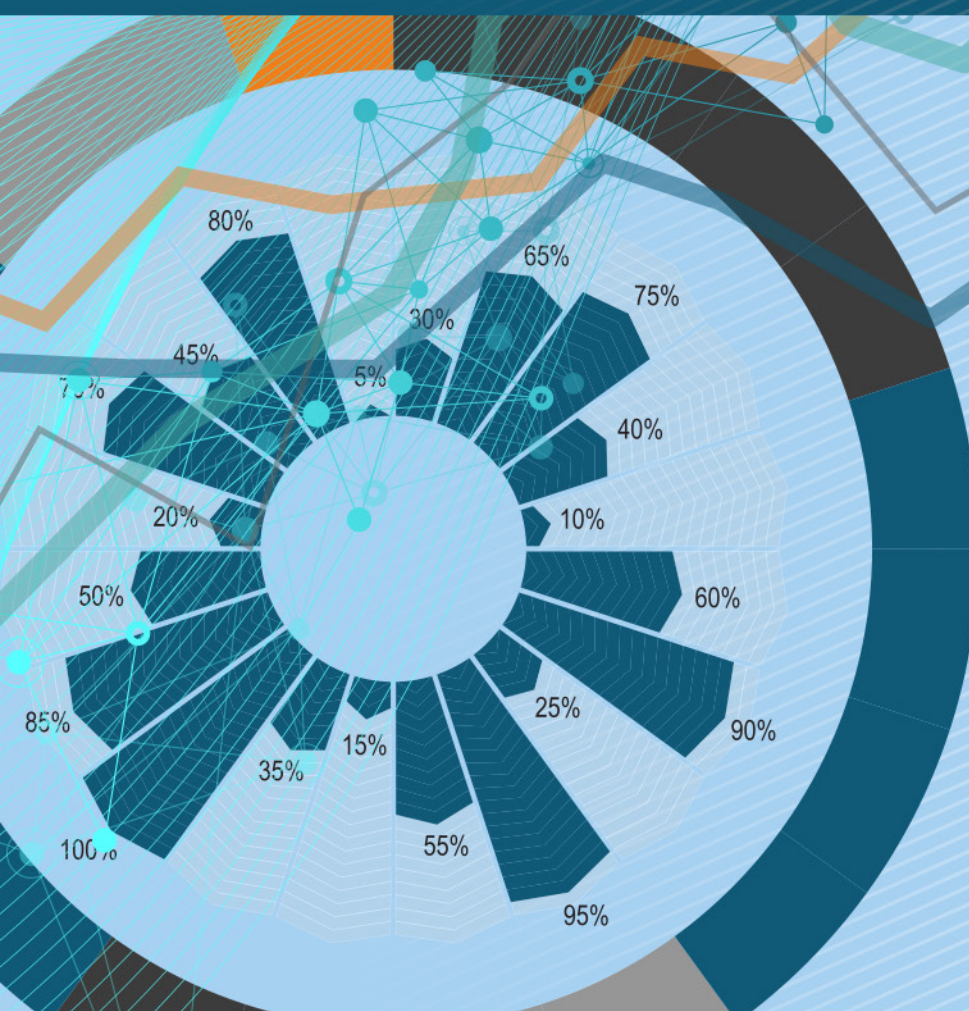# JOURNAL OF REGIONAL AND INTERNATIONAL COMPETITIVENESS

# JOURNAL OF REGIONAL AND INTERNATIONAL COMPETITIVENESS

## Scientific and practical peer-reviewed journal

**Journal of regional and international competitiveness** — theoretical and practical journal dedicated to the issues of international and regional competitiveness.

The **mission** of the journal is to spread modern economic knowledge, publish the most interesting results of scientific research in the field of regional and international competitiveness, and to serve as a helpful forum for professional discussion of a broad spectrum of fundamental problems of socio-economic development, an important tool of communication among science, education, and business.

**The Journal accepts for publication:** original articles; translations of published articles from foreign journals (with the consent of the right holder for the translation and publication); reviews; essays; reports.

# Contents

# Dear Reader!

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Scientific magazine "Journal of regional and international competitiveness" placed many relevant publications on the development of competition and the formation of competitiveness at the regional, national and international levels in 2021. It harmoniously integrated into the research agenda both Russian and Global communities. The authors and reviewers provided the publication's growth and the magazine's team promoted its transparency and accessibility.

Over the past year, the Journal received an ISSN; we concluded the agreements on the indexing of articles in the national electronic library E-library (e-library.ru) and placement of Journal issues in the scientific electronic library CyberLeninka (cyberleninka.ru); all articles and the Journal itself were assigned a digital object identifier DOI. In 2021, we also held a consultation session with representatives of the Expert Content Selection & Advisory Committee (ECSAC - RF) to promote the Journal into the international databases.

At the beginning of 2022, the "Journal of regional and international competitiveness", represented by its founder, Yaroslavl State Technical University, became a member of the Association of Scientific Editors and Publishers (ASEP).

We welcome the new members of the editorial board of the Journal: Maria Starikova, Doctor of Economics (Belgorod State Technological University named after V.G. Shukhov) and Rustem Nureyev, Doctor of Economics (Financial University under the Government of the Russian Federation).

We have three main goals for the year 2022:

- inclusion of the "Journal of regional and international competitiveness" in the list of journals recommended by the Higher Attestation Commission of the Ministry of Science and Higher Education of the Russian Federation;

- improving and automating the internal workflow of the Journal and defining sections of the site;

- increasing the number of authors, reviewers, and members of the Journal's editorial board.

Nowadays we live in a rapidly changing world. Non-economic factors are forcing us to reconsider the relevance and direction of further development of economic categories and science in general. In this regard, the issues of competitiveness in the global economic risks become completely different from the previous ones. As members of the scientific community we have to remain the voice of reason in the surrounding eventual chaos and uncertainty.

We consider it essential to continue to maintain the high quality of the Journal's published materials, to meet high international and national editorial and publishing standards, and to keep abreast of the new technologies and tools. Russia requires strong and authoritative scientific journals presenting the results of important research of scientists to the world community!

We hope to see you not only among the readers but also as authors and reviewers of our Journal.

I'd like to express my deep gratitude to all members of Journal team. There would be no development without everyone's personal contribution!

Svetlana N. Rastvortseva
Chief Editor

# New mechanisms and forms of e-commerce as a factor of improving business competitiveness

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**Abstract.** The paper examines new mechanisms and forms of e-commerce emerged during the crisis and the COVID-19 pandemic and given the impulse to the development of the online economy. It prompted entrepreneurs to transform business management practices and models to find optimal supply chains to find ways to increase competitiveness. The digital technologies become ontological while digital platforms continue to evolve through ecosystems. The online economy begins to shape new items of leadership and conditions for e-marketplace interactions in the competitive conditions. The authors focus on the analysis of the patterns influencing changes in e-commerce forms, methods and mechanisms. The aim of the paper is to identify e-commerce in the entrepreneurial ecosystem as a factor of business competitiveness. The paper dwells on the exploration of the use of new forms of entrepreneurship in e-commerce including technological one.

**Keywords:** e-commerce, fierce competition, monopolistic pressure of big capital, rivarly for the consumer, technological entrepreneurship, «low-touch economy», marketplaces, online shopping

## Introduction

2022 is characterised by the continuing pandemic of COVID-19, the economic crisis and the presence of a «low-touch economy». The socio-economic and political transformation during the COVID-19 pandemic initially led to widespread disruption in business processes: global supply chains and logistics were disrupted, borders were closed, quarantine and distant work were implemented. In this context, many businesses were forced to adopt to the new digital technologies; the pandemic expanded the range of entrepreneurial opportunities globally, which is particularly relevant for the Russian Federation. Indeed, its share of world markets for advanced manufacturing does not exceed 0.6%, nor does hi-tech in general (no more than 0.5%), with the exception of nuclear technology (16.7% of the world market) and armaments (1.2%) (Simachev et al., 2021). Nowadays there is a little involvement of Russia into global markets for advanced manufacturing due to low levels of technological entrepreneurship and modern business models, as well as low quality, non-competitiveness of many products and political biases.

Gradually adapting to the «low-touch economy» and new forms of interaction, many entrepreneurs rapidly began to digitalize business processes and accumulate large amounts of data. Artificial Intelligence (AI), robotics, blockchain and the Internet of Things (IoT) begin to penetrate e-commerce on a large scale. The search and processing of information are the main objects of activity. It prompted entrepreneurs to find optimal supply chains as quickly as possible, to adjust personnel policies, to pay more attention to employee skills, especially in business process analytics and to transform business management practices, which are major sources of the company competitive advantages. The establishment and development of digital platforms and ecosystems continued, modifying the way work is organised. The «low-touch economy» transformed the

nature of market competition, its modes and environment.

Digitalisation and the online economy become a fundamental trend in the development of global, international and most national economies; they shape new factors of leadership and competitiveness in the global marketplace, as well as conditions for effective interaction between innovative and active market participants. It is the core of e-commerce Competition, which plays a major role in improving the quality of life of the population, is intensifying. There is a fierce struggle for the consumers who want something new and different with a familiar brand from the comfort of his or her own home. Digitalisation is a guarantee of economic security and state sovereignty in the 21st century (Yudina et al., 2022).

**Methodology**

Scientists worldwide pay attention to digitalisation, entrepreneurial ecosystems, platform economies and the online economy. D. Cho, P. Ryan, G. Buchuni (Cho, et al., 2021) studied the entrepreneurial ecosystem as an institutional regulating structure. By D. Isenberg, the entrepreneurial ecosystems enhance business opportunities in e-commerce (Isenberg, 2021). P. Roundy, B. Brockman and M. Bradshaw studied the characteristics of ecosystems, their susceptibility to initial conditions of establishment (Roundy et al., 2017). E. Stam considered the entrepreneurial ecosystems spanning the regional, national and international levels and their impact on the economy and competitiveness (Stam, 2015). Freeman (2002); Lundvall et al. (2002); Cooke (2001); Spigel and Harrison (2018); Malecki (2018) focused on the creation of mobile and efficient national ecosystems and their role in the online economy. P. Jiang et al (Jiang et al., 2020) pointed e-commerce as an integral part of ecosystems.

M. Colombo et al. examined the rapidly growing innovative entrepreneurship and nascent new governance models. Also they noted the open innovation participants have significant advantages in enhancing innovativeness (Colombo et al., 2021). J. Sheth (Sheth, 2020) dwelled on the establishment of large digital platforms emerged during the COVID-19 pandemic, including the «low-touch economy» one. I.Z. Geliskhanov, T.N. Yudina studied the improving of «digital economy» business efficiency through the digital platforms (Geliskhanov, et al., 2018). The increased needs of entrepreneurs during the pandemic, not only for business success, including electronic business but also for personal well-being and health were in the focus of S. Lee and D. Lee (Lee et al., 2021). Authors agreed with P. Davidsson et al., who focused on the new opportunities for entrepreneurship, creating and offering previously unknown products and services in the COVID-19 period (Davidsson et al., 2020). C. Kirk and L. Rifkin (Kirk et al., 2020) considered the digitalisation as a faster pace in response to the «low-touch economy» as a potential transition to a new technological order and new forms of trade. Liguori and Pitts (Liguori et al., 2020) discussed the challenges of digitalisation for small businesses, their great potential in e-commerce and the resources required for this purpose.

J. Arauzo-Carod, A. Segarro-Blasco, and M. Taruel focused on the role of technology parks in the digitalisation of Spain's autonomous community, Catalonia, which are in direct proportion to the level of cluster development and innovation as a source of productivity improvement, including e-commerce (Arauzo-Carod et al., 2018). The American economist S. Sharma argued the interconnectedness of communications, computerisation and information in terms of digital economy (Sharma, 2018). The authors questioned S. Sharma's ideas about the digital economy uses ideas rather than material resources in economic activity, are controversial. F. Eggers (Eggers, 2020) explored the crisis of the economy as an opportunity to expand transformation for entrepreneurship. P. Tingvall and J. Widenward (Tingvall et al., 2018) pointed to the need to use best practice and highly skilled staff in the digital economy.

By the literature review, many researchers considered the issues of digitalisation in detail but the role of e-commerce in the business ecosystem is not sufficiently explored, especially in transition economies with resource constraints, particularly in the Russian Federation. There is a deficit of work examining the impact of e-commerce on business competitiveness. In this context, the aim of the study is to show the importance of e-commerce in the entrepreneurial ecosystem and platform economy as a factor having a huge impact on business competitiveness. The aim of this work is to consider the new mechanisms and forms of e-commerce,

both in Russia and in foreign countries. The research hypothesis is the potential of applying new forms of entrepreneurship based on the latest scientific advances, such as technological entrepreneurship, e-commerce and its use by Russian companies on a global scale, which would contribute to the competitiveness of the Russian economy. The methodology of the research is based on the application of institutional-economic, constructivist methods, general scientific methods within the framework of comparative, logical analysis and synergetic approach.

**Results**

K. Schwab, founder of the World Economic Forum and his co-author T. Mallere highlighted the obvious pandemic systems changes that were evident even before the crisis: a partial shift away from globalisation, an acceleration of digitalisation (Schwab et al., 2020). Internet innovation, the network productivity rise had a decisive impact not only on the quality of life of a huge number of people, but also on business, which resources redistributed from traditional companies to IT ones. For example, the combined wealth of the 7 richest US IT billionaires in 2021 is estimated to be $925 billion, surpassing the total wealth of all 103 billionaires from finance and investment, the 2nd most profitable industry in the ranking (Kai, 2021). The World Economic Forum 2022 viewed the «digital divide» as an imminent threat to the 3 billion people without access to the Internet (The Global Risks Report 2022).

Today companies increasingly focused on modern technology of business processes to the purchase of goods. The online economy expanded significantly during the pandemic. Banks are predominantly serving businesses and households online, cash circulation reduced significantly and importance of cryptocurrency is growing. During the pandemic many new companies emerged and started to grow rapidly thanks to the development of e-commerce: online shops (primarily marketplaces), logistics and IT companies. Many companies have significantly upgraded their facilities through the construction of modern warehouses and logistics centres and optimized their workforce.

There was a breakdown of supply chains due to the constraints of the covid pandemic. Businesses began to stockpile products, leading to a sharp demand for storage space. This led to the emergence of a new format of warehouse real estate – fullfilment centres, combining the role of a conventional warehouse and a factory-sorting facility for shipping orders to online shoppers. They become the core elements of the marketplaces supply chains and have shortened the time it takes for customers to receive their orders, creating a huge demand for automation and robotisation, which has long been held back by the low labour cost in the Russian Federation. The pandemic along with the economic crisis were a triggers for the instant growth of automation and robotised warehousing and the proliferation of e-commerce, increasing the quality and comfort of life.

Nowadays, manufacturers try to reach consumers with a high degree of engagement at a low cost of online advertising. The information technology is making a huge difference in terms of remembering individual consumer choices. It allows to study and form users' preferences in detail along with creating a positive brand image for the products and improving company's brand awareness. Ultimately it leads to increased competition for suppliers of goods and services.

To be competitive retailers and producers need to understand not only the consumers' needs but also the benefits of the product's delivery mode, its packaging and the ways of cost cutting. Harvard Business School economist M. Porter, one of the leading experts in the field of competition studies, identified 3 main competitive strategies: 1. cost leadership strategy; 2. differentiation strategy; 3. focus strategy (Porter, 2003). The cost leadership strategy lies in a firm's ability to set low prices and occupy a significant market share. For example, the discounters chains Svetofor, Dobrotsen and Fix Price started not only to sell cheaper goods, but also to deliver them to the consumer with high operational efficiency. The development of online sales is their additional option.

They generate profits through cost-cutting and efficient use of retail stores space. Also they save on shop decoration, so their outlets resemble shopping warehouses. The differentiation strategy is based on selling goods to a specific category of customers seeking to rationalise demand. The focus strategy is to better satisfy customers than competitors. As a result, hard discounter (low-price shop) sales in 2021 grew by more than

35% to more than RUB 620 bn (with overall food sales up 11.1% to RUB 18.4 trillion), and their share of total retail sales in the country increased from 2.8% to 3.4%. Svetofor was the best one (Ganzhur, 2021). Such shops provide the customer's sustainable consumption, which is becoming a trend not only in Russia, but even in Europe, where Svetofor started its shops, too.

In analysis, in order to achieve competitive advantage, it is essential to choose the right competitive strategy in a particular market segment; to form new business models; to adapt immediately to changes in the external environment; to sell innovative, competitive and low-cost products; to have mobile, modern logistics and AI capabilities to handle substantial amounts of information; to make efficient use of human resources capacity; and to manage the market situation through price changes, which is particularly important during crisis and pandemic, when there is a decline in living standards of the majority of the population.

A company's choice of strategy also depends on the global, national and market situation in a large extent. In the pandemic, for example, many companies began making home deliveries, which increased sales and customer loyalty to the outlet. Underpricing is aimed at capturing as much of the market as possible. The company must have large production capacities accessible for the network only. Digitalisation is not only changing the structure of economies and business models, but there is also a rapid increase in digitalisation of consumers, which is country-specific. For example, in the USA 81.6% of population use computers, in compare with 77.0% of Germany and 68.5% of Russia (Top Countries by Smartphone Users, 2021).

Digitalization technologies closely related to the new services and digital products are developing rapidly. Today, the IoT or technological networks of systems and platforms interacting with each other and the external environment is increasingly important for both businesses and users, leading to optimisation of business processes, improved interaction between suppliers and consumers, increased resource efficiency and cost reductions. The IoT was relatively slow in the period up to 2020, but now it is increasingly penetrating the lives of individuals. The current rapid development of the industrial and consumer IoT transforms the patterns and modes of interaction between subjects and objects.

One of the leaders of the IoT is the Canadian business smartphone company BlackBerry, which started working in the field of wireless data in 1984 and started the online smartphone shop in 2009. Today BlackBerry Limited leads the US smartphone sales, its capitalization is $ 6.88 bn. The main competitive advantage of this company is a very high level of data protection. That is why about half of Forbes' top businesses use its cybersecurity technologies. Its products are popular in the most countries of the world. It has active partnerships with the Google, Amazon and Microsoft cloud platforms.

Traditionally, the four US technology companies – Google, Apple, Facebook and Amazon (so called, GAFA) and two Chinese companies – Alibaba and Tencent – are considered the largest international ecosystems working at different platforms together. Accessible markets with high-developed infrastructure and quality human capital of staff are some of their most important components. They are increasingly influencing the global economy through financial strength and a large number of customers, including the online commerce sector. The American multinational corporation Google began by developing search. Nowadays it is a multinational retailer, thanks to a perfectly functioning supply ecosystem and high-established supply chains. Google operates more than 1 million servers in data centres around the world and spends $200 - $250 mln annually on IT equipment.

Entrepreneurial ecosystems (EEs) and digital platforms (DPs) are increasingly influencing the development of entrepreneurship and shaping its new business opportunities, including e-commerce. DPs are a web-based IT system facilitating the team action of platform members, enabling the instant exchange of external resources and innovation to create new products and services. They promote technological entrepreneurship. Its competitive edge is based on an innovative high-tech idea. The shift to a platform economy is driven by the exhaustion of the potential of traditional business models and the urgent need to break down geographical boundaries, leading to the rapid distribution of goods and services around the world. As a result, today digital platforms and the platform ecosystems transform entire industries and various types of socio-economic activity, becoming drivers of economic growth, innovation and competition (Geliskhanov, 2018).

Digital platforms not only provide fast and high-quality communications, but also focus comprehensive user information and lower barriers to market entry. In the digital economy data become a form of capital. However, economic advantages can only be obtained by those firms that have effective business technologies and ways of processing them. Initially, the platforms originated as advertisements for goods, but over time they have evolved into technology giants that set the «rules of the game». Services provided through Internet platforms save a great deal of time searching for goods, and linking multiple platforms into an ecosystem allows users to enter a single password and login across platforms, which increases the speed of shopping and quality of life.

The Bank of Russia considers SBER as the largest platform in the Russian Federation. It is continuously building up its non-financial services ecosystem by acquiring companies in various sectors of the economy. The core of the ecosystem are SberX and a number of research labs (Robotics, Blockchain, Artificial Intelligence) responsible for coordinating complex ecosystem development in terms of shaping a better customer experience (Ecosystems, 2021). The analysis of SBER's ecosystem establishment shows the constant growth of the new start-ups. They contribute to the credibility of its business environment, supporting small businesses, analysing business inventories, entering into partnerships of all kinds, and creating joint ventures with other companies. SBER is currently completing the creation of a box solution for an online shop, enabling entrepreneurs to put their goods on the shelves of all kinds of marketplaces very quickly. It forms an online trading holding company and divides its ecosystem into two: for business and for people. SBER's activities can be classified as technological entrepreneurship, based on an innovative high-tech ideas. The contribution of technological entrepreneurship to a country's economic development is reflected in the emergence of start-ups, the rapid growth and adoption of innovation and technology and the creation of new businesses and jobs.

SBER studies and analyses the market in detail, taking into account the needs of both corporate clients and the ordinary people. It also actively develops the own marketplace SberMegaMarket. SBER announced plans to invest about $3 bn into logistics for e-commerce development in 2022-2023 (Skrynnikova, 2021). Thus, SBER creates a new network – a virtual ecosystem that will revolutionize the structure. However, while SBER's net income rose 1.7 times in 3Q of 2021, approaching RUB 1 trillion, the ecosystem business is still making a loss for the 3Q in a row. Whereas SBER's global objective is to increase the share of non-financial businesses in its revenue. SBER invested $2 bln in the ecosystem development (Arutyunov, 2021). Although in many countries, financial institutions are prohibited from non-financial activities of financial companies.

VK (former Mail.Ru Group) is forming an ecosystem of more than 200 projects from its assets and services. Recently Pixonic, Yula, and taxi aggregator Citymobile emerged their own autonomous ecosystems. Delivery Club is very popular in the segment of food and grocery delivery. VK is going to invest more than $60 mn into online shop AliExpress Russia (Skrynnikova, 2021).

The COVID-19 pandemic and the «low-touch economy» accelerated the use of remote communication channels leading to a huge increase in online ordering of goods and services. During the COVID-19 pandemic, for example, online retailer Wildberries significantly increased its sales and became the number one Russian retailer in terms of turnover, which in 2021 was RUB 844 bn, approximately 1.9 times higher than the second largest Russian marketplace Ozon (Yuzbekova et al., 2021). There are 14 million people shopping on Wildberries every day. The fortune of T. Bakalchuk, the main owner of the Wildberries online shops, is estimated at $13 bn. Forbes ranked her 13th, she bacame the 2021 leader in terms of percentage of wealth growth (Tairov, 2021). Wildberries builds distribution centres in many areas of the country and recently acquired its own bank. The largest sales volumes were in digital appliances, electronics, accessories, children's goods, clothes and shoes. The market of online sales of clothing and footwear in Russia increased to 21% of the total online market. It developed business models differ from those in Europe. For example, in Russia there are «try-on» orders, whereas in the West there is a after purchase return practice. There is a common practice to pay after purchase in the Russian Federation, whereas in other countries prepayment is valid.

The Ozon marketplace is not yet focused more on profits, but on building infrastructure, R&D, investing and developing new areas, IT, marketing, building large warehouses (for example, in the Orientir West logistics park on the Novorizhskoye Highway in Moscow) and the Ozon Express fast delivery service, i.e.

there is fighting for the consumer. At the same time, the company's costs per order have fallen even though their volumes at Ozon have increased significantly (Skrynnikova, 2021).

E-commerce platforms are becoming increasingly important in the digital economy. For example, the online marketplace is the intermediary between supplier and buyer. It is an innovative way of organising sales and can be described as a type of technological entrepreneurship. Today, marketplaces define the dynamics of the online commerce market. The competitive advantage is based on an innovative high-tech ideas, and the creation of new products and services is linked to the use of scientific knowledge and technology. Marketplaces provide information about third-party products or services, offering customers a website to sell products from various companies. They also facilitate the exchange of new information between businesses and enable better analysis of offers and competitors. Famous Chinese ecosystem Alibaba, which has over 65 million users from 240 countries and is one of the largest sources of borrowing customers for the Chinese banking sector, also grew out of a commodity marketplace (Kheifets et al., 2021).

The main business model of the e-economy is Business-to-Customer – B2C, conducting e-commerce between legal entities and individuals. Many of the same products are sold online from different sellers, but they are priced differently. For example, clothes are sold at online shops like Lamoda.ru, Ozon.ru, Beru. ru (SBER and Yandex marketplace), Yandex Market, etc. As marketplaces bring together products from a wide range of suppliers and each manufacturer has its own page, the choice of products here is very wide. In addition, the user has fairly comprehensive information on the product suppliers, increasing the credibility.

The increased investment into the logistical infrastructure of the marketplaces made it possible to cover remote areas with online retail. For example, the new universal platform of the Novosibirsk footwear company OR Group is being integrated into the logistics infrastructure of the online shopping market and works with the e-commerce marketplace leader Wildberries (Kalyanina, 2022).

The widespread development of marketplaces provides small and medium-sized businesses with the potential to enter the market on a national scale and ensures their survival and profitability in times of crisis. Marketplaces contributes the increase of the small businesses activity. They set up personal pages to sell goods in online shops and open departments in shopping malls. According to Wildberries study in 2021, the share of young entrepreneurs under 25 selling through the marketplace increased 2.5 times, driven by the growth of digitalisation. About half of the entrepreneurs present on the marketplace buy goods from Russian producers or make them themselves. Almost half of them increased their sales in 2021 by 10-100%, and 15% of the sellers doubled the income (Kalyanina, 2022).

During the COVID-19 pandemic producers from the Russian Federation also began to increase their exports through marketplaces. Its main share consists of is food, drinks and alcohol. For example, the first 10 months of 2021 Wildberries increased the export turnover of Russian entrepreneurs by 44% and reached RUB 29 bln. (Novikova, 2021). Marketplaces operate on a cross-border system allows goods to be sold by storing them in one country and sending them out all over the world. The development of e-commerce makes it possible to widely advertise products unfamiliar to foreign consumers and to inform them about their storage, consumption and effects on the human body.

Today, all retailers operating offline have set up their own online shops, increased their presence on marketplaces and enter the market with their own platforms. Wholesale marketplaces started to appear. Thus, by the initiative of the Russian Union of Entrepreneurs of Textile Industry, a wholesale marketplace, Legprom. cloud was formed. It serves as a platform for attracting suppliers and manufacturers in this sector, in order to create synergies. A single digital marketplace enables the expansion of markets and the reduction of costs. Many companies today are constantly looking for the business partners. Foreign businesses are shown interest to the project. For example, IKEA produces up to 60% of the products sold in Russia and plans to increase it up to 80% by 2025 (Inkizhinova, 2021).

**Discussion**

The hypothesis of the study concerning new forms of entrepreneurship based on the innovative science and practice, such as technological entrepreneurship, can be used in e-commerce was confirmed. The results

of the study agree with the works of P. Jiang (Jiang et al., 2020) and M. Colombo (Colombo et al., 2021), who noted the great importance of innovativeness and modern logistics in e-commerce.

However, there are no institutions in the Russian Federation to support technological initiatives and start-ups, which is the basis for technological entrepreneurship. The potential for Russian companies to use e-commerce on a global scale has also been confirmed. However, the products of Russian firms engaged in electronic commerce abroad are not yet widely accepted in most countries. Many companies have a weak competitive advantages. In most cases, they are lacking accessible markets with high-developed infrastructure and quality human capital, a high-established supply chain and a large customer base.

In terms of e-commerce and digitalisation in general, there is an evolution of forms of capital influenced by digital technology. But along with real capital, fictitious, virtual, digital capital, primarily represented by securities on financial markets, is becoming increasingly important and serves as a source of crises (Katasonov, 2015). IT systems lead to a significant increase of the supplier company power. Competition for resources and markets both globally and within national economies is intensifying. Competition between firms increasingly turns into fierce competition. There is fierce competition among companies for government contracts in the USA, China and the Russian Federation. The leaders of many countries force national businesses to comply with the geopolitical interests of the state, even at times to the detriment of their profits. The role of the state increases and competition becomes manageable. In the US, for example, the authorities, by of geopolitical interests, force businesses to turn down profitable international contracts, while companies spend huge sums on political lobbying. Consequently, the economy is increasingly subject to monopolistic pressures from big capital, which benefits from state support. The centralisation of capitalism increases and A. Smith's «invisible hand» turns to monopolies.

### Conclusion

Digital technology, e-commerce become not only an alternative form of communication for online users but also institutions that supply them with a wide range of products both Russian and foreign. By purchasing quickly they not only save time but also gain access to brand information and have the opportunity to learn public opinion on the quality of these products. E-commerce contributes to the development of small and medium-sized businesses and thanks to modern technology and new mechanisms increases a firm's competitiveness. Emerging as an anti-crisis measure, the «low touch economy», including e-commerce, transformed the way companies operate, shifting the focus from chasing efficiency by eliminating weaknesses, to building resilience and competitiveness through investment into innovation. The way of compete changed, transactions became digital rapidly, and the pace of new technology adoption increased dramatically, as radical change sometimes leads to cutting-edge innovation. Another trend in the Russian Federation today is the acquisition of e-commerce businesses by banks, while marketplaces have started to buy their own banks.

### References

1  Simachev, Yu., Fedyunina, A., Yurevich, M., Kuzyk, M., & Gorodny, N. (2021). New Strategic Approaches to Gaining from Emerging Advanced Manufacturing Markets. *Foresight and STI Governance*, *15*(3), 6-21(in Russian).

2  Yudina, T. N., Aleshkovski, I. A., & Balashov, A. M. (2022). The COVID-19 pandemic as a catalyst for expansion of digital business. *IOP Conference Series: Earth and Environmental Science*, *741*, 147-152.

3  Cho, D. S., Ryan, P., & Buciuni, G. (2021). Evolutionary entrepreneurial ecosystems: A research pathway. *Small Business Economics*, 1–19. https://doi. org/10.1007/s11187-021-00487-4.

4  Isenberg, D. (2021). How to start an entrepreneurial revolution. *Harvard Business Review*, 88(6), 40–50.

5  Roundy, P. T., Brockman, B. K., & Bradshaw M. (2017). The resilience of entrepreneurial ecosystems. *Journal of Business Venturing Insights*, *8*, 99–104.

6  Stam, E. (2015). Entrepreneurial Ecosystems and Regional Policy: A Sympathetic Critique. *European Planning Studies*, *23*(9), 1759–1769.

7  Freeman, C. (2002). Continental, National and Sub-national Innovation Systems – Complementarity and Economic Growth. *Research Policy*, *31*(2), 191–211.

8  Lundvall, B.-Å., Johnson, B., Sloth, E., & Dalum, A. B. (2002). National systems of production, innovation and competence building. *Research Policy*, *31*(2), 213–231.

9  Cooke, P. (2001). Regional Innovation Systems, Clusters, and the Knowledge Economy. *Industrial and Corporate Change*, *10*(4), 945–974.

10  Spigel, B., & Harrison, R. (2018). Toward a process theory of entrepreneurial ecosystems. *Strategic Entrepreneurship Journal*, *12*(1),151–168.

11  Malecki, E. J. (2018). Entrepreneurship and entrepreneurial ecosystems. *Geography Compass*, *12*(3), e12359.

12  Jiang, P., Jiang, H., Hu, Y. C., Liang, C., & Wang, S. (2020). Identification of Key Factors Affecting Logistics Service Quality of Cross-border E-commerce. In: F. H. Nah, K. Siau (Eds.), *HCI in Business, Government and Organizations. HCII 2020. Lecture Notes in Computer Science*, *12204*, 384–396. DOI: 10.1007/978–3-030–50341–3_30.

13  Colombo, M., Dagnino, G., Lehmann, E., & Salmador, M. (2021). The governance of entrepreneurial ecosystems. *Small Business Economics*, *52*(2), 419–428. https://doi.org/10.1007/s11187-017-9952 (accessed 12.12.2021).

14  Sheth, J. (2020). Impact of COVID-19 on consumer behavior: Will the old habits return or die? *Journal of Business Research, 117*, 280–283. https://doi.org/10.1016/j.jbusres.2020.05.059 (accessed 02.02.2021).

15  Geliskhanov, I. Z., & Yudina, T. N. (2018). Digital platform: A new economic institution. *Quality Access to Success*, *19*(2), 20–26.

16  Lee, S. M., & Lee, D. (2021). Opportunities and challenges for contactless healthcare services in the post-COVID-19 Era. *Technological Forecasting and Social Change*, *167*(4), 120712. https://doi.org/10.1016/j.techfore.2021.120712 (accessed 03.10.2021).

17  Davidsson, P., Recker, J., & von Briel, F. (2020). External enablement of new venture creation: A framework. *Academy of Management Perspectives*, *34*(3), 311–332. https://doi.org/10.5465/amp.2017.0163 (accessed 13.11.2021).

