the transformation of resettlement systems: increasing polarization of urban and rural settlements, expressed in the concentration of residents either in large or small settlements; depopulation of rural areas; weakening of the supporting framework of urban resettlement (small towns system); strengthening of "focality" of rural settlement. Regional trends in changes of resettlement systems and their demographic consequences in many aspects repeat the all-Russian, especially occurring in the Non-Chernozem region. A special role in the observed transformations of the resettlement is played by large cities – Vologda and Cherepovets, attracting the population in the zone of their influence, which leads to a decrease in the population of remote rural settlements of municipal districts and the decrease in the urban population of district centers. The role of the Oblast's eastern districts in the concentration of rural residents in "bush" settlements is gradually decreasing.

In more than half of the municipalities in the Vologda Oblast the reduction of urban and rural population is due to the double effect of natural and migration losses. At the same time, the number and the share of such municipalities have increased significantly over the past 20 years. The most unfavorable situation is observed in Belozersky and Kharovsky districts, where the decrease in population under the "double pressure" of natural and migration losses is accompanied by unfavorable parameters of the age composition (population aging). In these municipalities throughout 2000–2021 there was a significant decrease in the population of rural settlements and the number of residents in the district centers (Belozersk and Kharovsk). Similar trends in the transformation of resettlement have affected the current demographic situation in the other 10 municipalities with "double" population loss.

Some municipalities of the Vologda Oblast have the potential of migration growth, however, compensation of natural decrease by migration growth currently occurs only in the urban areas of Kaduysky District. Obviously, a major role in this process is played by the urban-type settlements Kaduy and Khokhlovo, actively attracting population, due to which, however, the rural settlements of the municipal district are becoming less crowded.

A number of municipalities have favorable parameters of the age composition of the population (high share of children and/or population aged 15–64, low share of the elderly population), which can have positive consequences for the labor market in the form of an expanded supply of labor, for example, in rural and urban

areas of Nikolsky District, in urban areas of Sheksninsky District, in rural areas of the Urban Okrug of Vologda, Vologodsky, Babushkinsky and Vytegorsky districts. In some of these municipalities, however, migration outflows undermine the advantages of the age structure, as they "wash out" the young and working-age population from these territories.

Spatial transformations of urban and rural resettlement inevitably lead to changes in the demographic situation in the region and its municipalities – migration losses from donor territories and migration inflows to acceptor territories, transformation of the age composition of the population, changes in reproduction characteristics. Emerging socio-demographic disparities entail a decrease in the labor potential of small cities and small rural settlements and the concentration of labor resources in large settlements. As a result, intraregional socio-economic inequality is growing, the situation of the periphery population becomes vulnerable both in terms of access to social facilities and digital technologies, and the realization of opportunities in the labor market.

The study identified different types of territories in the region: the most vulnerable territories exposed to depopulation, territories in a state of depopulation, but with the potential to improve the situation (migration or age structure), and territories with the most favorable situation. The first group is characterized by the most unfavorable situation, since the decrease in the population of rural settlements is accompanied by the "shrinkage" of district centers, which entails an imminent reduction not only in demographic, but also in economic, labor and other potentials. Such municipal entities require the adoption of serious managerial measures at the regional level (for example, the creation of "zones of disadvantage"). In the case of the second group of municipalities, attention should be paid to using their strengths to improve and stabilize the situation as a whole. In particular, it is necessary to maintain the trend of migration growth (where it exists), stimulating the increase in its scale, the competent use of the potential of the age structure, creating favorable living conditions for the population and their fixation on the territory of the municipality (especially young and working-age citizens). In the case of the third group (Kaduysky District), it is advisable to ensure the preservation of positive trends (migration growth), paying particular attention to the development of rural areas of the municipality.

The results of the study contribute to the development of ideas about intraregional trends in the transformation of resettlement and related demographic trends; they can serve as a basis for the development and implementation of activities in the framework of municipal management programs, including the ongoing municipal reform of territorial organization.

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Youth Involvement in Digital Civic Activism: From Online Encounter to Participation

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Abstract. The involvement of the younger generation in civic participation practices is a relevant task for youth policy actors and public activists. The digital environment not only expands the forms and directions of civic activism, but also designs new mobilization mechanisms. Network communities have a high involvement potential, but they exist in a saturated information flow. Therefore, it is important to understand how users encounter messages on socially significant issues and initiatives to address them, and how they react to them ("input level": coming across an offer to participate in a civic project); and whether this experience affects the intensity of involvement in real practices of digital civic activism ("output level": reacting in the form of participation/non-participation in the project). The article is based on the results of an online survey of young residents of the Sverdlovsk Oblast (n = 1150). The sample population includes students and working youth. According to the results of cluster analysis, we propose a typology of

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models showing how young people encounter the content about civic initiatives; we identify and describe three types: involved, superficial and scrolling readers. We provide a classification of resources that young citizens are subscribed to, in terms of their connection with issues of civic activism; we also reveal that subscriptions to specialized resources are closely connected with the typology of encountering this type of content. We reveal how young people react when they come across civic messages, and find out that they mostly show denying and interested reactions, while the amount of supportive and active responses is negligible. We build a typology of digital participation based on assessing the intensity of involvement. The share of those highly involved in the information field and real practices is 5%; the majority of respondents belong to the medium-active and low-active participants in civic activism.

Key words: civic activism, youth, digital activism, engagement, mobilization of participation, factors promoting attractiveness of the content.

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Introduction

In recent years, the problem of digital civic activism of the younger generation have been raising an interest both among members of the scientific community and practitioner managers forming and implementing youth policy principles at all levels. Readiness to innovations and immersion in new high-tech communication means are becoming the basis of susceptibility to virtual services and the use of the internet technologies in different spheres (Istyagina-Yeliseeva et al., 2020). Digital tools allow young people to create/join communities, organize events, implement projects, express their civic position, and generally determine their place in social fabric while involving in digital civic activism practices.

Russia's national development goals include achievement of public well-being, for self-actualization, safe environment, as well as the digital transformation. The federal project "The Youth of Russia"[1] provides for creating conditions for effective youth self-realization, and also for covering youth projects, educational forums, outreach campaigning for young people from all regions. The digital development of the regions is ensured by spreading Internet access and achieving "digital maturity" in key sectors of the economy and social sphere. Active involvement of young people in the development of initiatives in the framework of the national projects has already been carried out at the start of their implementation[2].

One more support for developing the youth digital activism includes the main activity directions of the United Nations (UN): sustainable development goals[3], development of e-government, maintenance of democracy, etc. Countries around the world are engaging in the development of the digital citizenship by creating programs (for instance, UAE[4] or Scotland[5]). Projects in the

[1] Federal project "The Youth of Russia". Available at: https://edu.gov.ru/national-project/projects/young/

[2] "Culture", "Education" and "Ecology" – in the top 3 national projects for young people. NAFI, August 12, 2021. Available at: https://nafi.ru/analytics/kultura-obrazovanie-i-ekologiya-v-top-3-natsproektov-dlya-molodezhi/ (accessed: April 1, 2023).

[3] UN. Sustainable Development Goals. Available at: https://www.un.org/sustainabledevelopment/ru/sustainable-development-goals/ (accessed: March 29, 2023).

[4] Ministry of Interior of the UAE. Digital participation. Available at: https://www.moi.gov.ae/en/E.Participation.aspx (accessed: April 2, 2023).

[5] Scottish Government. Digital. Available at: https://www.gov.scot/policies/digital/ (accessed: April 2, 2023).

field of youth digital activism are based on the European Union Youth Strategy[6], which states the revolution in youth life due to the digital transformation and necessity to consider positive opportunities in policy and challenges of this transformation. To mobilize young generation, whose activities can contribute to the effective implementation of the 2030 Agenda into action, the National Youth Council of Russia has established an annual program for young representatives of civic society "SDG Youth Ambassadors in Russia"[7].

The Civic Chamber of the Russian Federation[8] note the significant development of the conditions for civic activism including through interaction between the authorities and communities of citizenson the Internet. The report mentions that the Internet space in Russia is a territory where institutions of a new type of civil society are being formed. It acts as a forum for discussions creating a system of interactions between participants with both common and opposite views and ideas, initiating new forms of civic engagement; as a result, there is "relatively high interest of the significant part of youth in establishing a broad public online dialogue about social, legal and other aspects of Russian society (Dombrovskaya, 2020).

The digital environment has a number of benefits for civic expressions removing barriers and obstacles. For instance, Madison and Klang note that on the individual level, involvement in digital activism increases participants' chances of becoming visible to a larger audience, raises awareness of areas of concern, and creates channels for promoting ideas and beliefs (Madison, Klang, 2020). Among various aspects of digital activism – forms and features of digital participation, pseudo-activism, borders with offline forms, etc. – mechanisms of involvement seem, in our opinion, to be the least studied. At the same time, the effective realization of the mobilization potential of digital communities can become a source and a driving force of real social transformation.

The Sverdlovsk Oblast is a fairly typical Russian region, with settlements of various types in terms of size, leading economic sector, and the development of digital infrastructure. At the same time, the Sverdlovsk Oblast's indicators by various criteria (level of Internet usage[9], average monthly salary[10], etc.) are close to the Russian average, which suggests that the conclusions drawn from the research in this region are typical. The Sverdlovsk Oblast is also the region which has managed to move from the category of most "anxious" to the group of well-balanced according to the CROS[11] index. The index primarily takes into account fears that have a regional context, provoke an active response in the form of discussion in social media, civic response, and lead to civic participation, which is a key way of overcoming anxiety. We believe that studying the involvement of the young generation living in the territory with a positive experience of solving socially significant problems through civic activism in the digital civic engagement practices will make it possible to characterize the modern image of young people as initiators and co-participants in the development of the region and civil society.

[6] The European Union Youth Strategy 2019–2027. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:C:2018:456:FULL (accessed: March 28, 2023).

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[9] Selected federal statistical observation on the use of information technology and information and telecommunication networks by the population. Observation results. 2021. Rosstat. Available at: https://gks.ru/free_doc/new_site/business/it/ikt21/index.html (accessed: March 30, 2023).

[10] Information for monitoring the socio-economic situation of the constituent entities of the Russian Federation. 2022. Rosstat. Available at: https://rosstat.gov.ru/folder/11109/document/13259 (accessed: March 29, 2023).

[11] National Anxiety Index. Rating of Russian regions. CROS. Available at: https://www.cros.ru/ru/exploration/research/ (accessed: March 19, 2023).

Literature review

Digitalization of all spheres of social life becomes a factor and a condition for the manifestation of youth civic position, marking its position and status in the social structure as a subject of social activity. R. Adler and J. Goggin define civic activism through the prism of citizen participation in community life in order to improve conditions and shape the future (Adler, Goggin, 2005). These are collective actions based on cooperation (Ekman, Amnå, 2012), and efforts are aimed at solving problematic tasks, pursuing interests, achieving the common good for communities, and influencing decision-making (Barrett, Pachi, 2019). According to E. Giddens a person as a supporter or activist of a social movement feels that they can influence the vector of further social development (Giddens, Sutton, 2018).

Civic participation can take many forms: individual and collective, passive, reactive and active, as well as political and non-political (Hashagen, 2002). P. Brandtzaeg has concluded that women are more likely to participate in humanitarian aid and social movements, while men are more active in political life (Brandtzaeg, 2017). J. Diehl and I. Chan have found that the main barriers to civic activism are a lack of influence on political decision-making and a perceived lack of topical issues (Diehl, Chan, 2021). According to P. Sztompka, citizens' involvement in social movements and their activism are associated with profound social transformations "affecting the sphere of traditions and customs that technological and industrial progress brings, as well as with abrupt economic crises and political upheavals of the social system" (Sztompka, 2005, p. 172). At the same time in social systems there are individuals and groups that become passive passengers, taking no action and hoping to benefit without cost. In this case, outside observers are formed assessing real civic activity as a type of behavior associated with certain risks.

Digital activism is becoming a relatively new type of civic activism. Social media act as a new "playground" for young people to express opinions, share experiences, leave feedback, and find like-minded people. The young generation is no longer focused on traditional social institutions and practices, and is turning to social media to affirm its identity as a new model of solidarity (Moran et al., 2018). A.N. Gureeva and her colleagues emphasize that young people are characterized by a focus on social change, which is evident in their everyday practices including media activity (Gureeva et al., 2020). The use of the Internet, according to the English sociologist Ch. Hine, has become perceived as a way of being present in the world rather than as a means of accessing a separate virtual domain (Hine, 2015).

Some researchers (Vissers, Stolle, 2014) believe that there is no clear verifiable evidence of the impact of online communication on civic activism. S. Boulianne (Boulianne, 2015) notes that current metadata conclusively demonstrates the formation of a link between social media and civic activism, but the question of causal relationships and transformative efficacy is still unresolved. L.N. Saburova's collective project (Saburova et al., 2021) proves that the information richness of communication in online groups works more to disseminate information than to mobilize to action. In addition, A. Afouxenidis estimates that people's ability to fully participate depends on previous offline experiences and degrees of technical competence (Afouxenidis, 2014), where the digital divide (Schradie, 2018) and weak digital skills limit engagement in civic activism for some groups[12].

Nevertheless, researchers agree that social media have a powerful resource for mobilization

[12] Cho A., Byrne J., Pelter Z. (2020). *Digital Civic Engagement by Young People*. Available at: https://www.unicef.org/media/72436/file/Digital-civic-engagement-by-young-people-2020_4.pdf

(Dahlgren, 2009). For example, A.A. Azarov and his colleagues have identified basic types of civic activism and found that the scale and conventionality of actors' activities under conditions of digital mobilization depend on the ability of agents to change roles and environments (Azarov et al., 2021). New forms of social connections act as the basis for the transformation of social life, bringing fundamental changes in the practices of civic participation. At the same time, the younger generation is able not only to reproduce routinized online actions, but also to create new ones using the tools available (Soldatova et al., 2020).

In this article, we will define digital civic activism as active participation in social activities through the use of modern information and communication technologies, including online media, in order to raise awareness of socially significant problems, to exert pressure or create initiatives to solve them. In our research, we focus on the aspect of involvement in online activism, attracting new participants in civic online projects. The main theoretical underpinnings are two theories: neo-behavioral theory, which allows viewing citizen engagement and activism as actions provoked by informational stimuli (Parma, 2021), and communication power, which points to the impact of some social actors on others and the pressure from the active core of the online community on the remaining citizens to engage (Castells, 2009).

Research design

The purpose of the research is to examine the impact of users' strategies of encountering the content about socially significant problems and civic initiatives to solve them on the intensity of engagement in digital civic activism. The research objectives are to construct a typology of young people according to their frequency of encountering and reacting to thematic content, to identify the structure of young people's subscriptions to social networks, the most appealing/mobilizing characteristics of engaging messages, and the intensity of youth involvement in actual digital activism practices.

The empirical basis is the results of the author's sociological survey of young residents of the Sverdlovsk Oblast in September 2022 (1,150 people aged 14–25). The research method is a combination of an online survey and a handout questionnaire (for students). The instrumentation for the two survey varieties is identical (with minor differences in the comments on the completion of the questionnaire and the design of tabular questions, taking into account the possibilities of the electronic form), as the questionnaire did not contain the types of questions that cause the greatest differences when using online and offline surveys (open-ended questions, knowledge questions whose answers can be "spied" online, etc.) (Shkurin, 2015).

To construct the sampling frame, we carried out a quota selection taking into account the following characteristics: type of settlement, gender, age, occupation. The territorial positioning of the sample assumed the inclusion of residents of the regional center (Yekaterinburg, 61% of respondents), large and medium-sized cities (10%), and small towns of the Sverdlovsk Oblast (29%). We defined the object age range according to the digital generation, the conventional boundary of which is 1995, and cultural and social identity is largely associated with Internet activity and the use of social media (Shaigerova et al., 2022). Among the respondents, 57% were female and 43% – male.

According to the occupation, the respondents' structure took into account the main activity type – students and working youth. The category of student youth is as follows: school students in grades 8–11 (14%), students in elementary vocational education (4%), students in secondary vocational education (34%), and students in higher education (38%). Among student youth, 57% of respondents are full-time students and do not work, and 20% combine study and employment. The proportion

of working youth alone is 10%; in this category 32% are professionals, 20% are freelancers, 15% are clerks, 15% are workers, 4% are managers, 4% have their own businesses, and 10% are temporarily unemployed.

We processed the data obtained in the survey using SPSS software. To achieve the purpose, we used both general scientific research methods (comparison, generalization, induction, classification, etc.) and special methods of working with quantitative data: construction of univariate and bivariate frequency distributions, correlation analysis, cluster analysis.

The task of considering the situation of young generation involvement in participation in digital projects of civic activism implied distinguishing two key levels: "input", which represents the situation of encounter in the information flow with the offer to participate in the project/action, and "output", which characterizes the reaction in the form of participation/nonparticipation in the project. Admitting a certain simplicity in this model of youth mobilization into digital activism, we consider it as a methodological framework that allows building a system of indicators and data analysis sequence.

On this basis, we have selected the most important indicators determining the highlighted levels of youth involvement in civic activism taking into account the need to capture the factors and motives for choosing a potential project to participate in the context of digital information flows. The indicators of the "input" level of involvement included the frequency of online encounters with certain content (about social problems of residents, civic projects, inaccurate and provocative information, etc.), subscription activity, reaction to appealing messages, attractive characteristics of involving messages; indicators of the "output" level of involvement included the activity of participation in online projects. As a basis for constructing the question about digital activism, we used the typology of D. George and D. Leidner, according to which the questionnaire provided a list of 22 actions covering as widely as possible all potential forms of digital participation.

The study puts forward two key hypotheses. The first one establishes the connection between the frequency of encountering information about socially significant problems of a city, level of interest in posts about civic activism, and intensity of involvement in digital civic activism. At the same time, it is impossible to establish the actual frequency of encountering such information on the Internet in the survey research, so the self-assessment of intensity is recorded. On the one hand, since the population under study seems to be quite homogeneous in terms of socio-demographic indicators, we can expect close parameters of lifestyle, value orientations, behavioral patterns, including on the Internet; in this context we can assume that the respondents have approximately the same level of digital competence, similarity of digital technologies used, social networks visited, etc. (Salganova, Osipova, 2023). On the other hand, the issue imposes certain filters on distribution channels (websites of organizations and social movements, bloggers' pages, communities in social networks, etc.), which creates individual trajectories of users' encounter with the disseminated content. The second hypothesis concerns the characteristics of the post/message itself, which allows highlighting the parameters that increase the likelihood of attention to the information itself and its mobilizing impact on the young audience.

Research results

In order to identify the categories of young people with similar characteristics depending on the frequency of exposure to content messages, we conducted a cluster analysis using the k-means method of respondents' answers to questions about the frequency of 1) reading messages on social networks and information portals concerning social problems of the residents of their city,

2) exposure to messages inviting them to participate in civil initiatives and projects (we used variables with ordinal scales according to the essence of the method, which allowed identifying the frequency of their exposure to content messages). As a result, we have identified three models of encounters with content *(Tab. 1)*.

Involved readers (16.4% of respondents) – constantly or regularly read news about social problems and their solutions, at least 3–4 times a week see messages about civic projects. This subgroup has a slightly higher proportion of young people aged 18–22 (48%, in the other two clusters 40–42%), fewer students in the humanities.

Superficial readers (47.7%) – are regularly or sometimes involved in reading media reports on social problems of residents, meet (notice) information about civic initiatives 1–2 times a month. There are slightly more women in this subgroup (63% compared to 55% in the other clusters).

Scrolling readers (35.9%) – very rarely or not at all interested in news about social life of a city, practically do not meet (do not notice) information about civic projects. The core of this subgroup is made up of young people aged 14–17 (51.5%, 39–40% in other clusters), with a slightly higher percentage of secondary vocational education students (36%, 29% in other clusters).

The predominant pattern is medium-intensity reading of content that creates an informational environment for potential audience involvement in civic activism practices. Between active and absent interest there is a shift to medium-intensity practices: 68% of survey participants sometimes or very rarely read about city's social problems. Let us also note that these patterns are fairly evenly distributed in different categories of social community of young people: their percentage ratio is maintained in territorial subgroups (depending on the type of settlement by size), in gender, educational (by the level of education received in the subcategory of working youth) and groups by education received (both by level – EVE, SVE, higher education, and by specialization).

Let us analyze the content characteristics of the identified patterns of encountering information about socially significant problems and projects in the order of their share of representation.

Table 1. Socio-demographic characteristics of representatives of different models of exposure to content about socially significant problems and civic projects, % by column

	Model of encountering content about socially relevant issues and projects		
	Involved readers	Superficial readers	Scrolling readers
Age, years			
14–17	38.6	40.4	51.5
18–22	47.6	42.5	40.2
23–25	13.9	17.1	8.3
Gender			
Male	45.8	37.1	44.6
Female	54.2	62.9	55.4
Occupation			
School pupils	16.3	13.0	15.4
Elementary vocational education (EVE)	5.4	3.5	3.3
Secondary vocational education (SVE)	29.3	29.4	35.9
Higher education	39.8	41.2	38.0
Working youth	9.0	12.6	7.7
Source: own compilation based on the sociological survey results.			

Superficial readers. Representatives of this type believe that they quite often encounter inaccurate information on the Internet (49.9%), do not often see provocation to risky actions (the average indicator is 1.99[13]), rarely encounter calls to participate in unsanctioned activities (1.68). One in five (18.4%) often sees the Internet environment as a threat to their personal safety. Their average level of involvement in reading news on issues of civic participation is combined with their assessment of the Internet as a medium-hazardous environment. Half (51.5%) assess themselves as rather socially active, and 47.3% describe the role of citizen initiative in the life of contemporary Russia as significant. On the one hand, self-assessment of activism has subjective criteria and does not always correspond to objective indicators of engagement (for example, those who give themselves high engagement scores have the lowest indicator for the time they need to spend on civic participation in order to consider themselves an active person). On the other hand, offline models of involvement can be used (through friendships, educational institutions, corporate volunteering, etc.).

Scrolling readers. The type of users who rarely browse content on socially relevant topics and, at the same time, consider the Internet to be the least threatening environment for their safety. They are characterized by mentioning rare encounters with unreliable information (37.5%), the lowest frequency of provocation to risky (1.80) or unauthorized (1.53) actions. Half of them practically do not face the violation of personal boundaries and safety. At the same time 28.4% consider themselves active participants in public life. Representatives of this type have a more pronounced position (62.1%), associated with an indication of the insignificance (up to the absence) of the influence of public initiative on life in the country.

Involved readers. High inclusion in studying socially oriented content is combined with the perception of Internet information as carrying high risks; 67.5% of representatives of this model believe that they constantly or frequently encounter inaccurate messages. They are characterized by the highest frequency of encounters with calls to action containing risks (2.50) or law violations (2.34); 40.4% often (25.9% of them constantly) feel that they are trying to violate their personal safety. Half of the representatives of this cluster highly evaluate the opportunities for civil initiatives to influence the processes in the country; 61.2% refer themselves to the socially active part of society.

Above, we have raised the issue about the difficulty of measuring the actual amount of content that each survey participant encounters. Indirectly, it was done through recording the type of communities to which there are subscriptions on social networks. Overall, among youth aged 14–25, bloggers are the most common subscribers: 61.7% choose them according to their interests, and 44.8% subscribe to popular and well-known bloggers. Almost every second respondent subscribes to the pages of celebrities (singers, musicians, artists) and famous people in educational/outreach resources. The top five also include communities devoted to problems and events in the region – 35.9% of respondents subscribe to them.

If we consider the results obtained more purposefully in the context of the research topic, then we can divide the presented resources into specialized (uniquely specialized for the topic of civic activism), potentially specialized (where civic activism is not the main content focus, but can be included in the discussion under certain

[13] The average collision frequency here and below can vary from 1 to 4, where 1 is very rare, 4 is almost every day, all the time. The higher the value of the average, the higher the collision frequency.

circumstances) and generally popular (recognizing the possibility of media personalities to influence public opinion and to form the interest of young people in projects – next we will turn to this idea, – here we rather take into account the motives for signing up for a blog, which are highly likely not related to civic activism).

Distribution of subscriptions among cluster representatives by the frequency of encounters with posts on socially significant issues clearly demonstrates that the involved readers create a rich specialized information environment in which their chances of encountering messages about social problems and civic initiatives that interest us are significantly increased *(Tab. 2)*. On average, involved readers subscribed to 2.13 specialized and 1.57 nonspecialized resources, superficial readers – to 1.47 and 1.48, respectively, scrolling readers – to 0.53 (4 times less than the involved) and 1.09. At the same time, the category of superficial readers is practically comparable to those involved in relation to subscriptions to potentially specialized resources and overtakes in interest to generally popular resources.

In order to reveal the closeness of the relationship between the selected clusters by intensity of encounter and subscriptions to certain types of resources, we conduct a correlation analysis with the calculation of linear correlation coefficients (reliable relationships between characteristics were described by Pearson's linear correlation coefficient r at the significance level $p < 0.05$, *Tab. 3*). The strongest correlation is expectedly observed with subscriptions to specialized resources: public organizations, pages of civic activists, thematic urban communities.

The analysis of the attractive characteristics of engaging online messages allowed identifying the top 10 parameters that can interest young citizens and encourage them to participate in a civic project *(Tab. 4)*, which confirms the hypothesis that the characteristics of the post/message itself and the mobilizing effect on different young audiences are related. The leading position (with a large margin

Table 2. Structure of subscriptions in social networks for representatives of various models of collision with content about socially significant problems and civil projects, % by column*

Resources	Model of encountering content about socially relevant issues and projects		
	Involved readers	Superficial readers	Scrolling readers
Specialized, of which are:	213.2	147.2	53.2
Nongovernmental organizations, social movements	50.6	30.6	8.3
Communities that discuss problems of a city, region	48.2	49.3	18.2
Public and civic activists	33.7	19.3	5.2
Specific political figures	33.7	19.0	8.3
Voluntary, charitable organizations	31.9	22.8	10.7
Political parties, movements	15.1	6.2	2.5
Potentially specialized, of which are:	156.6	147.5	109.1
Bloggers on interesting topics	68.1	69.8	57.0
Educational, outreach and scientific resources	60.2	54.9	42.4
Authorities (mayor, government, city administration)	19.3	13.7	4.7
House community	9.0	9.1	5.0
Popular, of which are:	100.6	109.9	84.9
Famous singers, musicians, artists	52.4	57.3	45.2
Well-known, popular bloggers	48.2	52.6	39.7
None of the above	3.6	8.1	20.9

* The amount exceeds 100%, as the respondent could specify more than one answer choice.
Source: own compilation based on the sociological survey results.

Table 3. Correlation of encounter patterns with subscriptions to certain types of resources on social networks

Subscription to online resources	Significance of communication
Nongovernmental organizations, social movements	-.340**
Public and civic activists	-.266**
Communities that discuss problems of a city, region	-.260**
Specific political figures	-.226**
Bloggers on interesting topics	-.101**
Voluntary, charitable organizations	-.189**
Authorities (mayor, government, city administration)	-.167**
Political parties, movements	-.166**
Educational, outreach and scientific resources	-.134**
Well-known, popular bloggers	-.083**
Famous singers, musicians, artists, etc.	-.073*
House community	-.064*
None of the above	.203**

* The correlation is significant at the 0.05 level (bilateral).
** The correlation is significant at the 0.01 level (bilateral).
Source: own compilation based on the sociological survey results.

Table 4. Characteristics of engaging messages which may encourage youth to participate, % by column*

Characteristic	On the data set	Model of encountering content about socially relevant issues and projects		
		Involved readers	Superficial readers	Scrolling readers
Personal interest in a topic	73.7	70.5	79.7	75.2
Participation of acquaintance, friends	44.3	47.0	44.7	44.4
High probability that this project will lead to real change	42.7	40.4	44.7	44.1
Anonymity of participation, impossibility to trace participants	34.1	30.7	35.2	38.3
High level of trust in a project organizer	32.4	38.6	37.5	27.5
Availability of information about the results of previous actions	29.3	39.2	33.7	20.7
Ability to vote quickly, no need to say/write a lot	25.7	31.3	27.5	25.3
Opportunity to express your opinion in detail, offer an idea, advice	24.3	36.7	30.0	13.5
Active discussion of a project, “noise” around a project	23.9	28.3	28.6	18.7
Participation of significant people, celebrities, and community leaders	18.0	27.1	19.9	13.8
Average number of responses**	4.06	4.66	4.39	3.70

* The amount exceeds 100%, as the respondent could specify more than one answer choice.
** The average number includes all responses, including those not in the top 10 listed in this table.
Source: own compilation based on the sociological survey results.

of choice from the next position in the ranking) is personal interest in the topic – 73.7% (recall that 61.7% of respondents also subscribe to bloggers on topics of interest to them, which confirms the high priority of personal interest). At the same time, the higher the level of involvement in reading posts on city problems and activism, the higher the importance of the level of trust in the project organizer, the opportunity to express their opinion in detail, the availability of information

about the results of previous projects, but also the active discussion of the project, the participation of significant people and community leaders. It means that virtually all characteristics of engaging messages are more intensively demanded and taken into account by active audiences. For the low-involved in the information agenda activism, the indication of anonymity of participation is more significant (in comparison with other clusters), here is a lower indicator of the average number of selected responses (3.7), 10% indicated only personal interest as a motivating factor.