18  Kirk, C. P., & Rifkin, L. S. (2020). I'll trade you diamonds for toilet paper: Consumer reacting, coping and adapting behaviors in the COVID-19 pandemic. *Journal of Business Research*, *117*(2), 124–131. https://doi.org/10.1016/j.jbusres.2020.05.028 (accessed 23.12.2021).

19  Liguori, E. W., & Pittz, T. G. (2020). Strategies for small business: Surviving and thriving in the era of COVID-19. *Journal of the International Council for Small Business*, *1*(2), 106–110. https://doi.org/10.1080/26437015.2020.1779538 (accessed 25.10.2021).

20  Arauzo-Carod, J., Segarra-Blasco, A., & Teruel, M. (2018). The role of science and technology parks as firm growth boosters: an empirical analysis in Catalonia. *Regional Studies*, *52*(5), 645–658. https://doi.org/10.1080/00343404.2018.1447098 (accessed 24.12.2019).

21  Sharma, S. (2018). Internet Economics. Retrieved from https://books.google.com/*books*?hl=en&lr=&id=PQZGJnKH4KwC&oi=fnd&pg=PR11&dq=McKnight+Internet+economics&ots=Glf9CX-2pht&sig=XTdAwuHAaa MzQG8sCYLYaQoLODY#v=onepage&q=McKnight% 20Internet%20economics&f=false (accessed 20.10.2019).

22  Eggers, F. (2020). Masters of disasters? Challenges and opportunities for SMEs in times of crisis. *Journal of Business Research*, *116*(1), 199–208. https://doi.org/10.1016/j.jbusres.2020.05.025 (accessed 25.11.2020).

23  Tingvall, P., & Videnord, J. (2018). Regional differences in effects of publicly sponsored R&D grants on SME performance. *Small Business Economics*, *54*(4), 951–969. https://doi.org/10.1007/s11187-018-0085-6 (accessed 23.01.2020).

24  Schwab, K., & Malleret, T. (2020). *Covid-19: The Great Reset*. Geneva: Forum Publishing.

25  Kai, K. (2021). *The richest US IT billionaires 2021. Forbes rating.* Retrieved from https://www.forbes.ru/milliardery/442375-samye-bogatye-it-milliardery-ssa-2021-rejting-forbes?utm_source=telegram&utm_medium=social&utm_campaign=it-milliardery-otdel (accessed 02.12.2021) (in Russian).

26 *The Global Risks Report* (2022). (17th ed.). World Economic Forum.

27 Porter, M. (2003). *Competitive strategy. Methodology for analyzing competitor industries*. M.: Alpina Business Books.

28 Ganzhur, E. (2022). *Income poverty: sales of hard discounters grew by 35% in a year*. Retrieved from https://www.forbes.ru/biznes/454969-dohodnaa-bednost-prodazi-zestkih-diskaunterov-za-god-vy-rosli-na-35utm_source=telegram&utm_medium=social&utm_campaign=krupnejshie-retejler (accessed 02.12.2022) (in Russian).

29 *Top Countries by Smartphone Users*. Retrieved from https://newzoo.com/insights/rankings/top-countries-by-smartphone-penetration-and-users (accessed 02.12.2021).

30 *BlackBerry Limited (BB)*. Retrieved from https://finance.yahoo.com/quote/BB/?guccounter=1&guce_referrer=aHR0cHM6Ly9ydS53aWtpcGVkaWEub3JnLw&guce_referrer_sig=AQAAANOtDJjdYeD-5qu7A4iZeqMD6DEWcYBi25096cHVVRTrSWoBHFlECys4cYBiszp0b2Lbm3KxOp8XeZHciIMzItRWK-Ckq11eycQtCdCMNH4tXbY5HI1zeipRLQq4Hm9aW8dB8jVxLfD62BrU2OUIXQ0K81oU1qX3_ggqy6T-jP8fc_L (accessed 02.12.2021).

31 Barron's. *Ranking The Big Four Tech Stocks: Google Is No. 1, Apple Comes In Last*. Retrieved from https://www.barrons.com/articles/ranking-the-big-four-internet-stocks-google-is-no-1-apple-comes-in-last-1503412102 (accessed 12.12.2021).

32 Pandia. *Google: One Million Servers And Counting*. Retrieved from http://www.pandia.com/articles/gartner (accessed 12.12.2021).

33 *Ecosystems: Regulatory approaches. Consultative report* (2021). M.: Bank of Russia (in Russian).

34 Skrynnikova, A. (2021). *Why Ozon continues to spend money on fighting for customers instead of making a profit*. Retrieved from https://www.forbes.ru/tekhnologii/446185-pocemu-ozon-prodolzaet-tra-tit-den-gi-na-bor-bu-za-klientov-vmesto-polucenia-pribyli?utm_source=telegram&utm_medium=social&utm_campaign=obem-oborota-tovarov (accessed 25.12.2021) (in Russian).

35 Arutyunov, A. (2021). *Sberbank almost earned 1 trillion. rub: what will be the next goal*. Retrieved from https://www.forbes.ru/finansy/444431-sberbank-pocti-zarabotal-rub1-trln-kakoj-budet-sleduusaa-cel?utm_medium=email&utm_source=UniSender&utm_campaign=262715021 (accessed 12.12.2021) (in Russian).

36 Yuzbekova, I., & Skrynnikova, A. (2021) *Grow at the same pace: why Ozon shares have risen in price*. Retrieved from https://www.forbes.ru/investicii/454433-rasti-temi-ze-tempami-pocemu-podoroza-li-akcii-ozon?utm_medium=email&utm_source=UniSender&utm_campaign=265926970 (accessed 05.12.2021) (in Russian).

37 Tairov, R. (2021) *The richest woman in Russia overtook the world's billionaires in terms of wealth growth in 2021*. Retrieved from https://www.forbes.ru/milliardery/448903-bogatejsaa-zensina-rossii-obo-sla-mirovyh-milliarderov-po-rostu-sostoania-v-2021-godu?utm_source=telegram&utm_medium=social&utm_campaign=bogatejshaya-zhenshh (accessed 02.11.2021) (in Russian).

38 Kheifets, B. A., & Chernova, V.Yu. (2021). Role of China in globalization of the world economy. *Rossiva i sovremennyj mir*, (2), 100-120 (in Russian).

39 Kalyanina, L. (2022). Bachata instead of waltz. *Expert*, (3), 24-27 (in Russian).

40 Novikova, E. (2021). Marketplaces open markets. *Expert*, (4), 24-27 https://expert.ru/expert/2022/04/marketpleysy-otkryvayut-rynki/ (in Russian).

41 Inkizhinova, S. (2021) Light industry in the catalog. *Expert*, (40), 20-21 (in Russian).

42 Katasonov, V. Yu. (2015). *Capitalism. History and ideology of "monetary civilization"*. M.: Institut Russkoi Civilizacii (in Russian).

# The impact of taxes on competitiveness of modern Russian economy

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**Abstract.** The article examines the relationship between taxes and organisational competitiveness, through the redistribution of national income, the fiscal function of taxes and the economical stimulation of production. One of the most effective forms of modern economic management, including those affecting the competitiveness of economic agents, is state fiscal regulation. Taxes, by participating in the redistribution of new value, are part of a single process of reproduction, a specific form of production relations. Fiscal regulation covers the economic life of a country, the structure of production, capital formation, personal consumption, and the very competitiveness of economic agents, since tax measures are the most universal tool for influencing superstructure relations on the basis. In addition to the financial function of securing government revenue, the fiscal tools contain enormous potential for economic impacts on the economic agents competitiveness.

**Keywords**: taxes, competitiveness, tax system, economic relations, tax policy, fiscal tools.

### Introduction

In a market, the basis of an organisation's success is the quality of its products, and the businesses compet for the quality with each other. The sale of a product means that it satisfies consumers in terms of its consumer properties. Competitiveness is the matching of the properties and characteristics of a product with the requirements of the consumer, which respects the interests of the producer and the consumer and means the product is fully compliant with the market conditions. The goods should have a combination of physical, chemical, aesthetic, ergonomic and other properties, as well as meet the requirements and conditions of their sale (in terms of price, timing, service, delivery, etc.). The product must constantly meet the needs of society, which are dictated by the interests, tastes and preferences of customers. The same product can be competitive in the domestic market and uncompetitive in the foreign one.

The competitiveness of a product varies according to market conditions, advertising and other internal and external factors. A product with a higher level of quality may be less competitive if its value increased significantly by giving the product new properties that are not required by the group of consumers for whom it is intended.

The consumer of a product is interested in value of the product not the nature. The more customers confirm this compliance, the more competitive the product is.

The most effective state regulation method to solve the competitiveness problem is taxation.

Taxes, by participating in the redistribution of new value, are part of a single process of reproduction, a specific form of production relations. The specific form of the production relations of taxes forms their social content.

Taxes, while expressing a more limited sphere of production relations, are only part of distributive, or rather redistributive, relations. Participating in the redistribution of national income, tax relations are subordinate to the primary relations of material production, changing according to the requirements of the productive forces and exchange. In general, they are derivative and secondary in nature.

In redistributing national income, taxes ensure the state appropriating the part of the new value

in monetary form. This part of the national income, forcibly mobilised in the form of taxes, becomes the centralised fund of financial resources of the state, i.e. the basis of its activity.

In addition, taxes, as a redistributive factor of national income, are also designed to defuse the resulting «failures» of the distribution system; by encouraging (or reducing this interest) people to develop a particular form of activity.

The compulsory acquisition process has a one-way movement of value (from the taxpayer to the state) without an equivalent exchange, i.e. there is no sale or purchase. Tax amounts are generated from the new value and become the property of the state.

Also taxes have a material basis. They are part of the income of members of society, expropriated and appropriated through political pressure by the state. This phenomenon acts as the material content of taxes. Increasing tax revenues mean an increasing generalization of national income.

**Main part**

We believe the taxes have a dual nature: they are a specific form of production relations (social content) and are part of the value of national income in monetary form (material content). Taxes, as a derived form of capital surplus or surplus value, are charged by the state to carry out its functions. On the other hand, as a derived form of the value of the necessary product, taxes mobilised for the reproduction of labour. The extent of the denationalisation of the value of surplus product depends on the activities of the state, which, under the influence of economic conditions, is constantly expanding its activities, giving rise to a real upward trend in the proportion of this denationalization.

Nowadays state also accumulates a certain share of the value of the necessary product due to its participation in the reproduction of the labour force, which covers such important areas as education, health care, defence, housing, culture, social security, etc.

Using political power, the state claims a share of the transformed forms of new value: profits, interest, rents and labour income, as well as a share of the price of goods and services. These features of non-productive exploitation enable the state to raise it to limits that are inaccessible under similar conditions to private capital, because the tax relationship is supported by the entire system of political pressure.

The economic nature of taxes is characterised by the monetary relationship that the state has with legal entities and individuals. Specific forms of manifestation of the tax category are the tax payments established by the legislative authorities.

The economic category of taxes is objective, reflecting the actual financial relationships existing in the economy. This category expresses the general regularities common to all economic relations, since taxes are closely related to other financial categories – public expenditure, public credit, etc. At the same time, taxes as a financial category having their own distinctive characteristics, features, forms of movement, i.e. their functions which distinguish them from the whole set of financial categories.

In any society the state uses taxes to carry out its functions and tasks and to achieve certain goals. Tax policy plays an important role in realising these goals. The process of its formulation and implementation provides the conditions for the fulfilment of society's tasks and acts as an active instrument of influence on economic interests.

Tax policy is an integral part of government fiscal policy. There is the state system of tax measure.

The content of tax policy is diverse. It includes the following essential links:

- development of evidence-based tax concepts. They are formed on the basis of a study of the requirements of economic laws, a comprehensive analysis of economic development, the prospects for the development of productive forces and production relations, and the needs of the population.

- determining the main uses of taxes for the future and the current period; it is based on ways of achieving the goals set out in economic policy, taking into account international factors.

- implementing practical actions aimed at achieving the goals set.

The unity of the three main objectives determines the content of tax policy. A tax policy which does not contain the basic concepts of tax development, i.e. which is focused on meeting current needs, is unrealistic;

at the same time, a tax policy which is limited to the formulation of basic concepts and areas of taxation without supporting them with practical government action is also unrealistic.

Tax policy aims at the intensification of social production, the dynamic and balanced development of all sectors of the economy, the acceleration of scientific and technological progress, and the resolution of social and economic problems. Tax policy should take into account the interests of both the state and labour collectives, as well as those of individuals, both central and regional. Tax policy is designed to increase the efficiency of production and the responsibility of producers of products and services. Through targeted taxes, money is concentrated on priority areas of government policy.

The tax policy is determined by financial and economic relations. It may vary according to the challenges faced by states at particular times. Tax policy is formulated and implemented under the influence of macro-level determinants of economic development (growth rates, financial situation, level of regional economic development, etc.). The level of taxation is also strongly influenced by the nature of government policy and the struggle of the population to improve their economic situation.

Russia's current tax policy is aimed at overcoming the negative processes that have accumulated over the years, creating the preconditions for the accelerated development of market relations, and increasing the role and importance of the regions.

The new principles of fiscal policy and fiscal regulation include: first, the economic independence of budgets at all levels. This means separate budget formation on a normative basis, approval and execution; secondly, the need to link the formation of independent budgets with the financing of the republican budget; thirdly, the formation of the budget on the basis of revenues derived from the formation of targeted budgetary funds for various programmes and activities, as well as targeted subsidies and subventions instead of impersonal subsidies to lower budgets; fourthly, fiscal regulation of the economic relations between the central and local authorities fundamentally changed.

The ultimate result of implementing the taxation principles will be increased production of consumer goods, development of entrepreneurship, support for the agro-industrial complex, and improved competitiveness of domestic goods.

Under the current tax system, businesses are interested in making a minimum profit to avoid high taxation. The economy becomes the costliest than ever before. This is also promoted by the prevalence of cost inflation and the presence of monopoly in a free pricing environment (Kushlin, 2002).

There are several tasks of the modern tax policy. At first, it needs to ensure sufficient budget revenues into financing of especially urgent social and economic programmes. At second, it needs to make sharp structural shift of economic proportions in favour of those industries working directly to meet the needs of the population. At third, in needs to create the most favourable conditions for stimulating business activity and increasing competitiveness of goods.

There are special fiscal tools for successfully tax policy implementing and enforcing. We consider it is a set of ways of organising tax relations applied by society in order to ensure favourable conditions for economic and social development. The fiscal tools include the types, forms and methods of organisation of tax relations and quantifying.

The fiscal tools structure is quite complex. It includes various elements corresponding to the diversity of tax relations. The multiplicity of tax interactions predetermines the application of a large number of types, forms and methods of their organisation (elements of the fiscal tools). On the basis of a thorough study of the operation of economic laws, the laws of tax development and the objectives of economic, financial and taxation policy state, represented by its executive and legislative authorities, establishes the best possible tax methods for forming the revenue part of budgets at all levels. The state provides a legal form to the fiscal tools through tax legislation and regulation. The fiscal tools are determined by a tax concept in terms of expressing of government.

The effectiveness of the fiscal tools depends on the essence of taxes and the laws of their functioning, the distinction between taxes and their functions. The tax policy and the fiscal tools make it possible to understand the relationship of basic and superstructural categories, i.e. the objectivity of taxes and the

subjective activity of the state.

Tax policy and the taxation mechanism determine the role of taxes in society. It is a subjective phenomenon closely linked to the activities of the state. The role of taxes is in constant flux and depends on changes in state policy. Also it is more fluid and multifaceted, reflecting in a concentrated form the interests and objectives of the dominant forces in society.

In the post-war years, the industrialised capitalist countries have repeatedly revised their tax policies and fiscal tools in line with new economic concepts. Their fiscal measures in the 50s and 60s were based on the Keynesian model, which focused on the regulation of aggregate investment and consumer demand of the population. These measures were aimed at increasing market capacity and mass consumption growth, helping the private sector to develop large-scale production, mitigating cyclical fluctuations and ultimately ensuring a more or less stable, relatively high rate of economic growth. In all economically developed countries, especially Japan, tax policy pursued as the short term so as the long term.

Fiscal regulation together with other state interventions contributed to a temporary partial solution to economic problems.

The Keynesian model (Keynes, 1983), included taxes, was recognized as ineffective in the mid-1970s and early 1980s because of declining of production, cyclical and structural crises, increased inflationary processes, social conflicts and other problems. It was replaced by «supply-side economics»: by it the taxation mechanism becomes the main instrument. Reducing corporate tax and income tax rates is intended to encourage capital, to encourage savings by the public. The reduction of bite of taxes is intended to have a positive effect on the long-term rate and proportions of monetary and productive capital accumulation, while the preferential tax regime stimulates the scientific and technological progress.

There are different points of views on the nature and content of the taxation mechanism. For example, Utkina T. (1999) believes the fiscal tools are firstly methodological and only then a procedural concept. Consequently, the fiscal tools have an ambivalent nature. This nature needs to be considered from a broad (general theoretical) and narrow (practical) perspective.

First, the fiscal tools are the tax theory considering this nature not only as an organisational and economic category, but as an objectively necessary process of managing the redistributive relations formed by the socialisation of part of the national income. The whole sphere of relations developing this process can be divided into three subsystems: fiscal planning, regulation and control. The theoretical definition of these subsystems specificity is governed by the fundamental assumptions of economic theory. All of them are the components of reproductive relations developing on the basis of a real economic basis.

Secondly, however, practice is different in terms of adjustments to the conceptually defined areas of tax planning, regulation and control. Therefore, the fiscal tools is a set of specific tax actions. This is a real tax proceeding. From this perspective, the fiscal tools act as an economic lever of subjective (imperative) regulation of the tax relations system. The subordination of such actions to the law precludes subjectivity in the regulation of tax relations.

The fiscal tools vary in accordance with specific space and time. Thus, tax actions at different levels of government and administration are significant so as the differences in timing. The fiscal tools are the set of practical tax actions, conditions and rules for implementing the provisions of tax laws in practice. This is why it is so important to follow the law in every practical action in order not to violate the basic fundamental requirement of tax theory – the subjective and objective origins of the taxation process constitute a whole. The tax action that is not based on an objective basis acts as a subjectivist interference in reproductive processes, which inevitably leads to their deformation.

The elements of the taxation mechanism are:
- forms of bite of taxes;
- system of laws and regulations;
- organization of the tax system;
- organization of business taxation;
- organization of personal taxation.

The fiscal tools are divided into a policy-making tool and a regulatory one.

The directive fiscal tools are designed for tax relations the state is directly involved. They include:
- taxes;
- government credit;
- budgetary expenditure;
- budget financing;
- organisation of the budgetary system and budgetary process;
- taxes planning.

In this case, the government develops detailed system of organisation of tax relations are compulsory for all participants.

The regulatory fiscal tools determine the basic rules of the particular segment of finance, without directly affecting the interests of the state. This type of fiscal tools is characteristic of the organisation of intra-business financial relations in private enterprises. In this case, the state establishes a general procedure for using the financial resources remaining the enterprise after taxes and other obligatory payments are made, while the enterprise independently develops forms, types of monetary funds, and directions for their use.

The state can stimulate or restrain economic development by changing tax policy and the fiscal tools.

Fiscal regulation covers the economic life of a country, the structure of production, capital formation, personal consumption, and the very competitiveness of economic agents, since tax measures are the most universal tool for influencing superstructure relations on the basis.

In addition to financial function of securing state revenues, the fiscal tools contain many opportunities for economic impact on social production, its dynamics and structure, the development of scientific and technological progress, etc.

**Conclusions**

One of the most effective forms of modern economic management, including those affecting the competitiveness of economic agents, is state fiscal regulation.

The competitiveness of national economy agents depends on the resources available and the efficiency of their use. It is largely determined by the level of needs, people's attitudes to work, forms and methods of motivation.

The basic concepts of motivation theory are interpreted differently in literature. In particular, there is no consensus in defining the concepts of 'motivation' and 'incentives'.

Motivation is the influence on human behaviour to achieve personal, group and societal goals. It is necessary to consider people's motives, i.e. what triggers their actions when choosing forms and methods of motivation.

Motivation can be carried out by a variety of methods: explanation, education, personal example, systems of rewards and punishments in the organization structure, etc.

Tax motivation is a component of the economic motivation. It is measured by the performance of market economy actors as well as by a number of characteristics that determine attitudes towards work. One form of tax motivation is a person's attitude towards taxes and the timeliness and completeness of their payment to the budget system.

The system of tax motivation as an activity of the personal factor, acts as a general basis for the development, identification and utilisation of sources of economic development, since the decisiveness of the human. The tax motivation system should be flexible and effective to react on changes in production, improve itself accordingly, and have the motivation effect on the competitiveness of economic agents through an interlinked system of economic interests.

**References**

1. Abalkin, L. I. (2000). *Russian school of economic thought: the search for self-determination. M*.: Institut ekonomiki RAN (in Russian).

2. Antonov, G. D., Ivanova, O. P., & Tumin, V. M. (2012). *Managing the competitiveness of an organisation*. M.: INFRA-M (in Russian).

3. Vavilov, Y. Y., Egorycheva, I. N., Sedova, M. L., & Semenova, O. N. (2003). *Finance*. M.: Soc. otnosheniya (in Russian).

4. Van Horn, J. K. (1997). *Fundamentals of financial management*. M.: Finansy i statistika (in Russian).

5. Lanin, B. E. (Ed.) (1992). *Everything began with a tithe*. M.: Progress (in Russian).

6. Cherkovets, V. N. (Ed.) (1989). *World history of economic thought. In 6 vols. V. 3*. M.: Mysl' (in Russian).

7. Gorsky, I. V. (1999). Tax policy and economic growth. *Financy*, (1), 22-26 (in Russian).

8. Gorsky, I. V. (2001). Taxes in the economic strategy of the state. *Financy*, (8), 36-47 (in Russian)

9. Arkhangelsky, V. N., Budarina, A. V., Bulanov, V. S. et al. (2002). *State Regulation of Market Economy*. V.I. Kushlin (Ed.). M.: RAGS (in Russian).

10. Gurvich, E. (2003). Russian tax reform - first results. *Modernisation of Russia's economy: results and prospects*. M.: Vyshaya shkola ekonomiki (in Russian).

11. Galbraith, J. K. (1979). Economics and the public purpose. M.: Progress (in Russian).

12. Zhuravleva, T. A. (2003). Realisation of economic interests as an objective basis of taxation. *Financy i credit*, (24), 76-78 (in Russian).

13. Zakhovaev, D. E. (1999). Taxes: political-economic aspect. *Candidate's thesis*. Ivanovo (in Russian).

14. Kalsin, A. E. (2002). Methodological peculiarities of the study of economic relations of budgetary organisations of the Ministry of Defence of the Russian Federation. *Vestnik KSU. Special issue*, 25-37 (in Russian).

15. Kaehne, F. (1960). *Selected economic works*. M.: Sotsekgiz (in Russian).

16. Kirdina, S. G. (2000). *Institutional matrices and Russia's development*. *M*.: TEIS (in Russian).

17. Silin, J. P., & Dvoryadkina, E. B. (responsible authors). (2020). Competitiveness of territories. *Proceedings of XXIII All-Russian Economic Forum of Young Scientists and Students (4 parts). (27-30 April 2020). P. 2: Directions: 05. Marketing and management: innovations, competition, threats and opportunities. 07 Social measurement of competitiveness*. Ekaterinburg: Izd-vo Ural'skogo gos. universiteta ekonomiki (in Russian).

18. Kugaenko, A. A., & Belyanin, M. P. (1999). *Theory of taxation*. M.: Vuzovskaya kniga (in Russian).

19. Kuzyk, B. (2004). *Russia has one effective way of development - its own*. M.: Znanie (in Russian).

20. Lebedeva, N. N. (2000). Problems of implementing the functions of economic institutions in the Russian economy. Y. M. Osipov, M. M. Guzev, & E. S. Zotova (Eds.). *Russia in current times*. M.-Volgograd (in Russian).

21. Lvov, D., Makarov, & V., Kleiner, G. (2000). *Russia's economy at the crossroads of the century*. *M*.: Upravlenie me`ra Moskvy (in Russian).

22. Lvov, D. S. (1999). *Development of Russia's economy and the tasks of economic science*. *M*.: Ekonomika (in Russian).

23. Lyubimov, N. N. (1956). *Finance of capitalist states*. M.: Gosfinizdat (in Russian).

24. Mayburd, E. M. (1996). *Introduction to the history of economic thought*. M.: Delo, Vita-press (in Russian).

25. Bryzgalin, A. V. (Ed.). (1997). *Taxes and tax law*. M.: Analitika-Press (in Russian).

26. Polyak, G. B. & Romanov, A. N. *Taxes and taxation* (2012). M.: UNITI-DANA (in Russian).

27. Romanovsky, M., V. & Vrublevskaya, O. V. (Eds.). (2003). *Taxes and taxation*. SPb.: Piter (in Russian).

28. Chernik, D. G. (Ed.). (1996). *Taxes*. M.: Financy i Statistika (in Russian).

29. Chernik, D. G. (Ed.). (2002). *Taxes*. M.: Financy i Statistika (in Russian).

30. Nelson, R., & Winter, S. J. (2000). *Evolutionary theory of economic change*. *M*.: Finstatinform (in Russian).

31. North, D. (1997). *Institutions, institutional change and economic performance*. M.: Fond ekonomicheskoi knigi «NACHALA» (in Russian).

32. Oleynik, A. N. (2000). *Institutional economics*. M.: INFRA-M (in Russian).

33. Petty, V. (1993). Treatise on taxes. *Anthology of economic classics.* (2 vols. Vol. 1.). M: Econov (in Russian).

34. Pushkareva, V. M. (1999). Genesis of the category "tax" in the history of financial science. *Finance*, (6), 12-14 (in Russian).

35. Pushkareva, V. M. (1996). *History of financial thought and tax policy*. M.: INFRA-M (in Russian).

36. Schumpeter, J. (1982). *Theory of economic development*. M.: Progress (in Russian).

37. Yutkina, T. F. (1999). *Taxation: from reform to reform*. M.: INFRA-M (in Russian).

# Technological renewal of production as the basis for increasing the competitiveness of the Russian economy[*]

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**Abstract.** The competitiveness of the economy is its ability to develop in the conditions of the modern struggle for the new world order. Based on the systems of indicators, the paper assesses the competitiveness of the Russian economy for 2004-2020. The study concluded that its level is decreasing. It proves that the value created in material production underlies the income of the entire society, including the state, and determines the growth rate and the number of people employed in the service sector, as well as in the infrastructure, construction, trade, transport, and communications industries. To accelerate economic growth, it is necessary first of all to increase the growth rate of material production. The obtained statistical dependences make it possible to estimate the volume of investments in fixed assets of material production necessary to ensure a given growth rate of material production and GDP. The paper shows that the Russian economy should do a full re-equipment of production based on modern technology. It has been established that the re-equipment is restrained by the system of relations of capitalist ownership of the means of production, which generates a massive outflow of resources and capital abroad. The study revealed that GDP growth is closely dependent on the growth of new value used within the country. The growth of natural rent in a number of industries has a negative effect, generates instability in the economy development. The technical re-equipment of all industries, primarily engineering, should be emphasized more than the growth of natural resource rent. It has been proved that the state of material production and the use of its results significantly affect not only the standard of living of the population, but also the most important demographic indicators: mortality, birth rate, natural increase of population, and its size. The paper proposes measures to enhance the competitiveness of the Russian economy, which involve a significant strengthening of the role of the state in the development of the economy, including on the basis of state planning.

**Keywords:** Competitiveness of the economy; indicators and assessment of the competitiveness of the Russian economy; reasons for the decline in the competitiveness of the Russian economy; the role of material production; the need for technological renewal of production; ways to increase the competitiveness of the economy; the role of the state in increasing the competitiveness of the economy.

**JEL codes:** E60, E61, E65, E66, E69

### Introduction

The research has begun due to the struggle of the imperialist powers for world domination, which, in particular, creates pressure and sanctions against Russia. Russia can withstand it by being economically competitive. At the same time, the most important socio-economic indicators deteriorated recently, which means that the competitiveness declined.

The issues of competitiveness are constantly discussed in various research. The concept of competitiveness, including the competitiveness of the national economy, has different interpretations (see, e.g., Klinova, 2020). Some studies report that the concept of national competitiveness is simply unnecessary (Krugman, 2009). In our opinion, this concept is needed to reflect important objective properties of the economy.

Speaking of the concept of national competitiveness, it does not only mean the free market (Jamel et al., 2021) or other world market metrics, e.g., high-tech export share (Gnidchenko, 2021) etc., because free

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[*] *In order to reach a wider range of readers (by agreement of the author and the publisher), we publish an article translated version first published in the journal "Theoretical Economics". 2022. - №3*

market has not existed for some time already. High-tech or high export countries are not the only successful ones — the less developed also are. The latter often develop faster (e.g., Viet Nam, India, etc.) than former (e.g., Japan, France, Italy).

Long lists of metrics in ratings created by World Economic Forum or World Management Development Institute evaluate the conditions for competitiveness in a country rather than the success of its economy not taking the competitiveness conditions into account or even against these conditions. This approach is based on the idea that the competitiveness is the only factor of a successful development and it does not consider cooperation or planning.

The national competitiveness is defined by many authors as the ability of a country to produce and reproduce the conditions necessary for population wellness; these conditions include the potential for exports, macroeconomic attractiveness and productivity (Jamel et al., 2021).

The authors understand the competitiveness of an economy as its sustainable high-rate development, which improves the quality of life for the population in the long run, while successfully overcoming external negative impact. It can be achieved by offering better conditions for competition and, if necessary, protectionist measures, state regulation, and economy planning, development of cooperation and mutual assistance between economic agents.

The theoretical basis of the study is the Marxist economic theory.

The purpose of the study is to identify the causes of the decline in the competitiveness of the Russian economy and to determine ways to overcome them, as well as factors and ways to improve it.

The main hypothesis of the study is, the competitiveness of the Russian economy is ultimately determined by the state of material production, primarily industrial production.

The study object is the economic system of Russia, the subject is the indicators of its development and their impact on the standard of living of the population. The indicators are analyzed for the period from 2004 to 2020 because of, on the one hand, the transition from the OKONKh Code to the OKVED code, and, on the other hand, the statistics. All calculations in the study were based on data from the official websites of Rosstat, the RF Ministry of Finance, the Federal Customs Service, and the Bank of Russia.

**Methods**

Two groups of indicators were chosen to analyze the competitiveness of the Russian economy:
1. Economic growth rates and indicators of the use of basic resources
2. Indicators of the quality of life of the population
The Group 1 includes:
– the GDP growth rate and the main sectors of material production;
– indicators of the use of labor resources;
– indicators of the use of basic business assets;
– indicators of the use of natural resources.
The Group 2 includes:
– growth rates of real disposable money incomes of the population;
– indicators of income differentiation of the population and the poverty rate;
– demographic indicators and indicators of the population's health.

Of course, the above indicators cannot be regarded as an exhaustive set of indicators for a comprehensive evaluation of the competitiveness of Russia's economy. Nevertheless, their dynamics, in our opinion, provide sufficient grounds to approximately evaluate it.

Correlation and regression analysis methods were used to analyze the dynamics of the above indicators. In some cases, the dynamics of indicators of the Russian economy were compared with the dynamics of similar indicators of other countries to make a more objective judgement.

**Results**

Results of the analysis of the Group 1 indicators.
Table 1 presents the indicators of physical growth rates of Russia's GDP in 2004-2020.

**Table 1** – Physical growth of Russian's GDP

| Period | 2004-2008 | 2009 | 2009-2014 | 2014-2019 | 2004-2019 | 2015 | 2015-2019 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average annual GDP growth rate | 1.067 | 0.922 | 1.027 | 1.005 | 1.023 | 0.963 | 1.015 | 0.998 | 1.015 | 1.028 | 1.020 | 0.970 |

*Source: calculated based on Russian Statistical Yearbook 2003-2021*

As can be seen from Table 1, a fairly high GDP growth rate in 2004-2008 (1.067) was replaced by a sharp decline in 2009 by 7.8%. In the next 5 years, 2009-2014, the average annual growth rate was 1.027, much less than the pre-crisis period. In 2015, there was another 4.7% decline. Then in 2015-2019, GDP grew unevenly, averaging 1.5% per year. A 3% decline in 2020 was caused by the coronavirus pandemic.

Overall, over the pre-coronavirus period, i.e., from 2004 to 2019, the average annual GDP grew by 2.3%. Thus, we can note the unevenness of Russia's GDP growth and a downward trend. The main reasons for this situation are:

– a significant dependence of the Russian economy on the world energy market, which causes fluctuations in the sold natural rent and the new value created in general;

– significant influence on the state of economy which is rendered by the policy of owners of the capital – non-residents, whose share in the assets used in Russia is rather essential;

– influence on the Russian economy by international financial institutions, controlled by the United States and their allies, the activities of which affect Russia's foreign economic relations.