Next, we should consider the situation of the transition from the position of the reader of the content about the socially significant initiatives of citizens to participation in these projects. Let us present the classification of the ways of responding to the received messages with appeals to participate in civic initiatives in the logic of consideration from the negative to the active *(Tab. 5)*.

1. Negative responses. Almost half of those surveyed (47.3%) practically do not read the content of messages about civic initiatives, or simply skip them (for 39%, this is the only practice meaning they have never carefully read such appeals). Another 9.8% tend to block messages from a given community, blogger or organization, thereby permanently depriving them of the opportunity to reapply/reach. Mostly ignoring practices are characteristic of representatives of the scrolling type, among whom 65.3% skip and 12.1% block such messages (the included type shows 18.7% and 7.8%, respectively, which indicates the possibility of these reactions in any category of youth audience, as well as a possible preference for targeted efforts to select a project rather than responding to the posts of strangers).

2. Interested responses. They are related to manifestation of interest in a project: 35.8% of respondents in most cases carefully read the messages (21.9% always limit themselves to this action). Representatives of the involved type (56.6%) are more inclined to read attentively, but this action is also quite common in the superficial type (42.4%), and in the scrolling type (24.8%); 8.2% (almost all answers here belong to involved readers) may even ask the organizers clarifying questions.

3. Supportive responses. At this level, there is a transition to actions related to the dissemination of information about civic projects: 11.7% of respondents usually forward/repost them, and 15.6% tell their friends about the projects they are interested in. Such practices are not a monoreaction and are always combined with other types of responses to such messages. The trend of more active use of these reactions by representatives of the involved and superficial types persists.

Table 5. Structure of reactions to engaging messages, % by column*

Type of response	Way to express the response	On the data set	Content collision model		
			Involved readers	Superficial readers	Scrolling readers
Negative	Block posts from a community, blogger	9.8	7.8	7.2	12.1
	Ignore it, do no read it	47.3	18.7	41.4	65.3
Interested	Read carefully, but usually do not participate	35.8	56.6	42.4	24.8
	Ask organizers qualifying questions	8.2	21.7	7.7	3.6
Supportive	Forward, share	11.7	25.3	13.3	5.0
	Tell friends about promotions, interested them	15.6	27.7	20.1	6.9
Action	Read carefully and often participate	7.1	20.5	5.2	2.5

* The amount exceeds 100%, as the respondent could specify more than one answer choice.
Source: own compilation based on the sociological survey results.

4. Action responses. This is a direct transition from reading to participating in a project. It is typical of 7.1% of respondents, of which 2.8% chose only this option. It is worth noting that among the scrolling readers 2.5% are ready to switch to participation in a project, among superficial ones – 5.2%, among involved ones – 20.5%.

Finally, let us consider the actual involvement of young people in digital activism practices. Respondents chose the actions they had taken in the previous year. Based on the content characteristics of the selected actions, as well as the number of actions used, we have constructed a typology of digital activism. Among the five most common forms of digital activism include, there are indicating their support of ideas, projects through "likes" (66.4%), posting reviews of products, services and organizations (38%), voting at news sites (32%), discussion of important issues on forums and in communities (28%), and analysis of open data on socially significant issues (27%). At the same time, 68.5% of respondents also choose the position of an observer, defining their interest in civic projects mainly as a side, informational, rather than active one.

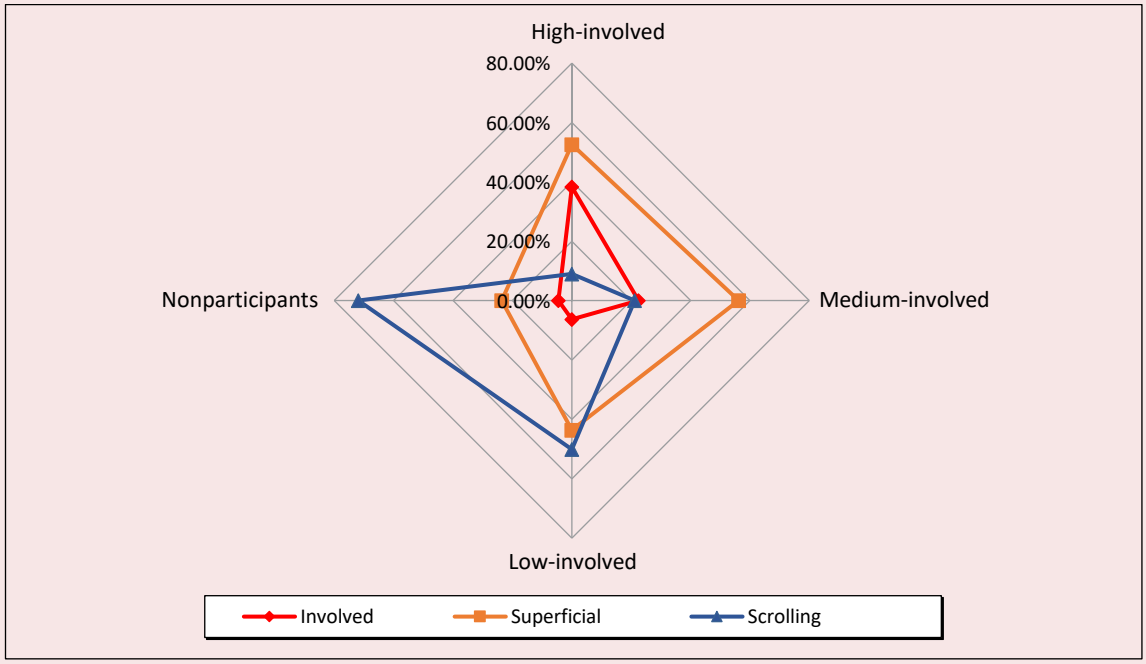
We classify the research participants according to the activity rate of real digital activism practices into four subgroups: highly involved note more than half (12–22) participation forms in the proposed list, the medium involved use 5–11 types of actions, the low involved practice 1–4 forms of activism, the nonparticipants use nothing. We should emphasize that there is a definite trend in our study related to the fact that the transition to more complex and "qualitative" forms of activism includes the use of simpler ones: if a person discusses problems with like-minded people or creates content on socially relevant issues, they are highly likely to also like and repost. Consequently, the total number of types of actions they commit will be greater, as confirmed through the calculation of averages. For example, among those who post likes, the average number of actions made is 7, and the mode is 5; among those who create content themselves, the average number of action types is 13, and the mode is 22. Therefore, in this case, the number characterizes both the diversity and the quality of the actions of civic activism.

Among the surveyed young people there are more representatives of the low- (40.1%) and medium- (37.0%) involved in digital civic activism. Highly engaged are 12.4% of those surveyed, of whom 4.0% have used all possible options for civic engagement. Finally, 10.5% of young people are not involved in digital activism (but can still use offline options for civic engagement).

This typology has a significant correlation with youth clusters in terms of frequency of encounters with posts on socially relevant issues: the significance of the relationship is 0.444; the correlation is significant at the 0.01 level (two-way). As the superficial readers make up nearly half of the youth surveyed, they naturally form the core of the three groups involved in activism: among the high- and middle-aged, 53–56% of superficial readers, and among the low-aged, 44%. Therefore, specificity is determined by which model representatives complement the superficial readers: among the highly engaged these are involved readers (38.3%), among the mid-involved a combination in equal proportions of involved and scrolling (22% each), among the low-involved 50% are scrolling *(Fig. 1)*. Among nonparticipants in civic activism, young people with low numbers of encounters with posts about social aspects of urban life and civic actions predominate, but involved readers are also present (4.5%).

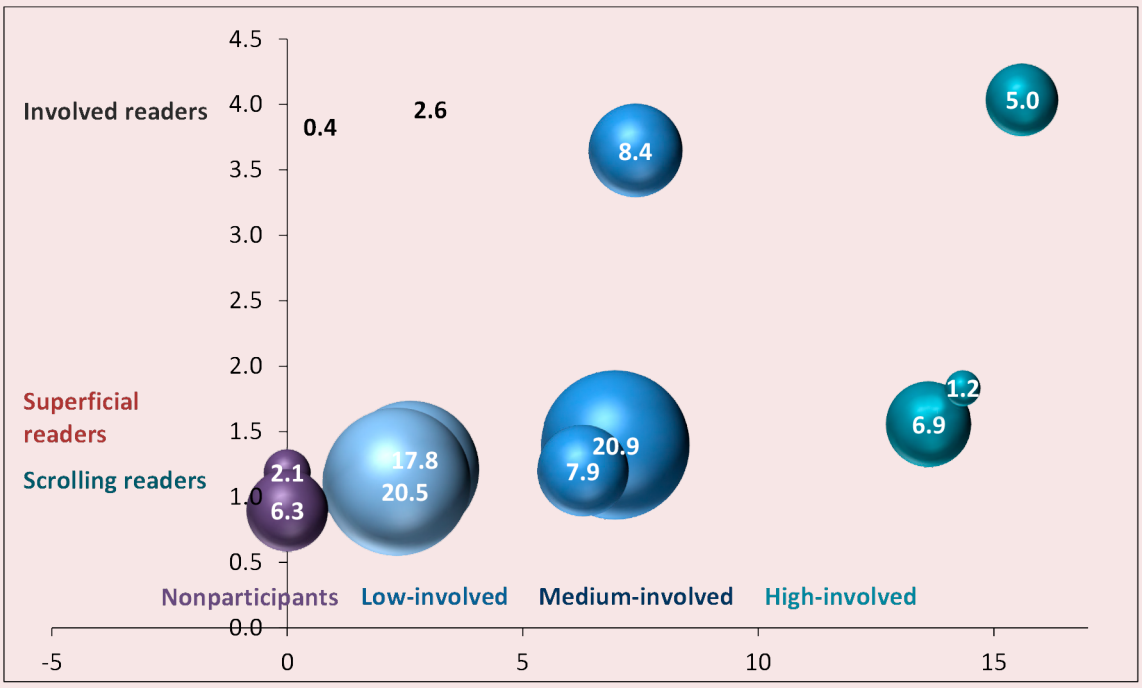
According to the youth survey results, the actual structure of involvement in digital civic engagement is as follows *(Fig. 2)*. About 60% of young people fall into three roughly equal groups (shares): medium-active and low-active participants, regularly or

Figure 1. Share of representatives of different models of encountering content among young people with different levels of civic activism, % by type of activity level



Source: own compilation based on the sociological survey results.

Figure 2. Matrix of youth involvement in digital civic participation, %



Source: own compilation based on the sociological survey results.

occasionally involved in reading media reports about social problems of residents (38.7%), and low-active participants, rarely interested in news from the social life of a city and practically ignoring posts about civic projects (20.5%). Those highly involved in real projects and information field of civic engagement make up 5% of respondents, about the same number are on the opposite side of the engagement scale (6.3% of scrolling nonparticipants). The presented model confirms the hypothesis that there is a connection between the frequency of encountering information about socially significant problems of a city, the level of interest in posts about civic activism and the intensity of involvement in digital civic activity.

Discussion

By creating conditions for civic activism, the digital environment becomes a mediator in the system of youth interaction. It is a kind of stage, which is set by activists, bloggers, opinion leaders, and institutional agents. It becomes important, according to P. Gerbaudo, to create a common identity matrix and emotional impulses for communication of Internet users (Gerbaudo, 2012), which allows not only attracting new and retain old participants, but also influencing the intensity of connections, increasing the willingness to get involved in real civic projects. Even the use of WhatsApp, according to S. Milan and S. Barbosa, solidarizes users as repetitive interaction on the app leads to a universal, identity-like sense of connectedness that unites social actors (Milan, Barbosa, 2020).

Research in recent years demonstrates that the youth involvement in civic activism is less influenced by gender or age indicators compared to content characteristics (Surkova et al., 2020). We have shown that interest in socially significant issues in general leads to a higher "noticeability" in the information flow of posts/blogs/sites about civic initiatives and actions, which in turn determines a more intensive involvement in real practices of digital activism.

We pay particular attention to the characteristics of informational posts that arouse interest and willingness to connect to a project. Since the key motivator is personal interest in the topic of a project, and external stimuli (participation of famous people, requests to participate, high probability of project results, etc.) to a small extent determine the support of young people, it is necessary to develop a comprehensive system of measures to expand the zone of youth's interest on socially important regional issues. Let us pay attention to the rather low position of educational/outreach resources in this rating, as well as the lowest position of house communities (with the growing importance of local activism and neighborhood communities) (Odintsov, 2020), which means less significant influence of these communities on the information environment of young people in terms of providing content on socially important topics.

Today young people are internally convinced that conditions for self-realization exist in Russia: 85% of citizens aged 18–24 believe that young people have the opportunity to fulfill themselves[14] and 34% want to do good to the country through active participation in public life[15]. The results of our study have documented the prevalence of an average level of exposure to mobilizing content, combined with an average or low level of participation. This does not correspond to the potential readiness of young people to be more involved in public life and requires further development of engagement mechanisms, taking into account the motivation of young people and the effectiveness of the characteristics of mobilizing messages.

[14] Opportunities for youth. VCIOM, December 8, 2022. Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/vozmozhnosti-dlja-molodezhi-monitoring (accessed: March 17, 2023).

[15] Youth values. VCIOM, December 14, 2022. Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/cennosti-molodezhi (accessed: March 18, 2023).

Conclusion

Public demand for youth activism remains one of the most stable trends of recent years. According to researchers of activism, phenomenon includes both social movements themselves, collective and individual actions aimed at strengthening the involvement of young citizens in public policy and solving current social problems, and policies of youth involvement in civic engagement implemented by various actors (Zemnukhova, 2021).

Our study highlights the understudied in sociology aspect of Internet users' "encounter" with information posts initiated by organizers and supporters of civic projects in order to engage new participants. This aspect is not given due attention in sociological studies. The novelty of the work lies in the expansion of empirical knowledge about the involvement of young people in the region in online forms of civic participation. It allows confirming the research hypotheses and build the author's typology of young citizens according to the level (frequency) of encounter with information posts on socially significant issues and activism, as well as the level (intensity of use of various forms) of digital participation. The conclusions drawn are common for young people in Russia, as the population studied presents different socio-demographic strata of young people, while digital literacy and patterns of digital technology use within the youth community have a high degree of similarity.

The formed model of involvement in digital civic participation can serve as a tool to describe the youth community structure, be used to identify the dynamics of the process, define the share and characteristics of the most active groups. The research proves the importance of a comprehensive approach to describing the mechanism of involvement in digital activism including both behavioral (both at the stage of recruiting for projects and their implementation) and motivational characteristics in the model. Civic activism, including in the online format, can be one of the effective mechanisms for applying young people's abilities to develop various spheres of regional public life if there is a system of support from local governments, public youth organizations, cultural and educational institutions, etc., as well as the development of effective promotion channels in the Internet space.

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Parent-Related Risk Factors Affecting Child Health (on the Results of a Cohort Monitoring Study for 25 Years)

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Abstract. The economic significance of the problem of preserving and strengthening the health of shrinking child population as an important component of reproductive, labor and human potential requires the search for and development of mechanisms to manage risk factors. We present sample results of a multi-year monitoring study of child health in the Vologda Oblast for 25 years of research (1998–2022). The purpose of our research is to evaluate the degree of risk to the health of preschool children caused by certain factors on the part of parents. The research methodology is the intracohort method of data analysis on 1,454 children from five cohorts (1998, 2001, 2004, 2014 and 2020 years of birth) by calculating the relative risk index. The scientific novelty is a comparative analysis of the influence of age, health and hazardous working conditions of future parents on the child health in the pre- and postnatal period. We have found that young maternal age is often a risk factor for child health, while mature maternal age increases the risk of cesarean section and delayed neuropsychological development in children by the age of 7. In contrast, father's young age acts as a protective factor during intrauterine child development, but increases the risk of disease development in the future. Mature father's age creates risks of congenital abnormalities of the cardiovascular system, but its negative effect is mitigated later on. We assume that the reason for this lies in the higher level of material wealth, medical literacy, and responsibility of aging parents. Parents' hazardous working conditions have a deleterious effect on the child health after birth, and on the maternal health in the prenatal period as well. A complicated obstetric history of previous and current pregnancies is the most significant risk factor on the maternal part. Her chronic diseases showed no association with abnormalities in the child health, the exceptions are obesity and thyroid dysfunction. In contrast, father's complicated obstetric history demonstrates a strong association with intrauterine fetal development disorders, the use of surgical childbirth, congenital abnormalities, the low Apgar score for the newborn, and child's disease in the future. Practical significance of the work lies in emphasizing father's role in the formation of child health and preparing recommendations for the prevention of child health disorders taking into account the data on the risk factors of both parents.

Key words: child health, child health risk, maternal age, father's age, hazardous working conditions, diseases of mother and father, obstetric history, chronic diseases, paternal health.

Introduction

Fertility rates have been declining progressively worldwide since the beginning of the 20th century, while life expectancy has been increasing in most countries. Infertility now affects about 15% of couples of reproductive ages. In addition, the proportion of people who postpone parenthood is growing (Eid et al., 2022), childlessness is increasingly common, and the prevalence of one- and two-child models is converging[1] (Churilova, Zakharov, 2019). Moreover, against the background of the COVID-19 pandemic in Russia, the number of people who want to have children (including childless people) has decreased even more (Makarentseva, 2020). These facts lead to an overall decline in fertility.

The UN predicts that by 2050, the share of elderly will exceed that of adolescents and young people combined (15 to 24 years old). The number of children under the age of 5 will be inferior to the number of people over 65[2]. This situation is dangerous for shrinking labor force and aging

[1] Shabunova A.A., Kalachikova O.N., Korolenko A.V. (2021). Demographic situation and socio-demographic policy of the Vologda region in the COVID-19 pandemic: Second regional demographic report. Vologda: VolRC RAS.

[2] United Nations. Demographic changes. Available at: https://www.un.org/ru/un75/shifting-demographics

population, which entails serious socio-economic and political problems[3] (Gurvich, Ivanova, 2018; Wang et al., 2020a).

Among other things, a country's development level should be judged by public health status and equitable distribution of health services (Asif et al., 2022). Children are the future human resource of any country, which means that their health needs reliable protection. Measures are currently being taken in Russia to improve the demographic situation, support maternity and childhood, and protect and promote children's health. However, despite this, the health status of the shrinking child population continues causing concern. The problem is also relevant for most world countries, which are also trying to reduce child morbidity and mortality rates[4]. Understanding the special economic importance of the problem of preserving the health of future generations as an important component of reproductive, labor and human potential in general also provides a rationale to search and develop mechanisms for managing risk factors (Shabunova et al., 2021).

The scientific research results indicate that the child's health of infant and preschool age is mostly influenced by medical and biological factors, occupational hazards, and maternal age. It is known that a woman who is healthy at conception has a better chance of a successful pregnancy and a healthy child. However, the outcome of childbirth (Stephenson et al., 2018) and the further development of the offspring depend on many social, medical and environmental conditions. For example, obstetric or extragenital pathology complicates the course of pregnancy and leads to the formation of various pathologies in the fetus, as well as in the neonatal period and beyond (Dymova, 2020, p. 88).

Most scientific biomedical research focuses on issues of obstetrics and gynecology (Karelskaya, 2016), and the search for risk factors for child health is most often confined to the mother (Nekrasov et al., 2013). It is necessary to have a deeper understanding of the father's contribution to offspring development.

Currently, the concept of "paternity" is insufficiently regulated from the legal, medical, and social points of view (Geras'kina, Syubaev, 2019). For example, Russia, being a social state, ensures the protection, support and welfare of the family, maternity, paternity and childhood according to Article 7 and part 1 of Article 38 of the Constitution of the Russian Federation. The Vologda Oblast also adopted Law 3602-OZ, dated March 16, 2015[5], which regulates relations in this sphere. But, unfortunately, the vast majority of the articles in these laws do not touch upon the father's role, focusing mainly on motherhood, family, and children. According to our hypothesis, paternal factors have no less, and in some cases more negative impact on the formation of children's health. In this connection, we consider it strategically important to study and compare maternal and paternal risk factors for the offspring's health in order to scientifically justify increased attention to the male role.

We should note that we have previously considered some socio-demographic, socio-economic, medico-biological, and environmental predictors on the part of the mother (Shmatova et al., 2022; Shmatova, 2022) and father (Razvarina, Shmatova, 2022; Razvarina et al., 2022a; Razvarina et al., 2022b). In our opinion, we can identify three important risk factors: age, health status, and working conditions before conception (both mother and father).

The purpose of our research is to assess the risk degree and direction of the impact of certain

[3] Denisenko M.B., Mkrtchyan N.V. (2022). Demographic changes and labor supply in Russian regions. *Demoscope Weekly,* 951–952, 21–40.

[4] UNICEF. *Levels and Trends in Child Mortality: Estimates Developed by the UN Inter-Agency Group for Child Mortality Estimation*; UNICEF: New York, NY, USA, 2021.

[5] Electronic Collection of Legal and Regulatory and Technical Documents. Available at: https://docs.cntd.ru/document/424041762

maternal and paternal factors on child health in the pre- and postnatal (during the preschool years) period.

The research tasks are:

1) to analyze studies on age (1), exposure to hazardous working conditions (2), and health status (3) of both parents as risk factors for child health;

2) to assess the relative risk of these factors to the child health on the part of the mother;

3) to assess the relative risk of these factors to the child health on the part of the father;

4) to compare the focus and degree of exposure to maternal and paternal risk factors for their child's health;

5) to offer targeted recommendations to neutralize the negative health risk factors for preschool children identified in the course of the study.

The research object is infants and preschool children of the Vologda Oblast. The subject is the health of children aged 0 to 7.

Research methodology

As an instrument of sociological method, we applied the prospective monitoring of cohorts of families with children, conducted by Vologda Research Center of RAS within the research "Studying the conditions of healthy generation formation"[6]. The methodology involved annual questionnaires filled out by parents and medical workers. The information base consisted of data from five waves of cohort studies. The criteria for inclusion in each cohort were the birth of a child in a certain period of time (May 15 – May 21, 1995; March 1 –March 7, 1998; March 1 – March 25, 2001; March 1 – March 25, 2004; March 1 – March 21, 2014; March 16 – April 10, 2020), the consent of a female parent to complete the questionnaire and participate in further stages of the prospective study, and the availability of medical personnel with the necessary documentation about pregnancy features and the respondent's health status. We selected families with children who participated in at least one of the study stages before the child reached the age of 7 (n = 1,464) for analysis from the total data set (n = 1,037; *Tab. 1*); 1,268 female participants of the cohort study were able to answer questions about a newborn's father.

Table 1. Research sample characteristics

Sample size	Cohort 1998	Cohort 2001	Cohort 2004	Cohort 2014	Cohort 2020	Total	
						abs.	%
Initial number of new mothers	199	250	265	370	380	**1464**	**100.0**
Initial number of married new mothers who answered the question about the child's father	139	208	237	341	343	**1268**	**100.0**
Participated in at least one observational phase (except the neonatal phase) up to and including 7 years of age	166	211	190	243	227	**1037**	**70.8**
in % of initial volume	83.4	84.4	71.7	65.7	59.7		
Database for research:							
Children at the age of: 0 years old	166	211	190	243	227	**1037**	**100.0**
1–2 years old	162	196	176	236	227	**997**	**96.1**
3–4 years old	135	166	160	186	–	**647**	**62.4 (79.9)***
6–7 years old	109	144	140	134	–	**527**	**50.8 (65.0)***

* Analysis for the 3–4 year and 6–7-year periods was conducted using observational data for cohorts born in 1998, 2001, 2004, and 2014; % of the initial sample was calculated without taking into account the 2020 cohort (n = 810).

[6] Each of the stages was held in 5 settlements of the Vologda Oblast – Vologda, Cherepovets, Veliky Ustyug, Kirillov and urban-type settlement Vozhega. We selected the towns at random.

At the first stage, the subsample included 1,464 cases (2,928 questionnaires), each based on questionnaires administered to two informants: the newborn's mother and medical personnel at the maternity hospital. We analyzed retrospective data on the maternal age, health status before and during pregnancy, working conditions in the year before the birth, and similar indicators of the child's father (from the mother's words). An obstetrician-gynecologist provided data on the obstetrician's medical history and a neonatologist presented data on the newborn condition.

Subsequently, we collected information about the children's health status – monitoring participants – through questionnaires from the district pediatrician at the respondent's place of residence (based on medical records). The presence of diseases in a child was determined mainly by open-ended questions (assuming a free-form answer) asked to medical staff. We combined diseases by groups related to one or another body system (cardiovascular, nervous, digestive, etc.). Some of the child's health deviations were calculated based on the answers to one (health group, delay in neuropsychological development, etc.) or several (weight deficit, delayed intrauterine development) questions of the questionnaire.

To assess the influence of the studied risk factors, we chose the relative risk indicator (RR)[7] for several reasons:

– the research information base was the cohort monitoring data;

– the task was to calculate the risk of losing the child's health in the presence or absence of risk factors, rather than the ratio of the odds of encountering the putative factors in patients with and without the outcome (as in case-control studies);

– we had selected monitoring participants over several years, and finished the study at the same time.

The RR is calculated based on a four-field contingency table: risk factor (yes/no) × adverse outcome (yes/no).

$$RR = \frac{A \cdot (C + D)}{C \cdot (A + B)}$$

If the RR > 1, we can conclude that the effect of the factor under study increases the disease development risk, and the higher the RR value, the higher the probability of disease development. If the RR < 1, the factor, on the contrary, reduces the probability of disease development. In each case, the statistical significance of the relative risk is necessarily assessed based on the values of the 95% confidence interval (CI). The value of the confidence interval is inversely proportional to the significance level of the relationship between the factor and the outcome, i.e., the lower the 95% CI, the more significant the relationship identified.

We should note that the RR does not provide information about the magnitude of the absolute risk (incidence), but rather demonstrates the strength of the relationship between exposure and disease. Even with high relative risk values, the absolute risk may be quite small if the disease is rare.

	Outcome (1)	No outcome (0)	Total
There is a risk factor (1)	A	B	A + B
There is no risk factor (0)	C	D	C + D
Total	A + C	B + D	A + B + C + D

[7] Relative risk is defined as the ratio of the probabilities of events in one group to a similar probability in another group. The RR was calculated as the ratio of the risk of health deterioration, disease development in the "exposed" group (affected by a risk factor) to the risk of disease development (or deterioration of the health group, increased incidence rate) in the "unexposed" group (not affected by a risk factor).

In our study, only the RRs greater than 1.10 were considered. In each case, the statistical significance of the relative risk was necessarily assessed based on 95% values.

On the basis of the reviewed literature and the medical-biological and sociological monitoring data available to us, we identified three risk factors, the effects of which could be assessed in both parents: (1) age; (2) health status (presence of chronic diseases of the cardiovascular, respiratory, digestive, nervous, endocrine, urinary systems; in mothers the obstetric history of previous pregnancies and the features of the current pregnancy; complications during childbirth) and (3) hazardous working conditions for mother and father (chemical and toxic substances, dust, gas, vibration, noise, humidity, radiation and microwave effect, high physical load, work on a conveyor belt, work in 2–3 shifts, high and low temperature, biological hazards, mental stress, night work).

We assessed the degree of influence of each factor on the part of both parents with respect to two periods of child development.

I – prenatal (intrauterine) period. We analyzed the impact of the factor on pregnancy (risk of anemia, toxicosis, edema); features and complications of childbirth (use of operative method of birth, asphyxia); changes in child health indicators (evaluation criteria: fetal intrauterine growth retardation (IGR) and deviations in health status, pathological conditions, diseases and congenital defects in a newborn).

II – assessment of the child's health indicators in the postnatal (extrauterine) period. The cut was made at the age of 1–2, 3–4 and 6–7. The choice of age periods was based on the timing of the extended clinical examination of children, accompanied by examinations by many specialists. The criteria were the registration of the child's health group II–IV, frequent morbidity and presence of chronic diseases for which the child was on the dispensary registry. In addition, we calculated the RR of individual diseases of various systems and organs.

Statistical analysis of biomedical and sociological data was performed using the SPSS statistical software package.

The scientific novelty lies in the comparative analysis of the influence of children's health risk factors by both parents in several generations of children from 0 to 7 years. The presented work allows deepening the knowledge about the influence degree of the most significant risk factors for child health (in the dynamics from conception and throughout the preschool age) on the part of both mother and father.

Analysis of studies and publications on the topic

Let us consider the experience of recent scientific research on the impact of the maternal and paternal health risk factors that we are studying.