In turn, these reasons are caused by specifics of the Russian economic system, which is essentially state-monopolistic capitalism.

As follows from Table 2, since 2004 until the coronavirus pandemic, Russia's average annual GDP growth rate was lower than in many former Soviet republics, except Ukraine; lower than in Bulgaria, Romania, Poland, Argentina, Turkey, South Korea, significantly lower than in China and India, but higher than in most industrialized countries of the West and Japan. However, the decline in the growth rate of the Russian economy after 2014 led to the notion that "Russia's share in world GDP collapsed to its lowest since the beginning of the century" (World Economic Outlook, 2021), the growth rate was below the world average.

GDP growth depends on two main factors: the number of people employed in the economy and their labor productivity, calculated as the ratio of GDP to the number of people employed.

The number of employed in the Russian economy, as shown in Fig. 1, depends not only on demographic factors, but also on changes in the value of natural rents and related fluctuations in the inflow of foreign citizens in legal labor activities.

The number of working-age citizens in our country has been steadily declining since 2005, and in 2020 it decreased by more than 8.3 million people, or 9.2%, compared to 2005.

**Table 2a** – Average annual GDP growth in several countries in 2004-2019

| Country | Russia | Azerbaijan | Armenia | Belarus | Kazakhstan | Kyrgyzstan | Moldova | Tajikistan | Uzbekistan | Ukraine | Bulgaria | Hungary | Poland | Romania |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average annual growth rates | 1.023 | 1.078 | 1.050 | 1.037 | 1.052 | 1.042 | 1.039 | 1.070 | 1.071 | 1.005 | 1.029 | 1.020 | 1.040 | 1.036 |

*Source: calculated based on Russian Statistical Yearbook 2003-2021*

**Table 2b** – Average annual GDP growth in several countries in 2004-2019

| Country | Brazil | India | China | South Africa | Mexico | Argentina | Turkey | South Korea | Austria | Belgium | Germany | Denmark | Italy | Netherlands |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average annual growth rates | 1.022 | 1.073 | 1.088 | 1.020 | 1.022 | 1.030 | 1.048 | 1.034 | 1.015 | 1.014 | 1.015 | 1.013 | 0.999 | 1.015 |

*Source: calculated based on Russian Statistical Yearbook 2003-2021*

**Table 2c** – Average annual GDP growth in several countries in 2004-2019

| Country | Great Britain | Finland | Australia | Canada | Norway | USA | Japan | France | Sweden |
|---|---|---|---|---|---|---|---|---|---|
| Average annual growth rates | 1.014 | 1.01 | 1.027 | 1.019 | 1.015 | 1.018 | 1.008 | 1.012 | 1.020 |

*Source: calculated based on Russian Statistical Yearbook 2003-2021*
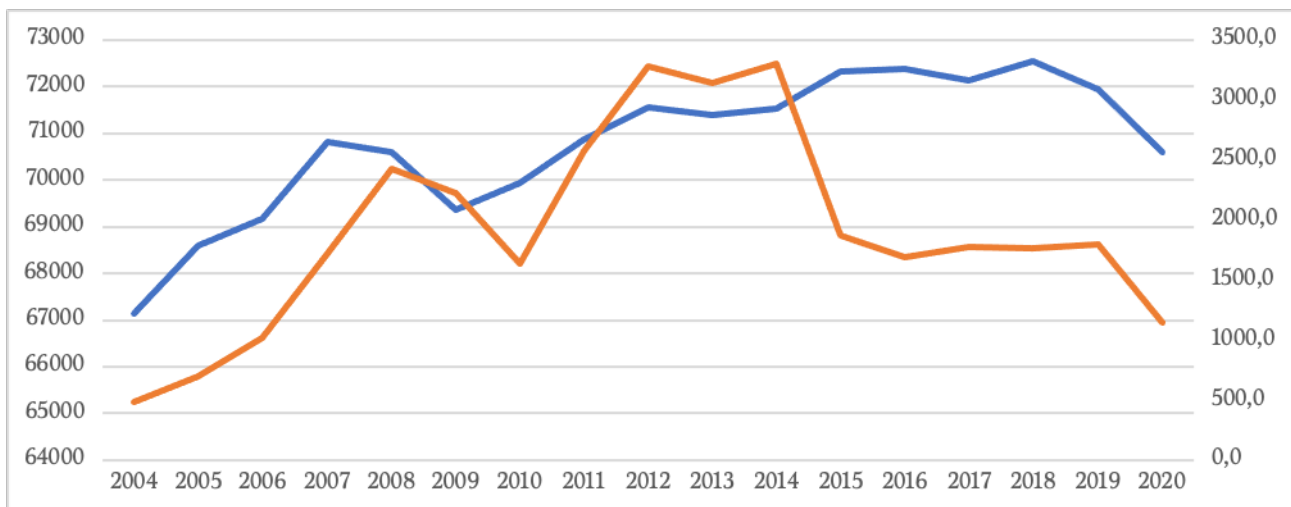


**Figure 1.** Average annual number of employed in the Russian economy, thousand people
(blue – Employed in the Russian economy; orange – Foreign citizens legally employed in Russia)
*Source: Russian Statistical Yearbook 2003-2021*

The increase in the number of employed because of the annexation of Crimea and the 2018-19 retirement reform was overshadowed by a stronger outflow of migrant workers, which led to a reduction in the total number of employed in 2020 to below its number in 2011. This shows that the number of employed people is one of the most important factors that led to the decline in GDP growth.

The most important indicator of labor use that directly affects the amount of GDP, as already mentioned, is labor productivity, calculated as the ratio of GDP to the number of people employed.

As can be seen from Table 3, the dynamics of the growth rate of labor productivity in the Russian economy is similar to the dynamics of GDP – the dependence on the dynamics of the value of natural rents and a downward trend.

**Table 3** – Growth rate of labor productivity in the Russian economy

| Period | 2004-2008 | 2009 | 2009-2014 | 2014-2019 | 2004-2019 | 2015 | 2015-2019 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average annual GDP growth rate | 1.049 | 0.943 | 1.021 | 1.004 | 1.017 | 0.953 | 1.017 | 0.996 | 1.019 | 1.022 | 1.029 | 0.988 |

*Source: calculated based on Russian Statistical Yearbook 2003-2021*

The decline in the growth rate of labor productivity led to the fact that in 2011-2017, it grew by only 1.3%. As a result, Russia stopped catching up with several developed countries according to the indicator. See Table 4.

**Table 4** – Ratio of countries by GDP (PPP) per person employed, Russia = 1

| Country | 2011 | 2014 | 2017 | Country | 2011 | 2014 | 2017 |
|---|---|---|---|---|---|---|---|
| Russia | 1.00 | 1.00 | 1.00 | Lithuania | 1.16 | 1.21 | 1.29 |
| Azerbaijan | 0.72 | 0.74 | 0.72 | Netherlands | 1.89 | 1.87 | 2.08 |
| Armenia | 0.37 | 0.45 | 0.57 | Poland | 1.18 | 1.16 | 1.32 |
| Belarus | 0.74 | 0.75 | 0.71 | Romania | 0.89 | 0.91 | 1.16 |
| Kazakhstan | 0.91 | 0.99 | 1.08 | UK | 1.66 | 1.63 | 1.79 |
| Kyrgyzstan | 0.15 | 0.17 | 0.19 | Finland | 1.83 | 1.79 | 1.98 |
| Moldova | 0.27 | 0.30 | 0.34 | France | 2.02 | 1.96 | 2.10 |
| Tajikistan | 0.17 | 0.19 | 0.24 | Sweden | 1.89 | 1.78 | 1.98 |
| Ukraine | 0.41 | 0.43 | 0.47 | Australia | 1.88 | 1.83 | 1.88 |
| Austria | 1.94 | 1.93 | 2.10 | Canada | 1.81 | 1.72 | 1.82 |
| Belgium | 2.16 | 2.11 | 2.36 | Norway | 2.70 | 2.47 | 2.46 |
| Bulgaria | 0.84 | 0.80 | 0.90 | South Korea | 1.32 | 1.26 | 1.50 |
| Hungary | 1.30 | 1.17 | 1.24 | USA | 2.45 | 2.26 | 2.41 |
| Germany | 1.90 | 1.81 | 1.99 | Turkey | 1.20 | 1.36 | 1.52 |
| Denmark | 1.90 | 1.90 | 2.16 | Switzerland | 2.03 | 2.14 | 2.40 |
| Italy | 2.01 | 1.87 | 2.07 | Japan | 1.53 | … | 1.51 |

*Source: calculated based on Russian Statistical Yearbook 2003-2021*

Increase in labor productivity can happen extensively – at the expense of lengthening the time of labor of the employed and increasing its intensity – and intensively – by introducing new technologies and increasing the technical equipment. The extensive way has its limits, and crossing them leads to violation of workers' health and ability to work. Intensive way is the main direction of increasing labor productivity.

As the data analysis showed, in Russian economy in 2004-2020, the average annual number of work hours per worker decreased. For example, in 2004-2010, it decreased by about 74 hours, or 3.4%, and in 2010-2020, by another 89 hours, or 4.2%. Therefore, the main driver of productivity growth has been improvements in the technical equipment. However, it has been slower than in those countries where productivity growth has been faster.

This led the authors to analyze another factor of production – means of labor. Machinery and equipment, among other active means of labor, has the largest impact on the level of labor productivity. As the Table 5 shows, since 2011 – especially after 2014 – the most important indicators of machinery and equipment production in the Russian economy have significantly worsened, which had been unsatisfactory even before that.

Despite the constant growth of the physical volume of fixed assets in the economy, on average by about 3.5% annually, companies that create the bulk of new value saw the accelerated depreciation of machinery and

equipment, the increased share of fully worn-out active part of the means of labor. While fully depreciated used machinery and equipment increased by 3.7 percent from 2004 to 2011, it was already 25.6 percent higher in 2017 compared to 2011. And two years later, even before the pandemic, it was up another 15.9% in 2019. As the pandemic began in 2020, these trends intensified further. The authors argue that it caused the drop in productivity growth, as discussed above.

**Table 5** – Indicators of the machinery and equipment production in Russian companies over a number of years (excluding small businesses)

| Period | 2004 | 2011 | 2014 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| Wear rate, % | 53.3 | 54.1 | 56.3 | 60.4 | 61.3 | 62.1 | 63.0 |
| Share of completely worn out, % | 26 | 22 | 23.1 | 27 | 27.8 | 28.7 | 30.2 |
| Growth of physical volume, %, 2004 — baseline | 100.0 | 122.5 | 138.2 | 153.7 | 160.2 | 167.6 | 173.8 |

*Source: calculated based on Russian Statistical Yearbook 2003-2021*

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The rate of renewal of the technical equipment for production obviously depends, first of all, on investments in the basic business assets. Their figures quite explain the negative processes in the production of the means of labor. See Table 6.

**Table 6** – Specific weight of some kinds of investments in GDP, %

| Investment type | On average in 2004-2011 | On average in 2012-2019 |
|---|---|---|
| Fixed assets investments | 19.0 | 17.9 |
| Non-financial assets investments | 14.5 | 13.6 |
| Machinery, equipment, transport investments | 7.3 | 6.2 |

*Source: composed by author*

The higher the rate of accumulation, the higher the rate of economic development, because the increase of accumulation helps accelerate the technological renewal of the economy and improve the technical equipment. Thus, in China in 2004-2019, the accumulation rate was on average about twice as high than in Russia (Bulletin on current trends in the Russian economy, 2020). Hence, the growth rate of the Chinese economy, as well as the labor productivity of Chinese workers, was much higher than the corresponding Russian indicators.

To increase the growth rate of labor productivity and, consequently, GDP, it is necessary to increase the amount of funds going both for technological renewal of existing production and for creating new enterprises equipped with advanced technology. There are opportunities for this, as will be shown below.

The most important factor of production is natural resources: reproducible and non-reproducible.

The analysis found that when the capitalist relations were being rebuilt in the 1990s, there was an avalanche-like deterioration in the main indicators of the use of reproduced natural resources, which changed for the better after the 1998 crisis. However, even today, the reproduction of natural resources remains below the level of 1990 by many important indicators. See Table 7.

**Table 7** – Some of the most important indicators of the reproduction of natural resources

| Period | 1990 | 2004 | 2008 | 2014 | 2015 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| Area under crops, thousand hectares | 117705 | 77323 | 76923 | 78525 | 78635 | 79888 | 79948 |
| Area under fruit and berry crops, thousand hectares | 866 | 632 | 533 | 514 | 512 | 465 | 463 |
| Mineral fertilizers applied to soil (converted to 100% of nutrients), million tons | 9.9 | 1.4 | 1.9 | 1.9 | 2 | 2.7 | 3 |
| Organic fertilizers applied to soil, million tons | 389.5 | 53.2 | 51.3 | 61.6 | 64.2 | 70.7 | 70.5 |
| Limestone meal and other limestone materials applied to soil: total, million tons | 31.4 | 2.4 | 2.3 | 2.3 | 2.1 | 2.3 | 2.9 |
| Gypsum and gypsum-containing rocks applied to soil, million tons | 1361 | 16 | 3.8 | 10 | 3.2 | 15.3 | 20.6 |
| Phosphate meal applied to soil, thousand tons | 500 | 56 | 24 | 20 | 9.7 | 20.6 | 18.2 |
| Cattle, millions | 57 | 23.2 | 21 | 18.9 | 18.6 | 18.1 | 18 |
| including cows, millions | 20.6 | 10.2 | 9.1 | 8.3 | 8.1 | 8 | 7.9 |
| Pigs, millions | 38.3 | 13.7 | 16.2 | 19.5 | 21.4 | 25.2 | 25.9 |
| Sheep and goats, millions | 58.2 | 18.1 | 21.7 | 24.4 | 24.6 | 22.6 | 21.7 |
| Milk produced, million tons | 10.1 | 5 | 6.3 | 9 | 9.5 | 10.9 | 11.2 |
| Cattle and poultry production, million tons | 55.7 | 31.9 | 32.2 | 30 | 29.9 | 31.4 | 32.2 |
| Stock of wood, billion m³ | 81.6 | 82.1 | 83.3 | 82.8 | 82.8 | 82.6 | 82.5 |
| Forest regeneration, thousand hectares | 1831 | 797 | 828 | 863 | 803 | 1,068 | 1,134 |
| Fish and other aquatic biological resources caught, tons | 7900 | 2965 | 3333 | 4235.1 | 4492.5 | 4983.3 | 4974.8 |
| Juvenile fish and other bioresources released into water bodies, millions | … | 6452.2 | 7908.4 | 8864.7 | 8974.8 | 8848.5 | 8353.2 |

*Source: Russian Statistical Yearbook 2001*

The authors believe that the data on the volume of wood burned at the root is also quite indicative. In 1990, this indicator was 23.5 million m³, in 2004-2010, it rose to 32.6 on average, and in 2011-2020, to 71.7 million m³. In recent years, i.e., in 2018-2020, it has already reached 106.6 million m3. These figures eloquently characterize the level of forest protection (Russian Statistical Yearbook 2003-2021, 2021).

Current trends in the use of natural resources were also reflected in the dynamics of agricultural production in Russia. In 1990-1998, it decreased by 44%, in 2004, it reached only 71.6% of the 1990 level and surpassed this level only in 2014 by 0.3% (Russian Statistical Yearbook – 2001, 2001).

The use of reproduced natural resources is regulated by the "Agriculture, forestry, hunting, fishing and fish farming" industry. In 2004-2019, this industry increased its output annually, with the exception of a slight decline in 2010 and 2012, while the number of employees and the growth of technical equipment of labor declined. Overall, it increased by 53.7% over 2004-2019, which enabled a reduction in imports of a number of food products and, for some items, an increase in exports.

The growth of output happened mainly due to two main factors: the labor factor capacity and the

number of employed workers who create value. The statistically significant correlation between these factors and the volume of industry output is:

$$O_1 = 0,611 CL_1^{1,425} \cdot VCW_1; \quad R = 0,909; \tag{1}$$

where

$O_1$ – industry output, measured in 2004 prices, billion rubles;

$VCW_1$ – value-creating workers in the industry, thousand people;

$CL_1$ – capital-labor of value-creating workers, measured as the ratio of the volume of fixed assets used by them in billion rubles, measured in 2004 prices, to the number of value-creating workers in the industry;

$R$ – correlation factor of the given ratio.

Note. Hereinafter, all monetary indicators will be measured in 2004 prices, in billion rubles, the number of employed – in thousand people.

$0,611 CL_1^{1,425}$ indicates the labor productivity of value-creating workers. The degree index, which is 1.425, shows that the growth of labor productivity in the industry was faster than the growth of capital equipment; therefore, not only the amount of the used means of labor increased, but the introduction of more efficient equipment also did. The growth of labor productivity in the industry is also affected by other factors: the improvement of crops, soil quality, livestock and poultry breeds, changes in the weather, etc. But their influence on labor productivity, as the analysis shows, is less significant than the use of more advanced machinery.

**Table 8** – Indicators of machinery and equipment production in "Agriculture, forestry, hunting, fishing, and fish farming" companies for a number of years (excluding small businesses)

| Period | 2004 | 2011 | 2014 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| Wear rate, % | 46 | 43.3 | 50.6 | 54.1 | 55 | 55.8 | 57.2 |
| Share of completely worn out, % | 24.6 | 8.8 | 11.4 | 15.7 | 16.5 | 18.1 | 19.4 |

*Source: Russian Statistical Yearbook 2003-2021*

The data in Table 8 shows that the companies in the industry, which create about half of its new value, improved the indicators of equipment reproduction in 2004-2011, but then they declined again. The share of fully depreciated machinery was less in 2019 than in 2004, but the depreciation rate was higher.

This affected the level of labor productivity in the industry, calculated as the ratio of output to the number of value-creating workers. While this rate increased by 41.6% in 2004-2011, increasing by 5.1% per year on average, it increased by 27.6% in 2011-2019, increasing by 3.1%. on average The average growth rate in industry productivity in 2004-2019 was 4.0% (Calculated based on Russian Statistical Yearbook 2003-2021).

In general, the indicators of machinery and equipment production, as well as labor productivity in these industry enterprises are better than for the production as a whole. At the same time, an increasing share of production in the industry is created by small business entities, but the statistics of their fixed asset reproduction indicators are not public knowledge. The authors believe that with these indicators, the production of fixed assets in the industry would change for the better.

Thus, subject to further improvement of the use of available reproducible natural resources, renewal and improvement of technical equipment, the industry has a significant potential for growth, even with a smaller number of employees.

The state of non-reproducible natural resources, or the material and raw material base of the Russian economy is reflected primarily in the size of their explored reserves. As Table 9 shows, deep exploratory drilling in Russia has sharply declined since 1990 and remains at about 1 million meters annually.

Nevertheless, as the report prepared by the Ministry of Natural Resources of the Russian Federation

states, "As a result of geological exploration work performed by subsoil operators, there were incremental reserves of a number of minerals (oil, natural gas, coal, iron ores, copper, molybdenum, zirconium, rare earth metals, gold, platinum group metals, and graphite), which helped maintain reproduction indicators consistently at the target and above for a ten-year period. Reserves of nickel, cobalt, zinc, potassium salts, and fluorspar remained virtually unchanged over this period. At the same time, stocks of lead, tin, and tungsten decreased" (On the State and Use of Mineral Resources of the Russian Federation in 2020, 2021).

**Table 9** – Deep exploratory drilling in Russia

| Period | 1990 | 2000 | 2004 | 2009 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| Total, thousand meters | 5299 | 1722 | 931 | 913 | n/a | n/a | n/a | n/a |
| Including oil and gas, thousand meters | 5286 | 1719 | 925 | 901 | n/a | n/a | n/a | n/a |
| Oil, million meters | 5.2 | 1.5 | 0.8 | 0.7 | 100.0 | 1.1 | 1.2 | 0.9 |

*Source: Russian Statistical Yearbook 2001*

Table 10 shows that production of the main types of mineral resources declined after 1990, but then began to gradually recover, and even surpassed 1990 levels for oil, natural gas, and primary energy resources as a whole. The production in 2020 declined because the global demand for energy resources also declined due to the coronavirus pandemic.

**Table 10** – Extraction of main types of mineral resources in Russia

| Period | 1990 | 2004 | 2010 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| Coal, million tons | 395 | 282 | 322 | 410 | 439 | 439 | 398 |
| Oil, million tons | 516 | 459 | 506 | 547 | 556 | 561 | 513 |
| Natural gas, billion m³ | 641 | 633 | 651 | 691 | 726 | 739 | 694 |
| Primary energy resources, million tons of fuel equivalent | 1857 | 1687 | 1812 | 2012 | 2089 | 2110 | 1975 |
| Iron ore concentrate, million t. | 107 | 97.1 | 95.9 | 95 | 96 | 97.7 | 100 |

*Source: Russian Statistical Yearbook 2001*

Russia has basic natural resources for many years to come and has considerable potential for successful competition in the raw materials markets. At the same time, it is important to track the mining industry, which expores and extracts these resources.

In 2004-2019, industry output increased by 25.6%, with an average annual growth rate of 1.5%. In 2020, it decreased by 8.1%. In 2004-2019, the correlation of output and factors of production in the industry is:

$$O_2 = 536{,}8CL_2^{0,19} \cdot VCW_2; R=0{,}949 \qquad (2)$$

where

$O_2$ – industry output;

$VCW_2$ – value-creating workers in the industry;

$CL_2$ – capital-labor of value-creating workers, measured as the ratio of the volume of fixed assets used by them to the number of value-creating workers in the industry;

R – correlation factor.

The given correlation has a sufficiently high explanatory power ($R^2 = 0.90$). It shows that the output in the industry depends mainly on two factors – the number of value-creating workers and their labor productivity ($536{,}8CL_2^{0,19}$), which depends on capital-labor. The degree in the formula of labor productivity (0.19) is less than 1. It indicates that, for the same increase in labor productivity for a given number of workers, a larger increase in means of labor is required. In the language of microeconomics, the marginal productivity of

fixed capital is equal to 0.19 of its average productivity. In other words, the capital intensity of production is constantly increasing.

It is usually explained by "objective processes of depletion of the mineral resource base and deterioration of mining conditions", which cause "growth of specific capital expenditures for the creation of new production facilities" (Zamaraev & Marshova, 2020). Nevertheless, the authors believe it is necessary to pay attention to the indicators of reproduction of means of labor in the industry.

**Table 11** – Indicators of machinery and equipment production in mining companies for a number of years (excluding small businesses)

| Period | 2004 | 2011 | 2014 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| Wear rate, % | 53 | 59.1 | 64.3 | 64 | 64.6 | 65 | 66 |
| Share of completely worn out, % | 20.8 | 28.2 | 31.5 | 33.7 | 34.1 | 35.7 | 37 |

*Source: Russian Statistical Yearbook 2003-2021*

These indicators steadily deteriorated during the studied period, as Table 11 shows, and were worse than in other manufacturing industries as a whole. The average annual growth in labor productivity, measured as the ratio of output to the number of workers creating value was only 1.1% in 2004-2019 (Calculated based on Russian Statistical Yearbook 2003-2021).

The industry retains its competitiveness mainly due to the profitability of mineral resources extraction, even in the increasingly complex objective conditions of production. However, as can be seen from the data presented, it needs a serious technological upgrade, which would improve the efficiency of the economy as a whole, free up some labor for use in other industries, and ease the labor of those employed.

The ability of the economy to develop against the negative influences of the outside world, of course, depends not only on the industries directly interacting with nature. The industries that produce finished products and bring them to consumers play an important role. According to OKVED-2016, these include the following types of economic activity (Note: OKVED-2016 is taken as the basis for classifying industries, since the period 2004-2019 is analyzed):

1. manufacturing industries;
2. production and distribution of electricity, gas, and water;
3. construction;
4. wholesale and retail trade; repair of vehicles and motorcycles
5. hotels and restaurants
6. transportation and communications.

The first two activities, along with mining and quarrying, are part of manufacturing. The vast majority of their output is in the form of goods and has value. The other four industries provide services in addition to creating value. (For example, construction, in addition to creating buildings for sale, provides repair services. In trade, along with services, there are additional costs of production. The same in the catering industry. Freight transport is part of the production process, and passenger transport is a service.)

The new value created in the above industries, as well as in the two considered at the beginning of the analysis, forms the source of all primary income in the economy. Income from payment for services, ultimately generated by their exchange for value, is secondary in nature. Therefore, new value underlies the value of GDP, but only the part that is used domestically. By this we mean the amount of new value minus the balance of the current account, deductions to sovereign funds and the reserves of the Bank of Russia.

Since the value creation is important for forming income of economic entities, the authors analyzed the indicators of the development of value-creating industries. The amount of new value contained in the output of industries was estimated by adding net taxes on products to net output. To compare the value created in different periods, it was converted to 2004 prices using GDP deflator indices. As a result, the new value was measured as exchange value, at its purchasing power. The number of those employed creating value in the industries and in the economy as a whole was also estimated. All calculations were based on data from Rosstat,

the Federal Customs Service of the Russian Federation, the RF Ministry of Finance and the Bank of Russia.

In 2004-2019, the following statistically significant correlation was relevant

$$NV = 22{,}65CLV^{0{,}447}VCW + NR; R = 0{,}948; \tag{3}$$

Where $NV$ – all the new value created in the economy during the year;

$VCW$ – average annual value-creating workers in the economy;

$CLW$ – capital-labor of value-creating workers;

$22{,}65CLV^{0{,}447}$ – labor productivity as the ratio of created value, natural rent excluded, to the number of value-creating workers;

$NR$ – the amount of natural rent sold in a year, billion rubles, in 2004 prices.

Natural rent represents the excess of producers' income over the normal level due to the sale of raw materials and materials made of them. According to the analysis, the size of the natural rent depends primarily on the value of oil and oil product exports. Its dependence on these factors is:

$$P = -5842 + 4.88E_N + 2.71E_{NP}; R = 0.784 \tag{4}$$

where $E_N$ and $E_{NP}$ are revenues from oil and oil products exports, respectively;

$R$ – multiple correlation factor.

Formula (4) explains fluctuations of rent by about 61.5%. Therefore, the natural rent also depends on the sale of other resources, but to a lesser extent.

In expression (3), the degree at capital-labor less than 1, which means that at the same increase of capital and the same number of workers, the increase of labor productivity without the natural rent will be less and less. To study this effect, the authors analyzed the indicators of machinery and equipment production in the industries where new value is created. The results of the analysis for two of them were given above, Table 12 shows the results for the rest, except for the "Hotels and restaurants" industry. (Since 2017, OKVED was changed, and Rosstat provides information on the new classification, which is reflected in the table).

**Table 12** – Indicators of machinery and equipment production in companies in a number of industries (excluding small businesses)

| | Wear rate, % | | | Share of completely worn out, % | | |
|---|---|---|---|---|---|---|
| Years | 2004 | 2011 | 2014 | 2004 | 2011 | 2014 |
| Manufacturing industries | 53.4 | 51.6 | 53.9 | 28.7 | 18.1 | 18.9 |
| Production and distribution of electricity, gas, and water | 57.1 | 42.2 | 43 | 23.6 | 13.8 | 12.5 |
| Construction | 48.9 | 53 | 59.9 | 19.7 | 16.9 | 20.1 |
| Wholesale and retail trade; repair of vehicles and motorcycles | 65.6 | 71.9 | 67.9 | 48.3 | 46.8 | 43.7 |
| Transportation and communications | 36.2 | 56.2 | 59.8 | 12.6 | 20.3 | 24 |

| | Wear rate, % | | | | Share of completely worn out, % | | | |
|---|---|---|---|---|---|---|---|---|
| Years | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| Manufacturing industries | 58.5 | 60.4 | 60.7 | 62.2 | 23.5 | 24.4 | 25.5 | 27.3 |
| Electric power, gas and steam supply; air conditioning | 48.6 | 49.6 | 51.3 | 52.9 | 15.7 | 17.9 | 16.7 | 19.3 |
| Water supply; sewage, waste collection and utilization, pollutant elimination | 60.6 | 61.7 | 63.9 | 64.1 | 26.5 | 29.1 | 30.6 | 31.4 |

| | Wear rate, % | | | | Share of completely worn out, % | | | |
|---|---|---|---|---|---|---|---|---|
| Years | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| Construction | 64.7 | 60.3 | 62.3 | 62.2 | 26.4 | 22.3 | 26.5 | 28 |
| Wholesale and retail trade; repair of vehicles and motorcycles | 72.6 | 73.1 | 73.5 | 74.8 | 47.1 | 48.1 | 46.8 | 48.4 |
| Transportation and storage | 62.6 | 63.1 | 63.8 | 65.4 | 25.8 | 26.8 | 27.8 | 30.2 |
| Information and communications | 65.3 | 67.8 | 68.5 | 67.5 | 29.8 | 31.7 | 35.8 | 34.5 |

*Source: Russian Statistical Yearbook 2003-2021*

These indicators show that in 2004-2011, the reproduction indicators of the most important part of the means of labor improved slightly in two out of five industries and declined in three. But then, especially after 2014, all industries saw a steady deterioration in performance. Overall, in 2019, and even more so in 2020, the machinery and equipment production in the companies that produce the bulk of the value were significantly worse than in 2004. It is clear that one should not expect an increase in the growth rate of labor productivity in such conditions. In 2011-2019, they declined substantially compared to 2004-2011. See Table 13.

**Table 13** – Average annual growth in production of new value per 1 value-creating worker, in constant prices, in %

| Period | 2004-2011 | 2011-2019 | 2004-2019 |
|---|---|---|---|
| New value, natural rent included | 2.4 | 0.6 | 1.4 |
| New value, natural rent excluded | 2.7 | 0.3 | 1.4 |

*Source: calculated based on Russian Statistical Yearbook 2003-2021; Russian Federal Customs Service; Ministry of Finance of the Russian Federation; Statistical Bulletin of the Bank of Russia*

The indicators of the new value production affected the service industry and the economy as a whole.

As the analysis showed, all industries, depending on the main factors affecting their dynamics, can be divided into three groups (according to OKVED-2016):

1) Industries in which the main factors are the number of employees, fixed assets, natural rent. These are:

– agriculture, forestry, hunting, fishing, and fish farming;
– mining;
– manufacturing.

This is where new value is created.

2) Industries in which all new value created in the country serves as the main factor, since it determines the demand for the products of the industries. These include:

– production and distribution of electricity, gas, and water;
– wholesale and retail trade; repair of vehicles and motorcycles;
– education;
– communal, social, and personal services.

The first two industries create new value. But in construction, some of the activities are services. The remaining two industries are service.

3) Industries where the main determinant of output is the new value used domestically, which determines the demand for the results of their activities:

– construction;
– hotels and restaurants;
– transportation and communications;
– finances;

– real estate, renting, and services;

– public administration and military security; social insurance education;

– health care and provision of social services;

– communal, social, and personal services.

All branches of this group belong to services.

The analysis revealed the following statistically significant correlations for the first group of industries:

$$OG_1=32,27CLG_1^{0,518} \cdot VCWG_1+0,23NR; R=0,970; \tag{5}$$

$$NVG_1=9,81CLG_1^{0,561} \cdot VCWG_1+0,947NR; R=0,985; \tag{6}$$

where $OG_1$, $CLG_1$, $VCWG_1$, $NVG_1$ – the output, the capital-labor, the value-creating workers, and the new value in the products of industries in Group 1, respectively.

Equations (5) and (6) show that the output and new value in this group of industries is affected not only by the number of value-creating workers and their capital-labor ratio, but also by the amount of natural rent.

The new value contained in the output of Group 1 industries ranged from 45% to 59% of all new value created in the economy in 2004-2019. This was caused by fluctuations in the value of natural rents.

For the second group of industries, correlations are:

$$OG_2=3144.9+0.316NV+0.064WG_2-0.296NR; R=0.891; \tag{7}$$

$$NVG_2=586.14CLG_2^{0.103}VCWG_2+0,178NR; R=0.573; \tag{8}$$

where $OG_2$, $CLG_2$, $VCWG_2$, $NVG_2$ – the output, the capital-labor, the value-creating workers, and the new value in the products of industries in Group 2, respectively.

In addition, a significant correlation was established between the number of those employed in this group of industries and the amount of all new value created in the economy:

$$WG_2=18990.8+0.134NV+0.257FG_2-0.316NR; R=0.910; \tag{9}$$

where $OG_2$, $WG_2$, $FG_2$ – the output, the workers, and the fixed assets in Group 2, respectively.

Expressions (7) and (9) show a significant direct dependence not only of the output, but also of the number of workers in the Group 2 on the amount of new value created in the economy. The new value is the main factor determining the output. The correlation factor between the output in the group of industries and all new value created in the economy is 0.820. The other factors have only 7.1% of impact. This happens because the rise in new value increases the demand for the products of Group 2 industries, which boosts output and employment. An increase in the natural rent leads to an increase in the cost of specific material costs in these industries, which has a certain negative impact on output and on the number of workers. The volume of fixed assets positively impacts the number of workers in this group of industries because the expansion of fixed assets requires more workers to serve them.