Age of mother and father. From an obstetric point of view, maternal age (some reports say that it is older than 35 years, others say – older than 40 years) is associated with an increased risk of adverse pregnancy and birth outcomes (Aoyama et al., 2019). With maternal age, the risks of gestational diabetes and preeclampsia, threatened miscarriage, premature birth, fetuses with congenital abnormalities, and low birth weight increase (Carolan, Frankowska, 2011; Schmidt et al., 2012). The risk of macrosomia increases significantly after age 36 (Wang et al., 2020b). We should note that the association between prematurity and advanced maternal age remains controversial because of the possible combined effect of other factors (hypertension, obesity, diabetes, varicose veins, gynecological diseases, obstetrical childbirth, and use of assisted reproductive techniques).

However, from a socio-economic point of view, mother's advanced age is a protective factor. The worldwide trend of delayed childbearing is associated with higher levels of female education and career investments contributing to socio-economic status and material well-being, which in

turn is beneficial for child health (Arkhangelskii, Kalachikova, 2020; Shmatova et al., 2022; Pillas et al., 2014). This statement has been confirmed by a number of population-based studies (Bushnik, Garner, 2008; Sutcliffe et al., 2012; Kato et al., 2017; Falster et al., 2018).

Consequently, socio-economic superiority associated with maternal older age may compensate for biological disadvantage of loss of health potential in some cases. Nevertheless, for example, Down syndrome risk remains significantly higher in children born to women over age 34. It is worth noting that women under age 26 also had a higher risk of the genetic disorder in offspring compared to women at the older age of 27–33 (Song et al., 2022).

The increasing maternal age at first birth is generally recognized, but much less discussed is the fact that the prevalence of mature paternal age (over 40 years old) is also expanding, as are the health effects of this trend. For instance, in this male group there is a decrease in fertility and in the future mother of his child there is an increase in pregnancy complications (gestational diabetes, increased risk of placental detachment (Alio et al., 2012) and premature birth), in offspring there is a delayed intrauterine development, low birth weight, low Apgar score (Sipos et al., 2004; Alio et al., 2012; Khandwala et al., 2018), increased risk of chromosomal and nonchromosomal birth defects (including heart defects, tracheo-esophageal fistula, esophageal atresia, other skeletal/muscular/pelvic anomalies, Down syndrome (Yang et al., 2007; Phillips et al., 2019). Many researchers have linked paternal adulthood to various psychiatric and neurocognitive disorders in children, such as schizophrenia, autism, and obsessive-compulsive disorder (OCD) (Malaspina et al., 2001; Conti, Eisenberg, 2010; Hultman et al., 2011; Wu et al., 2012; Ek et al., 2015; Sharma et al., 2015; de Kluiver et al., 2017; Brandt et al., 2019). Data also show a linear increase in infant health risks each year as the father ages, which may be related to mutations in sperm DNA (Khandwala et al., 2018).

In turn, several in-depth studies have found no increased risk of preeclampsia in male partners over aged 45 when controlling for maternal age and other comorbidities (Hurley, DeFranco, 2017; Khandwala et al., 2018).

Hazardous working conditions of mother and father. Negative environmental conditions affect parents' reproductive health and their offspring health. Environmentally induced epigenetic changes can cause many pathological conditions (from genetic disorders to neurological conditions including schizophrenia and autism) (Xavier et al., 2019).

Russian studies have identified occupations dangerous to reproductive health that increase disorder risks in children's development in the first year of life. They include model makers and controllers in mechanical engineering and crane operators in metallurgical production; chemical analysis laboratory technicians, chemical engineers in the chemical industry (including petrochemical, polymer processing, organic synthesis); surgeons, obstetricians, midwives, surgical nurses working in hospitals (Fesenko et al., 2017).

Unfavorable effects associated with chemical exposure in the expectant mother include spontaneous abortion, premature birth, stillbirth, developmental delays, congenital anomalies (Koch et al., 1990), oncopathology in children (Lassi et al., 2014), and urogenital problems in sons (Rodprasert et al., 2021).

Ionizing radiation is also known to have harmful effects on the reproductive systems of both men and women (Temple et al., 2006). For mothers exposed to radiation in the workplace, the risk of early miscarriage increases 1.3-fold (and 1.5-fold for women monitored for 6 months after conception) and 2.3-fold for stillbirths (Betts, Fox, 1999). The risk of malignant neoplasms in their children also increases (Adab et al., 2004).

Previously, we have identified connection between electromagnetic radiation in the place of family residence and fetal pathology in the

intrauterine period, with effects persisting until the age of 6–7 (pathologies of ENT organs, increased morbidity frequency, rise in body mass index) (Shmatova et al., 2022).

The negative impact of the increased mental stress, namely prenatal stress, is also a significant risk factor for a woman's health and that of her unborn child. Anxiety and depression during pregnancy increase the likelihood of fetal death, miscarriage (Schetter, Tappeg, 2012), preterm birth, and surgical childbirth (Erickson et al., 2017). Maternal anxiety has a significant impact on the formation of the child's psyche (Batuev, 2000; Petrosyan, 2016). Increased maternal anxiety is also associated with a twofold increase in the risk of the infant developing mental disorders (Monk et al., 2019), nervous system abnormalities, and, consequently, cognitive and intellectual problems (Schepanski et al., 2018).

Exposure of men to certain chemicals leads to infertility, altered hormone levels, and risk of cancer in offspring (Rodprasert et al., 2021; Singh et al., 2021). A significant association has been found between paternal exposure to ionizing radiation before conception and Non-Hodgkin's lymphoma in their children (Adab et al., 2004; Barrett, Richens, 2003).

Russian scientists have also proven the relationship between occupational hazards (various types of radiation, temperature changes, chemical action) and some disorders of child health and development (Sofronov, Shakirova, 2010; Baklushina et al., 2014; Ivanov et al., 2018; Podsvirova et al., 2020).

Moreover, negative environmental factors affecting a father's health can indirectly affect not only his children, but also future generations (Day et al., 2016).

Complicated medical history of mother and father. A woman's health before conception is a key factor in determining the success of pregnancy and next generation health. Maternal acute and chronic diseases are well-known perinatal risk factors for child development disorders in preschool age (Bocharova et al., 2002).

Thyroid hormone imbalances (especially hypothyroidism) during pregnancy lead to adverse outcomes for a mother (gestational hypertension and preeclampsia, postpartum bleeding, miscarriage and preterm birth), fetus (congenital anomalies, growth retardation, perinatal disorders, death) and newborn (cognitive impairment) (Casey et al., 2005; Lassi et al., 2014).

Diabetes mellitus is one of the most common chronic diseases among women of childbearing age worldwide, and its rates are increasing. Diabetes during pregnancy is associated with an increased risk of psychiatric disorders in general and schizophrenia, mental retardation, and behavioral disorders in particular (Nogueira Avelar e Silva et al., 2021).

Lifestyle including physical inactivity, poor diet and obesity, stress and urbanization are known to play an important role in the development of diabetes (Kahn et al., 2006; Risérus et al., 2009). For instance, according to the WHO, about 80% of diabetics have an elevated body mass index (BMI). And obese patients are seven times more likely to develop diabetes. Being overweight is associated with an increased risk of most major adverse maternal and perinatal outcomes, from failure to conceive to pregnancy complications (pre-eclampsia, gestational diabetes) and childbirth (macrosomia), congenital anomalies, stillbirth and low birth weight, failure of breastfeeding and even maternal mortality (Gesink Law et al, 2007; Marchi et al., 2015; Turcksin et al., 2014; Poston et al., 2016). We should note that numerous studies have proven the cumulative effect of both maternal and paternal obesity on the risk of obesity in future generations (Godfrey et al., 2017).

Higher levels of maternal physical activity before conception in turn reduce the risk of gestational diabetes by 45% (Tobias et al., 2011) and preeclampsia by 65% (Aune et al., 2014). Walking

at a brisk pace for four or more hours a week before pregnancy also contributes to a lower risk of gestational diabetes (Zhang et al., 2006).

Pregnancy complicated by chronic hypertension and heart disease is associated with an increased risk of hypertension, other organ dysfunction, preterm childbirth, intrauterine growth retardation (IGR), fetal death, hypospadias and placental detachment. We should say that a systolic blood pressure above 130 mmHg increases the risk of preeclampsia by more than 7-fold (Caton et al., 2008).

Studies conducted at the turn of the 20th and 21st centuries have shown that women diagnosed with asthma before pregnancy are extremely likely to have exacerbations during pregnancy. This reinforces the importance of adequate disease control before conception, as asthma can cause serious complications in a mother (toxicosis, hypertension, preeclampsia, preterm birth) (Demissie et al., 1998) and a fetus (intrauterine delay, neonatal hypoxia, stillbirth, and infant mortality) (Liu et al., 2001). In turn, use of oral corticosteroids in the first trimester is associated with an increased risk of preeclampsia, a decrease in birth weight, and an increased risk of cleft mouth (Schatz, 2001). The analysis results show that preconception asthma medication use doubles the risk of gastroschisis in the fetus (Jones, Hayslett, 1996). Nevertheless, the risk of uncontrolled asthma is greater than that of essential anti-asthma medications.

Adverse pregnancy outcomes due to maternal renal disease include preeclampsia, chronic hypertension, cesarean section, preterm delivery, fetal growth retardation, increased risk of fetal death and stillbirth. Renal hypertension is associated with a 10-fold increased risk of fetal death compared to women with normal blood pressure (Jungers et al., 1997).

A research by Krapels and colleagues found an association of any maternal illness and cold in the periconceptional period (3 months before and after conception) with orofacial defects. The risk of malformations of the maxilla-facial area increases by a factor of 1.5 to 1.7 (Krapels et al., 2006).

A number of studies have shown the impact of the future father's chronic diseases as perinatal risk factors (Podsvirova et al., 2020). Overall, the risk of disease among children of fathers with poor health outcomes increased more than threefold (Azuine, Singh, 2019). The results underscore the important role of fathers not only in the physical well-being but also children's mental well-being of (Azuine, Singh, 2019). Mental health disorders in an expectant father during the waiting period (perinatal stress) increase the likelihood of emotional and behavioral problems in a child by 2.6 times (Day et al., 2016; Wong et al., 2016; Glasser, Lerner-Geva, 2019; Sokół-Szawłowska, 2020).

The effects of diabetes in men include reproductive disorders, which can be inherited through the male line and passed on to more than one generation, thereby increasing the risk of diabetes in offspring (Ding et al., 2015).

Fathers' significant contribution to the development of metabolic disorders in children has been proven. Moreover, transmission has also been observed in subsequent generations (Christoforou, Sferruzzi-Perry, 2020). Male obesity is associated not only with impaired own fertility (Kort et al., 2006), but also with an increased risk of chronic diseases in offspring (Kaati et al., 2002), such as diabetes, obesity (Andreeva et al., 2019), brain oncopathology (Day et al., 2016). A father's childhood eating habits may increase or decrease the risk of fatal cardiovascular disease in his children and grandchildren (Krempley et al., 2016).

Thus, the scientific research data confirm the relevance of the health risk factors we selected for the analysis of children's health in preschool age by both parents. Let us consider the results of our assessment of the relative risk for each criterion.

Main results

Maternal factors

Maternal age. According to our data, the expectant mother's young age (< 20 and < 30 years) is a risk factor for anemia during pregnancy (increasing its risk 1.5–fold) and edema (2.2–1.7-fold, respectively; *Tab. 2*). Mothers under 20 years old are twice as likely to have fetal malformations and 1.7 times as likely to have birth defects in their newborns. Older age correlates only with the risk of operative caesarean section in labor, and the older the age, the higher the risk.

Analysis of the influence of maternal age on developing diseases in children at preschool age showed[8] that young age increases the probability of developing diseases of the digestive system (by 2 times) and ENT organs (by 50%) in infancy, neurological (by 60%) and allergic manifestations (by 70%), and tooth decay at the age of 3–4 (by 3.6 times). Children born to mothers aged over 40 have a 77% increased likelihood of developing ENT diseases at the age of 3–4 *(Tab. 3)*.

Maternal age over 40 years is associated with the following risks: a child is registered as early as

Table 2. Maternal age as a risk factor for pregnancy complications and newborn health problems (RR, 95% CI)

Maternal age, years	Pregnancy complications			Child health disorder	
	Anemia	Edema	Cesarean section	Intrauterine growth retardation	Newborn health problems
Under 20	1.48 (1.29–1.69)*	2.21 (1.49–3.30)		2.22 (1.23–3.98)	1.69 (1.24–2.28)
Under 30	1.54 (1.33–1.77)	1.73 (1.18–2.54)			
Over 30			1.69 (1.31–2.20)		
Over 35			1.88 (1.40–2.52)		

* Hereinafter, we show the relative risk ratio (RR), with the 95% confidence interval (CI) in parentheses.
Note. We determined the presence of anemia and edema during pregnancy, childbirth by cesarean section, intrauterine growth retardation, and the presence of neonatal disorders based on the answers to the questionnaire designed for completion by medical personnel (obstetrician-gynecologist and neonatologist).

Table 3. Maternal age as a risk factor for child health in preschool age (RR, 95% CI)

Maternal age, years	Child's age									
	1–2 years					3–4 years				6–7 years
	Health disorders; illnesses									
	Dispensary registration	Weight deficit	Anemia	ENT organs	GT	Cardiology	Neurology	ENT organs	Caries	Lagging behind the NPD
Under 20				1.49 (1.07–2.08)	2.02 (1.19–3.42)		1.59 (1.12–2.47)		3.61 (1.14–11.41)	
Under 30				1.50 (1.15–1.96)	2.55 (1.50–4.32)	1.81 (1.22–2.70)				
40 and older	2.14 (1.47–3.11)	4.23 (1.10–16.23)	2.43 (1.17–4.29)					1.77 (1.13–2.76)		7.24 (2.58–20.30)

[8] Hereinafter, we determined the considered abnormalities in the child's health based on the answers of local pediatricians; the child's presence in the dispensary registry, weight deficit, anemia, ENT organ diseases and gastrointestinal diseases based on the pediatrician's answers about the child's health at age 2, in the absence of data – at the age of 1. Similarly, we determined adverse outcomes at the age of 3–4 and 6–7. Cardiology, neurological problems, ENT organ diseases, presence of caries and some others – by open questions for pediatricians. The lag in neuro-psychological development was calculated by the question "Does the child's neuro-psychological development correspond to the norm?" (a variant of the pediatrician's answer "lag behind").

infancy, weight deficiency and anemia at 1–2 years; ENT diseases at 3–4 years and delayed neuropsychic development (NPD) by 6–7 years. It can be caused by a decrease in the mother's health potential at the time of conception and carrying a child.

Thus, we can conclude that mother's young age is more often a risk factor for the child's health in the prenatal period and throughout preschool age. For older mothers (over 40 years old) conscious motherhood and high medical activity are more common, which has a favorable effect on the pregnancy course, but at the same time increases the likelihood of the development of pathologies in the child in 1 year with their subsequent removal at an older age. Nevertheless, there is a significant increase in the risk of delayed NPD to school age.

Mother's hazardous working conditions[9]. Exposure to radiation and microwave frequencies in a mother's workplace one year before childbirth increases her risk of developing anemia (by 46%) and edema (by 80%) during pregnancy *(Tab. 4)*. Contact with toxic and chemical preparations correlates with the risk of cesarean section, increasing it 1.7-fold, and with infected people, animals, plants, and microorganisms 1.9-fold. If maternal working conditions were associated with dustiness, the risk of birth of a child with birth defects increased by 60%.

Unfavorable working conditions of the expectant mother correlate with some pathologies in the child during their growing up. For example, gas pollution, work on an assembly line, and exposure to high temperatures contribute to the development of various ENT diseases *(Tab. 5)*. Mother's exposure before and during pregnancy to low temperatures in the workplace increases the risk of developing lacrimal duct stenosis in the unborn child by 5.5-fold.

Table 4. Maternal hazardous working conditions in the year before birth as a risk factor for pregnancy complications and newborn health disorders (RR, 95% CI)

Risk factor, condition	Pregnancy complications			Newborn health problems
	Anemia	Edema	Cesarean section	
Chemical and toxic effects			1.74 (1.22–2.46)	
Dustiness				1.59 (1.17–2.16)
Radiation and microwave effect	1.46 (1.15–1.85)	1.80 (1.27–2.56)		
Biological hazard			1.89 (1.35–2.64)	

Table 5. Maternal hazardous working conditions in the year before birth as a risk factor for child health in preschool age (RR, 95% CI)

Maternal hazardous working conditions	Child's age			
	1 year old		3–4 years old	6–7 years old
	Diseases			
	Neurology	Lacrimal dust stenosis	ENT organs	ENT organs
Gassing			1.71 (1.33–2.21)	
Working on conveyor belt	2.22 (1.10–4.48)		1.61 (1.11–2.34)	2.57 (1.26–5.25)
High temperature			1.47 (1.15–1.87)	
Low temperature		5.52 (1.30–23.46)		

[9] We determined occupational risk factors based on the answers chosen by the laboring mother to the question "Working conditions at the enterprise where you worked a year before the birth of your child". The list included the following hazardous factors: chemical and toxic substances; dustiness; gas pollution; vibration; noise; humidity; radiation and microwave frequency; heavy physical workload; work on a conveyor belt; high temperature; low temperature; biological hazards (microorganisms, sick people, animals, plants); mental stress; work in 2–3 shifts; work at night; work on the computer more than 4 hours a day.

Mother's complicated medical history. Mother's chronic diseases, according to our calculations, showed no association with the development of certain diseases in the child at preschool age. The exception was maternal history of complicated thyroid hyper- or hypothyroidism, in which the relative risk of endocrine disease in a child by the age of 6 or 7 was 8.18 (95% CI 2.04–32.88). We also found that a diagnosis of maternal obesity doubles the risk of delayed neuropsychic development of a child by the age of 3–4 (RR = 2.04; 95% CI 1.07–3.86).

At the same time, according to our calculations, mother's obstetric history has a serious influence on the development of certain diseases in the future child (according to the obstetrician-gynecologist's answers based on the data from the maternal medical record). For example, stillbirth as an outcome of previous pregnancies 5.5-fold increases the risk of digestive disorders in the infant and 16-fold of bronchial asthma by the time of school enrollment *(Tab. 6)*. Children whose mother had a history of ectopic pregnancies were 8 times more likely to develop an umbilical hernia in the first year of life, 12 times more likely to have bronchial asthma, and 7 times more likely to be obese at the age of 6–7.

In turn, anemia and edema during the current pregnancy correlate positively with the risk of ENT diseases at 1 year and cardiovascular disorders at 3–4 years *(Tab. 7)*.

Table 6. Complications of mother's previous pregnancies as a risk factor for some diagnoses in the preschool child (RR, 95% CI)

Complications	Child's age			
	1 year old		6–7 years old	
	Child's diseases			
	GI	Umbilical hernia	Bronchial asthma	Elevated BMI
Stillbirth	5.54 (1.36–22.47)		15.88 (2.89–87.25)	
Ectopic pregnancy		7.91 (1.40–44.80)	11.89 (1.97–71.57)	6.88 (1.19–39.75)

Table 7. Complications of mother's current pregnancy as a risk factor for some diagnoses in the preschool child (RR, 95% CI)

Complications during pregnancy	Child's age				
	1 year old	3–4 years old			6–7 years old
	Child's diseases				
	ENT organs	Cardiology	Neurology	ENT organs	Neurology
Toxicosis				1.33 (1.13–1.57)	1.52 (1.12–2.07)
Anemia	1.61 (1.25–2.06)	1.62 (1.17–2.23)			
Edema	1.61 (1.21–2.15)	1.61 (1.15–2.27)	1.89 (1.30–2.75)		
Protein in urine tests	1.90 (1.48–2.44)			1.37 (1.15–1.63)	
Eclampsia seizures				1.65 (1.24–2.18)	

Note. These maternal risk factors were calculated based on the answers to the questions about the pregnancy features ("Will you indicate what diseases the respondent had during the pregnancy. Particular attention should be paid to cases of nephropathy, pre-eclampsia, eclampsia"; "Was the respondent hospitalized or outpatient care during pregnancy (specify gestational age and diagnosis)?"; "Was there any protein in urine tests?"; "Did she have any eclampsia attacks?"; "Did she have any edema during pregnancy?").

Paternal factors

Paternal age. According to our calculations, a young age (less than 30 years) of the man is a protective factor for the development of anemia (RR = 0.70; 95% CI 0.61–0.79) and edema (RR = 0.55; 95% CI 0.38–0.79) in the mother of the unborn child during pregnancy, as well as for health problems, abnormal conditions, diseases, and congenital malformations in the newborn (RR = 0.71; 95% CI 0.56–0.91). If a man is over 40 years old, his child is three times more likely to develop congenital cardiovascular abnormalities, including heart defects (RR = 3.05; 95% CI 1.18–7.87).

We obtained the following results with regard to the influence of the father's age in the postnatal period of child development. Children whose fathers are mature men (over 40 years old) have a slightly (12%) higher probability of lowering the health group below II in infancy *(Tab. 8)*. The offspring of young men (up to 20 years old) have a threefold increased risk of developing GI diseases by the age of 2 and an 18–20% reduction in health group at the age of 3–4 and preschool age. In children whose fathers are up to 30 years old, the risk of delayed physical and neuropsychic development increases by 40% already in infancy, doubles the risk of digestive system disorders by the age of 2, and 80% of cardiac diseases by the age of 3–4.

Thus, father's young age has a favorable effect on the pregnancy course and intrauterine development of the fetus, but can lead to some health problems of a child in the early preschool age. Parenthood at a more mature age may have a negative effect in the prenatal period and the first year of life, but the further influence of this risk factor is neutralized. This may be due to higher levels of medical literacy and responsibility, financial security and readiness to promote a child's health among older fathers. Despite this, the age of the future father over 30 years old increases the probability of delay in the NPD by the age of 3–4.

Father's hazardous working conditions[10]. We have found that father's harmful working conditions a year before the birth of the child act as a risk factor for the child health. For example, working in a gassy environment tripled the risk of asphyxia in childbirth (RR = 2.99; 95% CI 1.35–6.63), and biohazard conditions (microorganisms, sick people, animals, plants) contributed to an 18% increase in the risk of a lower child health group by the age of 3–4 (RR = 1.18; 95% CI 1.14–1.22).

Table 8. Father's age as a risk factor for child health in preschool age (RR, 95% CI)

Father's age, years	Child's age					
	1–2 years old		3–4 years old			6–7 years old
	Child health disorders					
	Mismatch between physical and NPD	GI diseases	Health groups II–IV	Lagging behind the NPD	Cardiological diseases	Health groups II–IV
Under 20		3.09 (1.50–6.40)	1.20 (1.15–1.24)			1.18 (1.14–1.23)
Under 30	1.40 (1.13–1.74)	2.00 (1.35–2.97)			1.81 (1.23–2.69)	
30 and older				1.82 (1.22–2.70)		

[10] We determined occupational risk factors on the part of the father based on the mother's answers to the question "Working conditions at the enterprise where your husband worked a year before the birth of the child". The list of harmful conditions is the same as for the mother (see "Mother's hazardous working conditions").

In addition, we analyzed the risk of developing certain diseases in the child depending on hazardous working conditions of his father before conception. We found that the greatest harm to the child's health is caused by a man's work in close contact with chemical and toxic substances. Children of such fathers are 75% more likely to have neurological diseases already in the first year of life, two or more times more likely to have allergic manifestations and disorders of the digestive system from the age of three *(Tab. 9)*.

We note that the risk of developing an umbilical hernia in infancy was 4.6 times higher in infants whose fathers worked in conveyor belt. Gastrointestinal diseases are more susceptible to children whose fathers worked in an environment with increased gas pollution. If a man worked in a humid environment, his child is 5.5 times more likely to develop bronchial asthma by preschool age. Obesity at the age of 6–7 years is 5.7 times more likely in children whose fathers worked in a biologically hazardous environment a year before their birth.

Complicated paternal medical history. Our study has revealed that a complicated paternal history may adversely affect the child's health from the prenatal period. For example, male diabetes mellitus on average 8-fold raises the risk of intrauterine growth and development retardation and asphyxia during birth *(Tab. 10)*, and metabolic disorders and tuberculosis 3.3 and 5.5-fold,

Table 9. Father's hazardous working conditions as a risk factor for developing certain diseases in a preschool-age child (RR, 95% CI)

Father's hazardous working conditions	Child's age						
	1 year old		3–4 years old		6–7 years old		
	Child's diseases						
	Neurological diseases	Umbilical hernia	GI diseases	Allergic manifestations	GI diseases	Bronchial asthma	Obesity
Chemical and toxic effects	1.74 (1.30–2.33)		2.16 (1.26–3.70)	2.41 (1.53–3.79)			
Dustiness					2.07 (1.16–3.70)		
Working on conveyor belt		4.63 (1.22–17.57)					
Humidity						5.52 (1.58–19.34)	
Biological hazard							5.74 (1.53–21.51)

Table 10. Complicated paternal medical history as a risk factor for childbirth and newborn health (RR, 95% CI)

Father's diseases*	Disorders of childbirth and child health			
	IGR	Cesarean section	Asphyxiation	Apgar score less than 7
Diabetes mellitus	8.13 (1.98–33.36)		16.78 (4.00–70.45)	
Endocrine diseases		3.35 (1.62–6.95)		
Venereal diseases				2.83 (2.59–3.10)
Tuberculosis		5.54 (4.83–6.37)		2.83 (2.59–3.09)
Diseases of urogenital diseases				2.08 (1.43–3.02)

* The presence of the indicated father's diseases was determined by asking the child's mother, "Does your spouse have any diseases (including chronic ones)?" Groups of diseases according to ICD-10 class (with the most common examples), individual diseases (venereal diseases, tuberculosis) were indicated, and there was also an opportunity to write about the existing disease in a free form in case of difficulty in answering the question.

respectively, increase the risk of caesarean section during childbirth. The risk of giving birth to a baby with a low Apgar score is more than doubled in men who had venereal and genitourinary diseases, as well as tuberculosis.

We also note the impact of the father's complicated medical history as a risk factor for some health disorders of his children at birth. For example, skin and subcutaneous tissue diseases in a man increase the risk of jaundice in his newborn son or daughter by 4-fold and of musculoskeletal abnormalities (hip dysplasia, valgus foot, clubfoot) by 11-fold. The risk of giving birth to a child with a congenital heart defect is 3.8 times higher in a father with digestive system diseases. Urological problems in newborn boys (hypospadias, cryptorchidism, testicular prolapse) correlate positively with paternal genitourinary problems *(Tab. 11)*.

Chronic diseases in a male medical history continue affecting the offspring's health in the future worsening such general indicators as health group, frequency of diseases and dispensary registration. For example, a father's history of diabetes mellitus, tuberculosis, or venereal diseases increases the incidence of his children's illnesses in infancy, dispensary registration, and deterioration of health group II or lower by 15% (RR = 1.16; 95% CI 1.13–1.19), by the age of 3–4 the risks grow to 19% (RR = 1.19; 95% CI 1.15–1.24) and by the age of 6–7 – a quarter (RR = 1.25; 95% CI 1.19–1.31). Paternal congenital malformations raised the incidence of child morbidity by a third by the age of 1–2 (RR = 1.33; 95% CI 1.23–1.44) and decreased health group by 22% (RR = 1.22; 95% CI 1.15–1.30). If a father had diseases of the urogenital, endocrine, nervous, respiratory, and kidney systems, his offspring had an average risk of an 18–20% reduction in health group by the age of 3–4 and 6–7. In addition, paternal metabolic and genitourinary system disorders increased the incidence of disease in the child by a quarter by preschool age (RR = 1.25; 95% CI 1.19–1.31).

We also have found that certain chronic diseases in a male medical history increase the chance of developing certain diagnoses in his offspring during the preschool period. For example, father's nervous system and sensory organ disorders increase the risk of developing gastrointestinal diseases in his future children by 5 times by the age of 3–4, and by 6–7 – by 6.5 times *(Tab. 12)*. In turn, the presence of gastrointestinal problems in a father is not associated with similar diseases in children at preschool age, but doubles the risk of lagging behind the child's NPD by the age of 3–4. A father's medical history complicated by kidney disease is three times more likely to provoke the development of neurological diseases in his son or daughter by the age of 3–4. Earlier male venereal disease raises by 4.8 times the likelihood of gastrointestinal disease in his offspring by the preschool age. Skin and subcutaneous tissue

Table 11. Father's complicated medical history as a risk factor for the development of diseases in the newborn child (RR, 95% CI)

Father's chronic illnesses	Disorders of childbirth and child health			
	Newborn jaundice	Musculoskeletal abnormalities	Cardiovascular abnormalities	Urological problems in boys
Skin and subcutaneous tissue	4.09 (1.15–14.61)	11.25 (1.55–81.75)		
Digestive organs			3.75 (1.34–10.45)	
Urogenital system				12.49 (1.67–93.47)
Note. We determined diseases of a newborn child based on the medical staff's answers to the open-ended question "What pathological conditions and/or diseases did the child have in the first 7 days of life?"				

Table 12. Father's complicated medical history as a risk factor for child health in preschool age (RR, 95% CI)

Father's diseases	Child's age					
	1–2 years old	3–4 years old				6–7 years old
	Child's diseases					
	Cardiology	Lagging behind the NPD	Cardiology	Neurology	GI	GI
Nervous systems and sensory organs					5.24 (1.90–14.42)	6.45 (2.77–15.02)
Digestive organs		2.11 (1.10–4.06)				
Kidney				3.17 (1.54–6.50)		
Venereal diseases						4.75 (1.16–19.49)
Skin and subcutaneous tissue	2.83 (1.11–7.27)		2.68 (1.18–6.09)			

diseases more than 2.5 times increase the risk of developing cardiac diseases in his children starting at age 1.

Thus, we can conclude that the most significant risk factor for the offspring's health on maternal part is not so much her chronic diseases, but rather the complications of previous and current pregnancies. Father's complicated medical history, on the contrary, correlates with the development of a number of diagnoses in his children.

Conclusion

Parents' age, health status and effects of hazardous working conditions in the period before conception are significant risk factors for child health and not only have an impact in the prenatal and early postnatal period, but also continue worsening health throughout the preschool years.

Analyzing our results, we can make the following conclusions about risk factors.

On a mother's side, they are:

1. Mother's young age (up to 20 years old) is more often a risk factor for the health of the child during the prenatal period, as well as during the preschool period.

2. As a woman ages, her level of education and medical literacy, social status and financial status, and responsible attitude toward childbearing most often increase. The impact of these factors, according to our research results (Shmatova et al., 2022), to some extent levels out the negative impact of accumulated medical and biological predictors associated with loss of health potential. The mature age of the expectant mother is not associated with pregnancy threat, but it increases the risk of caesarean section at birth, the probability of developing some pathologies in infant (with subsequent healing as they grow up) and the lag of the NPD by school age (by 7 times).

3. Mother's hazardous working conditions have a significant detrimental effect on the course of pregnancy and childbirth, the newborn health and throughout preschool age, most often provoking diseases of ENT organs.

4. A medical history of stillbirths and ectopic pregnancies is extremely detrimental to a child's health from birth and throughout preschool age.

5. Mother's obesity and thyroid dysfunction are associated with a child's health risks.

On a father's side, they are:

1. Father's young age acts as a protective factor during pregnancy and intrauterine development, but is a risk factor for a number of diseases in the future (GI, cardiology, lagging of the NPD).

2. More mature age increases the risk of congenital abnormalities of the cardiovascular system and delay of NDP by the age of 3–4, but later its negative influence is leveled. Perhaps it is also due to greater medical literacy and responsibility, financial security and more opportunities to improve child's health.

3. Male hazardous working conditions have slightly less impact on the unborn child in the prenatal period than the mothers' ones, but also correlate with a number of diagnoses in the preschool period.

4. Unlike a mother, future father's medical history complicated by chronic diseases demonstrates a connection with intrauterine development of the fetus, surgical method of birth, development of congenital pathologies and low Apgar scores for a newborn. We also note its negative impact on child's health in the future.

Thus, we have confirmed the hypothesis of a significant impact on child health of not only mother's but also father's risk factors. The vast majority of them are manageable and can be neutralized by measures of state educational, medical and socio-economic support of men and women of childbearing age (starting with adolescents), improvement of gynecological, andrological and obstetric care, development of perinatal centers and male health clinics. Based on in-depth comprehensive analysis of Russian and international studies, as well as the results of our own long-term cohort monitoring, let us note some measures for preventing and treating childhood diseases.

Most studies on the reproductive process is conducted on women due to their obvious role in childbearing. In addition, women have a better knowledge of their reproductive function due to annual visits to a gynecologist, social pressure and communication with friends and family. Men only consult an andrologist or urologist about their reproductive health when they have medical or fertility problems. Therefore, it is important to activate a new research program stimulating a rethinking of male role in reproduction and health of future generations (Almeling, Waggoner, 2013).

Given the negative impact of environmental factors on both parents, it is necessary to create conditions for providing young families with children with housing in areas that exclude the impact of electromagnetic radiation. It is worth envisaging the provision of sanatorium treatment for children from families living in environmentally unfriendly areas, as well as parents working in industries with hazardous working conditions. We consider it essential to improve the regulatory and legal framework related to health protection of men and women working in hazardous conditions.

Medical services should focus on the emotional well-being of fathers during the perinatal period, which is important not only for men's health, but also for their wives and future children (Davenport et al., 2022). It is important to include questions about the condition of the father of the child during pregnancy during the screening of the psycho-emotional state of the expectant mother; if distress is detected, appropriate help should be provided (Glasser, Lerner-Geva, 2019); investigate paternal perinatal depression.

More attention needs to be paid to intervening with prospective parents before conception to improve maternal and child health and reduce the growing burden of noncommunicable diseases. It is important that health care providers be aware of ways to identify women and men who are planning to become pregnant (Stephenson et al., 2018).

Health care providers should be aware of the potential men's health risks for future generations and counsel not only future mothers, but also fathers accordingly.

Prevention of childhood overweight should also be done before conception (Guo et al., 2014) by both parents (Philips et al., 2020). The research results proves that fathers play a key role in children's eating behavior (Litchford et al., 2020; Davison et al., 2020). In order to have a significant impact on preconception health, a dual population strategy is required, improving nutritional status and increasing motor activity throughout life and especially during the reproductive years. The focus should be on all men and women who are thinking about conception (Stephenson et al., 2018).

Children's health can also be improved through policies and programs that support low-income young fathers and mothers, i.e., improve their financial status, education, and health literacy.

Reproductive planning and contraception for women of reproductive age with chronic diseases should be discussed immediately after diagnosis (Lassi et al., 2014).

Our monitoring results demonstrate the need for increased awareness of risk factors and motivation for health and lifestyle changes before conception among expectant parents. Interventions to improve health before conception should focus on communication between health professionals, schools, family members, and media (Daly et al., 2022).

We consider it advisable to use the elements of the proven mechanism of child health preservation by a mother as a basis for building medical and social support for future fathers, supplemented by adaptive measures that take into account the specific physiology and development of male organism. Qualitative characterization of risk factors on the part of both parents will allow correcting the existing system of prevention of child morbidity and strengthen their health potential.

Study limitations are the following: 1) the sample consisted of initially medically and socially advantaged women with children who wished to participate in monitoring, rather than all who gave birth during the cohort recruitment period; 2) there is a serious problem with maintaining cohort participation over the long research period; the sample decreases each year; 3) residual and unmeasurable confounding and combination of all internal and external factors requires further study; 4) in the current work we have not taken into account the interaction of mothers' and fathers' factors. The combined effects of both parents may have varying.

Further, we are planning to study maternal and paternal risk factors not only in preschool, but also at the child's older age including the use of other methods of analysis. Additional data may clarify the complex interaction of both maternal and paternal components. We recognize the need for scientific justification and the development of targeted recommendations for improving child and parental health policies to increase the health potential of future generations.

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Perception of Higher Education: A Public or Private Good?

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Abstract. The social benefit of higher education is one of the most important reasons for its being funded by the state. However, within the context of liberal economic policies, the perception of education as a private good and, therefore, the necessity of supplying it by the market has brought about a decrease in the state participation in higher education in many countries. Therefore, this study aims to determine whether students studying at public and foundation universities, differentiated according to financing, perceive their university education as a public or private good. In a sense, this study aims to examine whether different financing methods in higher education affect students' perception of higher education as a public good. In this study, the data collected from the students were tested within the scope of structural equation modelling, and the hypotheses put forward were confirmed. This study demonstrated that higher education is perceived as a public good by all university students whose financing method differs. According to the results obtained, students who are direct buyers of higher education services

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in universities that differ according to the financing method do not differentiate in terms of perceiving higher education as a public good.

Key words: higher education, public good, externalities, social benefit, private benefit, structural equation modelling.

Introduction

Education, which is a human right by national and international law, was defined as a right in the Universal Declaration of Human Rights in 1948[1] for the first time. Then, the International Covenant on Economic, Social and Cultural Rights (1996)[2], the United Nations Convention Against Discrimination in Education (1960)[3], and the Convention for the Protection of Human Rights and Fundamental Freedoms (1952)[4] define education as a human right. Today, 160 countries have been included in the United Nations Convention Against Discrimination in Education, which was signed on December 14, 1960. The Convention accepted that education is not a luxury but a fundamental human right, and the states' protection and substantial obligations to protect this right were emphasized. In this context, states are obliged to provide free and compulsory education. Furthermore, states have to stay away from discrimination and encourage equal education opportunities while fulfilling these obligations. In addition, the Convention holds the conditions responsible for realizing Higher Education based on individual ability as an education that can be seen equally by everyone.

While all these international agreements strengthened the public aspect of education, liberalization policies that became valid worldwide after 1980 caused the share of the public in education to decrease gradually. Thus, higher education has started to be defined as a traded service (Tilak, 2008), and its availability, traditionally seen as a public good based on the market, has become a dominant view due to the benefits it provides to society (Brown, 2015a). As a result, higher education was liberalized, private universities entered the market, and household education costs increased due to the cuts in the funds transferred by the state to higher education (Pusser, 2006). However, the social benefit provided by higher education is the essential issue limiting marketization in higher education (McMahon, 2009).

Neoclassical economic theory prescribes intervention of the state in the market in case of externalities, which it describes as one of the market failures. On the other hand, education gains the feature of being a public good because of its benefit scattered to the society, in other words, due to externalities. Nevertheless, despite the positive externalities of education, public financing of education and, accordingly, higher education has been limited in the world and Turkey within the scope of liberal policies implemented after 1980.

In Turkey, the share of the young population between the ages of 15–24 in the total population is 15.6%; and seven million young people are studying at higher education institutions. As of

[1] Universal Declaration of Human Rights, 1948. Available at: https://www.ohchr.org/sites/default/files/UDHR/Documents/UDHR_Translations/eng.pdf (accessed: January 10, 2022).

[2] International Covenant on Economic, Social and Cultural Rights, 1996. Available at: https://www.ohchr.org/en/instruments-mechanisms/instruments/international-covenant-economic-social-and-cultural-rights (accessed: January 10, 2022).

[3] United Nations Convention Against Discrimination in Education, 1960. Available at: http://portal.unesco.org/en/ev.php-URL_ID=12949&URL_DO=DO_TOPIC&URL_SECTION=201.html (accessed: January 10, 2022).

[4] Convention for the Protection of Human Rights and Fundamental Freedoms, 1952. Available at: https://www.echr.coe.int/documents/convention_eng.pdf (accessed: January 10, 2022).

2021, there are 207 universities in Turkey, 129 of these universities are public universities, and 78 are foundation universities.

Although there is a student contribution (the share of student contributions is generally below 10%) in state universities, their funding is provided from public sources to a great extent. A foundation higher education institution is defined as a university and high technology institute established by foundations, and faculties, institutes, colleges, vocational colleges, conservatories, research application centers and vocational colleges that are not affiliated with a university or high technology institute, provided that they are not for profit purposes. In foundation universities, financing of education and training is provided by foundation revenues, student fees (user fees), and government aid. As of 2020, the ratio of scholarship students in foundation universities has been increased to 15%, and students who are successful in the university entrance exam can benefit from scholarship opportunities at different rates.

Article 42 of the Constitution of the Republic of Turkey states: no one can be deprived of the right to education and training. Higher education in Turkey had been fully financed by the state until the first foundation university was established in 1986. Within the scope of liberal policies, the share of foundation universities has increased over the years, reaching 37% of all universities in 2022.

Since foundation universities are financed within the scope of user fees, more middle and upper-middle income groups can benefit from this education.

Being a public good is ascribed to education and higher education in particular because of the positive externalities they comprise. In this context, there have been different studies in the literature. It was examined to determine whether education is a public good or society perceives education as a public good. In the context of modern approaches, education is classified as a public good (Samuelson, 1954). It is stated that it is not a public good when considering its rivalry and exclusion characteristics (Kaul, Mendoza, 2003). Although the preferences of the political powers restrict the state's share in the economy and accordingly its share in higher education, the opinions of university students about the public aspect of higher education should be essential.

While it is being discussed in theory whether education is a public good, it has been examined what kind of good the society perceives as education and higher education in practice. It has been concluded that different demographic factors affect the perception of education[5] (Immerwahr, Foleno 2000; Baum et al. 2013).

According to national and international conventions, education has been accepted as a fundamental human right rather than a luxury. By emphasizing the obligations of States to provide free and compulsory education, equality of opportunity in education is promoted. Ensuring equal opportunity in education means that everyone benefits from education services without discrimination. While the liberal policies implemented almost all over the world after 1980 narrowed the state's share in the economy, this shrinkage also occurred in education expenditures and the presentation of education as a public good. In parallel with the shrinkage of the public's share in education, a more significant portion of the household's income had to be allocated to education. This situation, on the one hand, disrupts the equality of opportunity in education; on the other hand, it can negatively affect the social benefit. For this reason, it is essential whether university students, who directly take sides in the individual and social benefits of education, perceive education as public or private property

[5] Dudley J. (2015). *Perceptions of Higher Education: Private Good or Public Good?* Ph.D. dissertation. The University of Missouri-Columbia.

This study aims to determine whether students studying at public and foundation universities perceive their university education as a public or private good. In a sense, this study aims to examine whether different financing methods in higher education affect students' perception of higher education as a public good. Thus, with this study, in a sense, it will be determined how the higher education students evaluate the changing public share in higher education.

Education within the scope of public goods and externalities

It has been the subject of many studies to determine in which group the education service should be included in classifying private goods and public goods. In these studies, education has been described as a public good, semi-public good, and private good. This is due to the presence of different opinions regarding the definition of public goods in literature. The modern public goods theory is based on the description provided in (Samuelson, 1954), according to which the features of public goods should include the absence of rivalry between individuals in the consumption of the good. In other words, the marginal cost of the good should be zero and the benefit of the good cannot be excluded from the additional user (Musgrave, 1959). In this public goods classification limited by these two characteristics, education can be described as a private good in terms of not being excluded from the benefit of the good and not having rivalry in its consumption. Malkin and Wildavsky draw attention to the fact that a good that is classified as a public good in one society may be a private good in another society, and the society can determine the classification in question (Malkin, Wildavsky, 1991). In parallel with this, Kaul and Mendoza stated that the classification of public goods could not be made solely according to the criteria expressed by Samuelson (Kaul, Mendoza, 2003). Goods can be evaluated socially differently despite their basic characteristics and classified as private or public goods according to political preferences. In this context, Kaul and Mendoza placed education in different categories of goods and considered education both as a private good and as a human right, as well as a public good because of the positive externalities created by educated people and because the contributions of the educated people to economic growth and development being more productive (Kaul, Mendoza, 2003). In this classification, the main distinguishing element in characterizing education services as both private and public goods is its positive externality, i.e. the non-compensable effect of one's actions on the welfare of the other party. Since externality is a kind of by-product of any activity (Tullock, 2011), the private sector will not offer these by-products for free or bear their costs. Therefore, the production of such goods and services will have to be provided by the public sector (Batırel, 1990). In this context, it is helpful to examine the externalities of education.

Benefits provided by education and positive externalities

Due to the positive externalities, education has been closely associated with the public interest from classical economic theory to the present. Marshall describes education as a national investment (Marshall, 1890). Furthermore, in endogenous growth theories, education is an important component of economic development (Neira et al. 1990). Progressing in parallel with these views, many studies in the literature have discussed the individual and social benefits of education under different sub-titles (Weisbrod, 1964; Bowen, 1988; Baum, Payea 2004; Tilak, 2008). In their study detailing the benefits and costs of education, Mignat and Tan discussed the scattered benefits and costs of education individually and socially (Mignat, Tan, 1996). As shown in *Table 1*, the individual costs of education are analyzed as direct and indirect costs. Direct individual costs include tuition fees, books, etc., and transportation costs, while indirect individual costs consist of wages given up by not

Table 1. Education costs and benefits and their accrual to individuals and society in general

	Individuals	Society
Cost	C1. Direct costs (including school fees)	C3. Public subsidy (net of cost recovery and adjusted for possible deadweight losses of tax-financed public spending)
	C2. Forgone production (lost earnings, etc.)	
Benefits	B1. Increased market productivity (as reflected in earnings or other outputs)	B3. Spillover effects on worker productivity (as when a person's education enhances the work productivity of their coworkers)
		B4. Expanded technological possibilities (such as those arising from the discovery, adaptation, and use of new knowledge in science, medicine, industry, and elsewhere)
	B2. Private non-market effects (better personal health, expanded capacity to enjoy leisure, increased efficiency in job search and other personal choices)	B5. Community non-market effects (greater social equity, more cohesive communities, stronger sense of nationhood, slower population growth and related alleviation of environmental stress, reduced risks from infectious diseases, crime reduction, and so on)

Source: (Mignat, Tan, 1996).

working during the training. The social costs of education, on the other hand, result from the financing of the services with taxes.

Mignat and Tan (Mignat, Tan, 1996) associated the individual benefit of education with B1 and B2 and the social benefit with B3, B4, and B5 subheadings (see Tab. 1). In this context, individual monetary benefits of education included higher productivity and, therefore, higher net income, better job opportunities, higher savings, personal and professional mobility; social monetary benefits – higher national productivity, higher tax revenues, greater flexibility in the workforce, higher consumption, less dependence on the government; individual non-monetary benefits – educational enrichment, better working conditions, higher personal status, higher job satisfaction, better health and life expectancy, improved spending decisions, higher value of hobbies and leisure activities, personal growth; social non-monetary benefits – social adaptation, appreciation, social diversity, and cultural heritage, higher social mobility, lower crime rates, more donations and charitable work, increased capacity to adapt to new technologies, and higher social/political participation. On the other hand, the works (Jongbloed, 2004; Vossensteyn, 2009) examined the individual and social benefits of education within the scope of monetary and non-monetary benefits. Moreover, McMahon associated the non-market social benefit of education with externalities and public goods *(Tab. 2)*.

The indirect relationship of education with externalities comes from the benefits of education scattered in society and on future generations, besides its benefits only for the individual. While individuals consider only their individual benefits

Table 2. Total benefits of education

Private benefits	External social benefits
A-1. Market benefits to earnings and growth *Direct effects*	B-1. Indirect effects on earnings and growth *Indirect effects*
A-2. Private non-market benefits *Direct effects*	B-2. Indirect effects on non-market private benefits *Indirect effects*
A-3. Non-market social benefits *Direct effects*	B-3. Indirect effects on non-market social benefits *Indirect effects*

Source: (McMahon, 2006).

when making their education investments, in other words, education expenditures, they are not interested in social benefit; for this reason, education expenditures remain below the socially efficient level. In the Neoclassical economic theory, this is one of the market failures, which is the reason for the state's intervention in the economy, and it results in ascribing the public good attribute to education due to its externalities.

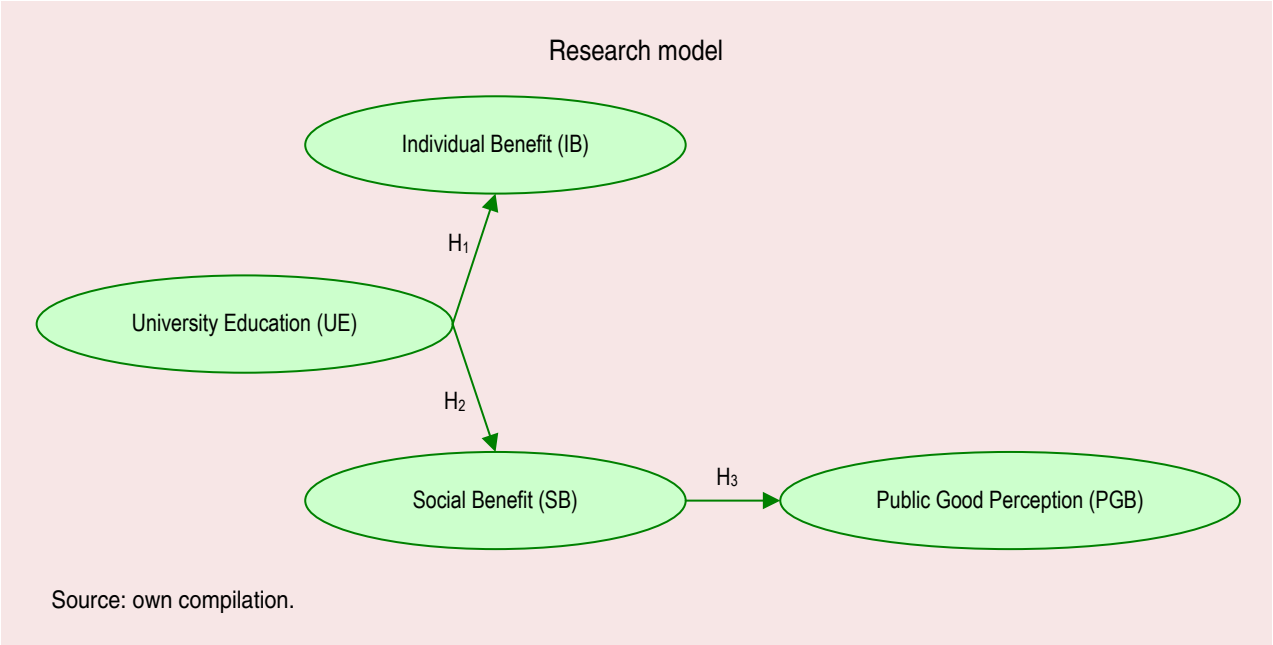
Along with the education service in general, higher education is also considered a public good, a merit commodity. In addition to being a public good in itself, higher education produces many public goods. The public goods that higher education produces, shapes, and nurtures are also diverse. The social purpose it serves, its nation-building role, the public interest, and the human rights nature of higher education all these dimensions are closely interrelated. They should be regarded as fundamental and uncompromisable principles in education (Tilak, 2008). With the liberalization practices that began in the 1980s, higher education, which has the attribute of being a public good, has become commodified, and the "higher education market" (Kirp, 2003) has grown rapidly. This trend toward increased participation of non-state actors in education is mainly caused by the discrepancy between rising demand for education at all levels and public budget constraints in expanding non-governmental organizations and increasing economic liberalization that encourages business sector participation (Daviet, 2016).

In theory, while the subject of whether education would be a public good within the scope of individual and social benefits has been widely covered in the literature, a limited number of studies have been conducted on how society perceives higher education in practice. In this context, the study (Immerwahr, Foleno, 2000) examined how higher education was perceived by the parents of students with different ethnic origins. As a result of the study, it was determined that all groups perceived higher education as extremely important and thought that it was necessary for good jobs and a middle-class lifestyle; in addition, it was concluded that African-American and Hispanic parents attach more importance and priority to a university education than white parents. All groups participating in the study think that the country should ensure that no qualified students are excluded from university education because of cost. However, despite the frequent complaints about the high cost of higher education, most parents believe that anyone who wants to study at university can access this service. Parents stated that they were worried about paying for their children's education, but they were sure that their children would go to university and find a way to pay for it (Immerwahr, Foleno, 2000). Baum et al. have shown that gender, age, and race of an individual influence their perceptions of higher education (Baum et al., 2013). Some researchers use the survey method to find out whether society perceives higher education as a public or private good[6]. In the study, based on the hypothesis that demographic factors would be the determining elements in the perception of higher education as a public good, as a result of the survey applied to individuals over the age of 18, it was concluded that higher education was generally perceived as a public good. Still, the differences in education level could affect this perception. Using the findings that Dudley obtained in 2015, our study focuses on whether students studying at public and foundation universities in Turkey perceive higher education as a public good depending on the individual and social benefits provided by higher education.

Methodology

In the study, an inductive approach was used in accordance with the sociological methodology. Data were collected within the scope of the survey

[6] Dudley J. (2015). *Perceptions of Higher Education: Private Good or Public Good? Ph.D. dissertation*. The University of Missouri-Columbia.



Source: own compilation.

method, which is the main research technique of direct observation. With the survey, which is a first-hand data collection technique, systemized questions about the perception of higher education, which is the research subject, were created.

The research model (Figure) demonstrates four latent variables within the model. These are university education (UE), individual benefit (IB), social benefit (SB), and public good perception (PGP). University education (UE) is an exogenous variable; individual benefit (IB), social benefit (SB), and public good perception (PGP) are endogenous variables. The single-headed arrows show the effects of each latent variable on other latent variables.

Our research model contains three research hypotheses – H1, H2, and H3. They revealed the relationships based on the theoretical framework among the latent variables. We differently tested the hypotheses for both public and foundation universities. The details regarding the hypotheses are seen below:

H1: University education (UE) positively impacts individual benefit (IB).

H2: University education (UE) has a favourable influence on social benefit (SB).

H3: The social benefit of university education (SB) contributes positively to the perception of university education as a public good (PGP).

Using a questionnaire method, we obtained the data from 227 students who study at the foundation and public universities. The number of participating students from the public university is 116, and the number of participating students from the foundation universities is 111. In addition, we procured the data on foundation universities from three different universities to increase the number of samples. We acquired the data for both foundation and public universities in 2019. While the percentage of male students participating in the public university is 51%, the percentage of female students is 49%. On the other hand, while the share of male students attending foundation universities is 62%, the rate of female students is 38%.

First, we generated the attitude statements to test the model put forward within the scope of structural equation modelling and the hypotheses (H1, H2, H3). In this context, we shared 25 attitude statements based on literature and field studies with students studying at the foundation and public universities. Since we wanted to

Table 3. Statements subject to confirmatory factor analysis, and their codes

Statement code	Statement
[a]IB1	An individual with a university education is happier in business life.
IB2	An individual with a university education is happier in his social life.
IB3	University education provides better job and career opportunities for the individual.
IB4	University education provides new social opportunities for the individual.
IB5	University education increases the individual's sense of achievement.
[b]SB1	The university creates new job opportunities in its region.
SB2	The University organizes cultural activities in its region.
SB3	The university facilitates access to public health and other services.
SB4	The University stimulates the local economy in its region.
SB5	The University attracts qualified job opportunities to its region.
[c]UE1	Getting a university education improves the technological innovations in the country.
UE2	Getting a university education encourages scientific research in the country.
UE3	Getting a university education improves the level of knowledge in the country.
UE4	Getting a university education enables the development of social, cultural, and political leaders.
[d]PGP1	University education should be free.
PGP2	Anyone who requests it should be able to get a university education.
PGP3	University education should only be offered by the public sector and financed by taxes.
PGP4	The benefit of a university education spreads to society.
Note: [a]individual benefit; [b]social benefit;[c]university education; [d]public good perception.	

develop a new attitude scale, we excluded seven with low reliability from the 25 attitude statements presented to the students for the first time. Thus, we made the analysis and tests to build an attitude scale with 18 statement *(Tab. 3)* and designed the statements in the questionnaire according to the 5-point Likert method. The scores in the questionnaire were interpreted as follows: 1 – strongly disagree, 2 – disagree, 3 – neither agree nor disagree, 4 – agree, 5 – strongly agree. The statements regarding individual and social benefit were adapted from (Immerwahr, 2000). Within this framework, we performed confirmatory factor analysis and successfully applied the first part of the scale development phase. Finally, thanks to the test results, within the scope of structural equation modelling, we accepted the hypotheses for both foundation and public universities. We analyzed the collected data through AMOS (Analysis of Moment Structures) 18 and SPSS (Statistical Package for Social Science) 19 programs.

Results

Under this heading, we respectively explain the results of missing value analysis, frequency analysis, confirmatory factor analysis, analysis of structural equation modelling analysis, and hypotheses put forward depending on the variables.

Missing value analysis

It was necessary to perform a missing value analysis because there were missing data in the surveys we collected for attitude statements. Among the 227 observations, the test result *(Tab. 4)* was compatible with the data presented in the literature.

Table 4. The result of missing value analysis

Test Result	Acceptable p-value	Reference
0.394	> 0.05	(Tabachnick, Fidel, 2013)
Source: own compilation.		

Table 5. The acceptable fit index values for confirmatory factor analysis (CFA)

Fit index	Acceptable value	Public university	Foundation university	Reference
		CFA	CFA	
CMIN/DF	< 5	1.276	1.648	Dattalo, 2013
GFI	> 0.80	0.891	0.858	Lee et al., 2015
RMSEA	0.03 < x <0.08	0.049	0.077	Hair et al., 2014
CFI	≥ 0.90	0.969	0.910	Azmi, Bee, 2010
IFI	> 0.90	0.970	0.913	Collier, 2020
Source: own compilation.				

Confirmatory factor analysis

We performed confirmatory factor analysis by using goodness of fit indices (GFI) or statistics (Özdamar, 2017) within the scope of the research model. We tested the relationship between the observed variables in the model and the latent variables. The sample size for our study exceeded 100 (Brown, 2015b), which is a sufficient number for both foundation and state universities.

We used many statistically sufficient model fit values (Meydan, Şeşen 2015), such as CMIN ($\chi 2$)/DF, GFI, IFI, CFI, and RMSEA for testing confirmatory factor analysis. In this context, *Table 5* demonstrates that fit values and ranges based on the modification index regarding public and foundation universities include the sufficient results. In order to strengthen the hypothesized confirmatory model (Schumacker, Lomax 2004), we applied the modification index between only two observed variables (IB1 and IB2: see Tab. 3) for the relevant public university.