The significance of dependence (8) is not very high, but it also shows the lack of obvious technical progress in the production of value in this group of industries. The direct dependence on the value of natural rents happens because the growth of rents leads to an increase in prices, which allows industries to increase their income.

Similar correlations were established for the Group 3 industries:

$$NVG_3=0.109CLG_3^{1.12} \cdot VCWG_3+0.048NR; R=0.889; \tag{10}$$

$$OG_3=1577.2+0.601NV_D+0.187FG_3; R=0.959; \tag{11}$$

$$WG_3=17938.1+0.181NV_D+0.301FG_3-0.189NR; R=0.965; \tag{12}$$

where $NVG_3$, $CLG_3$, $VCWG_3$ – the new value, the capital-labor, and the value-creating workers in the products of industries in Group 3, respectively.

Where $OG_3$, $WG_3$, $FG_3$ – the output, the workers, and the fixed asset in Group 3, respectively.

NVD – the new value used domestically.

Equation (10) shows a certain technical progress in this group of industries, as the capital equipment degree exceeds 1. However, the previous statement says that this is not enough for technical progress to

become tangible at the level of the whole process of value creation in the economy.

Natural rent has only a small impact on the value of new value in the equation (10). By excluding it from the correlation, the multiple correlation coefficient reduces by only 1.3%. But, like for Group 2, it happens because the growth of natural rents leads to a slight increase in prices, which increases the income of the industry group.

Equations (11) and (12) show that the main determinant of output and employment in this group is the new value used domestically. The value of the natural rent has no significant impact on the output of these industries. The impact of natural rents on the number of workers is also low. Excluding rents from the correlation formula reduces the multiple correlation coefficient by only 1%. At the same time, it works in the opposite way.

The authors also tested the hypothesis that the main factor affecting the value of GDP is the new value used domestically. The analysis produced the following correlation:

$$GDP=1.558VD_D+9894; R=0.936;\qquad(10)$$

where GDP – gross domestic product;

NVD – the new value used domestically.

The correlation is quite significant, which can also be seen in the graph in Figure 2. It shows that each additional billion rubles of value used.
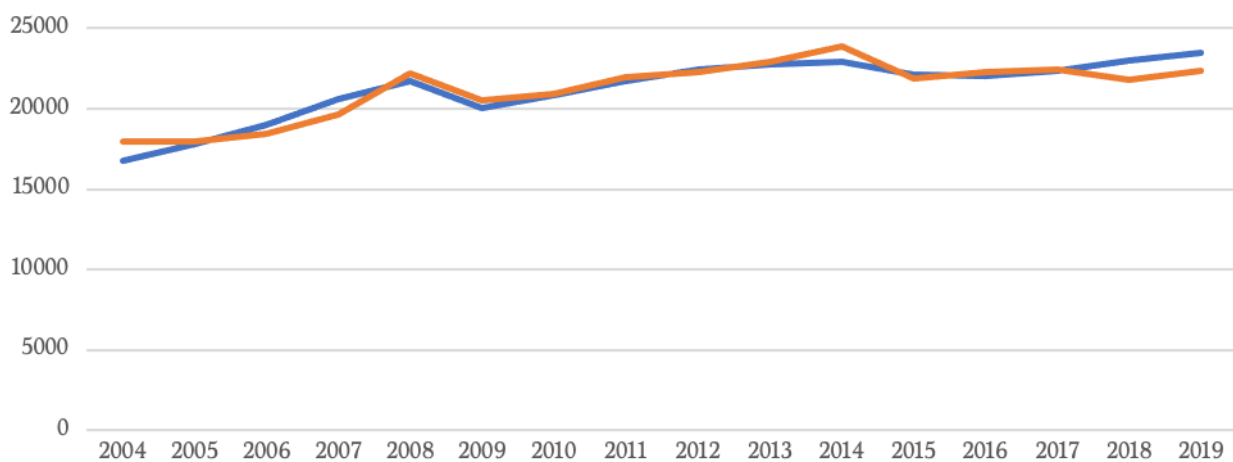


**Figure 2.** Actual and estimated values of GDP in 2004 prices, billion rubles
(blue – actual values; orange – estimated values)

*Source: composed by author*

Estimates within the country increases GDP by about 1.55 billion rubles. Conversely, for example, an increase in net exports by 1 billion rubles, all other things being equal, reduces GDP by the same 1.55 billion rubles.

Thus, production, appropriation, and use of value physically create the income of all subjects of the economy.

The generated income, in turn, determines the standard of living of economic participants. Thus, the correlation factor between the annual growth of GDP and the growth of actual final consumption of households is 0.941. The close correlation between these indicators can be seen in the graph in Figure 3. The correlation factor between the basic coefficients of GDP growth and real disposable money income of the population is 0.951. It was the dynamics of GDP that determined the indicators of growth of the population's real disposable money incomes. See Table 14.

As follows from the data in Table 14, after the rapid growth in 2004-2008, a period of slowing growth and then decline in real disposable income began. The average annual growth rate fell from 10% in 2004-2008 to 2.8% in 2009-2014, and then to -1.8% in 2014-2019. When the pandemic started in 2020, they fell another 2% (Russian Statistical Yearbook 2003-2021, 2021).

**Table 14** – Average annual growth rates of real disposable money incomes of the Russian population

| Period | 2004-2008 | 2009 | 2009-2014 | 2014-2019 | 2004-2019 | 2015 | 2015-2019 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average annual growth rates | 1.100 | 1.021 | 1.028 | 0.982 | 1.030 | 0.968 | 0.986 | 0.942 | 0.988 | 1.004 | 1.010 | 0.980 |

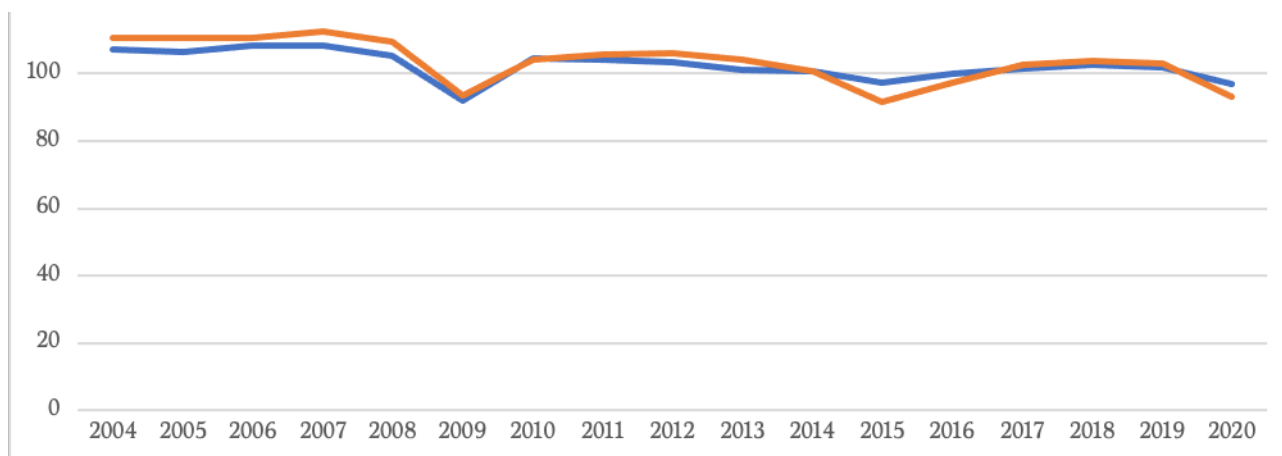*Source: Russian Statistical Yearbook 2003-2021*



**Figure 3.** Annual growth rate of GDP and actual household end consumption, in %
(blue – GDP; orange – Actual household final consumption)

*Source: Russian Statistical Yearbook 2003-2021*

The fall in the rate of production of new value has caused a decrease in the growth rate of GDP and, as a consequence – lower growth and a decrease in real incomes of the population.

Meanwhile, the standard of living of the population does not only depend on the growth of total consumption and real income, but also their differentiation, as well as the proportion of the population below the poverty line.

As Figure 4 and 5 show, the funds ratio rose sharply from 15.2 in 2005 to 16.8 in 2006-2007 and then began to decline gradually, reaching a value of 14.8 in 2020, although there was some increase in 2012 and 2018. The proportion of people with incomes below the subsistence level fell from 17.7% in 2004 to 10.7% in 2012, but then rose to 13.4% in 2015. It then began to decline and was 12.1% in 2020 (Russian Statistical Yearbook 2003-2021, 2021).
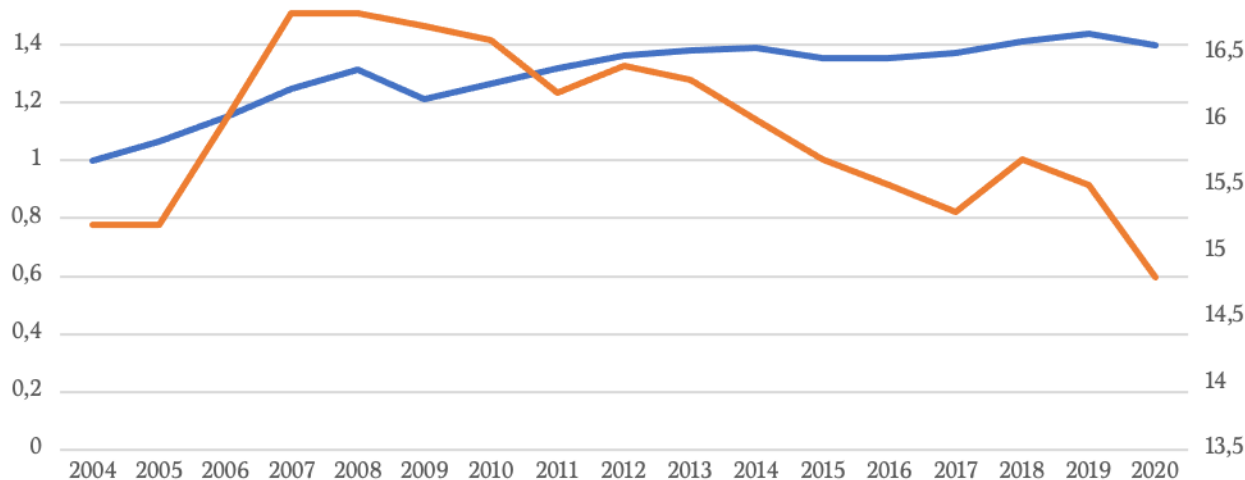


**Figure 4.** GDP growth and fixed assets factor dynamics in Russia
(blue – GDP growth; orange – Fixed assets factor)

*Source: Russian Statistical Yearbook 2003-2021*

This is the official statistics. There are no more reliable data. It follows that, on the one hand, income inequality has been decreasing in recent years (reduction of the fund ratio); but, on the other hand, inequality has increased from 2012 to 2020, as the share of the population with incomes below the subsistence level has grown.
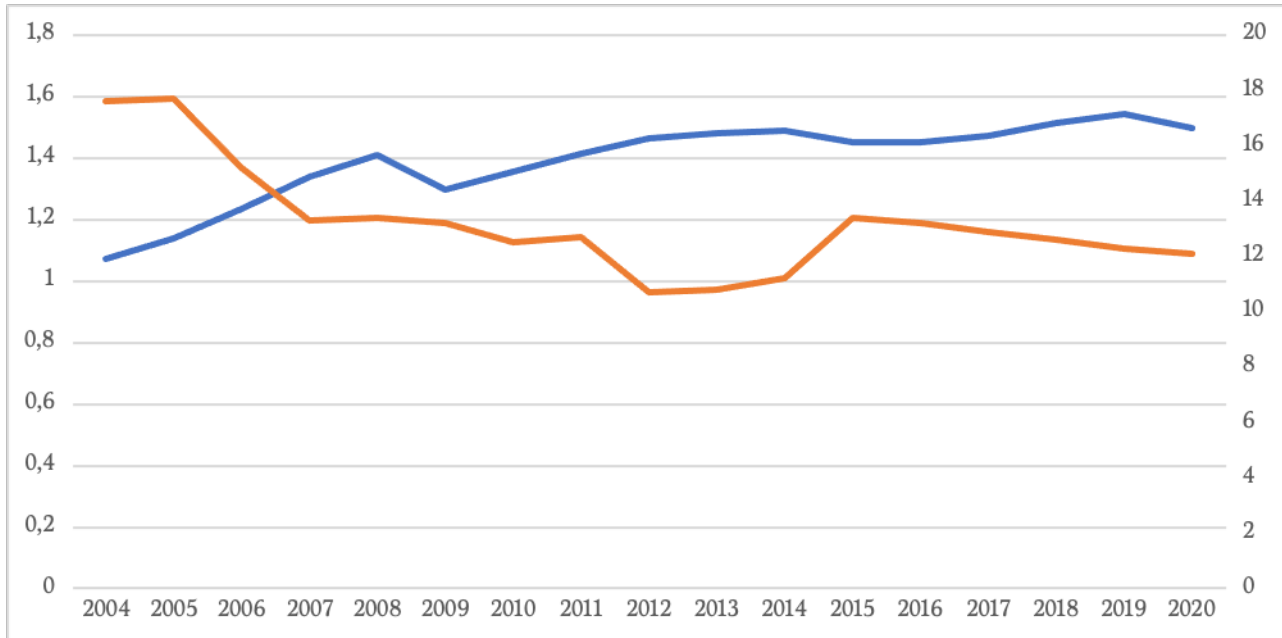


**Figure 5.** GDP growth and share of population below the poverty line
(blue – GDP growth; orange – % population below the poverty line)

*Source: Russian Statistical Yearbook 2003-2021*

An important indicator of the standard of living is the morbidity rate of the population. See Figure 6. As can be seen from the graph, the morbidity of the Russian population was increasing until 2014, reaching about 115.0 thousand people, then in 2015-2019 began to fluctuate around the level of 114.6 thousand people per year. But when the pandemic started, it suddenly dropped (?) to 111.3 thousand people in 2020 (Russian Statistical Yearbook 2003-2021, 2021) (because they detected less?), while during this period there was a sharp increase in the Covid-19 cases and population mortality (See Figure 7). These are Rosstat data.
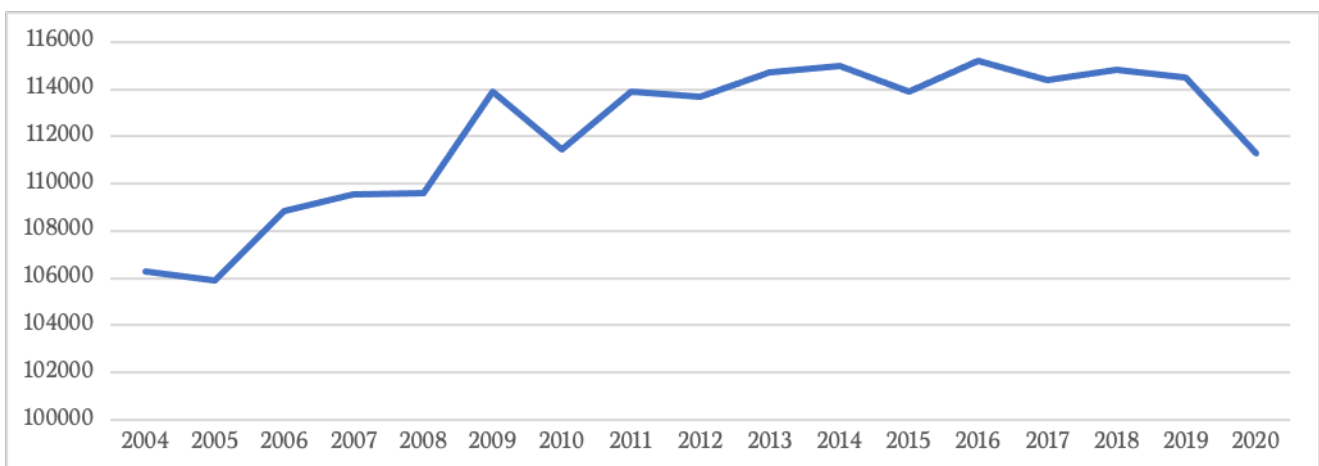


**Figure 6**. Total morbidity in Russia, thousand people

*Source: Russian Statistical Yearbook 2003-2021*

As Figure 7 shows, the natural decline in population since 2005 gradually decreased, reaching about 0 in 2012, then the natural population growth began to increase, which is 0.3 per one thousand people in 2015. Since 2016, however, natural decline began to rise again, increasing to -2.2 in 2019 and to -4.8 per one thousand people in 2020.

**Figure 7.** Indicators of mortality and natural growth of Russia's population
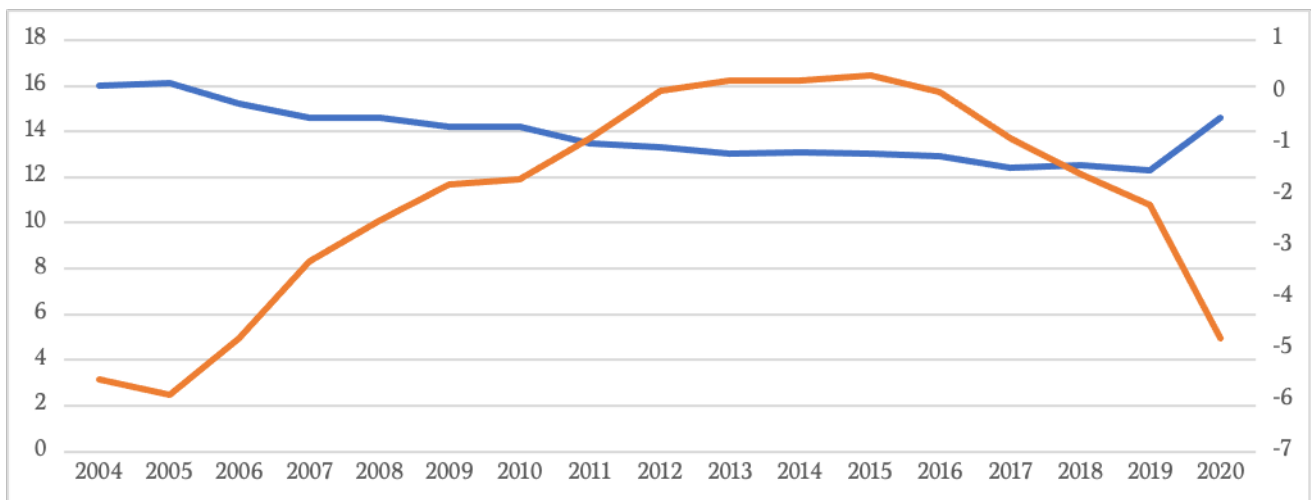(blue – Dead, per thousand people; orange – Natural population growth)
*Source: Russian Statistical Yearbook 2003-2021*

Analysis of the data showed that the dynamics of natural population growth is closely related to the growth of real disposable income of the population. The correlation factor between these values is 0.878. And the correlation factor between the mortality rate and the growth of real disposable money income of the population was -0.832, i.e., a significant inverse relationship – the higher the income, the lower the mortality rate. This means that the dynamics of production and use of value ultimately determines the dynamics of the most important demographic indicators.

At the same time, it was discovered that the correlation factor between the growth of real disposable income of the population and total morbidity is 0.889, which indicates a significant direct correlation – with the growth of income, morbidity shows a clear upward trend. This phenomenon can probably be explained by the environment degradation, the increase in the social and psychological problems of the population, the level of medical care and other factors, which requires a special study. In any case, this fact does not indicate an improvement in the quality of life of Russian citizens.

An analysis of the dynamics of the birth rate is also interesting. See Table 15.

**Table 15** – Birth rate per thousand people in Russia

| Period | 2004-2008 | 2009-2014 | 2015-2019 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| Average rate for the period | 10.9 | 13.0 | 11.0 | 12.9 | 11.5 | 10.9 | 10.1 | 9.8 |

*Source: Russian Statistical Yearbook 2003-2021*

Russia's fertility rate increased from 10.4 in 2004 to 13.3 in 2011-2014, but then began a steady decline and fell below the 2004 level in 2019. In the Covid year of 2020, the decline continued. The graph in Figure 8 clearly shows the relationship between the fertility rate and the growth rate of real disposable income of the population, although this factor is, of course, influenced by other factors, above all – the age structure of the population.

Indicators of average life expectancy, which has been growing steadily since 2004 and increased from 65.31 years to 73.34 years in 2019, i.e., by 8 years, also portray the living conditions of Russians in a good light. But in 2020, it decreased to 71.54 (Russian Statistical Yearbook 2003-2021, 2021).

One should keep in mind that this is a hypothetical indicator, not an actual one. But even this indicator shows that Russia lags behind most industrialized countries, and not only them.

**Discussion**

The analysis shows that since the early 2010s, the competitiveness of Russia's economy as it was defined

previously in the paper has been declining, although its position in the WEF and IMD ratings has been moving up. The dynamics of the entire set of Russia's main socio-economic indicators discussed above testify to the decline of competitiveness.
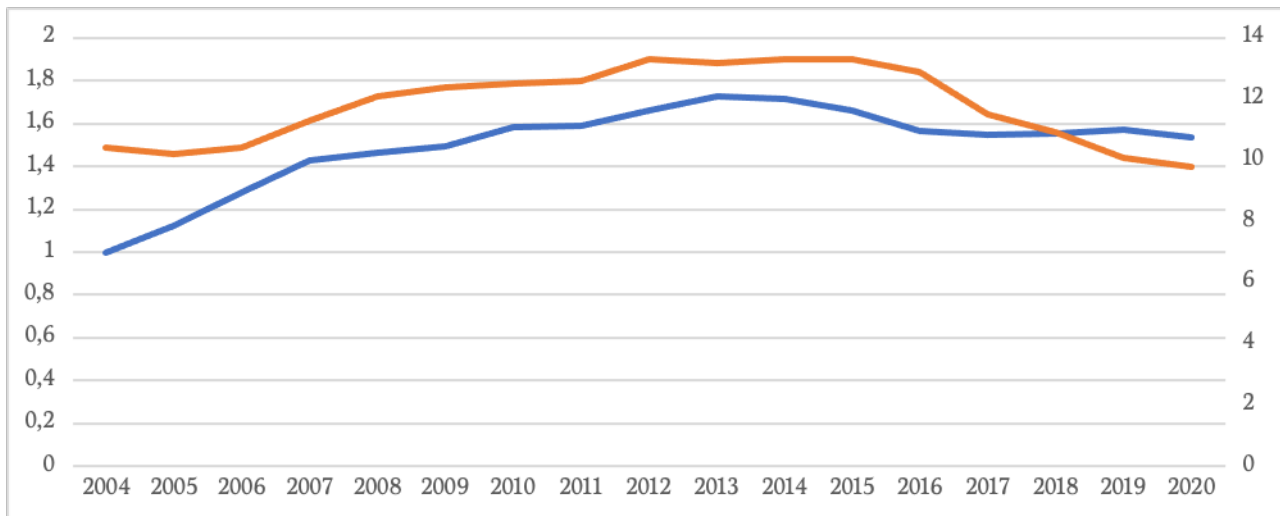


**Figure 8.** Dynamics of the birth rate and real disposable money incomes of the population
(blue – Real disposable income growth, 2004=1; orange – Birth rate)
*Source: Russian Statistical Yearbook 2003-2021*

The main reason for that, as has been shown, is the increasing wear and tear of the means of labor in use, which slows down the growth rate of labor productivity in manufacturing, which is the material basis of the whole economy. In addition, a significant part of the created value is removed from the economy. In 2004-2019, according to the estimates, the Russian economy lost value of more than 30.6 trillion rubles in 2004 prices, which is 31% more than the entire volume of GDP in 2019 in the same prices. This led to a low level of capital investment and a slowdown in renewing the materials and machinery in production and services. In 2020-2021 the outflow of value has only accelerated.

The study found that the growth of net exports is not a stimulus for economic development; on the contrary, other things being equal, it reduces domestic demand and income of economic subjects, because it reduces the new value used inside the country, creating the main channel for the value outflow. The country has to realize that exports are not needed just for the sake of exports, but precisely to buy abroad what the country needs.

Many authors point out the unacceptable deterioration of the economy. For example, experts of the National Rating Agency believe that it is necessary to increase labor productivity growth to 4-4.5% per year through a significant increase in investment in fixed capital and development of advanced technologies.

As Vodomerov (2021) shows, if all the new value created were used to develop the country, the pace of Russia's socio-economic development could be significantly accelerated and stabilized, increasing the competitiveness of the Russian economy. The existing property relations allow a narrow group of the oligarchs to own the results of the labor of millions of workers and use them in their narrow self-interest, which hinders this development.

A serious negative impact on our economy is also caused by the growing economic war being waged by the U.S. and its allies against Russia, whose actions are in no way guided by the requirements of «fair» or «free» competition.

To overcome the negative trends, it is necessary to abandon the concept of national competitiveness as providing conditions for freedom of competition, all the more so because the creation of such conditions in the current realities is nothing more than utopia. The state should increase its role in ensuring the competitiveness of the national economy, as noted by many authors. Various measures in this direction are proposed, see, for example, Klinova (2020), Zehri (2020), Naidenova & Leonteva (2020), Vlasov & Sinyakov (2020).

In particular, C. Zehri advocates an active state restriction of capital outflows, referring to the fact that

«after the 2008 financial crisis, international financial institutions have changed their views on the benefits of capital account liberalization... The International Monetary Fund (IMF) has publicly supported 'measures to control capital flows... International banking and financial institutions have agreed that capital account liberalization is a major source of financial instability, and capital controls can be an effective way to protect financial systems from its volatile flows» (Zehri, 2020).

However, the proposed measures, as a rule, are limited to various ways of indirect influence on market relations by the state. Taking into account the structure of ownership relations that has developed in Russia, where the vast majority of large corporations have foreign registration, and the share of non-residents' capital is very significant, measures of this kind will not make a sufficient impact.

The new composition of the Russian Government sets tasks and draws up programs on development of mechanical engineering, including electronic equipment production, which should prove to be good. Although it has been done before, but the declared goals, as a rule, were not achieved.

However, it seems that the role of the state should be strengthened even more. The point is that the main task to be solved is to transfer the economy to modern machinery in a historically short time by re-equipping the existing and building new enterprises. To do that, annual deliveries of new machinery to enterprises over the next few years must be 300% larger than now, both through imports and mainly at the expense of the development of Russian machine building.

Funds for this can be obtained through:

– substantially restricting capital outflows from the country (this should not stop capital exports, which are aimed at capturing foreign enterprises to acquire advanced technology or create conditions for the export of goods);

– using a large part of the sovereign funds and reserves of the Central Bank;

– internal government loans from the population (which would reduce financial speculation and scams by banks using people's deposits);

– increasing the taxation of capital taken offshore, as well as the super incomes of the richest part of the oligarchs;

– preserving resources and cancelling economically failing projects like Moscow City, etc.

These funds must be used for the technical reconstruction of the economy. It is clear that this task cannot be accomplished within the free competition. State planning is required. It must redistribute value flows in the economy by directing them to development and implementation of new technology, including an increase in imports of modern machinery in exchange for raw materials, primarily to revive the Russian machine-tool industry and the machine-building industry in general. As the competitiveness of these sectors increases, the need for and dependence on imported machinery will diminish, and the economy will be transferred to the Russian equipment.

In this case, the state should force corporations to adhere to the national interests, up to and including the nationalization of enterprises, if it is required to preserve the integrity and security of Russia in the face of the growing onslaught from the United States and its satellites. This is not the time to believe in fables about the benefits of liberal economics.

**Conclusions**

Main results of the study:

1) The study was based on the author's interpretation of the concept of economy competitiveness, which reflects the objective ability of the economy to develop in the context of the current intensified struggle for the new world order. It was used to assess the competitiveness of the Russian economy and to conclude that it has been declining since about 2011.

2) The provision of Marxist theory about the key role of material production in the economy was confirmed. It is the value created in material production that underlies the income of society as a whole, including the state, and determines the growth rate and the number of people employed in services, as well as infrastructure, construction, trade, transport, and communications. Therefore, in order to accelerate

economic growth, it is necessary first of all to increase the growth rate of material production.

3) The statistically significant dependencies obtained in the course of the study help estimate approximately the investments in fixed assets of material production necessary to ensure the specified growth rate of material production industries and GDP.

4) In the Russian economy as a whole, the indicators of reproduction of materials and machinery for manufacturing are declining. This means that a cardinal re-equipment of manufacturing with modern technology is overdue. However, it is restrained by the system of capitalist property relations on means of production, which generates a mass outflow of resources and capital abroad. It benefits a certain part of owners of means of production, but dooms the country to technological backwardness.

5) The study showed that the growth rate of GDP is in close direct correlation with the growth of new value used domestically (NVD). Therefore, positive net exports do not contribute to economic growth, but only pave the way for capital outflows abroad. Deductions to sovereign funds and the Central Bank reserves also reduce the value of the NVD. Restricting investment in the Russian economy under the pretext that it seems to have reached «full employment» or that it is «overheating» is not tenable. It's all about where and in what form investments are directed. If through investments, manufacturing is re-equipped with new machinery, it will let all economy sectors grow and also release the workers from manufacturing to other sectors.

6) The increase of the NVD is achieved primarily by increasing imports. But it should be done with maximum benefit for the national economy. First of all, it is necessary to increase imports of the most effective technology in exchange for exported resources, while avoiding the import of equipment that can be produced in Russia. Only what cannot be produced domestically in the near future should be imported.

7) As the analysis showed, the growth of natural rent, causing an increase in prices for industrial products, does not impact all sectors positively. The current dependence of the economy on the volume of natural rent is a factor that disturbs sustainable economic growth. The development of the economy needs to focus not on the growth of natural rents, but on the technical re-equipment of all industries, especially mechanical engineering, which produces the means of labor. Onlis this can help the country achieve true economic sovereignty in the economic war around the world and create the grounds for solving all major problems of the Russian economy: poverty, migration, demography, labor shortages, ecology, import substitution, economic diversification, etc.

8) The study showed that the growth of GDP caused by the development of material production and the use of its results significantly affects not only the standard of living, but also the most important demographic indicators: mortality, birth rate, natural increase and, therefore, the population. This once again confirms the Marxist theory that mentions the role of material production as the basis of life of the entire society. Any statements that material production seems to play a secondary role in modern society, giving way to services, are false in Russia's case. It has been shown that the development of the service sector crucially depends on the production and use of value.

9) The paper proposes measures to enhance Russian economic competitiveness which go beyond ensuring freedom of competition and suggest a greater role for government in economic development, including through government planning.

**References**

1. Klinova, M. V. (2020). The state and national competitiveness (case study of the EU). *Voprosy ekonomiki,* (8), 146-158 (in Russian).

2. Foreign affairs. (1994). Krugman, P. *Competitiveness: A Dangerous Obsession.* Retrieved from https://web.archive.org/web/20090123155129/http://www.foreignaffairs.org/19940301faessay5094/paul-krugman/competitiveness-a-dangerous-obsession.html (accessed 01.02.2022).

3. Jamel, L., Derbali, A., Lamouchi, A., & Elnagar, A. (2021). Trade Openness and Competitiveness: BRICS and Sub-Saharan Africa Countries. *International Organisations Research Journal,* 16(1), 64–84. Retrieved from https://iorj.hse.ru/en/2021-16-1/458538272.html (accessed 01.02.2022).

4.  Gnidchenko, A. A. (2021). Measuring competitiveness by quality: what's wrong with high-tech exports? *Voprosy ekonomiki,* (12), 48-65 (in Russian).

5.  Federal State Statistics Service. (2021). *Russian Statistical Yearbook 2003-2021.* Retrieved from https://rosstat.gov.ru/folder/210/document/12994 (accessed 01.02.2022) (in Russian).

6.  Finanz.ru. (2021). *Russia's share in global GDP has plummeted to its lowest since the turn of the century.* Retrieved from https://www.finanz.ru/novosti/aktsii/dolya-rossii-v-mirovom-vvp-rukhnula-do-minimuma-s-nachala-veka-1030863206 (accessed 02.02.2022) (in Russian).

7.  Analytical Center for the Government of the Russian Federation. (2020). *Bulletin on current trends in the Russian economy,* (67), November.  Retrieved from https://ac.gov.ru/uploads/2-Publications/BRE/_%D0%BD%D0%BE%D1%8F%D0%B1%D1%80%D1%8C_web.pdf (accessed 01.02.2022) (in Russian).

8.  *Russian Statistical Yearbook, 2001.* (2001). M.: Goskomstat (in Russian).