Analysis of structural equation modelling

Structural equation modelling tests the effects of these variables on each other (Hair et al. 2014; Yıldırım et al. 2016) by revealing the observed and latent variables (Meydan, Şeşen 2015) within the scope of the multiple equations modelling with dependent and independent variables (Bentler, 2006). In this context, we either rejected or accepted the hypotheses we put forward.

We reached an adequate sample size from both foundation and state universities. It was observed that our data set showed a multivariate normal distribution (Bayram, 2016), and these distributions remained below the critical ration value for foundation and state universities. The results regarding this are shown in *Table 6*.

Fit indices used for confirmatory factor analysis are also performed for the structural equation modelling[7]. Fit values and ranges based on the modification index regarding public and foundation universities within the scope of structural equation

Table 6. The sample size and critical ration value regarding structural equation modelling

Sample size / Critical ration value	Foundation university	Public university	Acceptable sample	Reference
Sample Size	111	116	100	(Kline, 2011; Hair et al., 2014)
Critical Ration Value	7.353	5.917	< 10	(Kline, 2011).
Source: own compilation.				

[7] Holtzman S., Vezzu S. (2011). Confirmatory Factor Analysis and Structural Equation Modelling of Noncognitive Assessments using PROC CALIS, NEGUS, Statistics & Analysis. Available at: https://www.lexjansen.com/nesug/nesug11/sa/sa07.pdf

Table 7. The acceptable fit index values for structural equation modelling (SEM)

Fit index	Acceptable value	Public university	Foundation university	Reference
		SEM	SEM	
CMIN/DF	< 5	1.325	1.539	(Dattalo, 2013)
GFI	> 0.80	0.885	0.870	(Lee et al., 2015)
RMSEA	0.03 < x < 0.08	0.053	0.070	(Hair et al., 2014)
CFI	≥ 0.90	0.963	0.923	(Azmi, Bee, 2010)
IFI	> 0.90	0.964	0.925	(Collier, 2020)
Source: own compilation.				

modelling revealed statistically sufficient results *(Tab. 7)*. At the same time, for strengthening the hypothesized confirmatory model (Schumacker, Lomax 2004), we applied the modification index between only two observed variables (IB1 and IB2; see Tab. 3) relevant for both public and foundation universities.

Interpretation of hypotheses put forward depending on the variables

In this study, when we considered the results of the statistically adequate fit indexes related to both confirmatory factor analysis and structural equation modelling in the previous titles, we revealed that the p-values of all the hypotheses (H1, H2, and H3) depending on the latent variables within the scope of both state and foundation universities were statistically significant and therefore all hypotheses were accepted. Furthermore, we observed the effects of all variables on each other have a positive appearance *(Tab. 8)*. In this context, we interpreted all of the hypotheses according to the standardized regression weights as follows.

We accepted the hypothesis H1 (University education (UE) positively impacts individual benefit (IB)) for foundation and public universities. In other words, it is seen that there is a significant relationship between university education and individual benefit statistically. Furthermore, the test results for hypothesis H1 (for public and foundation universities) demonstrated that compared to foundation university students, public university students

Table 8. Results of testing the hypotheses regarding foundation and public universities

Hypothesis	Formulation	Standardized regression weight	P-Value	Test results
H_1 (Public university)	*University education (UE) positively impacts individual benefit (IB)*	0.802	P < 0.01	Accepted
H_2 (Public university)	*University education (UE) has a favorable influence on social benefit (SB)*	0.817	P < 0.01	Accepted
H_3 (Public university)	*The social benefit of university education (SB) contributes positively to the perception of university education as a public good (PGP)*	0.498	P < 0.01	Accepted
H_1 (Foundation university)	*University education (UE) positively impacts individual benefit (IB)*	0.587	P < 0.01	Accepted
H_2 (Foundation university)	*University education (UE) has a favorable influence on social benefit (SB)*	0.826	P < 0.01	Accepted
H_3 (Foundation university)	*The Social benefit of university education (SB) contributes positively to the perception of university education as a public good (PGP)*	0.321	P < 0.05	Accepted
Source: own compilation.				

reveal a lot more supportive attitude regarding the opinion that university education has an impact on individual benefit.

We accepted hypothesis H2 (University education has a favourable influence on social benefit) regarding foundation and public universities. This conclusion indicates a significant relationship between university education and social benefit in terms of statistics. Furthermore, the test results for hypothesis H2 (for public and foundation universities) reveal that both foundation and public universities have similar supportive attitudes regarding the opinion that university education impacts social benefit.

We accepted hypothesis H3 (Social benefit of university education contributes positively to the perception of university education as a public good) for foundation and public universities. This result demonstrates a significant statistical relationship between public good perception and social benefit. On the other hand, the test conclusions for hypothesis H3 (for public and foundation universities) showed that compared to foundation university students, public university students have a more supportive attitude regarding the opinion that the social benefit of university education contributes positively to public good perception.

Conclusion

In this study, in the context of spreading liberalization policies in education and taking into account the marketization in higher education in Turkey, we investigated the perception of public goods by students studying at foundation universities and public universities. According to the results of the field research, students studying at foundation universities in Turkey, where the household budget directly covers the financing of higher education, think that the social benefit of higher education is higher than the individual benefit. In addition, the students perceive higher education as a public good, just like students studying at public universities, due to the social benefit in question.

The results obtained in the study differ from those presented in (Immerwahr, 2000; Baum et al., 2013) which note that demographic variables and income level are effective in the perception of higher education as a public or private good[8]. Our work has concluded that higher education is perceived as a public good by all students studying at universities with different financing methods.

We found out that students who are direct buyers of higher education services at universities that differ in the method of financing perceive higher education as a public good, which should be taken into account by the state. The state striving to maximize public welfare should not ignore the significant public benefits of higher education.

The perception of higher education as a public good by students who directly benefit from higher education services strengthens its financing by the public sector. In accordance with the opinion of students, it is necessary to increase the share of the public sector in higher education.

In this context, in the financing of higher education, which is perceived as a public good, user fees are replaced by taxes for financing. Increasing the share of education and higher education in the total public budget plays a key role in increasing the share of the public sector in higher education. Human capital has an important place in eliminating social inequalities and competing with the global world. The share of higher education in the development of human capital is undeniable. In this context, increasing the share of higher education expenditures from the public budget should ensure that the higher education service is used for free financing for everyone who wants it, and should also ensure that the share of higher education investment expenditures is increased. Thus, a contribution will be made to the human capital required for development.

[8] Dudley J. (2015). *Perceptions of Higher Education: Private Good or Public Good? Ph.D. dissertation*. The University of Missouri-Columbia.

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Reassessment of the Todaro Paradox: An Extended Panel Data Analysis on Developing Countries

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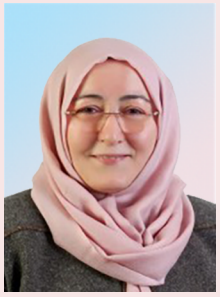

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Abstract. This paper empirically analyzes the Todaro Paradox for eight developing countries for the period from 1992 to 2019. Having different data characteristics, we apply three different panel approaches (Fixed Effect, Random Effect, and Full Modified Ordinary Least Square) by using distinct models. Our findings from different models depict that the Todaro Paradox is valid for the sample economies. Specifically, we observe a negative relationship between the price level ratio of purchasing power parity conversion factor (GDP) to market exchange rate and urban population contrary to the price level ratio of the purchasing power parity conversion factor (GDP) to the market exchange rate – rural population nexus. Thanks to obtaining these links, we apply the third empirical model to verify the Todaro Paradox. The analysis of the price level ratio of the purchasing power parity conversion factor (GDP) to the market exchange rate and total unemployment in the urban population provides strong evidence for the validity of this paradox. Deviated from the previous literature, this paper

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applies the price level ratio of the purchasing power parity conversion factor (GDP) to the market exchange rate since the higher the purchasing power parity of a country, the lower the rate of rural-urban migration is expected. By using one extra variable (unemployment), we test the Todaro Paradox. This combination of variables as well as different panel techniques (Fixed Effect, Random Effect, and Full Modified Ordinary Least Square) allow us to draw more robust conclusions. To address the challenges posed by rural-urban migration, policies should be designed to promote sustainable development in both urban and rural areas. This can include measures to create employment opportunities and improve the quality of life in both areas, as well as policies to regulate migration and manage the pressures caused by rapid urbanization.

Key words: migration, purchasing power parity, Todaro Paradox, urban economy, unemployment, rural economy.

Introduction

The concept of migration encompasses different perspectives. Internal migration refers to mobility within the borders of a nation (Puhani, 2001), whereas external migration refers to mobility between settlements in two or more countries (Bell et al., 2002). An individual who migrates from one country to another for employment purposes is considered an immigrant (Gimeno-Feliu et al., 2019; Jean, Jiménez, 2011; Kemnitz, 2003; Wong, 1991). Ravenstein studied the behavior patterns of individuals in relation to migration and noted that the movements of immigrants tend to be short-distance and directed towards large commercial and industrial centers (Ravenstein, 1889). As a result, migration from areas close to big cities is on the rise and has become a popular destination for immigrants seeking employment. On the other hand, residents of urban areas tend to migrate less frequently compared to their rural counterparts, leading to a higher rate of rural-to-urban migration (Ravenstein, 1889). Migration that involves leaving one's country for a different region for employment purposes can result in differences between the sending and receiving regions in terms of their economic and social characteristics (Castles, 2000). The issue of employment is crucial in this context. Many studies have shown that unemployment is a major motivator for migration (Herzog, Schlottmann, 1984; Kingma, 2007; Potts, Mutambirwa, 1990; Zhang, Song, 2003). Employment, as an economic concept, refers to the use of production factors for the purpose of generating income. In addressing the problem of unemployment, countries implement various policies and strategies.

Policies aimed at enhancing employment in cities can lead to migration from rural to urban areas, particularly in developing countries. Todaro and Harris modeled the factors that drive rural-to-urban migration in developing nations (Todaro, 1969; Harris, Todaro, 1970). In their model, the determining factors are wage differences between rural and urban areas and employment opportunities in cities. As long as expected urban wages, adjusted by the probability of finding a job, are higher than rural wages, migration from rural to urban areas will persist. In developing countries, it takes place in two stages. Initially, migrants are unable to secure formal sector employment due to a lack of qualifications, but they find work in the informal sector. In the second stage, they switch to formal sector employment. As a result, unemployment is both a cause and a consequence of migration and will persist as long as there are wage and employment disparities between rural and urban regions (Harris, Todaro, 1970; Todaro, 1969). The

duration of time required to secure formal sector employment and the availability of employment opportunities are important factors in triggering migration (Todaro, 1969). Todaro introduced the concept of the "Todaro Paradox", which suggests that the positive effect of increasing employment opportunities in urban areas on unemployment is offset by the negative effect of rural-to-urban migration. Investments aimed at reducing urban unemployment may lead to higher unemployment, emphasizing the importance of rural development in addressing the issue (Todaro, 1976).

On the other hand, considering Purchasing Power Parity (PPP), which represents a rate of change that equalizes the purchasing power of different currencies by removing price level disparities between countries is crucial for the analysis of the Todaro paradox[1]. The study of PPP began several decades ago, with the most well-known method of calculation being the Geary-Khamis dollar. This method, introduced by Roy C. Geary in 1958 and developed by Salem H. Khamis in the early 1970s (Brunt, Fidalgo, 2018), combines PPP and international average prices of goods. The calculation of PPP in the USA is based on the years 1990 or 2000, and international comparisons of per capita income in Geary-Khamis dollars provide a more meaningful comparison of standard of living than per capita income at current prices (Nordhaus, 2007). The US dollar serves as the common currency in these calculations (Dornbusch, 1985).

The Todaro Paradox and purchasing power parity are two related economic concepts. The Todaro Paradox is caused by the fact that, despite high levels of urban unemployment, people still migrate from rural to urban areas in search of work. This contradicts the classical theory of migration, which states that people should only move if there are more job opportunities in the destination location (Haas et al., 2019). PPP, on the other hand, is a theory that states that the exchange rate between two currencies is equal to the ratio of the prices of a basket of goods in each country (Samuelson, 1964). In other words, PPP states that the same goods should cost the same amount in different countries after adjusting for exchange rates. The relationship between the Todaro Paradox and PPP lies in the fact that PPP is often used to measure the purchasing power of different currencies in different countries. When PPP is applied to the Todaro Paradox, it becomes clear that people are moving to urban areas not just because of the availability of jobs, but also because they believe that their purchasing power will be higher in the city, even if they are unemployed. PPP helps to shed light on the motivations behind migration in the context of the Todaro Paradox, and can help economists better understand the forces driving rural-urban migration.

In this study, the "Price level ratio of PPP conversion factor (GDP) to market exchange rate" is employed as a variable to test the correlation and causality between this factor and the rate of rural-urban migration. This relationship has not been previously examined in the existing literature on the subject. The study aims to contribute to the field by incorporating a unique variable and conducting econometric analysis using three different techniques: Fixed Effect (FE), Random Effect (RE) and Full Modified Ordinary Least Square (FMOLS).

Several propositions motivated us to conduct this investigation.

First, we aim to address the socio-economic problems associated with migration, which are crucial for development, within the context of the Todaro Paradox. The purpose of the paper is to emphasize the importance of this critical topic and to consider comprehensively its implications, which have been overlooked by the empirical literature.

[1] Francois-Seeney D.J. (2013). *Macrodeterminants of Labor Migration from CEE Accession Countries to Select EU Countries*, Doctor of Philosophy Thesis. Mississippi: The University of Southern Mississippi.

Second, the Todaro Paradox explains why people in developing countries migrate from rural areas to urban areas despite worsening economic conditions in the latter. Focusing on the Todaro Paradox by using the correct variables can provide insights into the motivations behind rural-urban migration and the push and pull factors that influence this phenomenon.

Third, policymakers can better target interventions aimed at reducing rural-urban migration and promoting sustainable development in developing countries by understanding the Todaro Paradox.

Fourth, rural-urban migration can have both positive and negative effects on the development of a country. By studying the Todaro Paradox, researchers can better understand the results of rural-to-urban migration and identify ways to mitigate its negative effects while enhancing its positive effects.

Our contributions to the literature can be divided into two folds. First, we use the price level ratio of the PPP conversion factor (GDP) to the market exchange rate since the higher the PPP of a country, the lower the rate of rural-urban migration is expected. By using one extra variable (unemployment), we test the Todaro Paradox. This combination of variables allows us to draw more meaningful conclusions and have the potential to reveal new insights into economic literature.

Second, the FE, RE and FMOLS methods allow for a more comprehensive and nuanced examination of the relationship between the price level ratio of PPP conversion factor and other variables related to rural-urban migration, leading to more robust results and a better understanding of the underlying causal relationships. Moreover, these techniques allow for the control of potential omitted variable bias, cross-sectional dependence, and endogeneity.

Literature review

This paradox has been studied by numerous researchers, some of whom have found support for Todaro's conclusion that urban employment growth does not lead to increased unemployment, while others, such as (Zarembka, 1970) and (Blomqvist, 1978), found that growth of urban employment may result in increased migration and therefore higher unemployment in the long run. The lack of data in underdeveloped and developing countries has made it challenging to test the validity of the Todaro Paradox, so more empirical studies are needed (Blomqvist, 1978; Zarembka, 1970). Takagi modeled the Todaro Paradox according to differences in decision-maker expectations and determined the conditions under which the paradox would occur (Takagi, 1984). Todaro (Todaro, 1969) concluded that job opportunities created in the modern sector would not increase unemployment (Fields, 1975), but Blomqvist and Zarembka revealed that unemployment rate could increase in the long run if a different migration function was assumed (Arellano, 1981). Nakagome conducted a study on the Todaro Paradox within a spatial context, advancing the model to encompass a spatial labor market. He argued that an increase in expected income, due to increased employment opportunities, would result in either a rise in unemployment through the expansion of the labor market or through migration from rural to urban areas (Nakagome, 1989). Stark et al. posited that if the demand for urban labor is inelastic, then an increase in urban employment will lead to a decrease in urban unemployment. The Todaro Paradox arises from certain assumptions, such as the inability of underdeveloped and developing countries to achieve a significant increase in employment with a minor decrease in wages. In these countries there is often a low elasticity of the demand curve, which means that the paradox may

not occur (Stark et al., 1991). Raimondos created a Harris – Todaro model, in which the rural labor market is characterized by monopolistic behavior. This study suggests that if the number of workers in the city exceeds the number of unemployed, then creating employment in the city would decrease unemployment and eliminate the Todaro Paradox. Moreover, Raimondos asserts that urban growth in countries with monopolistic rural labor markets will not cause excessive rural migration and is more likely to decrease unemployment (Raimondos, 1993). Brueckner, Thisse, and Zenou modified the Harris – Todaro model by incorporating the land market (BZ model). According to their model, growth in the formal sector will not lead to rural-urban migration, as high land rents in the city will counteract the increase in job prospects (Brueckner et al., 1999). Brueckner and Kim noted that sector growth would increase the urban population and, in turn, the land rent, which would reduce the expected income level and benefits (Brueckner, Kim, 2001). Zenou evaluated the Todaro Paradox within the context of effective wage theory and matching models, determining that the Todaro Paradox would not occur in models with an effective wage add-on. However, in the matching model, Zenou found that a decrease in unemployment benefits, as a policy tool, would increase both urban employment and urban unemployment. This research emphasized that employment policies implemented in cities would cause mobility from rural areas or smaller cities to metropolitan cities, resulting in the paradox (Zenou, 2005).

The research (Espindola et al., 2006) interpretes workers' migration as a social learning process by imitation, shaped by a computational model. Using the simulation model, the dynamics of transition toward an equilibrium with continued growth in the urban segment of the total population are observed. Such an equilibrium is characterized by a balance between rural and urban wage expectations (the generalized Harris – Todaro equilibrium condition), urban population concentration, and urban unemployment. These results, originally obtained by Harris and Todaro, are new features of our model (Esp ndola et al., 2006). Chaudhuri explores the discrepancy between the negative effects of foreign capital as predicted by the Harris – Todaro model and the liberalized investment and trade policies pursued by developing countries. Using the example of the three sector Harris – Todaro model with agricultural dualism and a non-traded final commodity, the paper argues that foreign capital inflows can actually improve welfare and alleviate unemployment, explaining why many developing countries have experienced "jobless growth" in the liberalized regime (Chaudhuri, 2007).

As Pi and Yin note, an increase in partial privatization can affect unemployment and social welfare differently, depending on whether the capital is sector-specific or sector-mobile. In the short run, when capital is sector-specific, partial privatization may lead to higher unemployment, but the impact on social welfare will depend on the market share of the public firm and the level of privatization. In the long run, when capital is mobile, partial privatization may reduce unemployment, but again, the impact on social welfare will depend on the market share of the public firm and the degree of privatization. Overall, the authors note that in the real world, both public and private firms often compete with each other (Pi, Yin, 2016). Kondoh and Kurata studied the impact of policy changes and improvements in the agritourism sector in a developing country. They found that labor outflow from urban to rural areas can be beneficial, but the impact of wage changes or foreign capital investment is uncertain. They also concluded that a greater focus on agricultural goods in the agritourism sector can lead to improved domestic welfare and lower urban unemployment, and that environmentally friendly agritourism can have positive impact on both welfare and employment (Kondoh, Kurata, 2021).

Sancar conducted a research to assess the validity of the Harris – Todaro model in 12 regions of Turkiye using panel data methods over the period 2008–2019. The results showed that the Harris – Todaro model was valid in six regions, but not valid in the other six regions (Sancar, Akbaş, 2022). Sevencan used vector error correction model (VECM) methodology to analyze the short-run dynamics and causal relationships between GDP and remittances in three groups of countries: low-income, lower-middle-income, and upper-middle-income. The results showed that in low-income countries, GDP causally affects remittances in the short run. Additionally, the study found that the long-term positive impact of unemployment on human development index (HDI) highlights the significance of underutilized labor in low-income nations. Despite this, unemployment in the country of origin does not significantly affect the relationship between remittances and development in low-income countries (Sevencan, 2023).

Models, data and methodology

In order to test if there is a correlation or causal relationship between this factor and the rate of rural-urban migration, this study uses a measure of the "Price level ratio of the PPP conversion factor (GDP) to the market exchange rate" as a variable. We conduct econometric analyses using three different methods (FE, RE and FMOLS). The data used in this study consists of annual observations from eight developing countries[2] over the period from 1992 to 2019, annually.

Since migration data for eight selected developing countries could not be reached, we use "Urban population (% of the total population)" covering the period 1992–2019. As independent variables, we consider: "Rural population (% of the total population)", "Employment in agriculture (% of total employment) (modeled ILO estimate)", "Unemployment, total (% of the total labor force) (modeled ILO estimate)" and "Price level ratio of PPP conversion factor (GDP) to market exchange rate". All data were obtained from the World Bank database[3].

The first two models aim to econometrically analyze the effect of "Price level ratio of the PPP conversion factor (GDP) to market exchange rate" on the rural and urban populations. The purpose of the third model is to analyze the relationship between unemployment, rural population and Price level ratio of the PPP conversion factor (GDP) to market exchange rate and Employment in agriculture within the framework of the Todaro Paradox *(Table 1)*.

Model I: $lntnikn_{it} = \partial_1 + \partial_2 lnsagp_{it} + \varepsilon_{it}$

Model II: $lntnisn_{it} = \partial_1 + \partial_2 lnsagp_{it} + \varepsilon_{it}$

Model III: $lntnisn_{it} = \partial_1 + \partial_2 lnsagp_{it} + \\ + \partial_3 lntnikn_{it} + \partial_4 lntiiti_{it} + \partial_5 lntnitu_{it} + \varepsilon_{it},$

where:
i – the selected country,
t – the time in the models,
ε – the error term.

Table 1. Descriptions of the variables

Variable	Definition	Source
tnitu	Employment in agriculture (% of total employment) (modeled ILO estimate)	World Bank Database, World Development Indicators
tnikn	Rural population (% of total population)	
tiiti	Unemployment, total (% of total labor force) (modeled ILO estimate)	
sagp	Price level ratio of PPP conversion factor (GDP) to market exchange rate (%)	
tnisn	Urban population (% of total population)	
Note: All data cover the period 1992–2019 and are included in the model annually.		

[2] Russian Federation, Argentina, Brazil, India, Turkey, Czechia, China, Egypt, Arab Rep.
[3] Available at: https://data.worldbank.org/ (accessed: February 1, 2023).

Findings

Cross-section dependence test

The consideration of cross-section dependence between the series plays a significant role in affecting the results of the analysis (Breusch, Pagan, 1980; Pesaran, 2004). Before conducting the analysis, it is necessary to test for the presence of cross-section dependence and cointegration equations in the series. This is crucial in determining the appropriate unit root and cointegration tests to be employed, as failing to do so may result in erroneous findings (Yilmaz, Sensoy, 2022). The Breusch – Pagan Lagrange Multiplier (LM) test is used to detect the presence of cross-section dependence when the time dimension of the panel is larger than the cross-section dimension (Breusch, Pagan, 1980). In cases where both dimensions are substantial, the Pesaran Cross-Section Dependence (CD) test can be applied (Pesaran, 2004). This study employed the LM test, as the panel consisted of eight countries over 27 years. However, this test is subject to error if the group mean is zero and the individual mean is non-zero. Pesaran et al. corrected this error by incorporating the variance and mean into the test statistic, leading to the deviation-corrected LM test (LMadj) (Pesaran et al., 2008). The results of the cross-section dependence tests can be found in the *Table 2*.

As the results show, all probability values are below 0.05, implying the rejection of H_0 and the acceptance of the existence of cross-section dependence between the variables.

Panel unit root tests

In this study, Levin – Lin – Chu and Augmented Dickey – Fuller (ADF) – Fisher Chi-square unit root test methods (Dickey, Fuller, 1981; Levin et al., 2002).

Null hypotheses assume that there is a common unit root process as the basic hypothesis at their own level in the variables applied to Levin – Lin – Chu, ADF – Fisher Chi-square tests, which are non-stationary panel unit root tests. However, we can see that there is no unit root and they are static. The results are presented in *Table 3*.

Panel cointegration test results

All variables are stationary in Model I and have cross-section dependence between them. Pedroni, Kao and Fisher and Johansen panel cointegration tests can be applied to determine whether there is a long-term equilibrium relationship between the series in Model 3 (Kao, 1999; Pedroni, 1999, 2004). According to the results of the tests of the series in which three separate panel tests are applied, the p values of most statistics are less than 0.10, 0.05, and 0.01 *(Tab. 4)*. In summary, it can be concluded, that there is evidence of a long-run relationship between the variables of both our models.

Table 2. Cross-section dependence test

Variable *(ln)*	Test	Statistic	Prob.*
tnitu	Breusch – Pagan LM	5055,988	0.0000
	Pesaran Adj. LM	163,1826	0.0000
tnikn	Breusch – Pagan LM	1656,567	0.0000
	Pesaran Adj. LM	43,8863	0.0000
tiiti	Breusch – Pagan LM	4151,596	0.0000
	Pesaran Adj. LM	131,4447	0.0000
tnisn	Breusch – Pagan LM	5055,988	0.0000
	Pesaran Adj. LM	163,1826	0.0000
sagp	Breusch – Pagan LM	4203,963	0.0000
	Pesaran Adj. LM	133,2824	0.0000

Note: (*) indicates 1% significance level.
Source: own compilation based on Eviews 10 (IHS Global Inc).

Table 3. Panel unit root tests

Variable*(ln)*		Method	Level	*I(1)*
tnitu	Individual Intercept	Levin – Lin – Chu	0.0823***	0.0420**
		ADF – Fisher Chi-square	0.3465	0.0000*
	Individual Intercept and Trend	Levin – Lin – Chu	0.9575	0.0001*
		ADF – Fisher Chi-square	0.9595	0.0000*
tnikn	Individual Intercept	Levin – Lin – Chu	0.0627***	0.0010*
		ADF – Fisher Chi-square	0.1461	0.0000*
	Individual Intercept and Trend	Levin – Lin – Chu	0.0138**	0.0000*
		ADF – Fisher Chi-square	0.2631	0.0000*
tiiti	Individual Intercept	Levin – Lin – Chu	0.3735	0.0056*
		ADF – Fisher Chi-square	0.6541	0.0026*
	Individual Intercept and Trend	Levin – Lin – Chu	0.0000*	0.0000*
		ADF – Fisher Chi-square	0.0000*	0.0000*
sagp	Individual Intercept	Levin – Lin – Chu	0.0990	0.0000*
		ADF – Fisher Chi-square	0.4101	0.0000*
	Individual Intercept and Trend	Levin – Lin – Chu	0.8880	0.0005*
		ADF – Fisher Chi-square	0.9397	0.0000*
tnisn	Individual Intercept	Levin – Lin – Chu t*	0.5359	0.0465**
		ADF – Fisher Chi-square	0.4786	0.6706
	Individual Intercept and Trend	Levin – Lin – Chu t*	0.0016*	0.0486**
		ADF – Fisher Chi-square	0.2316	0.7585

Note: (*), (**) and (***) indicate 1%, 5% and 10% significance level, respectively.
Source: own compilation based on Eviews 10 (IHS Global Inc).

Table 4. Model III cointegration test results

Test author	Test	Statistic	Prob.	Weighted Statistic	Prob.
Pedroni	Panel v-Statistic	11.48871	0.0000*	5.318.920	0.0000*
	Panel rho-Statistic	1.242299	0.8929	2.048.779	0.9798
	Panel PP-Statistic	-0.921806	0.1783	1.127.582	0.8703
	Panel ADF-Statistic	-5.921875	0.0000*	-2.829.234	0.0023*
	Group rho-Statistic	2.930425	0.9983	N	N
	Group PP-Statistic	1.671212	0.9527	N	N
	Group ADF-Statistic	-5.060226	0.0000*	N	N
Kao	Statistic		Prob.		
	-2.018001		0.0218**		
Fisher, Johansen	Hypothesized	Fisher Stat. (from trace test)	Prob.	Fisher Stat. (from max-eigen test)	Prob.
	None	348.6	0.0000*	200.7	0.0000*
	At most 1	190.2	0.0000*	93.08	0.0000*
	At most 2	126.3	0.0000*	69.62	0.0000*
	At most 3	82.64	0.0000*	74.18	0.0000*
	At most 4	30.65	0.0149**	30.65	0.0149*

Note: (*), (**) indicate 1% and 5% significance level, respectively.
Source: own compilation based on Eviews 10 (IHS Global Inc).

Findings on panel models

As a result of the cointegration test, we can infer that there is a long-term relationship between all series in Model III. The coefficients of all variables in the models can be calculated with three separate panel data approaches. Fixed Effect (FE), Random Effect (RE), and full modified OLS (FMOLS) methods can be used in the models. Since there is no consensus on panel cointegration estimation, it would be more appropriate to use all methods to obtain a more robust result. Findings can be found in *Table 5*.