9.  Ministry of Natural Resources of Russia. (2021). *State Report «On the State and Use of Mineral Resources of the Russian Federation in 2020».* M.   Retrieved from https://www.mnr.gov.ru/docs/gosudarstvennye_doklady/gosudarstvennyy_doklad_o_sostoyanii_i_ispolzovanii_mineralno_syrevykh_resursov_2020/ (accessed 02.02.2022) (in Russian).

10. Russian Federal Customs Service. *Open Data.* Retrieved from https://customs.gov.ru/opendata (accessed 20.01.2022) (in Russian).

11. Ministry of Finance of the Russian Federation. *Statistics.* Retrieved from  https://minfin.gov.ru/ru/statistics/ (accessed 20.01.2022) (in Russian).

12. Bank of Russia. *Statistical Bulletin of the Bank of Russia.* Retrieved from  http://www.cbr.ru/statistics/bbs/ (accessed 20.01.2022) (in Russian).

13. Zamaraev, B. A. & Marshova, T. N. (2020). Efficiency of the investment process of reproduction. *Voprosy ekonomiki,* (5), 45-68 (in Russian).

14. Finanz.ru. (2022). *Capital outflow from Russia sets record since annexation of Crimea.*  Retrieved from        https://www.finanz.ru/novosti/valyuty/ottok-kapitala-iz-rossii-ustanovil-rekord-s-anneksii-kryma-1031110345 (accessed 02.02.2022) (in Russian).

15. Vesti.ru. (2022). *Capital outflows from Russia have risen sharply.*  Retrieved from  https://www.vesti.ru/finance/article/2674950 (accessed 02.02.2022) (in Russian).

16. Vesti.ru. (2022) *Experts: Russia's previous sources of GDP growth have dried up, so we need to look for new ones.* Retrieved from  https://www.vesti.ru/finance/article/2671597 (accessed 02.02.2022) (in Russian).

17. Vodomerov, N. K. (2021). Problems of the Russian economy from the position of traditional Marxism. *Theoretical Economy,* (3), 39-58.  Retrieved from  http://www.theoreticaleconomy.ru/index.php/tor/issue/view/3 (accessed 02.02.2022) (in Russian).

18. Klinova, M. V. (2020). The state and national competitiveness (case study of the EU). *Voprosy ekonomiki,* (8), 146-158 (in Russian).

19. Zehri, C. (2020). Restrictions on Capital Flows and International Financial Institutions' Support. *International Organisations Research Journal, 15*(3), 51-71. Retrieved from https://iorj.hse.ru/en/2020-15-3/412085181.html  (accessed 02.02.2022).

20. Naidenova, Yu. N., & Leont'eva, V. V. (2020). Impact of economic policy uncertainty on investments by Russian companies. *Voprosy ekonomiki,* (2), 141-159 (in Russian).

21. Vlasov, S. A., & Sinyakov, A. A. (2020). Effectiveness of public investment and implications for monetary policy in Russia. *Voprosy ekonomiki,* (9), 22-39 (in Russian).

22. RBC. (2022). *Manufacturers of machinery from Russia have been set the goal of entering the world's top 5.* Retrieved from   https://www.rbc.ru/technology_and_media/14/02/2022/62089a019a794702e2673133?-from=from_main_6 (accessed 02.02.2022) (in Russian).

# Competition between the regions of the center of Russia for migration flows of the population: assessment and consequences

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**Abstract.** The paper contains the comparative analysis of migration indicators in the regions of Central Russia. The aim of the study is to analyse population migration in the regions of Central Russia, to assess youth migration activity and to identify measures to retain young people in the regions. The socio-economic development strategies and SWOT-analysis of the regions show advantages and disadvantages of the regions due to their proximity to the Moscow agglomeration. Residents of Moscow, the Moscow, Vladimir, Kaluga, Tver and Tula regions are much more involved into interregional migration than in regional one. The regions around the Moscow agglomeration are competing to attract investment, skilled labour and talented young people. But the proximity to the Moscow metropolitan area creates economic and labour market opportunities for the regions. They related to the increasing pace of relocation of production and office functions from Moscow to the neighbouring regions, the arrival of investors, the strengthening of interregional links for supplies of food and textile industry, the migration of Moscow and the Moscow region residents to the country houses, etc. The study concludes and recommends the measures to retain young people in the regions.

### Introduction

The modern regions economic development dwells on creating of efficient economy based primarily on innovation and the production of high-tech products and services. There is a trend of staff shortages, especially in blue-collar occupations, in mechanical engineering, metalworking, construction, utilities and agriculture (Babkova, 2018). Also there are conditions for increased competition between regions for skilled labour. At the same time by the Strategy of socio-economic development of the Smolensk region (hereinafter referred to as the Strategy) economic sectors and territories with higher wages, social security and decent working conditions will have a certain advantage.

The reasons for population migration are: education (especially at the youngest working age), the higher wages, family reasons (marriage, family break-up, moving as part of the family, e.g. children, unemployed members of the household); after retirement people return to the previous place of residence, desire to live in more favourable natural and climatic conditions, etc. Educational migration is related to education, skills development, various internships and other forms of human capital accumulation.

The economic factors of national and regional development primarily influence on migration. On the one hand, migration can be a factor of economic growth of the region. On the other hand, the migration of

residents, especially young people, from small towns to larger cities, from regional capitals to metropolitan areas reduces the labour and overall economic potential of regions and municipalities. The migration from the single-industry towns is particularly important. The main issues of single-industry towns in Russian regions are declining population, low employment opportunities; low investment attractiveness, etc. Largely, a single-industry town is a settlement located at a considerable distance from other towns and cities. The main economic risks of single-industry towns are related to the crisis of city-forming enterprises, narrow specialization of economic activities (Elizarova & Berendeeva, 2018).

It is necessary to study regional and interregional migration flows leading to the outflow of population from the region, the educational and labour migration of young people, to make forecasts and develop measures allowing to retain young people in the regions.

At present, residents of many regions in Central Russia migrate permanently or temporarily (on a rotational basis) to the metropolitan area of Moscow and the Moscow region, which is explained by the availability of a large number and variety of jobs, higher wages in the Moscow agglomeration, etc. by M. Kartseva, N. Mkrtchyan and Y. Florinskaya (2020): "migration is an important tool by which households counteract negative social phenomena such as unemployment and poverty".

The section "Spatial competition for human resources" of the Kaluga Region Strategy, noted "the Moscow agglomeration is constantly demanding new qualified middle and senior level human resources This need is met both by own resources and the population of the regions closest to Moscow. Over time, this workforce will be concentrated mainly on the technological services of the agglomeration. The formation of a technology zone in the Moscow region, where logistics, repair and processing facilities will be concentrated, is already underway. One of the main problems for the regions surrounding Moscow will be the problem of labour retention".

The impact of the Moscow agglomeration on migration is ambivalent. By the Kaluga Region Strategy, while 10-15 years ago the population of Central Russia and other regions of the Russian Federation, as well as citizens of the Commonwealth of Independent States (CIS), came to the capital region, in recent years a counter process began: Moscow is a source of settlement in the surrounding areas; the next 7-15 years a 'new settlement' trend will ensure a 'new habitat' at the border of the Moscow and Kaluga regions. The number of new settlers, according to expert estimates, could reach 300,000 by 2030.

Thus, the aim of this study is to analyze population migration in the regions of Central Russia (their "losses" and "gains" as a result of migration), the migration activity of young people (school, college and university graduates), and to identify measures to retain young people in the regions (the role of economic and social factors).

**Methodology**

The methodological basis for the study was a comparative analysis of regional strategies, including competitive advantages, strengths, weaknesses, opportunities and threats (SWOT-analysis). Also we used the statistical indicators of the Federal State Statistics Service of the Russian Federation on migration in the constituent entities of the Russian Federation, as well as scientific papers devoted to the analysis of the problems of the interrelation of migration processes and socio-economic development of territories (regions, municipalities). At the same time, the experts note a) the poor quality of migration general in Russia and in the Moscow and St. Petersburg agglomerations especially. The migrants have the greatest difficulty in getting registered (for example, differences in the statistics of migrants according to the data of the Ministry of Internal Affairs and Rosstat), b) difficulties in direct assessment of the intensity of the impact of migration processes on the formation of the region's population, due to which an indirect assessment using forecast methods is used (Doronina, 2019).

We identified 5 main items of our research.

Firstly, the "costs" of migration outflows from municipalities and regions, and the causes and negative consequences of these outflows are studied. Thus, A. Tebekin's research article shows a chain of socio-demographic problems and economic losses typical for the most regions of the country: reduction of jobs in

schools and hospitals as a result of their optimization, the need for labour migration of teachers and doctors, the search for spatially accessible other educational and medical institutions, the need for labour migration for part of the working-age population. It can be concluded that "the availability of social infrastructure facilities – schools and hospitals – is the basis for the development of settlements in the Russian Federation" (Tebekin, 2021).

The scientific works of A. Gayazov, G. Akhmetova, I. Utyasheva and N. Shamsutdinova (2020) concern the socio-territorial peculiarities of population migration, the demographic development gap between urban and rural areas. The authors believe that "reduction of negative trends in rural areas is possible with a comprehensive solution of territorial development issues, implementation of effective economic and social policy measures in the region, primarily in rural areas".

Secondly, there is a view of the significance of contemporary migration for Russia and the Russian regions, and the possibilities for attracting labour resources from outside. By T. Nefedova and A. Starikova (2020), the migration of the population serves as an indicator of the socio-economic well-being of a region. The authors point out "the spatial mobility of the population is one of the main ways in which it adapts to territorial socio-economic contrasts" and investigate the formation of vital hubs as a result of resettlement and labour migration and the partial level of its "landscape" through dacha, tourist and partly international migration.

L. Rybakovsky and N. Kozhevnikova (2019) examine international migration between the former USSR republics which are the modern Near Abroad countries. Also the authors discuss the reduced opportunities for Russia to attract immigrants from the countries of the Near Abroad.

Thirdly, the sources of population growth in metropolitan areas are studied. The article by K. Doronina (2019) dwells on the migration is not only compensated for natural decrease, but it also ensured quite a significant increase the Moscow agglomeration population, primarily due to Moscow's central position according to the location of the population of the Russian Federation and the adjacent territories. Long-term studies identify the consistent pattern of migration increasing in Moscow occurs at the age of 15-50 years. The age structure changes are due to migration of working-age younger population groups. Moscow has the most significant contribution of migration to births: 20% of the population aged 0-22 are children of migrants born in Moscow, another 20% are children of migrants were not born in Moscow, and children of the original population account for only 60%.

Fourth, the impact of the COVID-19 pandemic on migration in Russia is explored. N. Pokrovsky, A. Makshanchikova and E. Nikishin (2020) note the 2020 pandemic had a significant impact on migration flows in Russia. It led to an increase in atypical migration processes, above all the mass outflow of urban dwellers to non-urban spaces. The March-early May 2020 moves of city dwellers from Moscow to short-, medium- and long-distance suburban homes in the Moscow, Vladimir, Kostroma, Vologda and Nizhny Novgorod regions were investigated. The authors discuss the problem of reverse migration and de-urbanization, "life after the life in city" and the corresponding transformation of lifestyles. According to the authors, at least 50-60 million people in Russia today own a "second" country house. The concept of crisis epidemic de-urbanization migration to non-urban spaces within the parameters of the new migrants' life world" is introduced.

Fifthly, it is important to study the motivational migration intentions of young people, which is important for the further socio-economic development of regions and municipalities in terms their labour potential.

The migration flow mostly consists of active working age people. Young people constitute the main share of those who leave, many of them are also among those who stay yet, but plan to leave. For example, those who did not leave after school may leave after graduating from secondary / higher education institution, i.e. there are two main peaks of youth migration: "school – university" and "university – labour market" (Byuraeva, 2020; Gabdrakhmanov et al., 2019). It is therefore important to study the level of potential migration of young people. The study by Y. Byuraeva (2020) on the example of the Republic of Buryatia analyzes intra- and inter-regional movements of young people, the consequences of youth attrition, especially school leavers, for the region.

T. Doroshenko and G. Leonidova (2019) studied educational migration of school graduates in the Vologda region, indicated differences in educational migration of urban and rural school graduates, identified three groups of municipal districts, in which schoolchildren had different attitudes to educational migration outside the region.

The study by N. Gabdrakhmanov, N. Nikiforova and O. Leshukov (2019) substantiates the thesis of the high university attractiveness for young people, including remaining the main resource for retaining and attracting talent to the regions. At the same time, studies show more than half of the students in Russia study mainly in 2 of the 8 federal districts – the Central and Volga one. In Russia, 10 regions with the largest share of students in the population can be conventionally called the "student" regions: St. Petersburg and the Leningrad region, Moscow and the Moscow region, Republic of Tatarstan, the Oryol, Omsk, Tomsk, Tyumen, Kursk, Novosibirsk and Voronezh regions.

The paper analyzed the regional higher education systems demand and employment of university graduates. Also the authors introduced the regional universities demand indicators among school graduates, postgraduate mobility of university graduates (Gabdrakhmanov et al., 2019).

**Results**

We analyze the migration indicators of the regions of Central Russia according to the Statistical Collection "Regions of Russia".

By Table 1, in the period of 2013 and 2020 only the Kaluga and Moscow regions had notable positive migration balance (68 persons per 10,000 of population, respectively). In compare with 2018 and 2019, it decreased twice in the Moscow region and increased significantly in the Kaluga one. There is an excess of migration outflow over inflow, which leads to the population negative migration balance. Many regions are characterized by fluctuating the migration balance coefficient, especially in the Ivanovo, Kaluga, Ryazan and Tver regions.

In the pre-COVID-19 period (up to 2020) negative migration balance occurred in the Kaluga, Kostroma, Smolensk and Tula regions. Migration was affected by 2020, characterizing by the coronavirus pandemic, which due to travel restrictions declined the migration rate in all regions under study (except the Kaluga and Kostroma regions).

**Table 1** – Coefficients of migration balance per 10,000 population[1]

| Period | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| Moscow | 90 | 57 | 92 | 24 | 89 | 79 | 38 | 1 |
| Moscow region | 140 | 149 | 120 | 141 | 111 | 140 | 144 | 68 |
| Vladimir region | -4 | -1 | -11 | -2 | -21 | -24 | 20 | -13 |
| Ivanovo region | -5 | -7 | -22 | -13 | -22 | -33 | 8 | -1 |
| Kaluga region | 24 | 94 | 17 | 77 | 16 | 19 | -11 | 68 |
| Kostroma region | -5 | 2 | -10 | -15 | -33 | -43 | -5 | 3 |
| Ryazan region | 16 | 4 | 0.01 | 17 | 8 | -4 | 21 | 7 |
| Smolensk region | -18 | 21 | -6 | 2 | 24 | -2 | -4 | -47 |
| Tver region | 1 | -12 | -14 | 4 | -30 | -34 | 5 | -13 |
| Tula region | 4 | 19 | 19 | 21 | 25 | -9 | -4 | -3 |
| Yaroslavl region | 38 | 35 | 37 | 28 | 7 | 3 | 8 | -9 |

1) The sign (-) indicates a decrease
*Source: Regions of Russia. Socio-economic indicators. 2020*

By Figure 1, coefficient of the migration balance per 10,000 people in the regions under study differs significantly: the migration situation is most favourable in the Moscow and Kaluga regions even under the pandemic conditions of 2020. In recent years positive migration balance in the Yaroslavl region in 2020 is replaced by negative one. The Vladimir and Ivanovo regions, after showing the positive migration balance in

2019, in 2020 returned to the negative one, too.
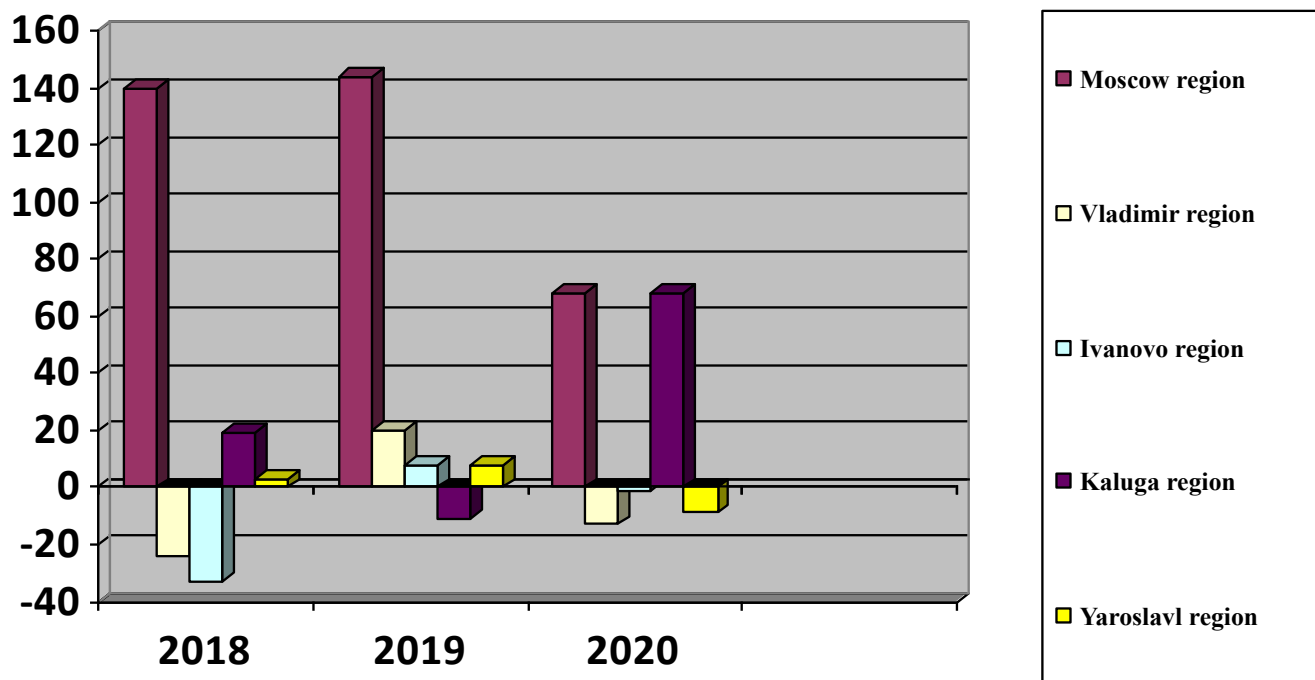


**Figure 1**. Coefficients of migration balance per 10,000 population in the 5 regions of Central Russia in the period of 2018-2020

*Source: Regions of Russia. Socio-economic indicators, 2020*

By Table 2, the main flow of arrivals to Moscow and the Moscow region are from other regions (in 2020, the percentages were 90.6 and 63.9, respectively). A high percentage of people from other regions also came from the Vladimir (48.4%) and Tver (43.1%) regions.

**Table 2** – Distribution of arrivals by the aim of trip (as a percentage of total arrivals)

| Period | Within the region | | | From other regions of Russia | | | From outside of Russia | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2018 | 2019 | 2020 | 2018 | 2019 | 2020 | 2018 | 2019 | 2020 |
| Moscow | 3.0 | 3.6 | 1.8 | 86.0 | 87.8 | 90.6 | 11.0 | 8.6 | 7.6 |
| Moscow region | 18.8 | 18.0 | 18.6 | 71.8 | 66.5 | 63.9 | 9.4 | 15.5 | 17.5 |
| Vladimir region | 44.4 | 38.2 | 35.2 | 48.9 | 43.0 | 48.4 | 6.7 | 18.8 | 16.4 |
| Ivanovo region | 54.8 | 50.4 | 49.6 | 42.9 | 40.2 | 39.7 | 2.3 | 9.4 | 10.7 |
| Kaluga region | 26.4 | 23.6 | 22.6 | 37.1 | 37.4 | 38.2 | 36.5 | 39.0 | 39.2 |
| Kostroma region | 59.3 | 56.0 | 54.3 | 34.2 | 34.2 | 37.3 | 6.5 | 9.8 | 8.4 |
| Ryazan region | 47.4 | 43.8 | 45.0 | 41.4 | 37.0 | 38.9 | 11.2 | 19.2 | 16.1 |
| Smolensk region | 40.3 | 40.9 | 41.3 | 29.4 | 31.0 | 36.8 | 30.3 | 28.1 | 21.9 |
| Tver region | 41.2 | 41.0 | 41.1 | 46.3 | 39.9 | 43.1 | 12.5 | 19.1 | 15.8 |

| Period | Within the region | | | From other regions of Russia | | | From outside of Russia | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2018 | 2019 | 2020 | 2018 | 2019 | 2020 | 2018 | 2019 | 2020 |
| Tula region | 37.3 | 37.3 | 36.1 | 32.7 | 34.2 | 36.3 | 30.0 | 28.5 | 27.6 |
| Yaroslavl region | 47.7 | 48.4 | 49.0 | 44.5 | 42.5 | 42.6 | 7.8 | 9.1 | 8.4 |

*Source: Regions of Russia. Socio-economic indicators, 2021*

E. Nikolaeva's (2021) research shows that about 40,000 migrants arrived in the Ivanovo region in 2020. Most are from Central Asia. The Ivanovo region is attractive (in descending order) for citizens of Tajikistan, Ukraine, Uzbekistan, Azerbaijan and Armenia. During the pandemic, about 65,000 people of the Ivanovo region work outside the region. In particular, the mobilization of doctors and nurses during the pandemic to work in hospitals in the capital significantly increased staff attrition, especially from regions closer to Moscow. Medical institutions in the Central Federal District (CFD) lost almost 3,000 staff – doctors and nurses – in just a few months of 2020. The greatest loss of health workers in the CFD is observed in the Tver, Smolensk, Vladimir, Ryazan and Ivanovo regions. In the Ivanovo region in January-December 2020 there was an intra-Russian (interregional) migration outflow of population in the amount of 1,631 people.

By Table 3, the main flow of departures in 2018-2020 in Moscow, the Moscow Region and the Vladimir Region are those who left for other regions of Russia (87.1; 64.7 and 55.2 percent, respectively). Interregional migration prevails in the Tver (46.7%), Tula (39.4%) and Kaluga (39.9%) regions. Intraregional migration also prevails in the Ivanovo, Kostroma, Ryazan and Yaroslavl regions. The percentages of departures within the region are 49.7; 55.0; 46.1 and 47.6, respectively. The Kaluga region is characterized by a predominance of migration to other regions, but with slight deviations in other directions. Over the past 3 years, the largest share of those who left Russia were from the Kaluga (32.7%), Smolensk (29.9%) and Tula (24.7%) regions, while the smallest share was from the Ivanovo region (4.4%). It can indicate the main stages of migration: people firstly leave the Ivanovo region and lately some of them leave Russia.

**Table 3** – Distribution of arrivals by the directions of trip (as a percentage of total arrivals)

| Period | Within the region | | | To other regions of Russia | | | Outside Russia | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2018 | 2019 | 2020 | 2018 | 2019 | 2020 | 2018 | 2019 | 2020 |
| Moscow | 4.1 | 4.3 | 1.8 | 85.6 | 85.2 | 87.1 | 10.3 | 10.5 | 11.1 |
| Moscow region | 26.1 | 25.5 | 22.1 | 66.9 | 67.5 | 64.7 | 7.0 | 7.0 | 13.2 |
| Vladimir region | 40.8 | 41.1 | 33.4 | 56.9 | 55.7 | 55.2 | 2.3 | 3.2 | 11.4 |
| Ivanovo region | 49.1 | 51.8 | 49.7 | 50.6 | 47.7 | 45.9 | 0.3 | 0.5 | 4.4 |
| Kaluga region | 27.6 | 22.9 | 27.4 | 43.1 | 44.3 | 39.9 | 29.3 | 32.8 | 32.7 |
| Kostroma region | 53.2 | 55.3 | 55.0 | 41.0 | 39.8 | 37.9 | 5.8 | 4.9 | 7.1 |
| Ryazan region | 46.9 | 46.5 | 46.1 | 44.7 | 41.5 | 38.6 | 8.4 | 12.0 | 15.3 |
| Smolensk region | 40.1 | 40.5 | 36.1 | 38.3 | 36.2 | 34.0 | 21.6 | 23.3 | 29.9 |
| Tver region | 37.2 | 41.7 | 39.5 | 54.7 | 50.4 | 46.7 | 8.1 | 7.9 | 13.8 |
| Tula region | 36.4 | 36.9 | 35.9 | 43.2 | 41.0 | 39.4 | 20.4 | 22.1 | 24.7 |
| Yaroslavl region | 48.2 | 49.7 | 47.6 | 42.1 | 42.4 | 43.4 | 9.7 | 7.9 | 9.0 |

*Source: Regions of Russia. Socio-economic indicators, 2021*

The study of Central Russia regional strategies shows the Moscow agglomeration (Moscow City and the Moscow region) is a strong centre of attraction for labour, investment and innovation. Thus, the Central Russia Strategies of the regions (Vladimir, Ivanovo, Kostroma, Ryazan, Yaroslavl, etc.) by the SWOT-analysis

consider the migration outflow of the most qualified personnel to Moscow and neighbouring regions as a threat or weakness, and note it is associated with significant interregional differentiation in wage levels. The Moscow region has a higher standard of living and quality of life and a higher labour market supply.

The Strategies of the regions under study mention, for example, pendular migration of the economically active population from the Vladimir region to the Moscow and Nizhny Novgorod agglomerations; centripetal processes of population migration between the Ivanovo region and Moscow; low migration attractiveness of the region for highly qualified labour migrants from the Yaroslavl region; migration outflow of the most qualified personnel from the Ryazan region to Moscow and neighbouring regions.

The Strategy of the Vladimir region states the reason for the migration outflow of the working-age population, primarily to the Moscow region, as a reduction of the number of employees at existing enterprises and high rates of underemployment at the region's enterprises. Although the Vladimir Region itself has a high level of registered unemployment compared to other subjects of the Central Federal District. There is a shortage of qualified workers and qualified managers in the administration of municipalities. The skills shortages, in turn, limit the growth of the productive and innovative sectors of the economy.

Advantages and disadvantages of the Ivanovo region's Strategy include the high attractiveness of the Moscow agglomeration for young people; tensions at the labour market; and competition from neighbouring regions. There are centrespinning processes in population migration between the Ivanovo region and Moscow. "There is both resettlement for permanent residence (insignificant scale) and temporary migration for employment purposes (pendulum and rotational migration), which has significant dimensions".

The reasons are the low level of income in the Ivanovo region and the higher level of wages in the Moscow one, which contributes to significant migration of the working-age population and the outflow of specialists to Moscow and neighbouring regions.

One of the Ivanovo region's main problems is interregional differentiation – a significant lagging behind a number of neighbouring CFD regions in terms of per capita GRP, average per capita income and average wages; and investment attractiveness. By the Strategy, the need to reduce commuting will encourage regional authorities to pay more attention to increasing wages in the region's organisations and enterprises and to create conditions for increasing the number of jobs.

The SWOT analysis of the Ryazan region considers the migration outflow of the most qualified personnel to Moscow and neighbouring regions as a threat. The "transformation of Ryazan into a densified, uncomfortable megalopolis, which has lost its competitive advantages in terms of urban environment compared to the Moscow agglomeration" takes place.

There are three main points of attraction for the Ryazan region's population: Moscow ranked the first as a major scientific and educational centre, the labour market and the sales market. Ryazan ranked the second as an intraregional centre of population attraction especially from small towns of the region (Kasimov, Rybnoye, Ryazhsk, Sasovo, Skopin). The third ranked the centres of neighbouring regions, which are within 2-4 hours reach (Voronezh, Lipetsk, Nizhny Novgorod, Tula).

By the SWOT analysis, the advantages of the Yaroslavl region affecting the interregional movement of labour force include the lack of labour force and the low migration attractiveness of the region for highly-skilled labour migrants.

The one of the disadvantages is growing competition from neighbouring regions in the investment and labour markets.

However, proximity to the Moscow region is mentioned among the competitive advantages of these regions in their strategies (Berendeeva & Korobova, 2021).

We assess the positive role of the Moscow agglomeration in the Ivanovo Region Strategy. By it "the growth of the population's income will be ensured by expanding the agglomeration influence of Moscow, which will manifest itself in increased investment in various areas of tangible and intangible production". This territorial proximity to the metropolitan megalopolis can have a positive impact on the development of the region through the strengthening of interregional connections for the supply of food and textile industry products.

Thus, the Yaroslavl region Strategy concerns a wide range of opportunities for the region's economic and labour market development is linked to the metropolitan area, namely the increasing pace of withdrawal of production and office functions from the congested and "expensive" Moscow region to other regions; the increasing inflow of investors from the metropolitan area; the presence of foreign companies aiming to locate their production facilities in Russian regions (not only in Moscow region); the availability of mobile skilled labour in other regions, etc.

Strategic development priorities include advantages of the proximity to the Moscow agglomeration to occupy the market in order to transfer office functions and production facilities of Moscow companies. Locating Moscow-based production facilities in the regions is relevant because the regions with a higher level of production activity more actively involve labour resources in production activities, attract more investment and conduct more active innovation activities (Babkova, 2018).

Studies examine the balance of internal labour migration of Russians is most influenced by the development of the labour market and social development of the regions (Kartseva et al., 2020). By A. Tebekin's paper, the "optimization" of the network of schools and hospitals in rural areas led to a migration outflow of the population, which emphasizes the importance of preserving and developing social infrastructure (Tebekin, 2021). In many regions the labour market is experiencing serious problems: while there is a high demand for workers, the labour supply does not meet employers' requirements. But vacancies do not match applicants' demands in terms of skills, salary and working conditions. The imbalance of supply and demand in the labour market forces people to leave (Berendeeva, 2020).

The research article by Nikolaeva raises the urgent problem of employment of university graduates who cannot find jobs in their specialization due to de-industrialization and low wages in those sectors of the economy (services, trade, construction), where jobs are still appearing. By the author, "university graduates are unable to find jobs because they do not want to accept existing offers due to dissatisfaction with the salaries offered and the employer's lack of prestige by the opinion of the applicant and society as a whole". According to Rosstat, the unemployment rate of graduates of higher and secondary vocational education institutions in 2016-2018 is trending upwards. According to a sample survey of the labour force in 2019, among university graduates in 2016-2018 unemployment increased from 5.1% to 12.6%; among those with secondary vocational education: in the programme for training specialists of secondary level increased from 7.9% to 15.2%; in the programme for training qualified workers (employees), including primary vocational education – from 10.2% to 17.4% (at the same time, the indicators in rural areas are higher than in cities) (Nikolaeva, 2021).

Byuraeva's research, based on a survey of full-time undergraduate students of colleges and universities in the Republic of Buryatia and an analysis of statistical data, showed a preferential direction (centripetal for intraregional movements and westward for interregional movements). Young people in the constituent entities of the Russian Federation are primarily characterized by intraregional movements, which have a pronounced centripetal character, with young people striving for the regional capital with its resources. Other parts of the region are losing population every year due to the negative balance of young people, especially school leavers seeking to continue their education. The study concerns the types of youth migration, such as educational and labour ones; the age peaks are highlighted: 15-19 (age of entry to vocational education institutions) and 25-29 (searching for a job). The danger of youth migration is the most often irretrievable (the percentage of applicants who have left the region is insignificant) (Byuraeva, 2020).

The author concludes the consequences of the growing outflow of young people are dramatic, since the demographic situation is declining, the lack of professional workers is increasing, and the border region is becoming depopulated. By author's opinion, "the region risks facing serious problems in terms of competitiveness and economic security in the nearest future, since the quantitative indicators of youth migration directly affect the workforce (human resources), while its qualitative parameters (education, competences, knowledge, etc.) on the region's human capital" (Byuraeva, 2020).

A study by N. Gabdrakhmanov, N. Nikiforova and O. Leshukov analyses the changing demand for regional higher education systems. If the region number of the 1st year students exceeds the number of school graduates, the region is considered in high demand among the applicants. So, if the number of 1st year

students is lower than the number of school graduates, the region is in insufficient demand for the applicants (Gabdrakhmanov et al., 2019).

Monitoring of graduates employment (but it does not take into account the incoming flow of graduates), in the regions the postgraduate mobility of graduates is studied. It is calculated by comparing the number of graduates of the region leaving to find work in other regions and was employed within 1 year after graduation to the total number of graduates of the region who were employed within 1 year after graduation – indicator "share of graduates who left the region in the total number of graduates."

By the study, the biggest outflow is characteristic for the Kursk and Ivanovo regions, as there is a more socioeconomically developed region/city nearby. It draws the most graduates to its labour market – it is primarily the Moscow agglomeration (Gabdrakhmanov et al., 2019).

The authors give a typology of regions in Russia as a whole (based on the 2014 and 2015 research base):

1. Magnet regions are a group of regions with a high demand for school graduates and at the same time a relatively low postgraduate migration rate (10 regions of the country, with Moscow and the Moscow region as permanent leaders from the Central Federal District, and the Yaroslavl region in 2015).

2. Transition regions are a group of regions with a high demand for universities among school graduates and at the same time a relatively high rate of postgraduate migration (4 regions, from the Central Federal District – in 2014; the Voronezh, Ivanovo and Orel regions, and the Ivanovo and Orel regions in 2015).

3. Looped regions are a group of regions with relatively low demand for higher education infrastructure and low postgraduate migration, where looped systems "higher education – labour market" have developed, and the reasons for this situation are different for the regions within this group. (40 regions, from the Central Federal District it was the Lipetsk region in 2014 and the Belgorod, Bryansk, Kostroma, Lipetsk, Tambov and Tula regions in 2015).

4. Exporting regions is a group of regions with relatively low demand for higher education and high postgraduate migration (the Bryansk, Vladimir, Tambov, Tver regions in 2014, none in 2015).

5. Border regions is a group of regions whose postgraduate migration or demand indicators are close to the highlighted borderline values (the Belgorod, Kaluga, Ryazan, Kostroma, Kursk, Tula and Yaroslavl regions in 2014; the Vladimir, Kaluga, Kursk, Ryazan, Smolensk, Tver regions in 2015) (Gabdrakhmanov et al., 2019).

The authors conclude the necessity of taking into account the population projection of the 17-21 age group, especially 18-year-olds, and the availability of educational infrastructure in the context of demographic change (Gabdrakhmanov et al., 2019). The authors give a population projection for 18-year-olds in Russia's regions.

We sampled data from a study by N. Gabdrakhmanov, N. Nikiforova and O. Leshukov (2019) for the surveyed regions of Central Russia. By Table 4, the number of young people aged 18+ in 2016 was characteristic only of the Moscow region, the Vladimir, Tver, Tula and Yaroslavl regions. In the other regions, the number of young people of that age was no more than 8,000, and in the Kostroma region it was less than 6,000. A projected increase of more than 20% in 2026 is expected in many regions, including the Vladimir, Kaluga, Kostroma, Moscow, Tver and Yaroslavl regions. In the Ivanovo region it will exceed 30%. The exceptions are the Ryazan, Smolensk and Tula regions, with a rate of 15% and below.

**Table 4** – Projected number of 18-year-olds in the under study regions of Central Russia

| Entities of the Russian Federation | Population 2016, people | Projected increase, 2026, % |
|---|---|---|
| Vladimir region | 11303 | 24.15 |
| Ivanovo region | 7993 | 30.06 |
| Kaluga region | 8092 | 23.29 |
| Kostroma region | 5776 | 23.27 |
| Moscow region | 57242 | 22.63 |

| Entities of the Russian Federation | Population 2016, people | Projected increase, 2026, % |
|---|---|---|
| Ryazan region | 9368 | 12.78 |
| Smolensk region | 7872 | 15.08 |
| Tver region | 10806 | 22.06 |
| Tula region | 11544 | 13.01 |
| Yaroslavl region | 10496 | 20.81 |
| Moscow | 86295 | 17.80 |

*Source: Gabdrakhmanov et al., 2019*

By Table 5, the coefficient of demand for universities by school graduates regions under study in 2017 was highest in the Moscow region (1.44), followed by the Ryazan (1.21), Ivanovo (1.15), Kostroma (1.11) and Yaroslavl (1.09) regions. For other regions the coefficient is lower than 1. The rate of postgraduate migration in 2015-2016 was highest in the Ivanovo region (0.41). It was 0.3 and higher in the Vladimir, Kaluga, Ryazan, Smolensk, Tver and Yaroslavl regions.

**Table 5** – Coefficient of demand for universities by school graduates, and postgraduate migration rate of graduates in the under study regions of Central Russia

| Entities of the Russian Federation | The coefficient of demand for higher education institutions by school graduates | | | | Postgraduate migration rate of graduates | |
|---|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2014-2015 | 2015-2016 |
| Belgorod region | 0.69 | 0.82 | 0.84 | 0.99 | 0.26 | 0.25 |
| Vladimir region | 0.69 | 0.63 | 0.54 | 0.44 | 0.31 | 0.31 |
| Ivanovo region | 1.13 | 1.29 | 1.17 | 1.15 | 0.37 | 0.41 |
| Kaluga region | 0.27 | 0.27 | 0.30 | 0.62 | 0.33 | 0.32 |
| Kostroma region | 0.83 | 0.72 | 0.68 | 1.11 | 0.27 | 0.27 |
| Moscow and Moscow region | 1.60 | 1.54 | 1.48 | 1.44 | 0.32 | 0.29 |
| Ryazan region | 1.21 | 1.01 | 1.17 | 1.21 | 0.31 | 0.31 |
| Smolensk region | 0.59 | 0.53 | 0.58 | 0.69 | 0.32 | 0.33 |
| Tver region | 0.82 | 0.75 | 0.70 | 0.71 | 0.30 | 0.31 |
| Tula region | 0.78 | 0.75 | 0.78 | 0.78 | 0.27 | 0.26 |
| Yaroslavl region | 1.26 | 1.14 | 1.11 | 1.09 | 0.30 | 0.30 |

*Source: Gabdrakhmanov et al., 2019*

According to Rosstat, the number of students enrolled in programmes to train mid-level professionals in 2020/2021 will be, for example, 24,500 in the Vladimir region, 15,900 in the Ivanovo and 26,200 in the Yaroslavl regions. The number of students enrolled in Bachelor, Specialist and Master programmes in these fields is 25.4, 24.3 and 31.3 thousand, respectively (Regions of Russia. Socio-economic indicators, 2021). The graduation of mid-level specialists and the graduation of bachelors, specialists and masters in 2020 in the Vladimir region was 4.9 and 5.9 thousand people respectively, in the Ivanovo region - 3.2 and 4.8 thousand people, in the Yaroslavl region - 5.0 and 5.5 thousand people (Regions of Russia. Socio-economic indicators, 2021).

Educational institutions of the region develop new areas of training specialists. For example, in 2021, four colleges in the region developed new educational programs for the specialty "Operator of Knitting and Sewing Equipment" due to the demand of the region's enterprises. The first 15 students began studying at this specialty in 2021 at the expense of budgetary funds.

The primary and secondary vocational educational institutions of the region are training qualified

personnel by 125 specialties, interacting with 280 employers and training professionals at the secondary level and skilled workers (employees) programs. The 5 resource centers work on the basis of Ivanovo College of Textile Industry, Ivanovo Technical College, Ivanovo Industrial and Economic College, Ivanovo College of Services, Ivanovo Energy College; there are also 6 multifunctional centers of applied qualifications.

But the average salary in the region remains low. According to the Ivanovo region Committee for labor, promotion of population employment and labor migration, as of December 31, 2021 in the region is 62,2%, or 8676 vacancies by working professions with an average salary of only 20,2 thousand rubles; 37,8%, or 5272 vacancies are civil servant professions with an average salary of only 21,3 thousand rubles.

**Discussion**

Our study on migration flows in Central Russia by Rosstat data shows the residents of Moscow, the Moscow, Vladimir, Kaluga, Tver, and Tula regions participate much more actively in interregional migration than in intraregional one. The regions around the Moscow agglomeration are competing to attract investment, skilled labour and talented young people.

The Strategies of socio-economic development of the Central Russian regions consider the migration outflow of the most qualified personnel to the Moscow agglomeration as a threat and weakness.

But the proximity to the Moscow metropolitan area creates economic and labour market opportunities for the regions related to the increasing pace of relocation of production and office functions from Moscow to the neighbouring regions, the arrival of investors, the strengthening of inter-regional links for supplies of food and light industry, the migration of Muscovites and the Moscow region residents to the country houses, etc.

**Conclusions**

It is necessary to implement a set of measures to retain young people in the regions. First of all, it is the creation of jobs with decent salaries and working conditions, since it is labor migration, both international and internal, is most dependent on the complex development of regions (Doronina, 2019).

It is necessary to develop manufacturing industries because the regions with a higher level of production activity more actively involve labour resources in production activities, attract more investment and conduct more active innovation activities (Babkova, 2018). The regional labor market should motivate young people to come back, since irretrievable youth migration can have serious consequences for the region's economy.

The development of the science and education sector is necessary to reduce the migration outflow, preserve young people and the inflow of highly qualified personnel. Educational institutions (colleges, universities) have to develop new areas of training in accordance with the needs of the market, to train specialists in STEM professions (Berendeeva, 2019), which can retain young people within the region and attract them from other ones. It is important to create a modern educational infrastructure, student campuses.

Since the universities are attractive for the young people, it is necessary to pay serious attention to the development of regional systems of higher education, to study the factors of educational migration in specific regions of Russia. It is relevant to develop regional universities and make them competitive with universities in the capital and other major cities.

It is necessary to intensify work on the study of the migration intentions of young people and involve school teachers and lectures of the other educational institutions (colleges, universities), students themselves in it in order to make such research practical (for example, for students studying in the field of "Sociology", "Statistics", etc.).

**References**

1. Babkova, E.G., & Panakhov, A.U. (2018). Rating scope of balanced development of the Central Federal District federal subjects. *Nauchnyj zhurnal NIU ITMO. Seriya: Ekonomika i ekologicheskij menedzhment,* (2), 19-27 (in Russian).

2. Berendeeva, A. B., & Korobova O. O. (2021). The role of the Moscow agglomeration in the socio-economic development of central Russian regions (Part 2). *Journal of Regional and International Compet-*

*itiveniss,* (5), 58-68.  Retrieved from http://jraic.com/index.php/tor/issue/view/10/8

3.  Berendeeva, O. S. (2019). Staff training for STEM professions in the colleges of the Ivanovo region. *Social'no-ekonomicheskie i tekhnologicheskie problemy novoj industrializacii kak faktora operezhayushchego razvitiya nacional'-noj ekonomiki: sb. tr. Mezhdunar. nauch.-prakt. konf, 12 noyabrya 2019 g., Yaroslavl* [Elektronnyj resurs]. (pp. 273-278). Yaroslavl: Izdatel'stvo YAGTU (in Russian).

4.  Berendeeva, O. S. (2020). State of the regional labor market in conditions of coronavirus pandemic. *Posledstviya i vyzovy pandemii koronavirusa dlya tekhnologiche-skogo i social'no-ekonomicheskogo razvitiya obshchestva [Elektronnyj resurs]: sb. tr. Mezhdunar. nauch.-prakt. konf, 10 dekabrya 2020 g.* Yaroslavl. (pp. 95-102). Yaroslavl: Izd-vo YAGTU (in Russian)

5.  Byuraeva, Y. G. (2020). Youth migration in the Republic of Buryatia: trends and causes. *Sociologicheskie issledovaniya,* 10, 52-62 (in Russian).

6.  Gayazov, A. S., Akhmetova, G. F., Utyasheva, I. B., & Shamsutdinova, N. K. (2020). Socio-territorial features of natural and migration movement of the region's population in the Republic of Bashkortostan. *Sociologicheskie issledovaniya,* (12), 75-86 (in Russian).

7.  Doronina, K. A. (2019). Migration as a source of population growth in metropolitan megacities of Russia in the period between the censuses of 1989 and 2010. *Problemy prognozirovaniya,* (1), 131-141 (in Russian).

8.  Doroshenko, T. A., & Leonidova, G. V. (2019). School graduates' migration intentions and their implementation in the educational space of the region. *Social'noe prostranstvo,*  (4), 4. Retrieved from  http://sa.vscc.ac.ru/issue/21 (accessed 13.02.2022) (in Russian).

9.  Elizarova, A. A., & Berendeeva, O. S. (2018). Risks of socio-economic development of single-industry towns in Russia. *Mnogourovnevoe obshchestvennoe vosproizvodstvo: voprosy teorii i praktiki.* B.D. Babaev, E.E. Nikolaeva (Eds.). (pp. 28-36). Ivanovo: Ivanovskij gosudarstvennyj universitet, Vyp. 15. (in Russian).

10.  Kartseva, M. A., Mkrtchyan,  N. V., & Florinskaya, Y. F. (2020). Migration in Russia and regional socio-economic development: analysis of mutual influence. *Problemy prognozirovaniya,* (4), 87-97 (in Russian).

11.  Mkrtchyan, N. V. (2017). The youth Migration from small towns in Russia. *Monitoring obshchestvennogo mneniya: ekonomicheskie i social'nye peremeny,* (1), 225-242 (in Russian).

12.  Nefedova, T. G., & Starikova, A. V. (2020). Migrations as a way of the population adaptation to polarization of space at the centres of Russia. *Sociologicheskie issledovaniya,* (10), 24-38 (in Russian).

13.  Nikolaeva, E. E. (2021). Problems and prospects of employment of the population in the conditions of the pandemic (on the example of Ivanovo region). *Vestnik Ivanovskogo gosudarstvennogo universiteta. Seriya: Ekonomika,* (2), 62-70 (in Russian).

14.  Gabdrakhmanov, N. K., Nikiforova, N. Y., & Leshukov, O. V.  (2019).  *"From the Volga to the Yenisei...": Educational migration of youth in Russia.* M.: NIU NIU VSHE (in Russian).

15.  Pokrovsky N.E., Makshanchikova A.Y., & Nikishin E.A. (2020). Reverse migration in pandemic crisis: Russia out-of-town spaces as an adaptation resource. *Regional'nye issledovaniya,* (12), 54-64 (in Russian).

16.  Rybakovsky L.L., Kozhevnikova N.I. (2019). International migration of population of Russia: exchange of population with the post-USSR countries. *Regional'nye issledovaniya,* (9), 106-116 (in Russian).

17.  Tebekin, A. V. (2021). Analysis of the problems of the development of settlements in Russian Federation. *Teoreticheskaya ekonomika, 78*(6), 82-93.  Retrieved from http://theoreticaleconomy.ru/index.php/tor/issue/view/7/7 (in Russian).

18.  Federal State Statistics Service.  (2020). *Regions of Russia. Socio-economic indicators. 2020: stat. coll.* M.: Rosstat. Retrieved from https://rosstat.gov.ru/storage/mediabank/LkooETqG/Region_Pokaz_2020.pdf (in Russian).

19.  Federal State Statistics Service.  (2021). *Regions of Russia. Socio-economic indicators. 2021: stat. coll.* M.: Rosstat.  Retrieved from https://rosstat.gov.ru/storage/mediabank/Region_Pokaz_2021.pdf (in Russian).

20.  Department of Regional Development of the Vladimir region. (2020). *Strategy of socio-economic development of the Vladimir region until 2030.*  Retrieved from https://drr.avo.ru/strategia-social-no-ekonomiceskogo-razvitia (accessed 17.02.2022) (in Russian).

21.  Ministry of Economic Development of the Russian Federation. (2021). *Ivanovo Region Socio-Economic Development Strategy up to 2024.* Retrieved from

https://www.economy.gov.ru/material/directions/regionalnoe_razvitie/strategicheskoe_planirovanie_prostranstvennogo_razvitiya/strategii_socialno_ekonomicheskogo_razvitiya_subektov_rf/dorabotannye_proekty_strategiy/ (accessed 17.02.2021) (in Russian).

22. Ministry of Economic Development of the Russian Federation. (2020). *Strategy of socio-economic development of Kaluga region until 2030.* Retrieved from https://admoblkaluga.ru/sub/econom/strategy/Strateg_KO_red_26-11-2020_.pdf (accessed 17.02.2022) (in Russian).

23. Ministry of Economic Development of the Russian Federation. (2021). *Ryazan Region Socio-Economic Development Strategy up to 2030.* Retrieved from  https://www.economy.gov.ru/material/directions/regionalnoe_razvitie/strategicheskoe_planirovanie_prostranstvennogo_razvitiya/strategii_socialno_ekonomicheskogo_razvitiya_subektov_rf/dorabotannye_proekty_strategiy/ (accessed 17.02.2022) (in Russian).

24. Ministry of Economic Development of the Russian Federation. (2020). *Strategy of social and economic development of Smolensk region until 2030.* (as amended by the Resolution of Smolensk Oblast Administration No 280 of 19.05.2020). Retrieved from https://econ.admin-smolensk.ru/files/410/strategiya-socialno-ekonomicheskogo-razvitiya-smolenskoj-oblasti-do-2030-goda-v-red-postanovleniya-ot-19-05-2020-2.pdf (in Russian).

25. Ministry of Economic Development of the Russian Federation. (2021). *Yaroslavl Region Socio-Economic Development Strategy up to 2025.* Retrieved from

https://www.economy.gov.ru/material/directions/regionalnoe_razvitie/strategicheskoe_planirovanie_prostranstvennogo_razvitiya/strategii_socialno_ekonomicheskogo_razvitiya_subektov_rf/dorabotannye_proekty_strategiy/ (accessed 17.02.2022) (in Russian).

26. Official website of the Ivanovo Region Committee on Labor, Employment Promotion and Labor Migration. (2022). *Situation in the labor market of the Ivanovo region.* Retrieved from https://zan.ivanovoobl.ru/deyatelnost/proverki/situatsiya-na-rynke-truda-ivanovskoy-oblasti/ (accessed 18.02.2022) (in Russian).

27. Department of Education of the Ivanovo region. (2020*). Public report of the Department of Education of the Ivanovo region by 2020-2021 academic year* / Department of Education of the Ivanovo region. O.G. Antonova (Ed.). Ivanovo, 2021. Retrieved from  https://iv-edu.ru/press-tsentr/reports/ПУБЛИЧНЫЙ%20ДОКЛАД-2021.pdf (accessed on 18.02.2022) (in Russian).

# The role of the Moscow agglomeration for the socio-economic development of central Russian regions (part 3)

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**Abstract.** The article aims to comparative analysis of strategies of socio-economic development of 2 subjects of the Russian Federation – the Tver and Tula regions, scenarios of development with regard to influence of Moscow agglomeration. The authors analyze strengths, weaknesses, opportunities and threats related to the proximity of the regions to Moscow and the Moscow region as reflected in the SWOT analysis of the regions. The paper considers advantages of implementing inter-regional infrastructure projects for each of the regions; highlights the role of investments, including foreign ones and the advantages of cluster regional development. Also the paper summarizes the analysis of the impact of the proximity of Moscow agglomeration on the socio-economic development of the 8 constituent entities of the Russian Federation outlined in three articles.

### Introduction

The object of the study is Moscow – city itself, the Moscow region and two regions of the Central Federal District (CFD) close to the Moscow agglomeration – the Tver and Tula regions. Two previous articles concerned with the strengths, weaknesses, opportunities and threats associated with the proximity of the Vladimir, Ivanovo, Ryazan and Yaroslavl regions and the Kaluga and Smolensk regions (Berendeeva & Korobova, 2021a; 2021b) to Moscow and the Moscow region. Recent years Moscow, the Moscow region and the Kaluga region were donor regions, while the remaining constituent entities of the Russian Federation are subsidized.

The Tver region is the largest region of Central Russia in terms of area (its territory is 84.2 thousand km², which is more than the area of the Leningrad region and almost twice as large as the Moscow region, and almost three times larger than the Ivanovo region area). Tverskaya gubernia was the part of both the Russian Empire and the Soviet Union until 1929. The Tver region is an old industrial region. The region has a well-developed power industry (there are hydropower and nuclear power stations), mechanical engineering (production of excavators, passenger cars, textile equipment, agricultural machinery, garage and fire-fighting equipment, electrical products, instruments and lighting equipment, railway transport equipment, etc.), chemical, printing, woodworking, light, glass, building materials production, etc. Also there is developed electricity sector (a distance from the Moscow ring road to the border of the Tver region is 90 km).

The Tula region is much smaller (25,700 km²) but it has large metallurgical, machine-building (arms industry), chemical, light and food processing, mining manufacture. The Tula region ranks 3rd at the 2019 Russia's regions National Investment Climate Rating. The large polycentric Tula – Novomoskovsk agglomeration is situated in Tula region. The distance from the centre of Tula to the centre of Moscow is 185 km; from the northern outskirts of Tula to the southern outskirts of Moscow (Yuzhnoe Butovo) is 150 km. The distance from the centre of Tula to the centre of Moscow is 150 km.

Moscow-city and the Moscow region influence a lot on neighbour regions development. The surveyed regions mention the proximity of the Moscow agglomeration as a threat (outflow of working-age population) in their socio-economic development strategies. The reasons for the outflow of population are various, including the crisis of the local economy and "optimization" of social infrastructure. According to T. Nefedova's study, the presence of two "cuts"-profiles in the socio-economic space of Central Russia resembling together the letter X on the map. The first profile extends from St. Petersburg through towns and districts along the route to Moscow in the Leningrad, Novgorod, Tver, Moscow regions with Moscow to the south of the Tula region; the second profile also extends along motorways from districts and towns on the southern outskirts of the Kaluga region through the Moscow, Yaroslavl regions to the eastern outskirts of the Kostroma region. By the highlighted profiles we can see the flows of intra-regional, inter-regional and international migrants for permanent residence as well as intra- and inter-regional temporary labour migrations. As a result of these migrations, the Moscow region accumulates over 70% of the total population increase due to interregional migrations in the municipalities alongside both profiles and 30-60% of the population increase due to international migrants (Nefedova, 2020).

On the other hand, proximity to the capital region is a definite advantage, an opportunity for neighbouring regions (a large market for goods and services, location of production facilities of international companies, withdrawal of production and logistics centres from the Moscow metropolitan area, etc.). The metropolitan region and Moscow have objective agglomeration advantages and status rents. It is the result of the dominance of big business in the Russian economy, headquartered mainly in Moscow, with the capital receiving a large status rent in the form of high taxes and salaries. Since 2012 there have been changes in the development of the metropolitan agglomeration, primarily the administrative annexation to Moscow of a substantial part of the Moscow region (the least populated southwestern sector of the Moscow region, which has no large cities), which led to a 2.4-fold increase in the area of the capital (Zubarevich, 2021).

The proximity to Moscow and the Moscow Region plays an important role for the socio-economic development (SED) of central Russian regions, including the Tver and Tula regions. By socio-economic development Strategies (hereinafter referred to as Strategies) it is a competitive advantage of these regions. Although the Tver and Tula regions are old industrial regions and manufacturing there has the largest share in the structure of gross regional product (22.1% in the Tver region, 45.1% in the Tula region) the competition with the Moscow agglomeration for resources (labour, investment, innovation, financial, etc.) could weaken the realization of their economic potential (Regions of Russia. Socio-economic indicators, 2020). There are also the positive trends in the proximity to Moscow. For example, the transfer of industrial functions to the regions neighbouring Moscow continues. By N. Zubarevich opinion, it is "the diffusion of investment resources out of the MKAD". It is an additional stimulus for Moscow in terms of opportunity to develop new territories, increase housing construction and implement new infrastructure projects. According to the studies, the coronavirus crisis affected two subjects of the Moscow agglomeration more severely than most regions (Zubarevich, 2021). Therefore, by the post-COVID economy, the neighbourhood of the Moscow agglomeration can be seen for the regions in terms of not only 'losses' but also 'gains'. The aim of our third article is to assess the emphasis of the Tver and Tula regions replacing by developing of socio-economic relations with the Moscow agglomeration and what are the pros and cons of such geographical and economic interaction (Babaev, 2009).

### SWOT-analysis

The methodological basis for the study was a comparative analysis of regional strategies, including competitive advantages, strengths, weaknesses, opportunities and threats (SWOT analysis). Also we used statistical indicators of the Federal State Statistics Service of the Russian Federation, scientific research data and analytical data from major rating agencies.

### Results

Our study shows the occuring of depopulation in the surveyed regions (with the exception of Moscow and the Moscow region). There are 8 leading in terms of gross regional product regions of the Russian

Federation: Tula (over RUB 636 bn in 2018) and Yaroslavl (over RUB 560 bn); Ivanovo region (about RUB 198 bn) is the outsider. In terms of gross regional product per capita, the Kaluga, Yaroslavl and Tula Regions have over 400,000 RUB and the Ivanovo Region has less than RUB 200 mn roubles. The share of manufacturing in gross regional product is highest in the Tula (45.1%), Kaluga (42.4%) and Vladimir (34.4%) regions and lowest in the Ivanovo (19.2%), Smolensk (21.6%) and Tver (22.1%) ones. In terms of average salaries, the regions significantly lag behind the capital region: so in 2019, salaries in Kaluga region were 75% of those in the Moscow region; the Tula region respectively 69%, Yaroslavl region 65%, Ryazan region 62%, Tver region 60%, Vladimir region about 60%, Smolensk region 56% and Ivanovo region 50% (see Table 1).

**Table 1** – Main indicators of socio-economic development of the surveyed regions

| | Population at the end of the year, thousand people | | Gross regional product, million RUB (2018) | Gross regional product per capita, RUB (2018) | Share of manufacturing in gross regional product, % (2018) | Average monthly nominal salary of employees, RUB (2019) |
|---|---|---|---|---|---|---|
| | 2005 | 2019 | | | | |
| Moscow | 10924 | 12678 | 17881516.2 | 1423588.6 | 16.2 | 94294 |
| Moscow region | 6784 | 7691 | 4201768.8 | 556413.9 | 20.6 | 55555 |
| Vladimir region | 1486 | 1358 | 440543.0 | 321078.9 | 34.4 | 33076 |
| Ivanovo region | 1102 | 997 | 197839.8 | 195994.9 | 19.2 | 27553 |
| Caluga region | 1023 | 1003 | 465987.5 | 461023.2 | 42.4 | 41442 |
| Ryazan region | 1189 | 1109 | 383110.2 | 342734.4 | 29.2 | 34488 |
| Smolensk region | 1025 | 935 | 312857.0 | 330766.0 | 21.6 | 31269 |
| Tver region | 1415 | 1260 | 441653.6 | 345919, | 22.1 | 33524 |
| Tula region | 1615 | 1466 | 636133.7 | 428275.7 | 45.1 | 38151 |
| Yaroslavl region | 1313 | 1254 | 560577.9 | 443970.1 | 28.9 | 36016 |

*Source: Regions of Russia. Socio-economic indicators, 2020*

In this article we will focus on the characteristics of the socio-economic situation of the Tver and Tula regions in detail.

Our analysis shows the significant difference in population, wages, unemployment and migration in the Moscow agglomeration and the 2 regions under study (Tver and Tula). By Table 2, the population in the studied regions is declining. As a result, in 2019 the population of the Tver region was 89% of the 2005 level, while in the Tula region it was 91%. Average monthly nominal salary in the Tver region is 2.8 times lower than in Moscow, 1.7 times lower than in the Moscow region and 2.5 times lower than in the Tula region and 1.5 times lower than in the Tula region, respectively. According to sample surveys of the labour force in the pre-COVID economy, the unemployment rate was minimal in Moscow (1.4%) and the Moscow region (2.7%) and ranged between 3.7% and 4.0% in the Tver and Tula regions.

**Table 2** – Some indicators of socio-economic development of regions

| | Population at the end of the year, thousand people | | Average monthly nominal salary of employees (RUB) | Unemployment rate*, as a % of the labour force |
|---|---|---|---|---|
| | 2005 | 2019 | 2019 | 2019 |
| Moscow | 10924 | 12678 | 94294 | 1.4 |
| Moscow region | 6784 | 7691 | 55555 | 2.7 |
| Tver region | 1415 | 1260 | 33524 | 4.0 |
| Tula region | 1615 | 1466 | 38151 | 3.8 |

\* according to sample labour force surveys, annual average
*Source: Regions of Russia. Socio-economic indicators, 2020*

Population migration plays an important role as an indicator of the socio-economic prosperity of the region. By Table 3, the Moscow agglomeration had stable migration growth in 2013-2019. In the Tver region in 2019 the migration increase, which was negative in previous years, changed to a positive one (i.e. from migration loss to migration gain); in Tula region the situation is reversed (a change from a positive to a negative migration balance).

**Table 3** – Coefficients of migration rates per 10,000 population\*

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|------|------|------|------|------|------|------|------|
| Moscow | 90 | 57 | 92 | 24 | 89 | 79 | 38 |
| Moscow region | 140 | 149 | 120 | 141 | 111 | 140 | 144 |
| Tver region | 1 | -12 | -14 | 4 | -30 | -34 | 5 |
| Tula region | 4 | 19 | 19 | 21 | 25 | -9 | -4 |

\* The sign (-) indicates a decrease
*Source: Regions of Russia. Socio-economic indicators, 2020*

During the COVID-19 pandemic, migration to Moscow and the Moscow region decreased significantly. In 2020, the Tver and Tula regions were characterized by migration decrease (see Table 4).

**Table 4** – Migration increase (+) / decrease (-) of population, persons

| Year | 2019 | 2020 |
|------|------|------|
| Moscow | +47,584 | +1 614 |
| Moscow region | +110 198 | +51,250 |
| Tver region | +654 | -1514 |
| Tula region | -569 | -186 |

*Source: Key Indicators of the Socio-Economic Situation of the Constituent Entities of the Russian Federation in 2020*

In the Tver region migration has a moderating effect on population decline. The positive migration balance in the Tver region in the pre-COVID period was due to international migration, mainly the influx of people from the Commonwealth of Independent States (CIS) countries as part of the regional programme to assist the voluntary resettlement of compatriots living abroad. It is expected that the inflow of migrants will actively grow during the forecast period and will reach 15.5 persons per 10,000 of population in 2030 or three times the 2012 level (5.52 persons per 10,000 of population).

According to the statistical indicators ranking analysis, in 2017-2018 the strategic economic activities of the Tver region were manufacturing, transport, trade, agriculture, energy, real estate operations and (Boyko & Romaniuk, 2020). A decrease of labour productivity is one of the economic problems of the region (Kamaleev et al., 2020).

We analyze the socio-economic development strategy of the Tver region.

The key internal threats to the development of the Tver region are:

a) population decline, long-term negative demographic processes;

b) deficit of qualified staff;

c) lag between the renewal of industrial capacity and development needs;

d) insufficiently active enterprise innovation policy in the region;

e) strong differentiation of life in urban and rural areas, formation of dying-out villages and unpromising areas, unsustainable development and crisis phenomena in mono-profile settlements of the region;

f) stratification of the population in terms of living standards, affecting the growth of social tensions;

g) outflow of part of the population to Moscow and St. Petersburg, as well as internal migration to the regional centres and the emergence of territorial differentiation;

h) degradation of the environmental situation in the region (poor quality of fresh water, underdeveloped

waste management system, air pollution);

i) lagged adaptation of the region's life support systems to the needs of economic, social and other development challenges.

The basic principles for the construction of the Tver region Strategy are as follows:

– cluster approach of territorial development, strengthening the specialization of the regional economy;

– principle of resource-efficient development of the region (maximum utilization of mineral, labour and intellectual resources);

– principle of innovation (the ability to implement large-scale innovative projects for the benefit of the region and the country as a whole, including through international cooperation);

– rationalization of the transport network, maximizing the use of the area's transit capacity.

The section on the region's competitive advantages of the Tver region Strategy, it is noted that the region, in order to improve the demographic situation, attracts quite a large number of migrants, including from abroad, simultaneously turns out to be a population donor and a supplier of labour resources to other regions of Russia.

As in the previously considered strategies of other RF subjects, the region's economic and geographical location (proximity to the growing market of the Moscow agglomeration) stands out as an important advantag.

Key internal factors of socio-economic development of the Tver region:

– negative demographic phenomena, a long-term trend towards a natural decline in the labour force;

– a high level of labour migration (including temporary (commuting) migration between the Tver region and Moscow and other neighbouring subjects of the Russian Federation;

– the region dominant position within Tver city, with an accumulation of almost a third of the region's population and economic entities and a concentration of 53.22% of the turnover of large and medium-sized enterprises and organizations in the region;

– significant imbalances in the socio-economic development of municipalities, the extinction of rural municipalities;

– availability of an extensive transport infrastructure.

The development of the region's transport potential plays an important role. The large-scale transport infrastructure development projects will be implemented in the next 10 years within international transport corridor 9 in the transport sector. These, along with the high economic growth of Moscow and St. Petersburg and the expansion of their urban agglomerations, will increase the importance of the economic and geographical location factor for the Tver region and create new development opportunities. In this regard, one of the main principles of the Tver region Strategy is the rationalization of the transport network and the maximum use of the territory's transit capacity.

Transport projects in the Tver region:

– construction of a new high-speed toll highway Moscow-St. Petersburg and a high-speed railway providing train traffic at speeds up to 350 km/h with a stop in Tver;

– construction of a major discount airport, which will give an additional impetus to the economy of the Tver region at the expense of the emerging Moscow agglomeration.

As a result of these projects, in 7-8 years Moscow will have transport accessibility for passengers within 1-2 hours and for freight within 2-3 hours. The advantages for both the capital region and the Tver region are obvious.

The transport component plays an important role in the development of logistics, tourism in the region. The Tver region has a high cultural, historical and spiritual potential. In 2018, the Volga Sea cruise tourism and recreation cluster, which was announced by the Tver region, won in a nationwide competition in which 69 Russian regions took part (Balabeykina et al., 2021). The tourist transport and logistics hub on the territory of Zavidovo, which has no analogues in Russia, is considered to be the key object. In order to increase the flow of tourists, including foreign ones, the region is implementing the state programme "Development of Tourism Industry in the Tver Region" for 2018-2023 (Dombrovskaya, 2019).