Econometric analysis of the relationship between "Price level ratio of PPP conversion factor (GDP) to the market exchange rate (%)" and "Rural population (% of the total population)" and "Urban population (% of the total population)" have been analyzed in Models I and II. We analyze Models I and II with three different estimation methods.

According to the results obtained from Model I, 1% increase in "Price level ratio of PPP conversion factor (GDP) to the market exchange rate (%)", "Rural population (% of total population)" is increased by 17.1% (=Exp(0,158102)-1), according to the result of RE estimator, and increased by 17.9% (=Exp(0,165136)-1) according to the result of FE estimator. According to the FMOLS estimator, it decreases by 17.7% (=Exp(-0.190196)-1). According to these results, the 1% increase in the 'sagp' variable is the reason for an approximately 5.9%[4] increase in the 'tnikn'.

According to the estimator results applied to Model II, a 1% increase in "Price level ratio of PPP conversion factor (GDP) to the market exchange rate (%)" made "Urban population (% of the total population)" is increased according to RE, FE and FMOLS estimators, respectively, 13.4%, (=Exp(-0.14447)-1), 14.3% (=Exp(-0.154457)-1) and 16.5% (=Exp(-0.180467)-1). These results tell us that the 1% increase in the 'sagp' variable is the reason for the approximately 14.7%[5] average increase in the 'tnisn'.

The reason behind creating Models I and II is to determine the econometric effect of "Price level ratio of PPP conversion factor (GDP) to the market exchange rate (%)" on migration from rural to urban and from urban to rural. The econometric findings provide us with strong evidence that supports the expected effect. According to the estimator results applied to Model III, a 1% increase in "Employment in agriculture (% of total employment)" is upon "Urban population (% of the total population)" according to RE, FE, and FMOLS estimator results, causes an increase of 0.8% (=Exp(0.008173)-1),

Table 5. Panel models estimations results

Case	Variable	Random Effect	Fixed Effect	FMOLS
Model I	*lnsagp*	0.158102 (0.00)*	0.165136 (0.00)*	-0.190198 (0.00)*
	Adj. R^2	*0.118497*	*0.973315*	*0.974000*
Model II	*lntnisn*	-0.144470 (0.00)*	-0.154457 (0.00)*	-0.180467 (0.00)*
	Adj. R^2	*0.154292*	*0.950499*	0.956395
Model III	*lntnitu*	0.008173 (0.0861)***	0.013227 (0.0252)**	0.015935 (0.0883)***
	lntnikn	-0.557084 (0.00)*	-0.514098 (0.00)*	-0.486613 (0.00)*
	lntiiti	-0.019146 (0.0191)**	0.055604 (0.0291)**	0.071823 (0.0310)**
	lnsagp	-0.067522 (0.0001)*	-0.069450 (0.00)*	-0.081447 (0.0028)*
	Adj. R^2	*0.622765*	*0.977288*	*0.977471*

Note: (*), (**) and (***) indicate 1%, 5% and 10% significance level, respectively.
Source: own compilation based on Eviews 10 (IHS Global Inc).

[4] It is calculated as the average of 15.8%, 16.5% and -19%.
[5] It is calculated as the average of -14.4%, -15.4% and -16.5%.

1.3% (=Exp(0.013227)-1) and 3.7% (=Exp (0.015935)-1), respectively. These results show that a 1% increase in 'tnitu' is the cause of a 1.2%[6] increase in 'tnisn'.

An increase by 1% in "Rural population (% of the total population)" in Model III causes a decrease in "Urban population (% of the total population)", by 42.7% (=Exp(-0,557084)-1), 40.1% (=Exp(-0,514098)-1) and 38.5% (=Exp (-0,486613)-1), respectively. According to the results, a 1% increase in 'tnikn' causes a 40.4%[7] decrease in 'tnisn'; 1% increase in "Unemployment, total (% of the total labor force) (modeled ILO estimate)", one of our two most important variables in Model III, decreases "Urban population (% of the total population)" according to the RE estimator result. According to the FE and FMOLS estimator results, 5.7% (=Exp(0,055604)-1) and 7.4% (=Exp(0,071823)-1) increase, respectively. In other words, a 1% increase in 'tiiti' causes a 3.7%[8] increase in 'tnisn'.

An increase by 1% in last variable "Price level ratio of PPP conversion factor (GDP) to the market exchange rate (%)", which is the main component of this study, has 6.5% (=Exp(-0,067522)-1), 6.7% (=Exp(-0,06945)-1) vs 7.8% (=Exp(-0,081447)-1) negative effect on "Urban population (% of the total population)", as a result of the analysis made on RE, FE and FMOLS estimators, respectively. We can conclude, that a 1% increase in 'sagp' causes a 7%[9] decrease in 'tnisn'.

In general, the findings show that the Todaro Paradox is valid for the sample economies we consider. We find a negative relationship between the price level ratio of the PPP conversion factor (GDP) to the market exchange rate and urban population. In contrast, the relationship between the price level ratio of the PPP conversion factor (GDP) to the market exchange rate and rural population is positive. The results of the analysis provided strong evidence for the validity of this paradox

Conclusion

In this study, we analyze the validity of the Todaro Paradox based on an annual basis over the 1992–2019 period, using various variables over eight selected developing countries. As independent variables we consider the price level ratio of the PPP conversion factor (GDP) to the market exchange rate and total unemployment (% of the total labor force), rural population, and employment in agriculture. Urban population is included in the model as a dependent variable. The first two models show the relationship between the price level ratio of the PPP conversion factor (GDP) to the market exchange rate and the urban and rural populations. The relationship is negative and positive, respectively. This confirms the Todaro Paradox, which states, that rural-urban migration in developing countries occurs due to a perceived higher standard of living in urban areas despite worsening economic conditions. After finding evidence for the relationship in the first two models, the third model carries out the main analysis. This model provides evidence for the Todaro Paradox, which can inform future research and policies aimed at reducing rural-urban migration and promoting sustainable development in eight developing countries, that we consider in this study.

Addressing rural-urban migration challenges requires the implementation of policies that promote sustainable development in both urban and rural areas, such as measures to create employment opportunities and improve the quality of life, and to regulate migration and manage the situation caused by rapid urbanization. Moreover, policies should promote sustainable development

[6] It is calculated as the average of 0.8%, 1.3% and 1.5%.

[7] It is calculated as the average of -55.7%, -48.6% and -51.4%.

[8] It is calculated as the average of -1.9%, 5.5% and 7.1%.

[9] It is calculated as the average of -6.7%, -6.9% and -8.1%.

and address the challenges posed by rural-urban migration in developing countries. It is significant to highlight the relationship between economic factors and urbanization and suggest, that efforts to address poverty and unemployment may also have an impact on migration patterns. Further research in this area could help to refine our understanding of the urbanization dynamics and policies that support sustainable development in developing countries.

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Ways to Reduce Social Inequality

Review of the book: Bobkov V.N., Bobkova T.E. et al. (2022). Standard of Living and Quality of Life of the Russian Population: From Reality to Designing the Future: Monograph. FCTAS RAS. Moscow: FCTAS RAS. 274 p.

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Abstract. In the context of new geopolitical, financial, economic and epidemiological challenges, the issues of ensuring a decent standard of living and quality of life for the Russian population are still a priority in Russia's domestic policy. The relevance of this problem arouses scientific interest, which is confirmed by the publication of more than fifteen monographic studies over the past five years. The article analyzes the findings of a study published in 2022 in the monograph Standard of Living and Quality of Life of the Russian Population: From Reality to Designing the Future, prepared by a team of authors and edited by V.N. Bobkov, N.V. Loktyukhina, E.F. Shamaeva. The authors of the book – economists, sociologists, specialists in the field of medicine, environmental protection and labor law – presented the results of four years of studying the components, social standards and indicators of the standard of living and quality of life in modern Russia, their qualitative identification and quantitative assessment in the context of excessive socio-economic inequality. The main advantage of the monograph is an interdisciplinary approach to studying the quality of life, which allows for a comprehensive analysis of this indicator of the state of society from the standpoint of economic, social and legal relations. The article notes the structuring of the material, the sequence of its presentation – from theory to methodology and practical recommendations, brevity and accuracy of judgments about the categories under consideration, and a clear perspective of the authors. The novelty of the proposed publication is due to the fact that it

For citation: Leonidova G.V. (2023). Ways to reduce social inequality. *Economic and Social Changes: Facts, Trends, Forecast*, 16(2), 216–229. DOI: 10.15838/esc.2023.2.86.12

investigates new tools of governmental and corporate policy to regulate the standard of living and quality of life, in particular, the presentation of the authors' concept of a medium-term national program to reduce absolute monetary poverty. These tools are becoming an important step toward reducing social inequality. In practice, this is "designing the future", as the authors put it, and this is what provides the monograph with both scientific and practical significance.

Key words: quality of life, standard of living, population, precarious employment, unconditional basic income, concept of a medium-term national program to reduce absolute monetary poverty.

Introduction

The relevance of studying the quality of life is due to a number of circumstances, primarily the increasing importance of its significant improvement for modern Russia. The quality of life as one of the resulting indicators of the state of society, on the one hand, acts as an evaluative indicator of "the life of all spheres of the social system (political, economic, spiritual, social), on the other hand, is the most important factor affecting the state of society, its sustainable development" (Sushko, 2018). Therefore, the problem of the standard of living and quality of life is in the focus of attention of the government, society, and, of course, researchers.

Public attention to this problem is primarily associated with the constitutional provision of the welfare state, "whose policy is aimed at creating conditions for a decent life and the free development of a person"[1]. This is also confirmed by the inclusion of parameters of the standard of living and quality of life in the list of national goals of the RF[2]. National projects and federal activities in three areas are the implementation of real actions in this regard: "Human Capital", "Comfortable Living Environment" and "Economic Growth"[3].

The research interest is due to the problem of "terminological chaos" (Rossoshanskii, Chekmareva, 2016), caused by a variety of theoretical and methodological approaches to the study of the quality of life and also due to the need to systematize the knowledge accumulated by foreign and Russian scientists in this field, and the search for ways to solve current problems of the standard of living and quality of life.

A comprehensive approach to the discussion of the mentioned problems is proposed in the collective monograph *Standard of Living and Quality of Life of the Russian Population: From Reality to Designing the Future*. Its authors are scientists of one of the leading academic institutions – the Institute of Socio-Economic Studies of Population of FCTAS RAS, in particular, the staff of the Laboratory for issues of standards of living and quality of life. Due to the interdisciplinary nature of the publication, representatives of various fields – economics, sociology, medicine, environmental protection, and labor law – took part in the preparation of the book. The monograph was edited by Doctor of Sciences (Economics), Professor V.N. Bobkov, Doctor of Sciences (Economics) N.V. Loktyukhina, Candidate of Sciences (Engineering) E.F. Shamaeva.

The purpose of the article is to review the research results published in the monograph, to highlight the peculiarities of the material and its practical significance, and to evaluate the new tools of social policy proposed by the authors from the perspective of regional governance.

[1] Constitution of the Russian Federation: Adopted by popular vote on December 12, 1993, with amendments approved by all-Russian vote on July 1, 2020. Available at: http://publication.pravo.gov.ru/Document/View/0001202210060013 (accessed: October 20, 2022).

[2] Decree on the national development goals of Russia until 2030, dated July 21, 2020. Available at: http://www.kremlin.ru/events/president/news/63728 (accessed: October 20, 2022).

[3] National projects of Russia. Available at: https://национальныепроекты.рф/ (accessed: October 24, 2022).

Research methodology

As an empirical basis, the authors of the collective monograph relied on data from Rosstat, Russian Longitudinal Monitoring Survey of HSE, official materials of Russian ministries and agencies, the results of public surveys, in particular the authors' survey of the unemployed.

The reviewed monograph consists of six sections (14 chapters), in which from general to specific, from theory to methodological and practical recommendations, the problems of the standard of living and quality of life of the Russian population are revealed – from its real state to the authors' vision of the future.

The first section of the monograph is devoted to the theoretical and methodological foundations of the study of the standard of living and quality of life. The second section considers modern challenges to the standard of living and quality of life. Information about the monitoring study of income and standard of living based on social standards is presented in the third section. The fourth section is devoted to new tools of state and corporate policy for regulating the standard of living and quality of life. The authors put forward a concept of the medium-term national program for reducing absolute monetary poverty and their proposals on approaches to designing the standard of living and quality of life of Russians (the fifth section of the monograph). Finally, the sixth section accumulates the conclusions of the entire study.

Conceptualization of the quality of life: Structure and components

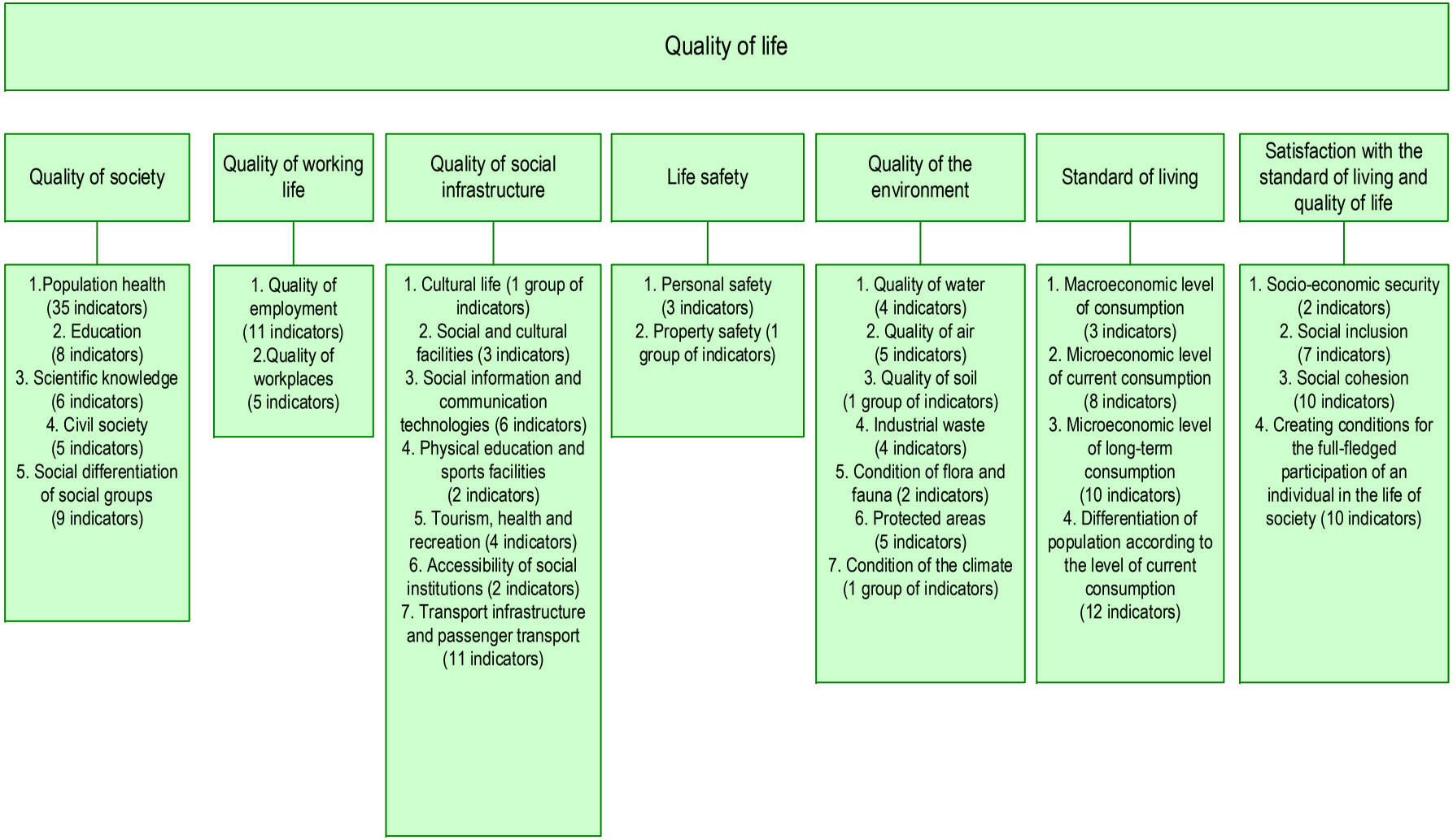
The starting theoretical point of the monographic publication are the categories of "standard of living and quality of life". Based on the research of Russian (S.A. Ayvazyan, V.N. Bobkov, N.M. Rimashevskaya, etc.) and foreign (P. Abbott, A. Walker, P. Hermann, etc.) scientists, the authors of the monograph specify theoretical and methodological basis for studying the standard of living and quality of life *(Fig. 1)*. In particular, the spheres of formation of the standard of living and quality of life (health and healthcare; life safety; worldview; socio-psychological; intellectual and educational; spiritual and cultural; professional and labor; family and personal; civil and social; anthroponatural and socio-economic spheres) are systematized and their components (quality of society; quality of working life; quality of social infrastructure; life safety; environmental quality; standard of living (consumption); and people's satisfaction with the standard of living and quality of life).

It should be noted that the diversity of knowledge fields, operating with the concept "quality of life", and differences in the goals of scientific research, have generated a large number of approaches to the definition of the structure of the quality of life, its conceptual and structural models. Many of these models correlate with the concept presented by the authors of the collective monograph.

Thus, one of the modern models (Ruževičius, Akranavičiūtė, 2007) contains the following structure of the quality of life: physical, material and psychological state, education and self-development, social relations, self-expression and recreation, safety and environment *(Fig. 2)*. Like the authors of the collective monograph, the researcher builds a logical relationship between the evaluated areas of the quality of life and its components, thereby showing the diversity of aspects of human life and drawing attention to the complexity of the concept.

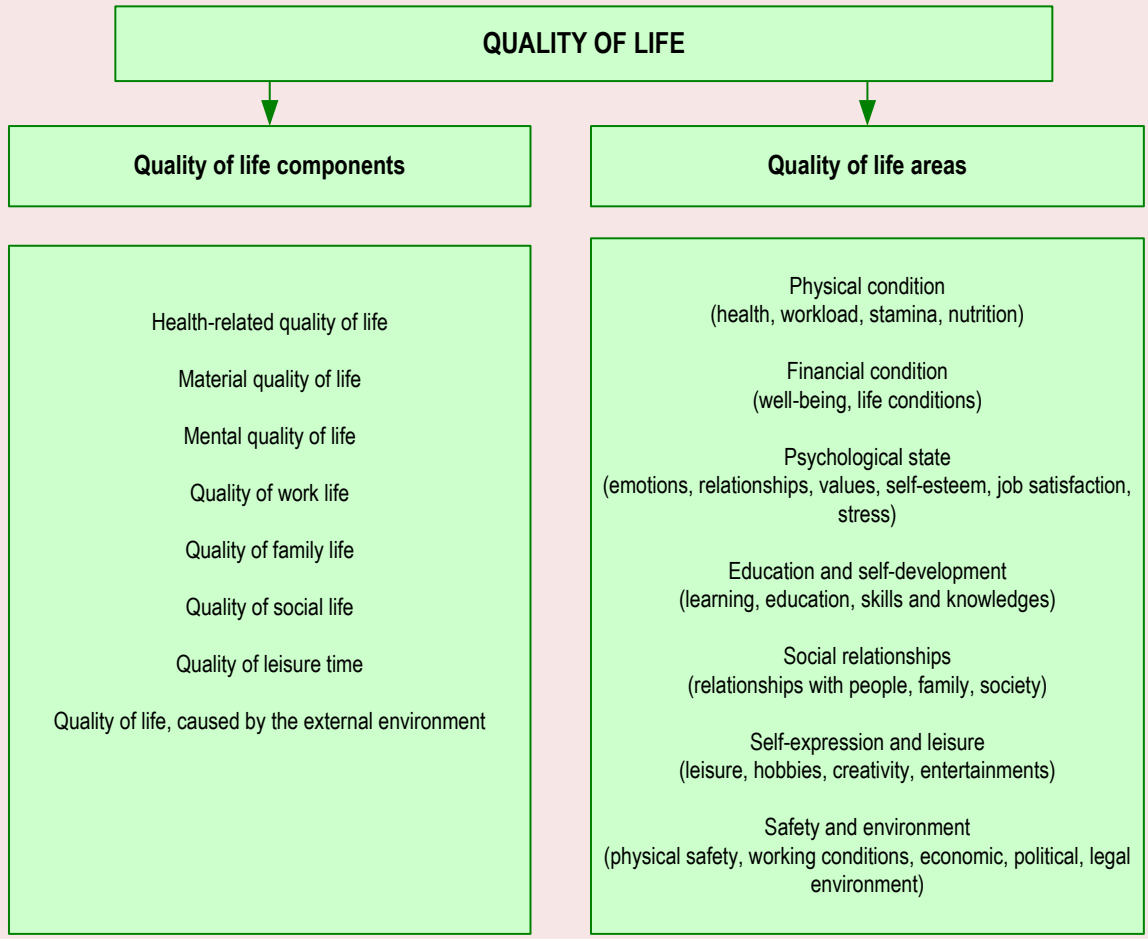
We should also mention the structure of the quality of life presented by a group of American researchers (Schalock, 2004). It is based on eight evaluation areas: emotional well-being, interpersonal relations, material well-being, personal development, physical well-being, self-determination, social inclusion, rights, interrelated with three factors: independence, social participation, well-being. We should note, that this

Figure 1. The concept of the quality of life, presented in the monograph "Standard of living and quality of life of the Russian population: From reality to designing the future"



Compiled according to: (*Standard of Living and Quality of Life*…, 2022).

Figure 2. Conceptual model of the quality of life



Compiled according to: (Ruževičius, Akranavičiūtė, 2007).

concept is focused on evaluating the quality of life as a whole and people with disabilities as a special socio-demographic group. In other words, the definition of the quality of life is based on the degree of inclusion in society.

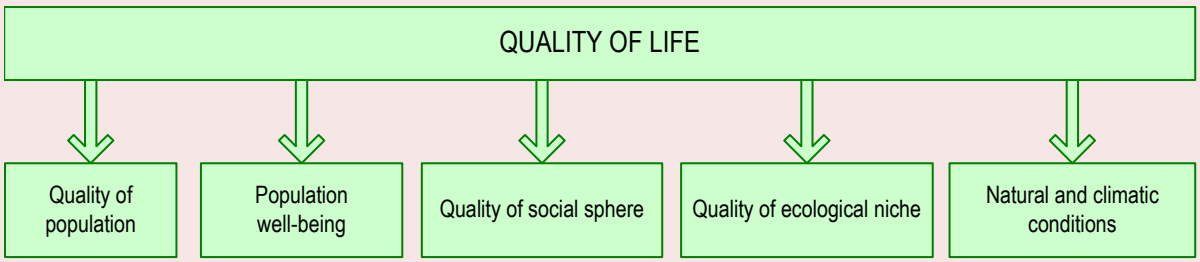
A similar position is held by other scholars (Cummins, 2000), who propose the following structure of the quality of life: material well-being, health, work, family well-being, security, social relationships and emotional well-being.

Russian scientists concentrate on the most problematic elements (Rossoshanskii, 2019). For example, in the studies of S.A. Aivazyan the quality of life is structured by five key blocks *(Fig. 3)*, comprehensively describing "the environment and the system of life support of the population" (Aivazyan, 2012).

The approach of scientists from the geography faculty of MSU (Zubarevich, 2007) differs in that the structuring of the quality of life is carried out in two ways: the definition of the minimum and the total list of components *(Fig. 4)*.

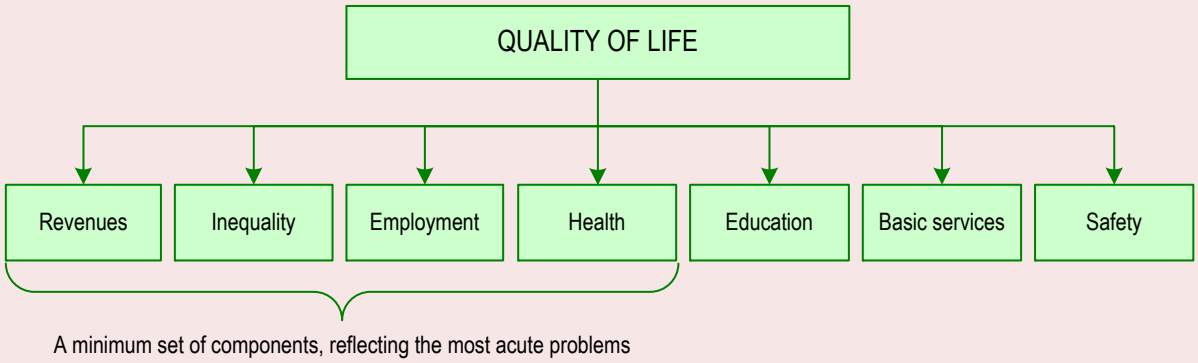
Thus, even the most modest review of theoretical and methodological sources of research on the quality of life allows us to evaluate a quite significant contribution of the authors of the collective monograph to the conceptualization of the term and its comprehensive study. Being

Figure 3. Structure of the quality of life according to S.A. Aivazyan's approach



Compiled according to: (Aivazyan, 2012).

Figure 4. The structure of the quality of life according to N.V. Zubarevich's approach



Compiled according to: (Zubarevich, 2007).

generally in the mainstream of such studies, the authors offer a broader view of the content and structure of the quality of life, give a comprehensive view of the variety of components and indicators, which are important for the development of scientifically based national social policy in the Russian Federation.

We should note another feature of the collective work, in particular the decomposition of the Sustainable Development Goals (SDGs) for the possibility of their interpretation in the aspect of reproduction of the components of the standard of living and quality of life substantiated in the monograph, which is confirmed in the work. The national set of the SDGs is reflected in the state strategic documents[4], respectively, its indicators are included in the concept of quality of life, presented by the author's group.

Quality of employment and quality of working life

The authors of the monograph define the quality of employment (QE) and quality of working life (QWL) as the central problem of the quality of life concept. The paper gives a theoretical overview of these concepts with an emphasis on the quality of working life as a broader category that includes,

[4] On the National Security Strategy of the Russian Federation: Presidential Decree 400, dated July 2, 2021. Available at: https://www.consultant.ru/document/cons_doc_LAW_389271/ (accessed: 20.10.2022); On the National development goals of Russia until 2030: Presidential Decree dated July 21, 2020. Available at: http://www.kremlin.ru/events/president/news/63728 (accessed: 20.10.2022).

along with the quality of employment, the quality of the working environment (the workplace) in which employment takes place The authors note: "Today, there is no unified scientific approach among researchers to assessing both the quality of working life and the quality of employment" (*Standard of Living and Quality of Life*..., 2022). The inconsistency in the conceptualization of the above categories is due to the fact that different approaches meet: 1) different number of indicators, 2) different levels of evaluation (territory, industry, enterprise). Moreover, the QWL is multidimensional, has a bilateral evaluation position (measured by objective and subjective indicators), is characterized by multiple evaluation parameters, the dynamics of socio-economic and technological conditions, and changes in employees' attitudes toward working conditions and work in general (Leonidova, Ivanovskaya, 2021). It should also be noted that the approaches to the content of QWL and QE are different. Thus, the authors point out that since 2000 several research projects at the international level have been undertaken: the European Employment Strategy; the OECD Better Life Initiative; the International Labor Organization's Decent Work Concept5; the UN EEC initiative6; the OECD Job Quality System; the European Working Conditions Survey, and the European Foundation for the Improvement of Living and Working Conditions approach7. All these projects somehow consider the quality of employment as "the state of an individual's labor activity, which allows them to fully realize the totality of their needs arising through the labor process, while creating a positive effect in the socio-economic and political spheres of society" (Salnikova, 2007). From the analysis presented in the monograph, we can conclude that employment quality is a "multidimensional, still forming concept of the complex relationship between employee and work" (Veredyuk, 2018). The author's approach to the definition of QWL as an integral and system-forming component of the standard of living and quality of life, considered at two levels of integration: the quality of employment and the quality of jobs, is very important in this case.

Industry 4.0 and the quality of life

A distinctive feature of the monograph is the systematization of modern challenges and their impact on the quality of life. Perhaps it is worth noting that such a concentrated analysis of the above-mentioned problem has not yet been found in the scientific literature. The authors chose the quality of working life as the field of concentration of contemporary challenges and highlighted positive and negative trends in the impact of typical technical and technological aspects of the Fourth Industrial Revolution (Industry 4.0) on the development of labor relations and society. Two areas of influence were identified: the transformation of jobs and public communications (which corresponds to the component "quality of employment") and the impact on the quality of working life and society.

The authors link the problem of Industry 4.0 impact on jobs to major scientific and technological innovations (robotics, development of the Internet of Things, Big Data analysis, cloud computing, IT technology, IT security, simulation modeling, intelligent materials) that "create qualitatively new environment and jobs to transform production, services and information, labor and society in general" (*Standard of Living and Quality of Life*..., 2022).