An important role is given to the innovative development of the region. By the inertial scenario of the

Strategy "unless active actions are taken to increase the quality of infrastructure and human capital it will be difficult for Tver Region to take a significant position on the scale of the Central Federal District in conditions of active growth of the Moscow agglomeration and successes in implementing innovative development strategies of neighbouring regions" (Regions of Russia. Socio-economic indicators, 2020).

The innovation scenario (as the most promising in terms of qualitative socio-economic development of the Tver Oblast) states the investment attractiveness of the clusters being formed will not only help to attract investment to the territory but also to locate research, manufacturing Russian and foreign companies, stimulate the transfer and localization of innovative product manufacturing technologies, provide assistance in attracting qualified workforce and students (Regions of Russia. Socio-economic indicators, 2020).

Attracting investment remains a priority in the investment policy pursued by the regional government. In the Tver region methods are used to influence the increase in potential demand for investment. The evidence is the creation of the Uzlovaya economic zone, as well as the territories introducing a special procedure for entrepreneurial activity (Gurovich, 2021).

We analyzed the socio-economic development strategy of the Tula region.

Studies based on mathematical methods on the components of regional sustainability (potential) according to five factors (economic, political, environmental, social and institutional) show the Tula region is among the regions with sustainable development, along with Moscow, the Moscow region, the republics of Tatarstan and Kabardino-Balkaria (Arzumanyan, 2021).

The Tula region Social and Economic Development Strategy to 2030 and the Tula region Social and Economic Development Forecast for 2022-2024 reflect the region's strengths and weaknesses.

Industry, wholesale and retail trade, construction, agriculture and real estate operations are the main contributors to the gross regional product in the structure of Tula region's economy; the growth rates of these sectors have a significant impact on the growth rate of the gross regional product. The following activities have the greatest impact on the dynamics of industrial production: food production; beverage production; manufacture of chemicals and chemical products; manufacture of other non-metallic mineral products; manufacture of fabricated metal products, except machinery and equipment; metallurgical production; manufacture of paper and paper products; supply of electricity, gas and steam; air conditioning, manufacture of motor vehicles, trailers, etc. Their total share in industrial production (in terms of shipped products) in 2020 was more than 86.0%.

A structural feature of the regional industry is the high share of enterprises in the manufacturing sector. The manufacturing industry of the Tula region is quite diversified, which increases the flexibility of the regional economy and ultimately works for its sustainability.

The region's proximity to Moscow, the country's largest market, as well as its developed infrastructure, qualified workforce and favourable investment climate are the main competitive advantages.

The Tula region is an attractive investment region for major foreign corporations as Unilever, Cargill, Procter&Gamble, SCA, Knauf and others. For example, 8 major projects were implemented in the agricultural sector. At present, 29 projects worth over RUB 44 bn are being implemented in the agricultural sector in the Tula region, which will eventually lead to the appearance of about 4,000 workplaces. It allows to provide region with its own agro-industrial products and leads to increase the volume and share of products sold outside the region, including the Moscow agglomeration. By the Forecast, the Tula region envisages the implementation of a large number of agro-industrial investment projects aimed at meeting consumer demand in the Moscow region, including different manufacturing as a part of the import substitution policy (Cherkizovo Group, McCain Foods Rus LLC, Cargill LLC, Kubanmaslo-Efremovsky Butter Plant LLC, etc.).

There are three federal highways on the territory of the region: M2 Krym, M4 Don and M6 Caspian. The Domodedovo international airport is located 100 km from the border of the region.

The Forecast of socio-economic development of the region until 2024 also envisages the increase in the number of educational, medical services, development of tourism and other types of services implemented both for the residents of this region and neighbouring ones.

The declining of the population is one of the region's weaknesses. According to the conservative version

of the Forecast, the average annual population number in 2024 will be 1,380,500 people; according to the basic Forecast version – 1,384,900 people; and will decrease by 77,100 and 72,700 people, respectively, compared to 2020. The State Programme to Assist the Voluntary Resettlement of Compatriots Living Abroad to the Russian Federation, approved by Presidential Decree No. 637 of 22 June 2006 'On Measures to Assist the Voluntary Resettlement of Compatriots Living Abroad to the Russian Federation' has been implemented in Tula region since 2011. During the period of 2011-2020 about 70,300 people moved to the Tula region. According to the Programme, more than 10,700 people are expected to move to the Tula Region for permanent residence in 2021-2024.

The regional authorities declare a responsible social policy related primarily to increasing the population's incomes and improving housing conditions.

In the field of investment attractiveness of the Tula region, the weak points or factors that may have a restraining effect on the investment dynamic, are:

– both unfavourable demographic structure of the region's population (high average age of the population and ratio of natural population growth rates, relatively low share of young people), which limits the labour potential of the region's economy and increases the burden on the budget, increasing the need for social expenditure;

– limited domestic demand due to the low income level of the population of the Tula region;

– high proportion of old and dilapidated housing;

– high competition for human resources with the Moscow region, resulting in an outflow of a significant number of highly skilled workers from the Tula region;

– presence of low-income territories, characterized by the population leaving (primarily rural areas and territories adjacent to the mines of the former coal basin near Moscow).

According to the Tula region socio-economic development Forecast for the next three years (2022-2024) there will be a strong development of 5 key clusters: automotive, metallurgical, innovative scientific and technological centre "Composite Valley" on the territory of the special economic zone "Uzlovaya", biotechnology cluster on the territory of single-industry town Efremov, tourism and recreation one.

The Tula region Social and Economic Development Strategy identifies 2 groups of clusters:

– group of priority (established) clusters with a steadily developing cluster structure with active intra-cluster interaction. The 8 of15 priority territorial clusters have significant innovation potential stand out (the Novomoskovsk and Shchekino gas and chemical clusters, the Efremov petrochemical cluster, the Tula region oil and gas chemical engineering cluster, the Tula region metallurgy cluster, the Tula region defence enterprises cluster, the Tula region transport engineering cluster, the Efremov biotechnology cluster);

– group of potential (emerging) clusters includes cluster formations with sufficiently strong clustering centres and a number of small and medium enterprises with an as yet unestablished system of communication links. The 4 of 15 potential territorial clusters of the Tula region have significant innovation potential (Aleksin cluster of special chemical products, Novomoskovsk cluster of household chemistry, the Tula region cluster of radioelectronic and electrical engineering, the Tula region cluster of information and telecommunications technologies).

The declared slogans acting as reference points for the strategic socio-economic development of the Tula region are: "Economic breakthrough", "Agroindustry – rural revival", "New industrialization", "Education of the future: human resources for industry", "Healthy and strong region", "Decent life in the small motherland", "Heritage preservation and tourism development" (Shulmin, 2019).

Thus, we analyzed the socio-economic development strategies of the regions neighbouring to Moscow and the Moscow region. We also analyzed the investment and innovation characteristics of the regions, the cluster initiatives underway, and the inflow of foreign investment

There is no doubt an active investment policy is the key to the dynamic development of the regions. For example, the strategy for socio-economic development of the Kaluga region goes under the slogan: "People are the centre of investment".

Table 5 shows the distribution of Russian regions by investment climate rating for 2018-2020. The

surveyed regions (with the exception of Moscow and the Moscow region) have reduced investment potential, and the Ivanovo region has low investment potential. Only two regions (Ryazan and Tula) have a low risk and the other regions have a moderate risk.

**Table 5** – Russian regions distribution by the investment climate rating in 2018-2020

| Year | 2018 | 2019 | 2020 |
|---|---|---|---|
| Maximum capacity – minimum risk (1A) | Moscow<br>Moscow region | Moscow<br>Moscow region | Moscow<br>Moscow region |
| Reduced capacity – minimum risk (3A1) | Ryazan region<br>Tula region | Ryazan region<br>Tula region | Ryazan region<br>Tula region |
| Reduced capacity – moderate risk (3B1) | Vladimir region<br>Ivanovo region<br>Caluga region<br>Smolensk region<br>Tver region<br>Yaroslavl region | Vladimir region<br>Ivanovo region<br>Caluga region<br>Smolensk region<br>Tver region<br>Yaroslavl region | Vladimir region<br>Caluga region<br>Smolensk region<br>Tver region<br>Yaroslavl region |
| Low potential – moderate risk (3B2) | | | Ivanovo region |

*Source: Investment attractiveness of Russian regions in 2020*

An important additional factor for development is the creation of special economic zones and technology parks. The effectiveness of establishing special economic zones in the regions is confirmed by scientific studies (Gvozdikova & Efremova, 2019). It is an additional impetus for development of the regions close to the Moscow agglomerationt, as can be seen in the Uzlovaya special economic zone of the industrial-production type in the Tula region. The location of this zone is very convenient (40 km from Tula, 15 km from Novomoskovsk, 180 km from Moscow), which firstly, makes it attractive not only for railway and passenger transport but also for air transport (the airport in Kaluga is nearby). Secondly, this zone has an opportunity to employ up to 1.1 million people in the radius of 40 km and to recruit necessary workforce on competitive basis (Shishkin et al., 2019).

The Ivanovo region announced the establishment of a special economic zone of the Ivanovo industrial-production type on the territory of 2 municipal formations – Ivanovo-city and the Rodnikovsky municipal district. There are plans for implementing textile industry investment projects with a total investment of over RUB 8 bn and the creation of over 3,000 jobs. The zone provides for exemption from import duties for the entire period (up to 49 years): from property tax and transport tax for 10 years; from land tax for five years; and a profit tax reduction (in the first five years from the date of the profit, it will be 2%; in the following five years, 7%, and after this period and before the zone closing – 15.5%).

The arrival of foreign investment provides an important impulse for regional development. By Table 6, the leaders among the 8 surveyed regions in terms of foreign investment inflow into the economy are the Kaluga region (the average value for 2013-2019 is USD 1,055 mn). The Tula (respectively, 687), Yaroslavl (273), Vladimir (264), Smolensk (162) and Tver (102) regions are next. Minimum foreign investment inflows in the Ivanovo (50) and Ryazan (89) regions.

By I.B. Gurkov, corruption at the level of regional administrations is combined with uncertainty of cost the necessary supporting infrastructure for new industrial projects when foreign investors choose to build new production facilities in Russia. Although the Central region (the Moscow region and nearby regions, especially the Kaluga one, and at less extent the Tver, Tula and Vladimir regions) continues to be a centre of attraction for foreign industrial investment in Russia. The leaders are still the Republic of Tatarstan and the Lipetsk, Nizhny Novgorod, Samara and Ulyanovsk regions. In the period of 2012-2018 the new plants of foreign corporations were established in 58 constituent entities of the Russian Federation. Thus, almost a third of Russian regions was unaffected by the establishing of new industrial facilities by foreign corporations in 2012-2018 (Gurkov, 2019). According to the author's research, 66% of "newcomer" and 59% of "veteran"

corporations chose the special economic zones or industrial parks for establishing their new plants, i.e. in areas with guaranteed supportive infrastructure, which leads to a "cascade effect", where foreign investors experience the success of previous investment projects and try to repeat it; the maximum number of new plant establishing was in 2015 (Gurkov, 2019). Nevertheless, the proximity of the regions to the Moscow agglomeration is an additional factor of foreign investment attracting.

**Table 6** – Foreign direct investment to the Russian regions economy, USD mn

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Average for 2013-2019 |
|---|---|---|---|---|---|---|---|---|
| Moscow | 108107 | 77801 | 66718 | 65314 | 85326 | 69873 | 93903 | 81006 |
| Moscow region | 6477 | 7499 | 8031 | 8205 | 9423 | 8841 | 12101 | 8654 |
| Vladimir region | 238 | 332 | 256 | 242 | 284 | 275 | 219 | 264 |
| Ivanovo region | 19 | 24 | 80 | 65 | 85 | 11 | 68 | 50 |
| Kaluga region | 648 | 707 | 1274 | 1060 | 1544 | 1197 | 954 | 1055 |
| Ryazan region | 27 | 150 | 97 | 59 | 226 | 49 | 18 | 89 |
| Smolensk region | 62 | 52 | 274 | 241 | 149 | 255 | 99 | 162 |
| Tver region | 104 | 96 | 202 | 70 | 53 | 106 | 82 | 102 |
| Tula region | 927 | 426 | 623 | 718 | 833 | 698 | 581 | 687 |
| Yaroslavl region | 481 | 224 | 138 | 142 | 452 | 169 | 308 | 273 |

*Source: Regions of Russia. Socio-economic indicators, 2020*

By this study the Tula, Tver, and Vladimir regions continue to be centres of attraction for foreign industrial investment (ranked 15-17 out of 58 regions surveyed, respectively). Most of these enterprises are the modern production facilities with a high technological level. There is a high share of corporations established their first Russian manufacture in 2012-2018 ("newcomers"). Compared to the Vladimir, Kaluga, Tver, Tula and Yaroslavl regions, foreign investment attraction is weaker in the Ivanovo, Ryazan and Smolensk regions (see Table 7).

**Table 7** – Distribution of newly established manufactures by constituent entities of the Russian Federation

| Entity of the Russian Federation | Total number of manufactures established in 2012-2018 | Number of manufactures established by "newcomers" | Number of manufactures established by "veterans" |
|---|---|---|---|
| Moscow and Moscow region | 32 | 21 | 11 |
| Kaluga region | 27 | 17 | 10 |
| Tula region | 5 | 1 | 4 |
| Tver region | 5 | 3 | 2 |
| Vladimir region | 5 | 1 | 4 |
| Yaroslavl region | 4 | 3 | 1 |

| Entity of the Russian Federation | Total number of manufactures established in 2012-2018 | Number of manufactures established by "newcomers" | Number of manufactures established by "veterans" |
|---|---|---|---|
| Smolensk region | 2 | 2 | 0 |
| Ivanovo region | 1 | 1 | 0 |
| Ryazan region | 1 | 1 | 0 |

*Source: Gurkov, 2019*

The cluster policy is one of the main development tools for the surveyed regions. By S. Shkiotov and M. Markin, the cluster initiative acts as a new trend in the implementation of regional industrial policy. The "Finnish model" is relevant for the Russian regions of Central Russia; the Japanese experience of leader firms and public-private regulation of economic processes is also interesting for Russia (Shkiotov & Markin, 2021).

Table 8 presents the clusters declared by regions in their socio-economic development strategies.

**Table 8** – Regional development clusters declared in socio-economic development strategies

| | Regional clusters |
|---|---|
| Vladimir region | – precision engineering<br>– pharmaceutical<br>– glass<br>– bioenergetic<br>– tourism and recreation |
| Ivanovo region | – textile industry<br>– agricultural<br>– flax<br>– tourism and recreation |
| Kaluga region | – life sustainment and environmental development<br>– automobile industry<br>– educational<br>– transport and logistics<br>– agrifood<br>– pharmaceuticals, biotechnology and biomedicine<br>– composite and ceramic technology<br>– nuclear technologies<br>– tourism and recreation |
| Ryazan region | – engineering, radio electronics and robotics<br>– IT<br>– construction materials<br>– medical |
| Smolensk region | – composite<br>– flax (flax cultivation, primary and downstream processing)<br>– tourism<br>– IT<br>– agrifood<br>– transport and logistics<br>– machine-building |
| Tver region | – railway<br>– transport and logistics<br>– bioenergetic |

| | Regional clusters |
|---|---|
| | – pharmaceutical<br>– agro-industrial<br>– tourism and recreation |
| Tula region | – industrial<br>– agricultural<br>– recreational<br>– touristic |
| Yaroslavl region | – gas turbine and power engineering industry;<br>– modern pharmaceutical industry and innovative medicine<br>– tourism and recreation<br>– automotive industry and automotive component manufacturers<br>– logistics and transport<br>– IT<br>– agro-industrial<br>– business outsourcing |

*Source: composed by the author*

Regional strategies emphasize the necessity of innovative development and economic modernization. The ranking of the surveyed constituent entities of the Russian Federation according to the value of the Russian regional innovation index: the Kaluga region (in all ratings) has the best positions along with the capital region, while the Tula, Yaroslavl, Smolensk, Ryazan, Vladimir, Tver and Ivanovo regions have the best positions by the ranking of the Research Institute-Higher School of Economics. By the rating of the Association of Innovative Regions of Russia, Moscow-city (3rd place), the Moscow (5th place) and the Kaluga regions (7th place) are followed by the Tula (15th place), Yaroslavl (16th place), Ryazan (26th place) and Vladimir regions (32nd place). The other regions lag more than 10 points: the Tver region (43rd place), Smolensk region (44th place), Ivanovo region (50th place) are among them (see Table 9).

**Table 9** – Rating of constituent entities of the Russian Federation according to the value of the Russian regional innovation index

| | Research Institute - Higher School of Economics, 2019 | | Association of Innovative Regions of Russia (AIRR), 2018 | |
|---|---|---|---|---|
| | Positioning of the region | Innovation index | Positioning of the region | Innovation index |
| Moscow | 1 | 0.5378 | 3 | 0.65 |
| Moscow region | 6 | 0.4616 | 5 | 0.60 |
| Kaluga region | 10 | 0.4207 | 7 | 0.57 |
| Tula region | 18 | 0.3954 | 15 | 0.51 |
| Yaroslavl region | 21 | 0.3849 | 16 | 0.50 |
| Smolensk region | 29 | 0.368 | 44 | 0.38 |
| Ryazan region | 30 | 0.3645 | 26 | 0.44 |
| Vladimir region | 35 | 0.3530 | 32 | 0.43 |
| Tver region | 47 | 0.3277 | 43 | 0.39 |
| Ivanovo region | 51 | 0.3226 | 50 | 0.36 |

*Source: Rating of Innovative Regions of Russia, 2020; Rating of constituent entities of the Russian Federation according to the value of the Russian regional innovation index, 2019*

By the researchers, the coronavirus pandemic has not only sharpened economic challenges, but has also acted as an accelerator for the transition to a new economic model, further increasing the need for

digital transformation of enterprises in terms of the transition to a neo-industrial development model. In this regard, it is important to implement "smart cities", "smart industries", based on "smart machines" and artificial intelligence, to use the smallest opportunities for rapid business restructuring (changes in organizational structures, production plans, supply chains) that will allow to withstand competition in modern conditions (Antonova, 2021).

**Discussion**

Thus, the three articles published in this journal contain the main conclusions of our analysis of the proximity to the Moscow agglomeration of 8 regions of Central Russia.

The proximity to Moscow and the Moscow region creates attractive conditions for neighbouring regions to locate production holdings in various industries. On the one hand, this is access to cheaper resources as land, energy resources and labour, and, on the other hand, proximity to the large sales market of the Moscow agglomeration. Studies show the growth rate of the gross urban product in 2020 in most Russian agglomerations was higher and the economic losses were less than in the Russian economy as a whole (Polidi & Gershovich, 2021).

Our analysis of strategies and forecasts of socio-economic development in the Moscow macro-region (Vladimir, Ivanovo, Kaluga, Moscow, Ryazan, Smolensk, Tver, Tula and Yaroslavl regions) for the near term shows the following:

Among the "weaknesses" of most of the surveyed regions is the high competition rate of labour resources from the Moscow agglomeration (Moscow and the Moscow region). The main goal of the regions is to create conditions to curb migration, especially of highly qualified specialists, to implement measures to attract and retain them permanently, including on the basis of Internet technologies, digitalization of labour relations, application of flexible and remote forms of employment, etc.

This topic is relevant due to the decline in the population of these regions (except Moscow and the Moscow region), the ageing of the population, the decline in the working-age population, the presence of intra-regional imbalances in population dynamics (Yakovenko et al., 2019).

The strategic priority of the surveyed regions is support of cluster development. Cluster policy and support of sectoral cluster initiatives are linked to improving regional competitiveness.

**Conclusions**

The Regional Strategies emphasize the development of transport transit potential, as federal highways pass through the regions, and Russia is now implementing a whole set of state programmes and national projects, including transport infrastructure development.

Increased production of new types of products, import substitution and the creation of industries for the deep processing of agricultural raw materials, including the use of biotechnology are regional development promising area. Although investment demand has recently decreased due to increased economic and epidemiological uncertainty and restrictive measures, an important area for regional development is still the improvement of investment attractiveness, namely the implementation of major investment projects in the core sectors of the economy. Regional activity is also evident in the creation of special economic zones, industrial and technology parks, territories of advanced socio-economic development, which ultimately strengthens the region's competitive advantages and economic potential, opportunities to market products, works and services for Moscow businesses and the Moscow agglomeration as a whole.

Regional strategies place great emphasis on the need for innovative development and economic modernization (ensuring economic growth, improving the investment climate and attracting investment, developing innovative activities and innovative infrastructure). It is important to intensify innovative technologies into traditional regional industries, e.g. mechanical engineering and metalworking, chemical industry, processing of agricultural products, etc.

The Regional Strategies prescribe measures to create favourable conditions for doing business, including by reducing administrative and bureaucratic barriers, simplifying permissive procedures, and developing effective instruments to support entrepreneurship (e.g. business-oriented lending), which can attract investors

from other regions and countries.

Responsible social policies are important to reduce social risks. The relevant tasks include the implementation of a large-scale programme of housing construction and modernization of the housing and utilities sector (e.g. a programme of large-scale construction of low-rise and individual houses) and the acceleration of the liquidation of dilapidated housing. Solutions of these problems include not only improving the quality of life in the regions, providing a multiplier effect for the entire regional economy. But it also makes the regions neighbouring the Moscow agglomeration more attractive for residents of Moscow and the Moscow region to buy their primary or second home.

The regions pay great attention to the development of tourism and recreational resources, including small towns, taking into account the proximity to major tourist routes and transport and logistics corridors.

The governors and their teams play an important role in the social and economic development of regions. By T. Nefedova, "The success of Kaluga is largely due to the flexible and active policy of the regional administration, which managed to attract foreign investment in the most in-demand industries and create new industrial sites near the border with the Moscow region" (Nefedova, 2020).

**References**

1. Antonova, I. A., & Sartakov, I. V. (2021) The COVID-19 pandemic is an accelerator of the transition to digitalization and «smart production». *Theoretical economy,* (7), 39-50. DOI 10.52957/22213260 _2021 _ 7 _39. Retrieved from  http://www.theoreticaleconomy.ru (in Russian)

2. Arzumanyan, M. S. (2021). Methodological tools for assessing the level of sustainability of Russian regions. *Social'no-ekonomicheskij i gumanitarnyj zhurnal Krasnoyarskogo GAU*, (1), 32-45 (in Russian).

3. Babaev, B. D. (2009). *Moscow: a donor or a "vampire"?* Ivanovo-Moscow (in Russian).

4. Balabeykina, O. A., Vlasova, M. A., & Gavrilova, K. S. (2021). The role of religious tourism in the economy of the Tver region: the experience of complex research. *Vestnik Tverskogo gosudarstvennogo universiteta. Seriya: Ekonomika i Upravlenie*, (3), 109-120 (in Russian).

5. Berendeeva, A. B., & Korobova, O. O. (2021). The role of the Moscow agglomeration in the socio-economic development of central Russian regions (Part 1). *Journal of Regional and International Competitiveniss,* (4), 43-56. Retrieved from http://jraic.com/index.php/tor/issue/view/9/7.

6. Berendeeva, A. B., & Korobova O. O. (2021). The role of the Moscow agglomeration in the socio-economic development of central Russian regions (Part 2). *Journal of Regional and International Competitiveness,* (5), 58-68.  Retrieved from http://jraic.com/index.php/tor/issue/view/10/8

7. Boyko, O. G., &  Romaniuk, A. V.  (2020). Definition of strategic economic activities of regional economy. *Vestnik Tverskogo gosudarstvennogo universiteta. Seriya: Ekonomika i upravlenie*, 3, 98-106 (in Russian).

8. Gvozdikova, N. K., & Efremova, N. E. (2019). The role of special economic zones in the development of the region on the example of the Tula region. *Vestnik Tul'skogo filiala Finuniversiteta*, (1-2), 83-86 (in Russian).

9. Gurkov, I. B. (2019). Location of Russian Enterprises of Foreign Corporations Opened in 2012–2018. *Prostranstvennaya ekonomika*, 15(2), 17-36 (in Russian).

10. Gurovich, A. M. (2021). Peculiarities of formation and implementation of state policy directions of spatial development on the basis of specific industries in territorial formations. *Vestnik Ekaterininskogo instituta*, (2), 24-28 (in Russian).

11. Dombrovskaya, V. E. (2019). Systemic and regional approaches in analysis of tourist space potential. *Vestnik Tverskogo gosudarstvennogo universiteta. Seriya: Geografiya i geoekologiya*, (2), 120-133 (in Russian).

12. Zubarevich, N. V. (2021). Economic development of metropolitan agglomeration after the expansion of Moscow. *Geourbanistika i gradostroitel'stvo: teoreticheskie i prikladnye issledovaniya: sbornik statej.* A.G. Makhrova (Ed.). (pp. 141-154). M.: Geograficheskij fakul'tet Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova (in Russian).

13. Kamaleev, R. Kh., Berman, S. S., & Golovanova, E. A. (2020). Analysis and evaluation of labour productivity of Russian regions. *Kazanskij ekonomicheskij vestnik,* (3), 36-43 (in Russian).

14. Nefedova, T.G. (2020). Contrasts of socio-economic space in Central Russia and their evolution:

two "cuts"-profile. *Regional'nye issledovaniya,* (2), 18-38 (in Russian).

15. Polidi, T. Д., & Gershovich, A. Y. (2021). The impact of corona crisis on the economies of major metropolitan areas. *Voprosy Ekonomiki,* (5), 145-159. Retrieved from  https://doi.org/10.32609/0042-8736-2021-5-145-159 (in Russian).

16. (2017). *Tula Region: Land of Strength and Talent: Proceedings of the Ministry of Economic Development of Tula Region.* Tula. Retrieved from  https://minek.rk.gov.ru/file/File/minek/2017/sez/mrv/tulskaya_obl.pdf (accessed 28.10.2021)

17. Shishkin, A. N., Savina, I. V., & Vedeneev, D. A. (2019). Functioning of special economic zone of industrial production type "Uzlovaya" as a factor in the development of the construction industry in Tula region. *Vektor ekonomiki,* (7), 30 (in Russian).

18. Shkiotov, S. V., & Markin, M. I. (2021). Analysis of the World Practice of Industrial Cluster Development. *Teoreticheskaya ekonomika*, *78*(6), 149-159. Retrieved from http://theoreticaleconomy.ru/index.php/tor/article/view/90 (in Russian).

19. Shulmin, S. A. (2019). On strategic planning at the regional level in the Russian Federation. *Vestnik Tul'skogo filiala finuniversiteta*, (1-2), 325-328 (in Russian).

20. Yakovenko, N. V., Komov, I. V., Safonova, I. V., Derevyagina, M. V., & Gosteyeva, Y. A. (2019). The Demographic aging of the population in the regions of the Central Federal District. *Nauchnye vedomosti Belgorodskogo gosudarstvennogo universiteta. Seriya: Estestvennye nauki, 43*(2), 154-164 (in Russian).

21. Rossiyskaya Gazeta. (2021, March 12). *Main Indicators of the Socio-Economic Situation of the Constituent Entities of the Russian Federation in 2020.* Retrieved from https://rg.ru/2021/03/12/percapita-dok.html (accessed 02.06.2021) (in Russian).

22. Federal State Statistics Service.  (2020). *Regions of Russia. Socio-economic indicators. 2020: stat. coll.* M.: Rosstat. Retrieved from https://rosstat.gov.ru/storage/mediabank/LkooETqG/Region_Pokaz_2020.pdf (in Russian).

23. Garant. (2013). *On the strategy for socio-economic development of the Tver Region for the period up to 2030: Decree of the Government of the Tver Region No. 475-rp of 24 September 2013.* Retrieved from https://docs.cntd.ru/document/430628871 (in Russian).

24. Official website of the Government of the Ivanovo region. (2021, 19 oct.) *Novosti.* Retrieved from https://ivanovoobl.ru/press (accessed 06.11.2021) (in Russian).

25. Association of Innovative Regions of Russia. (2021). *Rating of Innovative Regions of Russia.* Retrieved from https://i-regions.org/reiting/rejting-innovatsionnogo-razvitiya/ (accessed 28.10.2021) (in Russian).

26. National Research University "Higher School of Economics". *Rating of constituent entities of the Russian Federation according to the value of the Russian regional innovation index.* Retrieved from  https://region.hse.ru/rankingid19 (accessed 28.10.2021) (in Russian).

27. RAEX. (2020). *Investment attractiveness of Russian regions in 2020.* https://raex-a.ru/ratings/regions/2020 (accessed 28.10.2021) (in Russian).

28. *Strategy for socio-economic development of Tula Oblast until 2030.* Retrieved from  https://storage.strategy24.ru (accessed 18.10.2021)

29. On approval of the Tula Oblast socio-economic development forecast for 2022 and for the planning period 2023 and 2024: Tula Oblast Government Decree No. 480-r of 23.09.2021. Retrieved from   https://econom.tularegion.ru/upload/iblock/30b/30b4328d3d0fc7cb8d93ee76f8adbd86.pdf  (accessed  28.10.2021) (in Russian).

30. National Research University "Higher School of Economics". *Russian Cluster Observatory. Cluster Development Centres.* URL: https://cluster.hse.ru/clustercenters (accessed 18.10.2021) (in Russian).

# Competition for small and medium-sized enterprises financing in Russia: competitive advantages and disadvantages of crowdfunding platforms

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**Abstract.** The study identifies the main competitive advantages and disadvantages of investment platforms involved in the financing of small and medium-sized enterprises (SMEs) in Russia. By the study, crowdfunding for small and medium-sized enterprises is an analogue of overdraft with short repayment intervals. These platforms are used for short and extremely expensive money for urgent financing of awarded government contract or the implementation of a work stage. Two determinants define the system of SMEs financing in Russia. They are the mega-regulator actions and the measures of authorities support; the private investors behavior at the crowdfunding market plays a secondary role. The identified competitive advantages and disadvantages of Russian crowdfunding platforms allow us to make a number of recommendations for the main market participants - the mega-regulator, the authorities and the investment platforms owners. The recommendations aimed at expanding the number of players in the crowdfunding market, providing the safety of investment platforms and developing a mechanism for partial project investing.

**Keywords:** crowdfunding, investment platforms, The Bank of Russia, p2b market, small and medium enterprises.

**JEL codes:** G11, G21

### Introduction

Despite the crowdfunding market in Russia showed positive dynamics in the period 2021 and 2022 (Fig. 1), the past year was difficult: on the one hand, the market was abandoned by several major players, and on the other hand, the volume of the market did not reach the expected levels.

At the end of 2021 the crowdfunding platform SberCredo completely stopped its activity. The platform, which enabled IEs and small businesses to obtain funding from investors of up to RUB 800, 000 to six months, existed on the market for just over a year. According to experts' assessments, this test of the new market costs Sberbank RUB 75 mln (Trifonova, 2022). Thus, the only successful Russian bank project in the field of crowdfunding is "Potok Digital" by Alfa Bank But in spring of 2021 Alfa Bank reduced its stake in Potok Digital to 19%, despite the platform accounts for almost half of the entire crowdfunding market in Russia. The crowdfunding platform, which has been operating since 2015, costs RUB 139.8 mln to Alfa Bank (Sherunkova & Trifonova, 2021). The bank explains the Potok Digital launched as a startup became an independent business and its further development requires independence from the parent structure. However, market participants point out the project was successful for the crowdfunding market, but not for Alfa Bank itself. By the opinion of some researches, "crowdfunding in Russia is ineffective. For most investors the final return is at the level of Federal Loan Obligations (FLO) with incommensurably higher risks and time losses. Alfa Bank simply does not make sense to engage in this business" (Sherunkova & Trifonova, 2021).