The authors reveal the impact of Industry 4.0 on the quality of working life through development opportunities and emerging threats that must be confronted.

What are the opportunities highlighted by the authors of the monograph? First, the development

[5] Decent work. Report of the ILO Director-General. 87th ILO session. Geneva, 1999.

[6] Measuring Quality of Employment: Country Pilot Reports. UNECE, Geneva, 2010.

[7] Quality of Employment Conditions and Employment Relations in Europe. Dublin: Eurofound, 2013.

of the diversity of labor markets and forms of employment, which manifests itself in flexible, non-standard forms of employment that change its structure (Mandl et al., 2015). The growth of such employment forms offers the prospect of a more complete use of people's abilities and self-realization.

Second, the authors note such an opportunity as an increase in labor productivity and employee requirements, a reduction in labor sphere, which is facilitated by the automation of a growing number of tasks in the economy and other spheres of life. The transformation of employee requirements increases interest in the expansion of continuing education, motivation to acquire modern knowledge, including the use of information and communication technologies.

Third, there has been a tremendous increase in the connectivity of labor markets, economies and societies, which is manifested not only in the enormous scale of external and internal labor migration, but also in human development, the so-called e-migration. Employees are becoming increasingly mobile spatially and functionally and this allows them to work anywhere and anytime8, to increase income from employment.

Fourth, human intelligence is complemented by artificial intelligence, which "multiplies natural, human intelligence to maintain the manageability of socio-natural systems at all levels of human activity and their communities, opens up completely new potential horizons for humanity" (*Standard of Living and Quality of Life*..., 2022).

In considering the threats of Industry 4.0, the authors focus the reader's attention on the most obvious and truly dangerous problems of human development. First, there is widespread precarious employment, which infringes on workers' labor and social rights in terms of working hours, regularity and dignity of wages, labor protection, vacations and social insurance. It is enough to say that in 2018, 68.6% of salaried employees of organizations had signs of precarious employment, including 61.2% of households experiencing unfavorable material well-being as a consequence of this (Bobkov, Odintsova, 2020a). The same trend is noted in the studies of the researchers of Vologda Research Center of RAS (Popov, Soloveva, 2021): among salaried employees in the Vologda Oblast, the coverage of precarious employment is 39%, among entrepreneurs and self-employed it is 28%.

The authors speak of the threat of enormous unemployment as "the combined market capitalization of companies and their revenues are rapidly increasing, while the number of employees is decreasing" (*Standard of Living and Quality of Life*..., 2022).

The undermining of labor's social function is also among the threats of Industry 4.0, especially in the remote employment. Capitalism, according to researchers, is being transformed into a so-called platform capitalism (Degryse, 2017).

The authors do not ignore the threats posed to humanity by artificial intelligence, as the work – leisure balance is destroyed (Cook, 2020), the boundaries between free time and working time are erased, which leads to a decrease in the quality of working life of employees. Cybersecurity risks are increasing manifold, etc.

The authors also call the forecasted instability of modern societies, arising from negative mental, spiritual and moral, socio-economic, political and environmental contradictions in their development and the growing social tensions, as a threat of Industry 4.0. The digitalization of the labor market is accompanied by routine technological changes, which lead to the effect of emptying "middle" professions and professional polarization, to the inequality of access to digital tools and digital

[8] Messenger J., Vargas L., Gschwind L. et al. (2017). *Working Anytime, Anywhere: The Effects on the World of Work*. Eurofound. Luxembourg: Publications Office of the European Union. Available at: https://www.eurofound.europa.eu/sites/default/files/ ef_publication/field_ef_document/ef1658en.pdf (accessed: October 24, 2022).

competencies. The problems of disequilibrium in the biosphere and ecology are not ignored by the authors.

A characteristic feature of the book is the practical component of the analysis. The authors accompany the problematic issues in each chapter or section with arguments for possible solutions to various problems. So, in this case, it is proposed to neutralize the negative effects in certain forms of employment and activities; to use macro-regulation that includes the development of science and education; to develop institutional foundations for the creation of new highly efficient jobs; and to apply new institutions for the organization of society that improve its social quality.

The impact of digitalization and the digital divide on the standard of living and quality of life is described in detail and methodologically by a group of authors. The level of digital inequality is most evident in the use of the Internet and the differentiation between urban and rural population. Digital exclusion means either a complete loss of access or a significant decrease in accessibility for the individual (Gruzdeva, 2022).

Analyzing the problem of the digital divide and the policy documents on its reduction, acting within the framework of national projects, the authors conclude that the task of reducing the digital divide is not explicitly formulated9, and therefore is not supported by indicators and their planned dynamics, i.e. the question arises of the insufficiency of the planned measures. Moreover, as studies by Vologda Research Center of RAS show, "under conditions of increasingly early exposure of children to ICTs, an increase in life expectancy, the trend toward digitalization of the economy, social sphere and public administration in the foreseeable and forecasted future, the entire population of the country will somehow need the opportunity to use at least the Internet, so as not to be excluded from most social processes. In this case, it will be possible not just to talk about the general level of the digital divide, but to differentiate it at various levels (for example, at the basic, user and professional levels) for a new understanding of the influence of different factors" (Gruzdeva, 2022).

The book's authors did not ignore such a catalyst for fundamental changes in employment as the COVID-19 pandemic, which occurred in 2020. The author's group, in their own manner, has analyzed in detail and thoroughly the trends that have emerged in the field of research interest, concerning the quality of employment and related relationships. It should be noted that in this section the new forms of employment, their pros and cons, particularly the platform employment, self-employment, remote employment are analyzed in detail. Special attention is paid to the reasons of their spreading, positive and negative moments, it is pointed out that all these new phenomena require research and managerial impacts.

Quality of life, education, precarious employment

A large research block of the monograph is devoted to the issues of the standard of living and quality of life, considered in the context of professional education and precarious employment problems. In this section the authors on the basis of the developed original toolkit of multicriteria identification of social groups by the standard of living and quality of life and assessment of the scale of population localization in them (its individual categories), identified the most vulnerable groups from the economically active population (EAP), characterized by a low standard of living and quality of life (Bobkov, Odintsova, 2020b). The research approach in identifying population groups that differ in terms of the standard of living and quality of life relies on a set of criteria that are based on social standards.

[9] Unified plan for achieving the national development goals of the Russian Federation for the period up to 2024 and for the planning period up to 2030. Available at: http://static.government.ru/media/files/j8IV1FkssLpUqI89JCXZ2mLiIiLEn7H8.pdf (accessed: October 24, 2022).

Social standards for identifying groups with low standards of living and quality of life among the economically active population based on education and employment situation

Identification criteria	Requirements of social standards
Education	Basic or secondary general education
Employment situation	1. Availability of employment
	2. Absence of precarious employment
	3. If there is employment for hire: employment, requiring basic or secondary general education (employment as unskilled workers or enlisted men)
	Signs of precarious employment
	1. Key: 1.1. No official registration of employment; 1.2. Unofficial (partial or full) employment income; 1.3. Income from employment, which in relation to the subsistence minimum of the working population (SMwp) does not reach 4.1 SMwp
	2. Additional: 2.1. Deviations from standard working time (excessive or insufficient working time); 2.2. Existence of debt on salary; 2.3. Reduced wages or reduced working time not by employee's initiative; 2.4. Forced unpaid leave by the administration initiative; 2.5. Dissatisfaction with employment conditions
Compiled according to: (Bobkov, Odintsova, 2020b).	

According to our assessment, the social standards are the authors' findings of the research group, which have scientific novelty and practical relevance. The monograph gives the minimum requirements of educational standards and employment provisions. Orientation to social standards allows developing real managerial decisions.

An example of social standards for identifying groups with low standards of living and quality of life in the economically active population, based on education and employment situation, is shown in the *Table*.

Another distinguishing characteristic of the research is the definition of criteria for precarious employment. The peculiarity of the author's approach to the identification of precarious employment is the differentiation of its features into key and additional (see Table), which makes it possible to identify the most vulnerable population groups.

The use of the toolkit developed by the authors allows identifying that more than 90% of the employed and unemployed, classified in the lower groups on the standard of living and quality of life, do not reach the minimum requirements for one or more of the criteria of material and property security: 64.3% are on two or three criteria, i.e. they and their households are characterized by absolute monetary poverty, housing poverty, and/or they have no or insufficient financial reserve; another 28.5% are on one of the three criteria.

We should note that such an approach (estimation of unstable labor relations through the number of instability signs) was also used in Vologda Research Center of RAS (Leonidova, Rossoshanskaya, 2018). With its help it was shown that the more signs of precarious employment a worker has, the less productive their labor contribution is, the less effectively their labor potential is used.

One of the peculiarities of contemporary studies on this issue is the discussion of the phenomenon of the precariat – "a numerous socio-economic group deprived of most rights and guarantees" (Popov, Soloveva, 2020). In this case, Zh.T. Toshchenko's ideas that define employment precarization as "an objective-subjective phenomenon that quantitatively

and qualitatively transforms the established practices of the population's participation in labor activity", deserve special attention (Toshchenko, 2018, p. 81). The positions of the authors of the reviewed book slightly differ from the ideas of Zh.T. Toshchenko, because the nature of the precariat, in his opinion, "is not limited to issues of the labor relations stability".

In the monograph, based on an assessment of the compliance of the employed and unemployed with the requirements of the standards, the population groups with low standards of living and quality of life are identified as the core, extended core and periphery, which together cover 42.7% of the EAP population (2018 data). It should be noted that this group includes not only the unemployed, but also the employed population (both salaried and self-employed). This observation indicates the presence of such a category as the working poor in the country. Similar conclusions are contained in the works of other researchers (Ashmarov, 2018; Leonidova, Basova, 2020; Ryabushkin, Kapelyuk, 2020).

The monitoring results of the interregional differentiation of the main indicators of the standard of living and quality of life, carried out by the monograph's authors, indicate the unevenness of the existing indicators and indicators of the standard of living and quality of life in Russia's regions, with high interregional inequality in some of them. The authors point out that by the level of absolute monetary poverty, the purchasing power of the average per capita monetary income of the population, the R/P 10% ratio, and the interregional gaps are too large within one country. This shows significant spatial disparities in the living conditions of the Russian population, threats to the country's social security and requires the development of comprehensive measures to improve the situation and raise the standard of living and quality of life of citizens in all Russian regions.

New tools for regulating the standard of living and quality of life

The section devoted to the areas of improvement of the standard of living and quality of life contains the authors' accumulated vision of the unresolved problems, despite the changes in the Labor Code of the RF on distant (remote) labor, adopted at the end of 2020. For example, E.S. Gontmakher calls the refusal to establish in the law the right of employees to be "unconnected" and the preservation in the Labor Code of the RF of the odious norm of Article 101 on the irregular working day the biggest "disappointment" of the employment amendments (Gontmakher, 2019). Unresolved issues are the regulation of distant labor, complicated by a foreign element, the application of regional norms of labor law in situations where the distant employee and the employer are located in different regions of Russia, the lack of a clear framework for legal regulation of labor through online platforms.

The monograph's authors draw attention to such an instrument of state regulation of the labor market, as the State Employment Service (SES), currently experiencing increasing competition from private recruitment agencies. One of the priorities of the SES is the organization of vocational training and additional education of unemployed citizens and job seekers. According to the authors, it is the active program, more than any other aimed at overcoming the digital divide and the digital skills formation, reducing the imbalance of supply and demand in the labor market and therefore to improve the quality of employment.

The universal basic income (UBI) is also considered as a new instrument of economic and social policy. The conditions for its implementation, according to the authors, maturing objectively as a way to resolve the contradictions of socio-economic development. The book expresses confidence that now there are opportunities to experiment with transitional forms of unconditional basic income for the most vulnerable population groups.

However, it seems that the introduction of the UBI has not only supporters, but also opponents. The latter base their opinion on the fact that the introduction of UBI is possible in such a transformation of society, when corruption disappears, when society will mature to not consider this payment as a reason to refuse to work, etc. An analysis of the literature shows that in many countries the introduction of the UBI is focused on equalizing the income of the middle class and is possible only at a high level of socio-economic development of the country.

The arguments for implementing UBI (Kislitsyna, 2019) are based on the experiences of countries where it: a) has reduced poverty and inequality, improved public health (Tanner, 2015); b) has led to job growth and reduced school dropout rates10; c) has provided income security for non-working parents and caregivers, thereby expanding their rights, especially the rights of women11.

Quite a serious problem is achieving a balance in the implementation of UBI "between, on the one hand, ensuring the satisfaction of certain minimum needs of people, solving the problem of extreme poverty, but, on the other hand, not allowing basic income to turn into the only source of livelihood" (Gontmakher, 2019).

On the development of the concept of the medium-term national program for reducing absolute monetary poverty

Taking into account the undoubted relevance of the tasks, associated with increasing real incomes, reducing poverty and social inequality, the absence of a full and comprehensive system of measures in this direction and at the same time, the expected transformation of the relevant state policy, justified by the authors of social standards of living and quality of life of Russians, the monograph presents the author's concept of the medium-term national program for reducing absolute monetary poverty. The solution to this problem directly relates to an increase in the real income of the poorest part of the Russians and is an important step toward reducing social inequality, since it raises the standard of living of the lower-income strata. The conceptual solution to the problem of reducing absolute monetary poverty is the same "designing the future", stated in the title of the collective monograph.

The concept focuses on the development of socio-economic policy measures; their resource justification and the modeling of future results are carried out. The materials of the concept, proposed by the authors, can serve as the basis for legislative decisions in the field of improving the standard of living and quality of life of the Russian population.

Conclusion

Thus, the monograph's authors have managed to convincingly and consistently analyze the phenomenon of the standard of living and quality of life, its theoretical and methodological foundations, describing its indicator components and calculated integral indices for evaluation and comparative analysis. The monograph methodologically substantiates the concept, tools, measures and prospects of reducing absolute monetary poverty.

It is necessary to note the practical value of the work (carried out by the authors). First of all, the collective monograph "Standard of living and quality of life of the Russian population: From reality to designing the future" will be of interest to a wide range of specialists, researchers involved in the study of social and labor relations and problems of the standard of living and quality of life, and also to readers, interested in the social aspects of

[10] Lucas C. (2016). These are the simple reasons why a basic income for all could transform our society for the better. *Independent*. Available at: www.independent.co.uk/voices/if-everyone-was-given-a-basic-income-it-would-probably-cost-less-than camerons-means-testing-for-a6814701.html (accessed: February 15, 2023).

[11] Universal basic income: Concepts, facts, and practices: A summary of the World Bank publication *Exploring Universal Basic Income: A Guide to Navigating Concepts, Evidence, and Practices*. Washington, DC: World Bank, 2020.

regional development. The conceptual documents, developed by the authors, can be used by public authorities in the development of appropriate social policy. Also, the materials of the monograph will be in demand in the educational process by both teachers and students (graduate students, undergraduates) of economic and sociological specialties.

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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. The monitoring is conducted by VolRC RAS in the Vologda Oblast[1].

The following tables and graphs show the dynamics of several parameters of social well-being and socio-political sentiment of the region's population according to the results of the latest "wave" of the monitoring (April 2023) and for the period from April 2022 to April 2023 (the last seven surveys, that is, almost a year).

We compare the results of the surveys with the average annual data for 2000 (the first year of Vladimir Putin's first presidential term), 2007 (the last year of Vladimir 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 Vladimir Putin's third presidential term).

We also present the annual dynamics of the data for 2018 and for 2020–2022[2].

In February – April 2023, the share of positive assessments of the RF President's work did not change significantly (61%). The proportion of negative judgments is 23–24%[3].

Over the past 12 months (from April 2022 to April 2023), the share of positive judgments regarding the work of the head of state increased by 5 percentage points (from 56 to 61%). The share of negative assessments decreased by 2 percentage points (from 26 to 24%)[4].

[1] The surveys are held six times a year in the cities of Vologda and Cherepovets, in Babayevsky, Velikoustyugsky, Vozhegodsky, Gryazovetsky and Tarnogsky municipal okrugs, in Kirillovsky, Nikolsky and Sheksninsky municipal districts. 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 surveys is available at http://www.vscc.ac.ru/.

[2] In 2020, four "waves" of the monitoring were conducted. Surveys in April and June 2020 were not conducted due to quarantine restrictions during the spread of COVID-19.

[3] Here and elsewhere, in all tables and in the text, positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 2 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

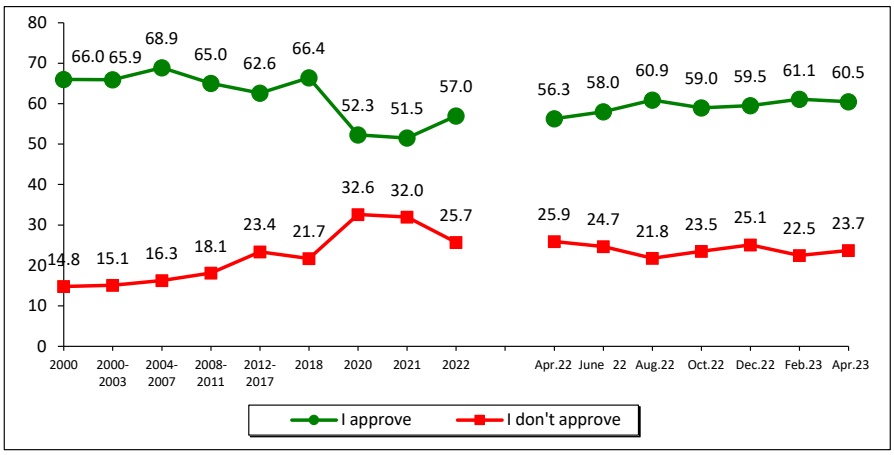
[4] Here and elsewhere in the text, the results of a comparative analysis of the data from the survey conducted in April 2023 and the results of the monitoring "wave" conducted in April 2022 are given in the frame.

How would you assess the current work of…? (% of respondents)

Answer option	Dynamics of the average annual data								Dynamics of the data for the last 7 surveys							Dynamics (+/-), Apr. 2023 to	
	2000	2007	2011	2012	2018	2020	2021	2022	Apr. 2022	June 2022	Aug. 2022	Oct. 2022	Dec. 2022	Feb. 2023	Anp. 2023	Apr. 2022	Feb. 2023
RF President																	
I approve	66.0	75.3	58.7	51.7	66.4	52.3	51.5	57.0	56.3	58.0	60.9	59.0	59.5	61.1	60.5	+5	-1
I don't approve	14.8	11.5	25.5	32.6	21.7	32.6	32.0	25.7	25.9	24.7	21.8	23.5	25.1	22.5	23.7	-2	+1
Chairman of the RF Government*																	
I approve	-*	-*	59.3	49.6	48.0	38.7	39.9	45.4	43.6	45.5	47.5	48.1	50.1	49.3	48.3	+5	-1
I don't approve	-	-	24.7	33.3	31.6	40.4	37.6	32.0	32.5	31.4	29.4	31.3	29.9	27.9	28.1	-4	0
Vologda Oblast Governor																	
I approve	56.1	55.8	45.7	41.9	38.4	35.0	36.7	40.9	38.2	41.2	43.3	43.0	45.5	47.1	48.3	+10	+1
I don't approve	19.3	22.2	30.5	33.3	37.6	42.5	40.5	35.8	37.3	34.3	32.5	33.9	35.2	33.0	32.3	-5	-1

Wording of the question: "How do you assess the current work of ...?"
*Included in the survey since 2008.

How would you assess the current work of the RF President?
% of respondents, VolRC RAS data)



Answer option	Dynamics (+/-), April 2023 to Apr. 2022	Feb. 2023
I approve	+4	-1
I don't approve	-2	+1

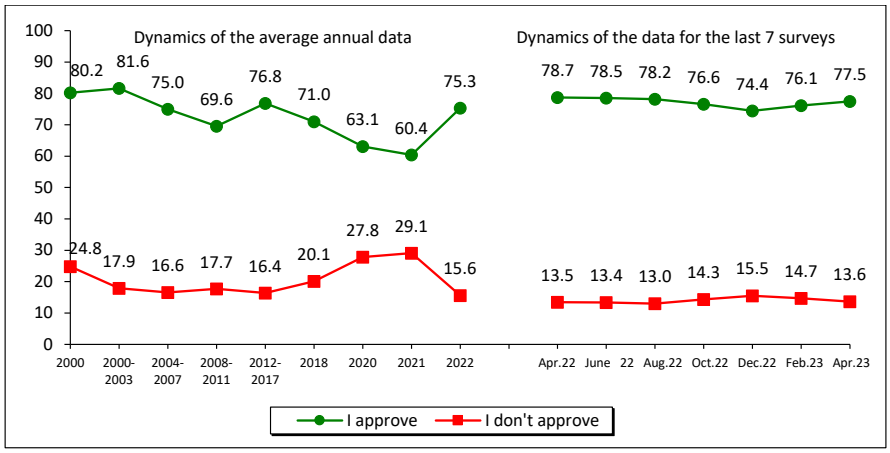
Here and elsewhere, all graphs show the average annual data for 2000, 2018, 2020, 2021, 2022, as well as the average annual data for the periods 2000–2003, 2004–2007, 2008–2011, 2012–2017, corresponding to presidential terms.

For reference:

According to VCIOM, the level of approval of the President's work from February to the first half of April 2023 increased by 2 percentage points (from 76 to 78%). The share of negative judgments did not change and amounted to 14–15%.

From April 2022 to the first half of April 2023, the assessment of President's work remained stable: the share of positive judgments is 78–79%, negative – 14%.

In general, do you approve or not approve of the work of the RF President?
(% of respondents; VCIOM data)



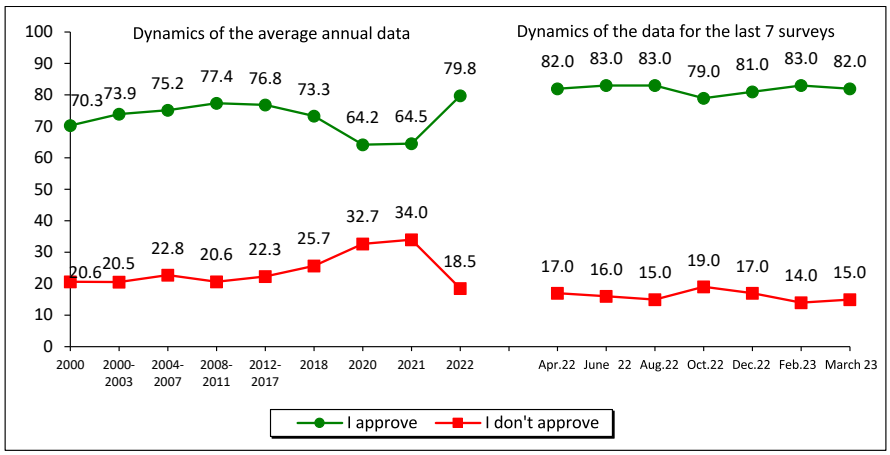
Dynamics (+/-), April 2023 to		
Answer option	Apr. 2022	Feb. 2023
I approve	-1	+1
I don't approve	0	-1

Wording of the question: "In general, do you approve or not approve of the work of the President of the Russian Federation?"
Data for April 2023 represent the average for three surveys: (April 2, 9 and 16).
Source: VCIOM. Available at: https://wciom.ru/

According to Levada-Center*, the share of positive assessments of the President's work in February – March 2023 amounted to 82–83%; the proportion of negative judgments was 14–15%.

There were no significant changes over the past 12 months: the share of positive assessments is 82%, negative – 15–17%.

In general, do you approve or not approve of the work of Vladimir Putin as President of Russia?
(% of respondents; Levada-Center* data)



Dynamics (+/-), March 2023 to		
Answer option	Apr. 2022	Feb. 2023
I approve	0	-1
I don't approve	-2	+1

Wording of the question: "In general, do you approve or not approve of the work of Vladimir Putin as President of Russia?"
Source: Levada-Center*. Available at: https://www.levada.ru

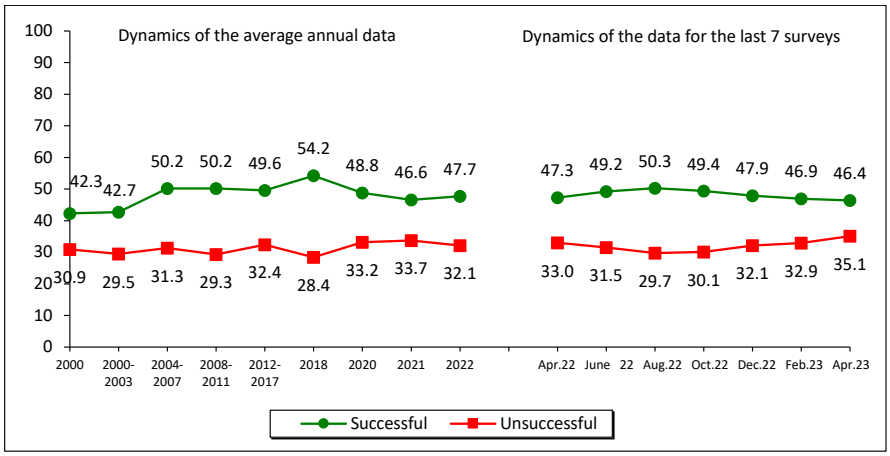
* Included in the register of foreign agents.

In your opinion, how successful is the RF President in coping with challenging issues?
(% of respondents; VolRC RAS data)

Over the past two months, the share of those who consider the RF President's work to strengthen Russia's international position to be successful did not change significantly (46–47%). The proportion of those who hold to the opposite point of view increased slightly (by 2 percentage points, from 33 to 35%).

From April 2022 to April 2023, the share of positive assessments of the President's work aimed at strengthening Russia's international position did not change and amounted to 46–47%; the share of negative judgements was 33–35%.

Strengthening Russia's international position

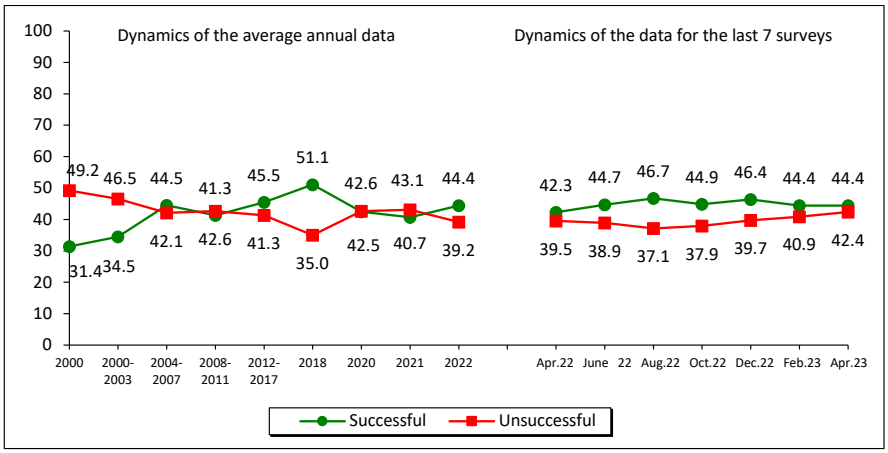


Dynamics (+/-), April 2023 to		
Answer option	Apr. 2022	Feb. 2023
Successful	-1	-1
Unsuccessful	+2	+2

In February – April 2023, the share of Vologda Oblast residents who positively assess the work of the head of state aimed at restoring order in the country was 44%; the proportion of negative judgments was 41–42%.

Over the past 12 months, the share of those who positively assess the work of the head of state to restore order in the country increased slightly (by 2 percentage points, from 42 to 44%). The proportion of negative judgments did not change (42%).

Imposing order in the country

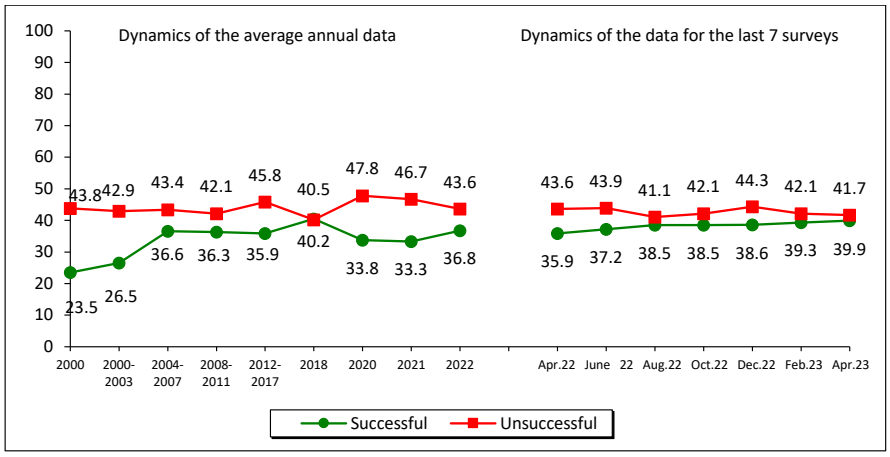


Dynamics (+/-), April 2023 to		
Answer option	Apr. 2022	Feb. 2023
Successful	+2	0
Unsuccessful	0	+2

The assessment of the President's work aimed at protecting democracy and strengthening citizens' freedoms did not change over the past two months: the share of positive judgments is 42%, negative – 39%).

From April 2022 to April 2023, the share of positive assessments increased (by 4 percentage points, from 36 to 40%) and the proportion of negative judgments decreased slightly (by 2 percentage points, from 44 to 42%).

Protecting democracy and strengthening citizens' freedoms

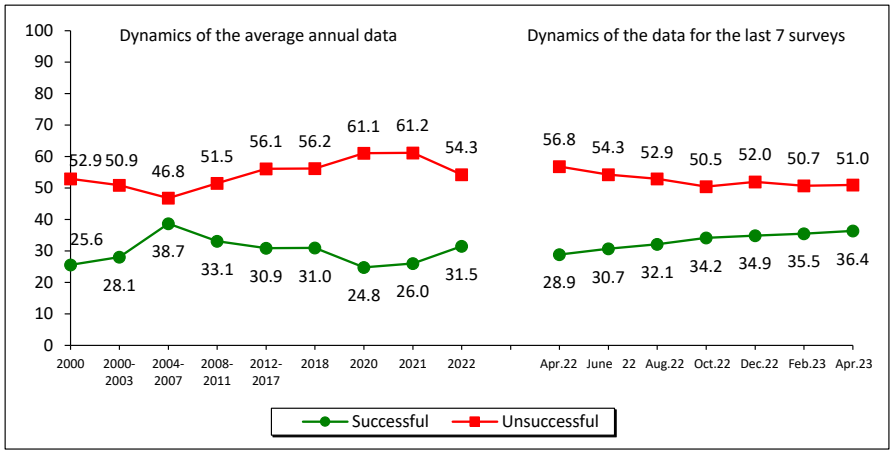


Dynamics (+/-), April 2023 to		
Answer option	Apr. 2022	Feb. 2023
Successful	+4	0
Unsuccessful	+2	+1

In February – April 2023, public opinion regarding the President's work aimed at boosting the economy and increasing the welfare of citizens did not change significantly: the share of positive assessments was 36%, negative – 51%.

Over the past 12 months, the share of positive judgments increased by 7 percentage points (from 29 to 36%), the proportion of negative ones decreased by 6 percentage points (from 57 to 51%).

Economic recovery, increase in citizens' welfare



Dynamics (+/-), April 2023 to		
Answer option	Apr. 2022	Feb. 2023
Successful	+7	+1
Unsuccessful	-6	0

The structure of political preferences of Vologda Oblast residents did not change over the past two months: the share of people whose interests are expressed by the United Russia party is 38–39%, the Communist Party – 9%, the Liberal Democratic Party – 6%, the Just Russia party – 5%, the New People party – 1–2%.

From April 2022 to April 2023, we note an increase in support for United Russia (by 4 percentage points, from 34 to 38%), as well as a slight decrease in the proportion of those who believe that none of the parliamentary parties expresses their interests (by 3 percentage points, from 31 to 28%).

Which party expresses your interests? (% of respondents; VolRC RAS data)

Партия	Dynamics of the average annual data												Dynamics of the data for the last 7 surveys							Dynamics (+/-), Apr. 2023 to	
	2000	2007	2011	Election to the RF State Duma 2011, fact	2012	2016	Election to the RF State Duma 2016, fact	2018	2020	Election to the RF State Duma 2020, fact	2021	2022	Apr. 2022	June 2022	Aug. 2022	Oct. 2022	Dec. 2022	Feb. 2023	Apr. 2023	Apr. 2022	Feb. 2023
United Russia	18.5	30.2	31.1	33.4	29.1	35.4	38.0	37.9	31.5	49.8	31.7	35.2	34.2	34.9	36.2	36.7	38.3	39.1	37.6	+4	-2
KPRF	11.5	7.0	10.3	16.8	10.6	8.3	14.2	9.2	8.4	18.9	9.3	10.1	11.2	10.2	10.4	9.9	9.3	9.5	9.3	-2	0
LDPR	4.8	7.5	7.8	15.4	7.8	10.4	21.9	9.6	9.5	7.6	9.9	7.3	7.7	7.8	6.8	6.0	6.3	5.9	6.9	-1	+1
Just Russia – Patriots for the Truth	-	7.8	5.6	27.2	6.6	4.2	10.8	2.9	4.7	7.5	4.7	4.9	4.5	4.8	4.9	4.5	4.7	4.6	4.7	0	0
New People*	–	–	–	–	–	–	–	–	–	5.3	2.3	1.5	1.3	1.6	1.9	1.1	1.5	1.3	2.1	+1	+1
Other	0.9	1.8	1.9	–	2.1	0.3	–	0.7	0.5	–	0.2	0.3	0.3	0.1	0.1	0.5	0.0	0.1	0.1	0	0
None	29.6	17.8	29.4	–	31.3	29.4	–	28.5	34.2	–	33.9	30.6	30.8	30.7	29.3	30.6	29.9	28.0	28.0	-3	0
I find it difficult to answer	20.3	21.2	13.2	–	11.7	12.0	–	11.2	11.1	–	10.0	10.1	10.0	9.9	10.5	10.8	9.9	11.4	11.4	+1	0

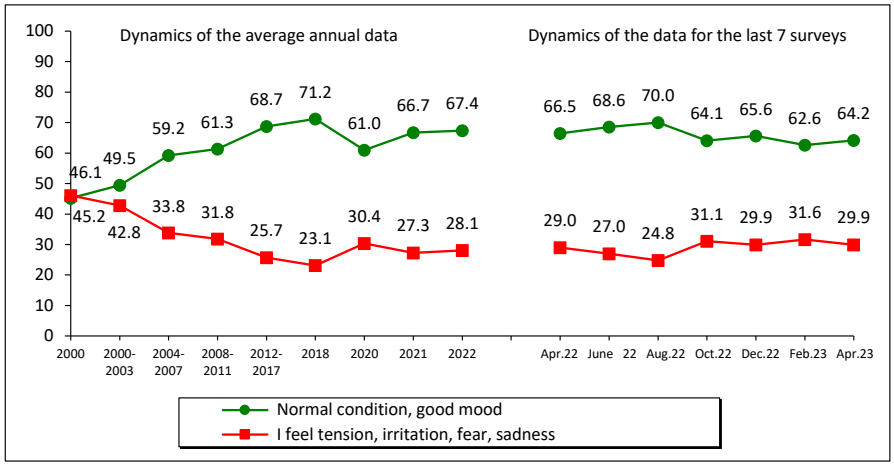
* The New People party was elected to the State Duma of the Russian Federation for the first time following the results of the election held on September 17–19, 2021.

Estimation of social condition (% of respondents; VolRC RAS data)

From February to April 2023, the share of positive assessments of social mood remained at the level of 63–64%. The proportion of those who feel predominantly negative emotions decreased slightly (by 2 percentage points, from 32 to 30%).

The proportion of people describing their daily emotional state as "normal, fine" decreased by 3 percentage points (from 67 to 64%). The proportion of those who experience mainly "tension, irritation, fear, sadness" did not change significantly (29–30%).

Social mood

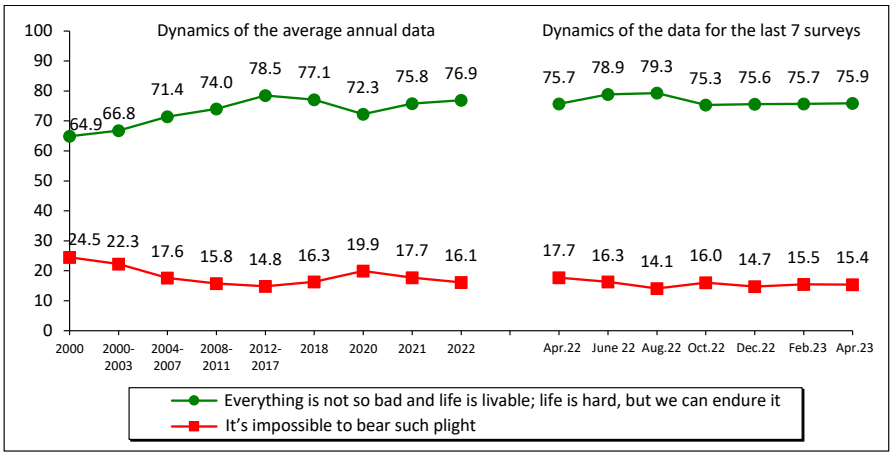


Dynamics (+/-), April 2023 to		
Answer option	Apr. 2022	Feb. 2023
Usual condition good mood	-3	+2
I feel tension, irritation, fear, sadness	+1	-2

In February – April 2023, the share of those who believe that "everything is not so bad and life is livable" (76%) and the proportion of those who note that "it's impossible to bear such plight" (15%) remained stable.

Over the past 12 months, the proportion of positive assessments of the stock of patience did not change (76%), while the share of negative judgments decreased slightly (by 3 percentage points, from 18 to 15%).

Stock of patience

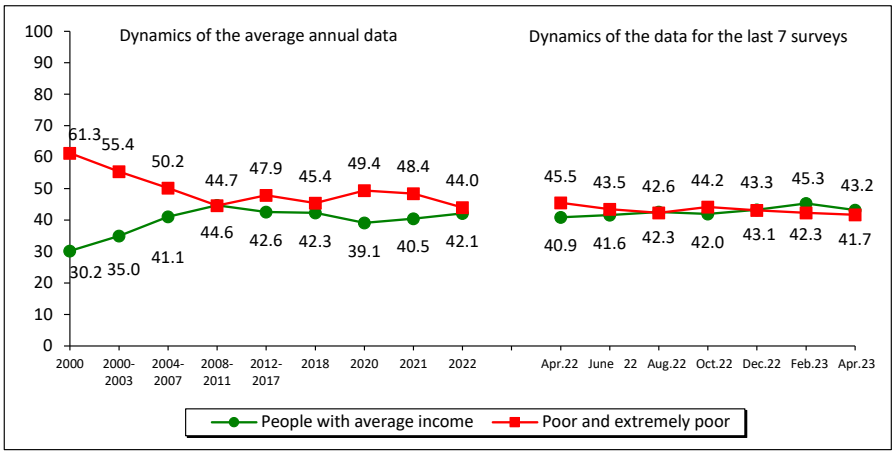


Dynamics (+/-), April 2023 to		
Answer option	Apr. 2022	Feb. 2023
Everything is not so bad and life is livable; life is hard, but we can endure it	0	0
It's impossible to bear such plight	-3	0

The proportion of Vologda Oblast residents subjectively classifying themselves as "poor and extremely poor" in February – April 2023 was 42%. The share of those who classify themselves as "middle-income" people increased slightly (by 2 percentage points, from 45 to 43%).

Compared to April 2022, mainly positive changes are noted: the share of the "poor and extremely poor" decreased by 4 percentage points (from 46 to 42%); the proportion of "middle-income" people increased by 2 percentage points (from 41 to 43%).

Social self-identification



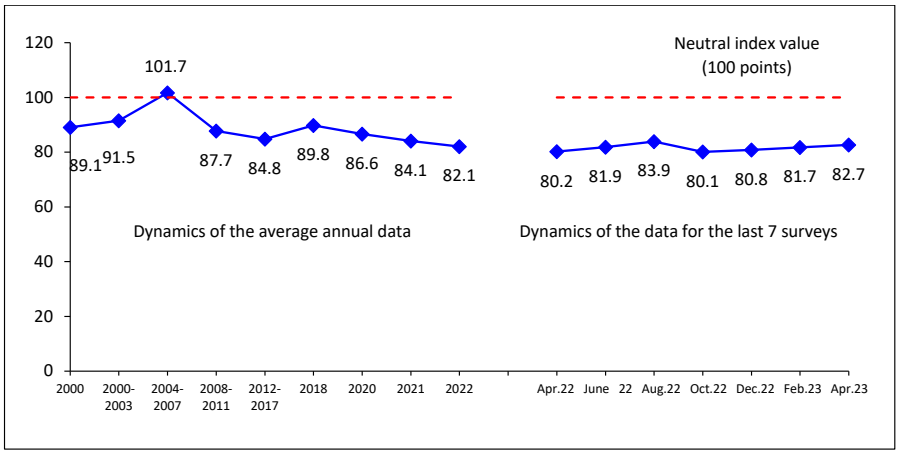
Dynamics (+/-), April 2023 to		
Answer option	Apr. 2022	Feb. 2023
People with average income	+2	-2
Poor and extremely poor	-4	-1

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

Over the past two months, the Consumer Sentiment Index (CSI) did not change; it amounted to 82–83 points.

Compared to April 2022, we note a positive trend: the CSI increased by 3 percentage points (from 80 to 83 points), which indicates an increase in people's optimistic expectations about the future of the Russian economy and their personal financial situation.

Consumer Sentiment Index
(CSI, points; data of VolRC RAS for the Vologda Oblast)



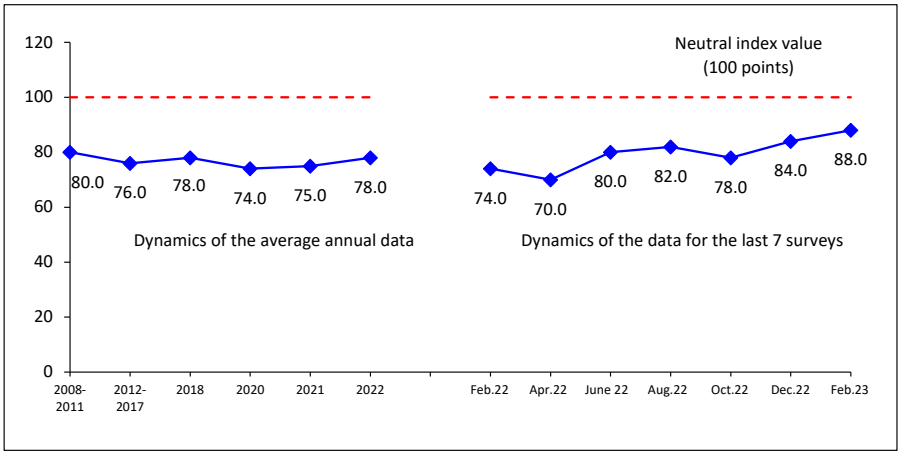
Dynamics (+/-), April 2023 to		
CSI	Apr. 2022	Feb. 2023
Index value, points	+3	+1

For reference:

According to the latest data from the all-Russian polls conducted by Levada-Center, positive changes are noted in the dynamics of the CSI for the period from December 2022 to February 2023 (the CSI increased by 4 points, from 84 to 88 points).*

For the period from February 2022 to February 2023, the CSI increased by 14 points (from 74 to 88 points).

Consumer Sentiment Index (CSI; Levada-Center* data for Russia)



Dynamics (+/-), February 2023 to		
CSI	Feb. 2022	Dec. 2022
Index value, points	+14	+4

The index is calculated since 2008.
Latest data are as of February 2023.
Source: Levada-Center*. Available at: https://www.levada.ru/indikatory/sotsialno-ekonomicheskie-indikatory/

* Included in the register of foreign agents.

Over the past two months, in 5 of 14 main socio-demographic groups, the share of positive assessments of social mood increased slightly (by 3–4 percentage points): among men, people aged 30–55, people with secondary and incomplete secondary education, people with the highest income (according to self-assessments), and residents of Cherepovets. We should also note that there are no negative changes in any of the groups.

From April 2022 to April 2023, mainly negative changes are noted in the trends of social mood. In 8 out of 14 socio-demographic groups, the share of positive assessments decreased, especially among people under the age of 30 (by 9 percentage points, from 82 to 73%) and people who, according to self-estimates of income, belong to the category of 20% of the least affluent residents of the Vologda Oblast (by 14 percentage points, from 62 to 48%).

Social mood in different social groups (answer option: "Wonderful mood, normal, stable condition", % of respondents; VoIRC RAS data)

Population group	Dynamics of the average annual data								Dynamics of the data for the last 7 surveys							Dynamics (+/-), Apr. 2023 to	
	2000	2007	2011	2012	2018	2020	2021	2022	Apr. 2022	June 2022	Aug. 2022	Oct. 2022	Dec. 2022	Feb. 2023	Apr. 2023	Apr. 2022	Feb. 2023
Sex																	
Men	50.1	65.9	64.5	69.1	72.8	60.8	65.7	66.8	68.3	67.4	69.9	65.0	64.7	62.5	65.4	-3	+3
Women	43.3	61.7	62.0	65.8	69.8	61.2	67.4	67.9	65.1	69.7	70.2	63.3	66.5	62.7	63.4	-2	+1
Age																	
Under 30	59.1	71.3	70.0	72.3	80.0	67.6	73.5	77.6	81.8	77.3	77.8	74.5	78.7	70.6	72.9	-9	+2
30–55	44.2	64.8	62.5	67.9	72.6	61.8	69.5	69.4	71.1	68.8	72.0	65.2	68.5	63.9	67.7	-3	+4
Over 55	37.4	54.8	58.3	62.1	65.2	57.4	60.5	61.1	55.2	65.3	64.6	58.7	57.2	58.1	56.9	+2	-1
Education																	
Secondary and incomplete secondary	41.7	58.4	57.4	57.2	64.8	56.1	62.1	64.6	63.0	65.8	68.5	58.9	62.7	57.2	60.2	-3	+3
Secondary vocational	46.4	64.6	63.6	66.7	72.2	63.5	66.7	68.3	69.8	70.5	71.0	65.8	64.3	63.7	65.1	-5	+1
Higher and incomplete higher	53.3	68.6	68.3	77.0	76.8	63.3	71.5	69.5	66.9	69.7	70.8	67.5	70.6	67.3	67.3	0	0
Income group																	
Bottom 20%	28.4	51.6	45.3	51.5	57.3	43.4	54.6	57.0	61.5	58.4	55.4	50.7	55.4	46.2	47.8	-14	+2
Middle 60%	45.5	62.9	65.3	68.7	71.9	62.6	67.3	68.1	64.2	70.3	73.2	65.9	66.1	62.2	64.4	0	+2
Top 20%	64.6	74.9	75.3	81.1	82.9	75.6	79.9	78.3	81.9	75.7	77.0	78.7	74.9	73.8	78.2	-4	+4
Territory																	
Vologda	49.2	63.1	67.1	73.6	71.0	60.9	60.3	59.8	60.2	61.0	61.5	55.7	57.2	54.5	56.0	-4	+2
Cherepovets	50.8	68.1	71.2	76.2	75.8	60.4	71.0	71.2	70.1	72.8	74.6	67.9	69.1	65.9	68.4	-2	+3
Districts	42.2	61.6	57.1	59.8	68.7	61.4	67.8	69.5	68.1	70.6	72.3	66.6	68.5	65.3	66.6	-2	+1
Oblast	46.2	63.6	63.1	67.3	71.2	61.0	66.6	67.4	66.5	68.7	70.1	64.1	65.7	62.6	64.3	-2	+2
Total number of positive and negative changes																0 / 8	5 / 0

TAKEAWAYS

According to the results of the next monitoring "wave", there were no significant changes in the dynamics of public opinion assessments over the past two months:

✓ **the level of support for the head of state (61%) and other federal and regional authorities remains stable (48% of Vologda Oblast residents positively assess the work of the Chairman of the RF Government and the Vologda Oblast Governor);**

✓ **there are no significant changes in the dynamics of self-assessments of the financial situation (the proportion of people subjectively classifying themselves as "poor and extremely poor" is 42%; the Consumer Sentiment Index is 82–83 points);**

✓ **there are no changes in the proportion of people who positively characterize their daily emotional state (63–64%) and have a high stock of patience (76%).**

More pronounced changes are observed in the annual dynamics (for the period from April 2022 to April 2023); we should emphasize that they are mainly positive:

✓ **there was an increase in the level of approval regarding the work of all major federal and regional authorities: the RF President – by 5 percentage points (from 56 to 61%); the Chairman of the RF Government – by 5 percentage points (from 43 to 48%); the Vologda Oblast Governor – by 10 percentage points (from 38 to 48%);**

✓ **the share of "poor and extremely poor" residents of the Vologda Oblast during the same period decreased by 4 percentage points (from 46 to 42%), the Consumer Sentiment Index, reflecting people's forecasts about the future of the Russian economy and their own financial situation, increased by 3 points (from 80 to 83 points).**

However, unfortunately, positive trends over the past 12 months have not yet been observed in the dynamics of social well-being: the share of positive assessments of social mood decreased slightly (by 3 percentage points, from 67 to 64%).

Thus, the most important changes that we see, according to the results of the monitoring, relate to two aspects, and both manifest themselves in long-term dynamics (over the past 12 months).

First, there is a gradual improvement in respondents' subjective assessments regarding the economic situation in the country and their own financial situation.

Second, it is necessary to pay attention to the positive trend in public opinion regarding the RF President addressing Russia's key domestic tasks. During the period from April 2022 to April 2023, there was an increase in the proportion of Vologda Oblast residents who note that the President is successful in boosting the economy and enhancing people's welfare (by 7 percentage points, from 29 to 36%); the share of positive judgments about the work of the head of state to protect democracy and strengthen citizens' freedoms increased (by 4 percentage points p., from 36 to 40%), as well as about his work to restore order in the country (by 2 percentage points, from 42 to 44%).

The analysis of the relevant monitoring indicators in the context of major socio-demographic groups allows us to draw the following conclusions.

1. Over the past 12 months, the number of groups in which positive changes are noted is greater than the number of groups in which negative dynamics are observed. This also applies to the assessment of the financial situation, economic situation in the country, and people's opinions about the success of the Russian President's solution of key tasks.

Dynamics of monitoring indicators reflecting self-assessment of the financial situation and assessment of the RF President's success in addressing the key tasks of the country for the period from April 2022 to April 2023 (% of respondents)

Population group	Indicators of self-assessment of financial situation						Proportion of positive assessments of the President's success in addressing Russia's key tasks											
	Proportion of the "poor and extremely poor"			CSI			Strengthening Russia's international position			Imposing order in the country			Protecting democracy, strengthening citizens' freedoms			Boosting the economy; enhancing welfare		
	Apr. 2022	Apr. 2023	+/-	Apr. 2022	Apr. 2023	+/-	Apr. 2022	Apr. 2023	+/-	Apr. 2022	Apr. 2023	+/-	Apr. 2022	Apr. 2023	+/-	Apr. 2022	Apr. 2023	+/-
Sex																		
Men	47.4	38.1	-9	79.1	82.2	+3	46.8	46.4	0	39.5	41.6	+2	33.7	38.8	+5	28.2	34.9	+7
Women	43.9	44.7	+1	81.1	83.1	+2	47.8	46.4	-1	44.6	46.6	+2	37.8	40.7	+3	29.4	37.6	+8
Age																		
Under 30	41.4	38.8	-3	85.5	89.7	+4	45.5	43.0	-3	41.4	40.7	-1	35.0	36.9	+2	27.7	31.3	+4
30–55	43.5	38.6	-5	82.5	84.8	+2	47.9	45.8	-2	40.9	44.4	+4	35.9	39.5	+4	28.0	36.3	+8
Over 55	49.4	46.7	-3	75.5	77.6	+2	47.3	48.4	+1	44.4	45.8	+1	36.3	41.3	+5	30.3	38.4	+8
Education																		
Secondary and incomplete secondary	53.5	48.6	-5	78.7	80.3	+2	45.8	45.9	0	37.7	44.5	+7	33.0	35.6	+3	25.5	32.7	+7
Secondary vocational	43.1	39.2	-4	80.0	84.5	+5	47.6	49.0	+1	42.4	45.1	+3	37.6	41.9	+4	31.3	38.2	+7
Higher and incomplete higher	37.3	38.4	+1	82.6	82.7	0	49.2	43.2	-6	49.0	43.2	-6	37.8	41.4	+4	30.2	37.6	+7
Income group																		
Bottom 20%	54.0	57.3	+3	72.2	72.6	0	35.8	26.6	-9	24.2	29.6	+5	22.6	20.1	-3	20.0	21.9	+2
Middle 60%	52.4	47.2	-5	81.0	83.9	+3	46.9	50.5	+4	44.4	43.6	-1	38.0	43.7	+6	29.6	38.1	+9
Top 20%	23.4	20.4	-3	92.5	93.3	+1	54.7	54.9	0	49.4	54.2	+5	46.0	48.0	+2	38.1	50.2	+12
Territory																		
Vologda	49.9	42.7	-7	69.5	69.3	0	42.3	35.4	-7	35.5	40.5	+5	25.2	28.6	+3	20.4	29.4	+9
Cherepovets	47.7	47.7	0	85.1	85.0	0	53.6	60.0	+6	44.2	54.1	+10	44.9	53.1	+8	34.1	47.7	+14
Districts	41.6	37.7	-4	83.4	89.1	+6	46.6	44.8	-2	45.1	41.0	-4	36.8	38.6	+2	30.7	33.9	+3
Oblast	*45.5*	*41.7*	*-4*	*80.2*	*82.7*	***+3***	*47.3*	*46.4*	*-1*	*42.3*	*44.4*	*+2*	*35.9*	*39.9*	*+4*	*28.9*	*36.4*	*+8*
Total number of positive and negative changes	**10 / 1**			**5 / 0**			**2 / 4**			**7 / 2**			**10 / 1**			**13 / 0**		

The exception is people's opinion about strengthening Russia's international position, which quite objectively reflects the real alarming situation that has developed since the beginning of the SMO.

2. Over the past year, none of the socio-demographic groups showed a deterioration in public opinion assessments concerning the dynamics of the financial situation, forecasts for the future of the Russian economy (CSI) and the work of the RF President to boost the economy and increase citizens' welfare. The only exceptions are the lowest-income (according to self-assessments) population groups, whose representatives are now more likely to classify themselves as "poor and extremely poor" (by 3 percentage points, from 54 to 57%).

In general, we think that the positive nature of public opinion trends is mostly due to the real, but largely unfounded, threats to the Russian economy that have arisen as a result of anti-Russian sanctions imposed by NATO countries. As the President noted many times[5], "the Russian economy proved to be much more resilient than the West thought", and it "has prevailed over the risks it faced", including those that "were impossible to anticipate"[6].

This, in particular, is reflected in official statistics. Thus, according to Vologdastat data, the real wages in the Vologda Oblast by the end of 2022 amounted to 100.6% of those in 2021 (for comparison, in 2021 – 98% of those in 2020[7]).

Thus, it is necessary to take into account the fact that current trends of public opinion are significantly influenced by events taking place in the international political arena. However, despite the significant complex of economic, political, and military threats that Russia has faced since the start of the SMO, there are no significant negative changes in the dynamics of population assessments on key monitoring indicators (such as assessment of the work of authorities, dynamics of living standards, and psychological well-being), both in the short and long-term dynamics.

At the same time, we cannot but note a number of population groups in which positive trends are insignificant, and negative changes are noted in the annual dynamics (first of all, people who, according to self-estimates of income, belong to the category of 20% of the least affluent residents of the Vologda Oblast, and persons with higher/incomplete higher education).

This is important information in connection with the need to further strengthen the course of internal socio-economic policy implemented by authorities at all levels (federal, regional, municipal) and aimed at maintaining the standard of living and quality of life of the general population, achieving social justice in society, ensuring social stability in difficult foreign policy conditions. We also note that the implementation of such a domestic policy by the state has become relevant due to the adoption of a new Foreign Policy Concept of the Russian Federation on March 31, 2023, which officially enshrines the status of Russia as a "unique country-civilization", which is "the core of the civilizational community of the Russian world"[8].

Materials were prepared by M.V. Morev, I.M. Bakhvalova

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[5] See, for example:

1. Vladimir Putin's joint press conference with President of Belarus Aleksandr Lukashenko, April 12, 2022. Available at: http://www.kremlin.ru/events/president/transcripts/68182

2. Vladimir Putin's speech at the plenary session of the Saint Petersburg International Economic Forum, June 17, 2022. Available at: http://www.kremlin.ru/events/president/transcripts/68669

3. Vladimir Putin's speech at the meeting of the Valdai International Discussion Club, October 27, 2022. Available at: http://www.kremlin.ru/events/president/news/69695

4. Vladimir Putin's speech at the meeting of the Council for Strategic Development and National Projects, December 15, 2022. Available at: http://www.kremlin.ru/events/president/news/70086

5. Vladimir Putin's speech at a meeting with representatives of the aviation industry, February 2, 2023. Available at: http://www.kremlin.ru/events/president/news/70484

6 Presidential Address to the Federal Assembly, February 21, 2023. Available at: http://www.kremlin.ru/events/president/news/70565

[7] Sources: Socio-economic situation of the Vologda Oblast in January – February 2023: Report. Vologdastat. Vologda, 2023. P. 69. Socio-economic situation of the Vologda Oblast in January – February 2022: Report. Vologdastat. Vologda, 2022. P. 69.

[8] Decree "On approving the Foreign Policy Concept of the Russian Federation", March 31, 2023. Available at: http://www.kremlin.ru/events/president/news/70811

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