Moreover, the crowdfunding market in Russia is developing much slower than in Western ones. In the U.S. the predicted market size will achieve USD 270.9 bn in 2022. In 2021, the Russian crowdfunding market expectations did not come true. The Association of Investment Platform Operators (AIPO) predicted

that by the end of the year the volume of loans could achieve RUB 10-12 bn rubles (in compare with RUB 7 bn in 2020); at the end of the year the market achieved RUB 8.9 bn in spite of increasing of the number of investment platforms operators from 20 to 54 (to February 2022).
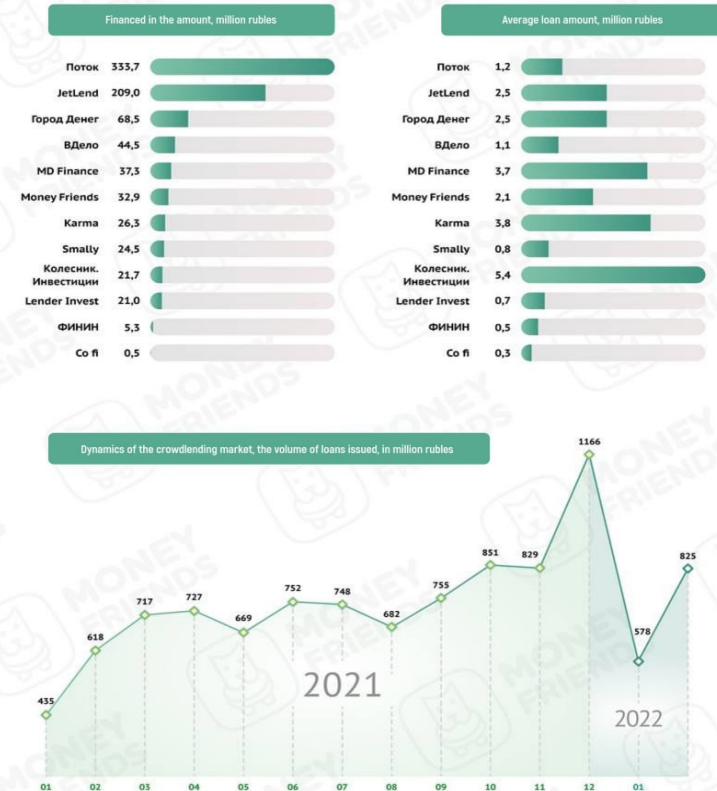


**Figure 1.** Crowdfunding Market Dynamics in Russia, 2021-2022

*Source: MoneyFriends, 2022*

AIPO attributes the bright prospects of the Russian crowdfunding market (Fig. 2) to the achievement of the primary goal currently facing the operators of investment platforms - to become the main source of funding for small and medium-sized enterprises (SMEs).
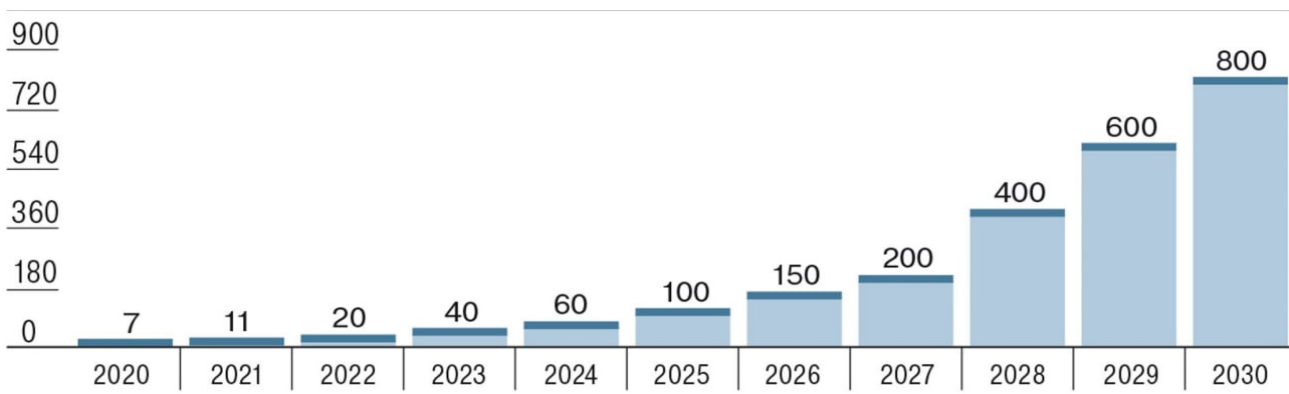


**Figure 2.** Loans growth potential through crowdfunding platforms, 2020-2030 (RUB, bn)

*Source: Trifonova, 2021*

Indeed, the market has the potential to grow, through crowdfunding in Russia less than 0.1% of SMEs are credited (abroad the figure reaches 10%), while less than 10% of SMEs have access to bank lending. At the same time, experts assess the need for SMEs financing at RUB 1.5-2 bn per month.

The competition for the SMEs financing is a real problem. On the one hand, the micro finance institutions offer their services (quarterly amount of funding for SMEs is comparable to the annual attraction through investment platforms), and on the other hand, banks provide variety of co-financing and supporting products to SMEs.

The purpose of this study is to identify the competitive advantages and disadvantages of investment platforms as entities financing SME projects, as well as to develop recommendations aimed at overcoming the failures of the crowdfunding market in Russia.

**Main Part**

What are the competitive advantages and disadvantages of investment platforms in terms of the fight for financing SMBs needs?

The competitive advantages of crowdfunding in Russia include (by SMEs as loan debtors):

- speed and simplicity of decision-making;
- no credit on real estate is required;
- low transaction fees (all operations are online);
- relative transparency of the market (if operators included in the register of the Bank of Russia);
- possibility of receiving a loan in the absence of access to bank financing (stop-factors for banks are: short a period of existence of the business, low contract value, low financial indexations, absence of visual cash flow);
- recent years' trend is to reduce the rates (from an average of 45-40% to 30-25% per year), especially now, against the background of a sharp increase of the benchmark interest rate, which made bank financing prohibitively expensive;
- institutional and financial support of the market as a whole (functioning of SMEs Corporation and the Moscow Stock Exchange in the market);
- a diversified offer: there are, for example, factoring platforms that finance against the debt receivable security, or platforms where you can invest exclusively against the real estate loan, including its purchase or construction.

From the point of view of SMEs, crowdfunding, in most cases, is an analogue of overdraft with short repayment intervals. These platforms are used for short and extremely expensive money to finance an awarded government contract or the implementation of a work stage, urgent funding for the first stage of work, or in the case of procuring goods up to date.

The Russian crowdfunding market existing practice is strikingly different from the vision of the market participants. They consider crowdfunding as an investment elevator for SMEs (Fig. 3). A promising company from the small business segment can start its way to the public debt market and earn the trust of private investors through crowdfunding, financing its own business, develop a public credit status (Trubachev, 2021).

Such a difference in the assessment of the Russian crowdfunding market is largely due to its competitive disadvantages:

- absence of a unified database of loan debtors for effective scoring;
- absence of a pool of high quality loan debtors and a unified rating system;
- small pool of investors: as estimated 80% of all private investment in the crowdfunding market are for 1,000 investors (Kosminski, 2021);
- high cost of borrowed funds;
- growth of past-due indebtedness (in the period from July 1, 2020 to July 1, 2021, the average industry past-due indebtedness increased by about three times, from 0.7-1.5% to 2.0-4.5%), restructurings and defaults (economical sanctions, the coronavirus pandemic and the decline in consumer and investment demand in the economy);

- absence of tax agent status for investment platforms (for example, platforms, have no opportunity to pay income tax received by individuals as a tax agents, transparently);
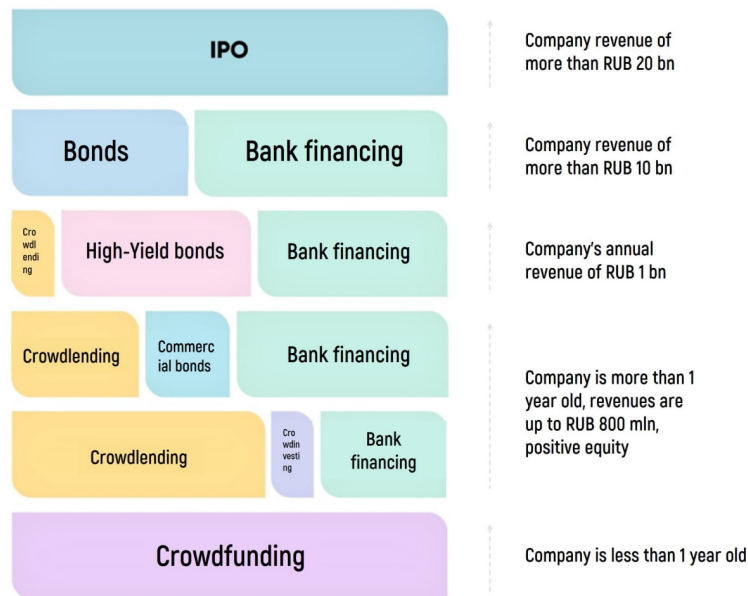
## INVESTMENT ELEVATOR FOR SMALL BUSINESS

| | | | | | Company revenue of more than RUB 20 bn |
|---|---|---|---|---|---|
| | **IPO** | | | | |
| | **Bonds** | | **Bank financing** | | Company revenue of more than RUB 10 bn |
| Crowdlending | High-Yield bonds | | Bank financing | | Company's annual revenue of RUB 1 bn |
| Crowdlending | Commercial bonds | | Bank financing | | Company is more than 1 year old, revenues are up to RUB 800 mln, positive equity |
| Crowdlending | | Crowdinvesting | Bank financing | | |
| | **Crowdfunding** | | | | Company is less than 1 year old |

**Figure 3.** Crowdfunding as an investment elevator for SMEs

*Source: Trubachev, 2021*

- hard rationing of amount raised and invested through the investment platform funds;

- prohibition on the use of cryptocurrencies in Russia, which significantly narrows the crowdfunding market, hinders the implementation of international projects and increases transaction costs;

- prohibition for non-residents to projects investing;

- absence of co-financing from development institutions, programs of cooperation with public authorities, tax preferences, etc.;

- large number of unreliable debtors using the investment platforms for intended investors defraud;

- low level of the population financial literacy of the population and low trust in crowdfunding in general;

- possibility of technical breakdowns in the work of investment platforms, the low quality of project management and support services (Dyachkov, 2020);

- absence of clear cybersecurity mechanisms and protocols to ensure the trouble-free operation of investment platforms;

- competition growth caused by microfinance institutions, which began to actively lend to SMEs recent years;

- decline of investors activity, caused by the unfavorable economic situation and the real disposable income of most investors, tending to use conservative investment instruments for minimizing the risks.

The identified competitive disadvantages and analysis of investment platforms activity allowed us to formulate a number of recommendations aimed at the development of this market.

Firstly, we need to increase the number of crowdfunding players. The limit of RUB 600.000 for individuals (unqualified investors) is too small in terms of inflation growth. Moreover, the established limit with a small number of investors significantly restricts the total amount of investment. Therefore, the legislator should pay attention to increasing the limit size for unqualified investors or the period of its coverage (for example, not by the accumulated total for the year, but for participation in one project or on one platform). It is also necessary to redefine the ban of cryptocurrencies within the framework of investment platforms. By Bloomberg (2022), Russians keep about RUB 16.5 tn in cryptocurrencies. This huge amount of money could be redirected to

finance SMEs. The use of digital ruble could significantly accelerate the implementation time of projects on crowdfunding platforms. It is important to expand the range of investors in the crowdfunding market by attracting foreign investors, either within the EAEU space or through accreditation mechanisms for foreign, primarily Asian investors (as in Canada) / e-citizenship e-residency (as in Estonia) (Klinov, 2018).

Secondly, there is an issue of improving the reliability of crowdfunding platforms. The risk of investments non-return within the framework of the work of investment platforms is quite high: investing into investment platforms are not protected, and the platforms are not liable for the obligations of companies attracting financial resources. In terms of the platforms are usually used to host startups, the probability of not being able to return the capital invested is extremely high. By the investment platform owners, the introduction of blockchain technology would not only increase the reliability and transparency of transactions but attract new users. By the Megaregulator, the creation of transparent and independent rating system for assessing crowdfunding platforms (as criteria, for example, it is possible to use the % of success of projects on the investment platform; information about the outstanding obligations of persons attracting investments under investment contracts, the total value of unfulfilled obligations, etc.). By the legislator, ability to consider model "platform regulated as banking", considering digital crowdfunding platforms as banks due to their economic and legal nature. But it is providing the banking license and complying with all the requirements arising from it (such as in France and Italy) (Kuvaeva and Chudinovskikh, 2020). Also, more stringent target standards of information disclosure and protection of investors' rights should be introduced into Russian practice, in particular, the mandatory informing of investors not only about the general, but also about the specific risks of the company attracting crowdfunding. By the Government of the Russian Federation, it is necessary to provide mandatory co-financing from institutional investors for the most high-risk projects (innovative, high-tech); attract development institutions to the crowdfunding market (they can use investment platforms as an attraction of additional financial resources in projects; to determine the direction of their activities (support of projects by large numbers of people is an indicator of public importance).

Thirdly, crowdfunding players need to provide a mechanism for partial investing into the project. We can offer the mechanism of the implementation: in the project description the loan debtor specifies the stages timing and receives money only for already performed stage. it allows the investor to avoid unnecessary risks. This system will help the investor to minimize risks. In case of failure of next stages, the investor can transfer funds to another project (for example, through smart contracts). By the State, there is an opportunity to subsidize projects on the stage of completion and implementation. In case of partial investments of project at its final stage requires additional funding, SME can get State subsidizing. It provides the completion of the project and minimizing the risks of the State.

### Conclusions

The failures of the Russian crowdfunding market are identified by the "teething troubles" of the new institutional system and by the unprecedented exogenous shocks of 2020-2022. The system of SME financing is now more dependent on two determinants - the actions of the mega-regulator (the dynamics of the benchmark interest rate and the reaction of banks, microfinance institutions and investment platforms), authorities support measures of SMEs; the behavior of private investors plays a secondary role. Any significant change in the determinants can fundamentally change the balance in the competition for SMEs financing.]

### References

1. Trifonova, P. (2022) Sberbank lost confidence to Credo. Retrieved from https://www.kommersant.ru/doc/5192768 (in Russian)

2. Sherunkova, O. & Trifonova, P. (2021) Alfa Bank exits the Potok. Retrieved from (in Russian)

3. Trifonova, P. (2022) Crowdfunding searches investors. Retrieved from https://www.kommersant.ru/doc/5193423(in Russian)

4. Trifonova, P. (2021) Platforms attract small businesses. Retrieved from https://www.kommersant.ru/doc/4816895(in Russian)

5. Trubachev, R. (2021) Crowdfunding as an issuer incubator for high-yield bonds market. Retrieved

from  https://rusbonds.ru/analytics/1792. (in Russian)

6.  Kosminsky, K. (2021): «There are all the prerequisites for the market to double every year. Retrieved from       https://www.finversia.ru/interview/kirill-kosminskii-est-vse-predposylki-k-tomu-chtoby-rynok-udvaivalsya-kazhdyi  god-102424?fbclid=IwAR0r8xtZB1xcuA  _ZmEfjyBXtiLi  25M  js6lVPcKYsTF_8X1J_WcJM6KjWIo8(in Russian)

7.  Dyachkov, E. (2020) Eight crowdfunding platforms for moneymaking (or not at all). Retrieved from https://vc.ru/finance/130792-vosem-kraudlendingovyh-ploshchadok-gde-vy-mozhete-zarabotat-ili-sovsem-net(in Russian)

8.  Bloomberg (2022) Russia Values Local Crypto at $200 Billion as Rules Near. Retrieved from  https://www.bloomberg.com/news/articles/2022-02-01/russia-values-local-crypto-market-at-200-billion-as-rules-near?srnd=premium-europe&sref=l3J6d079

9.  Klinov, A.O. (2018) Legal regulation of crowdfunding in Russia and abroad. Retrieved from https://www.elibrary.ru/item.asp?id=32787081. (in Russian)

10. Kuvaeva, Y.V. & Chudinovskikh, M.V. (2020) World practice of transformation of approaches to the regulation of crowdfunding // *Bulletin of the National State University of Economics and Management,* (3), 114-128. (in Russian)

# Methodological approach to assessing the efficiency of an integrated transport and logistics system

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**Abstract.** One of the main tools for assessing a firm's performance is an analysis of its logistics performance, which enables an objective characterization of the internal and external relationships of the analyzed entity, its development prospects, and opportunity of further making substantiated managerial decisions. The aim of the study is to develop a methodological approach to assessing the effectiveness of an integrated transport and logistics system to enable operational management decisions. The study identifies the functioning features of an integrated transport and logistics system and the factors affecting the efficiency of the functioning of an integrated transport and logistics system. Also the authors develop an algorithm for assessing the efficiency of an integrated transport and logistics system. The authors' methodological approach allows us to identify problem areas and active areas of the integrated transport and logistics system. Also it makes possible to make management decisions aimed at improving the efficiency of the system's functioning in the interests of all participants.

**Keywords:** logistics, efficiency assessment, integrated transport and logistics system, logistics management, decision-making.

**JEL codes:** B41, R4, M15

## Introduction

The country's economy is largely determined by the development of its transport industries, with transport and logistics systems aimed to reduce the costs of the entire supply chain. By fierce competition, exacerbated by the coronavirus pandemic, most businesses are reducing their supplying, stop the business or gone bankrupt. Thus, demand for transport services decreases. Transport companies, which are intermediaries between suppliers and consumers of products, experience the significant difficulties. If the transport and logistics system already had problems, this can only exacerbate the situation and can eventually lead to the bankruptcy of the company. To avoid this, management needs to use accurate and informative methods to evaluate the performance of the transport and logistics system.

Theoretical issues related to the peculiarities of the functioning of logistics systems and approaches to their evaluation are reflected in the works of such domestic and foreign authors as Anikin B.A. (2013), Gajinsky A.M. (2006), Mirotin L.B. (2000), Nerush Y.M. (2006), Rodkina T.A. (2001), Sergeev V.I. (1997), Stepanov V.I. (2006), Daniel L. Wardlow, Donald F. Wood & James S. Johnson (2002), Winkelhaus S, & Grosse E.H. (2020), Samal S.K. (2019), Tijan E. et al. (2019), Rubio S. et al. (2019) and others. Logistical optimization focuses on the criterion of minimum costs in the process of moving products from the supplier to the consumer, and it is not the absolute level of total costs. The most important is the ratio between the effort and the results obtained. In order to control logistics costs, logistics professionals need to identify cost centres in the supply chain

where costs accumulate and where effective cost reduction can have a real impact. However, at the moment there is no generally accepted approach allowing an accurate assessment of the logistics system efficiency. All chain actors are interlinked and responsible for economic results. This is an issue of emerging of integrated transport and logistics system and its correct assessment.

The modern economic conditions make the study relevant. The activities of each business entity are the subject of attention of a wide range of participants in market relations interested in the results of its functioning. On the basis of the available information they assess the financial position of the company. The assessment of logistics performance allows to objectively characterizing the internal and external relationships of the analyzed object, the prospects for development, and making the informed management decisions.

The aim of the study is to develop a methodological approach to assessing the effectiveness of an integrated transport and logistics system to enable operational management decisions.

The logic of the work was the sequential implementation of three interrelated blocks of research:
- analysis of the functioning of an integrated transport and logistics system;
- identification of factors affecting the efficiency of an integrated transport and logistics system;
- developing an algorithm for assessing the efficiency of an integrated transport and logistics system.

**Main Part**

A logistics system is a fundamental concept in logistics. It is a set of elements (links) that are in relationships and links with each other and form a certain integrity, designed to manage flows, perform certain logistics functions and operations, consisting, as a rule, of several subsystems and having developed links with the external environment (Anikin, 2013). This paper proposes to consider the integrated transport and logistics system both in terms of the system approach as a set of interrelated subsystems united by a common goal and in terms of the process approach, presenting the system as a chain of interrelated functions and operations (business processes), where the resources is input to the process and the output is the product/service.

The authors consider to suggest the following mandatory elements of a transport and logistics system:
- transformation process in terms of which the given initial condition (input) transforms into the desired result (output);
- system owner;
- agents carrying out the main activities within the system;
- consumers (external and internal). For them the functioning of the system results in the creation of added value and they are therefore influenced by the activities carried out by the system;
- environmental restrictions.

An essential feature of economic systems is the tendency to be «loosely structured», i.e. they do not have a clear structure. The systems approach should both help to achieve a given objective and correctly formulate the objective of the transport and logistics system itself, i.e. to highlight the main stages of the process of a particular product moving to a particular consumer.

A transport and logistics system has a complex structure and typically includes warehouses, terminals, transport, banks and contact centres. It can be extended with other elements, depending on the aims and functions of the system. All the chain agents are responsible for the economic results. The costs control is an effective mean to focus total resources fully on achieving results.

The scheme of an integrated transport and logistics system shown in Figure 1 clarifies the areas of responsibility of the process participants.

Transport and logistics systems are the complex objects of study, which manifests itself in the integral interaction of complex factors such as:
– presence of a large number of elements;
– complex nature of the interaction between the elements in terms of material, financial, information and other;
– multidisciplinarity (multi-assortment) of material flows;

– interrelationships and performance criteria of the elements of the system are difficult to formalize, qualitative in nature;

– stochastic nature of most factors and processes, making it difficult to assess system performance and management decision-making procedures;

– significant role of subjective factors due to the presence of human beings in the management systems of logistics structures.
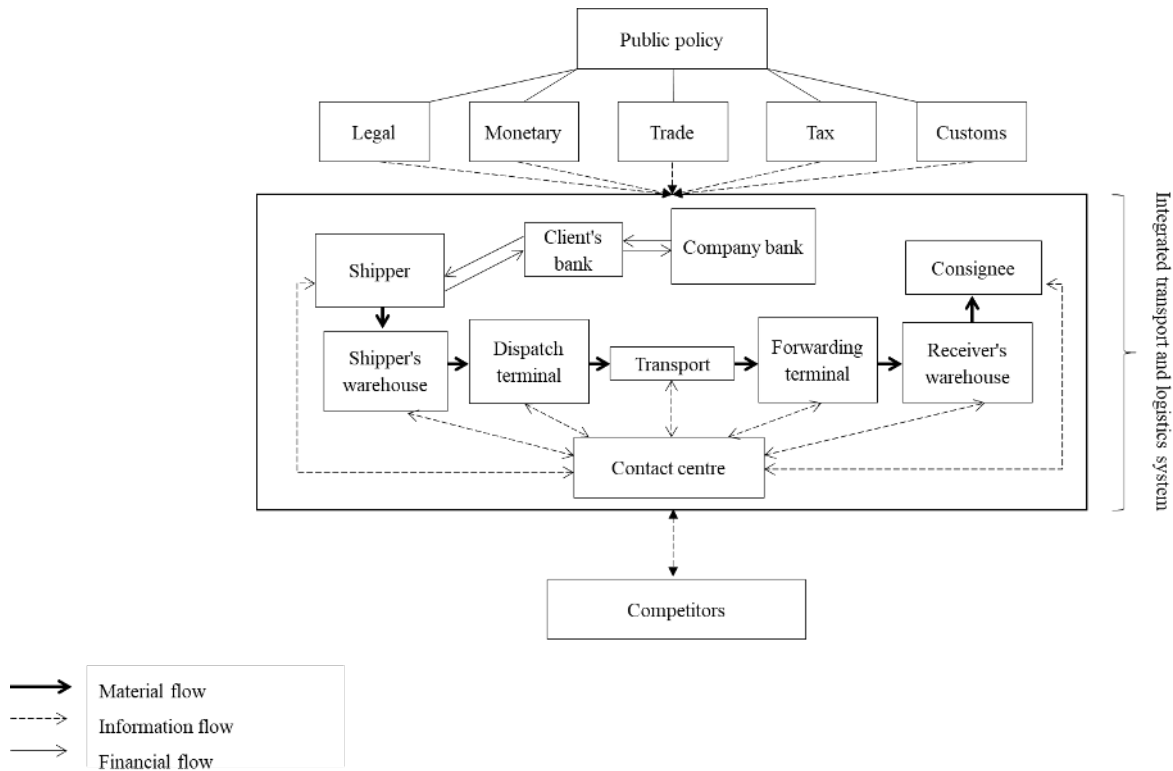


**Figure 1.** The scheme of an integrated transport and logistics system
*Source: composed by authors*

This variety of cause-effect relationships makes it difficult to assess the performance of a logistics system, which necessitated a systematization of the factors in terms of the possibility/impossibility of the logistics system to control them.

The complex factors were divided into two groups:

– objective and subjective;

– external and internal.

The objective controllable factors include the material, energy, financial, information and human resources required to support the activity of the transport and logistics system. The objective uncontrollable factors include the public policy elements shown in Figure 1, which are determined by the economic, political and social situation in the country as well as in the countries within the zone of the transport and logistics system.

The subjective controllable factors include the professional and personal characteristics of employees. The subjective uncontrollable factors include unstable inflation rates, political instability, unstable tax legislation, constant changes in laws and regulations governing logistics companies.

The external factors include those that a company cannot normally change, but must consider because they affect the bottom line. They be divided into direct impact factors (legislation regulating companies; actions of state and local authorities; current tax system; system of relations with business partners; competitors and competition; state of demand for services; possibility of changes in prices for services; technological level of the shipper, etc.) and indirect impact factors (political and economic situation in the country, the economic situation of the business sector, international actions, natural disasters, scientific and technological progress,

etc.)

Internal factors include the diversity of the transport environment, company strategy, management principles and methods, resources (technological, labour, information, financial) and their level of utilization, marketing activities, quality of work/services, etc.

All of the factors named are linked: a change in one factor can cause changes in others. It should be noted that the number of external factors affecting the functioning of transport and logistics systems, which need to be taken into account in production and economic activities, is increasing every year.

The efficiency of transport and logistics systems is the ratio of the results obtained from ensuring the required volume and quality of transport services, improving the economy of operation, reducing the time of cargo delivery, ensuring regularity of departure and arrival of cargo regardless of weather and climatic conditions, maximizing the safety of transported cargo, ensuring environmental friendliness of transport operations, etc. to the costs of achieving them.

We proposed to present the efficiency of a logistics system as a complex economic category, which characterizes the quality of the entire logistics system (degree of customer satisfaction) at a given level of total (logistics) costs.

$$K_i = \Sigma P_i / \Sigma S_i, \tag{1}$$

where $K_i$ – is the coefficient of performance of the transport and logistics system;

$P_i$ – is the profit of the transport and logistics system;

$S_i$ – is the cost of the transport and logistics system.

The concepts of minimizing overall logistics costs and managing the quality of logistics functions and operations throughout the production and business cycle are decisive for the formation of efficient integrated transport and logistics systems. The efficiency of transport and logistics systems can be improved if two conditions are met:

1st condition: $\Sigma P$ tends to the MAX;

2nd condition: total cost tends to MIN.

In an integrated transport and logistics system synergy effects arise as an intersection of a number of intra-organizational processes and processes reflecting¬ the influence of the external environment:

$$Ce_t = \{S_1 \cup S_2 \cup S_3\} : \{S_4 \cup S_5 \cup S_6\}, \tag{2}$$

in which $\{S_1 \cup S_2 \cup S_3\}$ – is the dynamics of the external environment, including:

$S_1$ – are changes in the external environment of the macroeconomic order (the non-linear nature of global economic development, the non-equilibrium nature of global economic processes, etc.)

$S_2$ – are changes in the external environment of the microeconomic order (economic kinetics of the region, the synergistic nature of specific markets, etc.);

$S_3$ – is a global trend;

$\{S_4 \cup S_5 \cup S_6\}$ – is the dynamics of intra-organizational change, including:

$S_4$ are the intra-organizational changes (processes of competition, intra-organizational cooperation, unification, etc.)

$S_5$ – is forming a set of management tools for the organization;

$S_6$ – is building the capacity of positive feedback channels (building an appropriate organizational management structure, motivation for innovation, etc.)

The «:» sign in formula (2) denotes synchrony, coherence in space and time of frequency, rhythm, directionality of dynamic endogenous and exogenous processes.

In modern reality the processes are asynchronous, the interests of the participants (links) of an integrated transport and logistics system will be different. Moreover, the priorities of participants' interests will change. It is important to reconcile the interests of all participants, which will minimize conflicts and ensure that the system functions most effectively within its intended purpose.

If we consider the integrated system from the perspective of trade-off theory, there is a clear need for a deliberate balancing of the interests of the participants, both at the macro and micro level. The above can be

represented in terms of a target function:

$$\sum_{i=1}^{n} \Pi_i = \sum_{i=1}^{n}\sum_{j=1}^{m} C_{ij} * \Pi_j \rightarrow \max \qquad (3)$$

in which $\Pi_i$ is the utility set (efficiency) of the integrated logistics system;

$\Pi_j$ – set of utilities (efficiency) of the subsystems of an integrated logistics system;

$C_{ij}$ – coefficient of linkage of the subsystems of an integrated logistics system;

$n$ – is a number of the subsystems of an integrated logistics system;

$m$ – is the number of structural links within each subsystem.

When assessing the efficiency of a transport and logistics system, it is necessary to:
- consider the enterprise's business as a single cost stream;
- identify cost centres;
- identify the most important cost points within each cost centre.

The efficiency of the economic activities of the links of an integrated logistics system is proposed to be evaluated as

$$K_{li} = D_{pli}/D_{zli}, \qquad (4)$$

where $K_{li}$ is the coefficient of economic efficiency for each link in the logistics system;

$D_{pli}$ – is the share of profit of each link in the total net profit of the logistics system;

$D_{zli}$ – is the share of each link in the cost of the logistics system.

The links in the logistics system are ranked according to the value of the business efficiency coefficient from the most significant to the least significant.

An assessment of the efficiency of the transport and logistics system is proposed according to the following algorithm, shown in Figure 2.
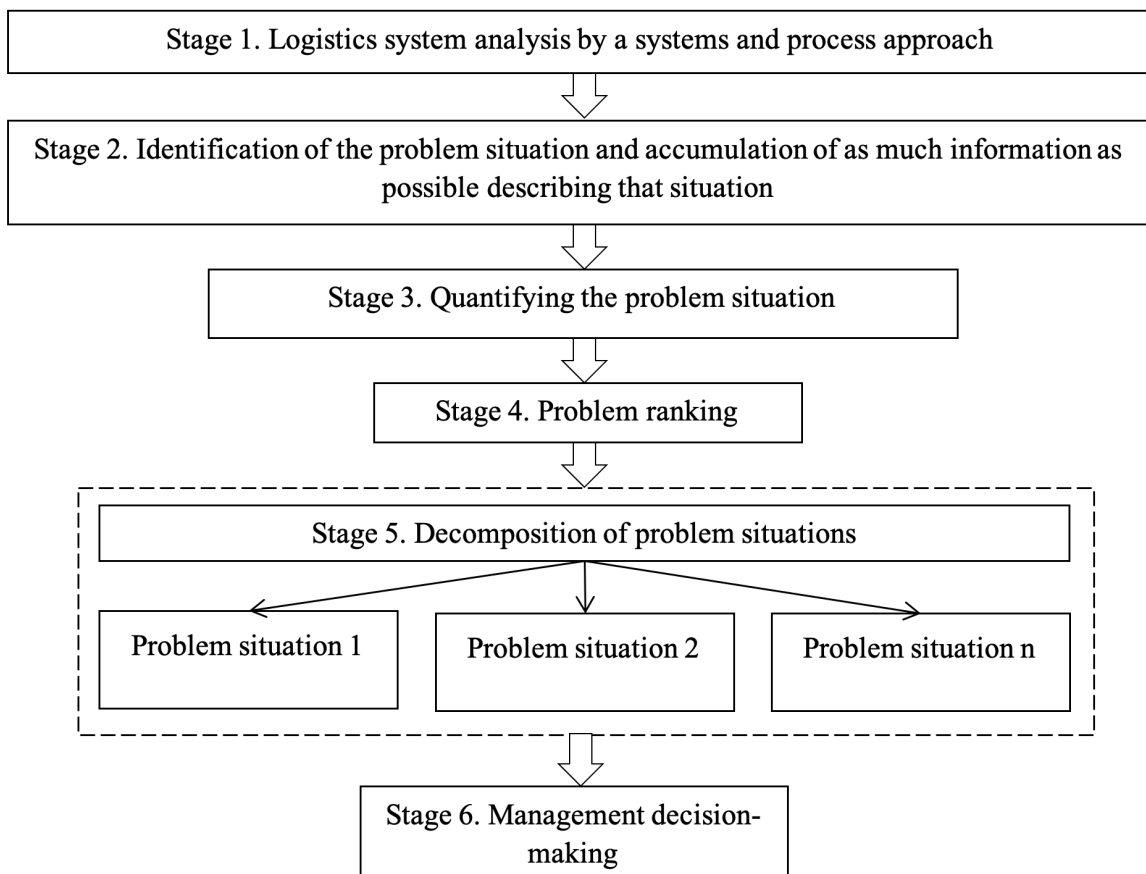


**Figure 2.** Algorithm for assessing the efficiency of an integrated transport and logistics system
*Source: composed by authors*

Each step of the algorithm has a strict set of sequential operations: setting objectives, forming tasks, collecting input data, calculating and forming the reporting module. The performing of operations according to strictly defined rules allows a full assessment of the efficiency of the transport and logistics system and determines the final level of its performance. The outcome should be improved enterprise performance through increased business flexibility and reduced response time to environmental changes, which is crucial to realizing the synergies of integrated transport and logistics systems in Russia.

Projects aimed at improving the efficiency of an integrated transport and logistics system should be assessed in terms of the likelihood of success.

An assessment of the effectiveness of such projects can be represented as

$$Y_k = \sum_{i=1}^{n} Y_{ik} \cdot C_i \tag{5}$$

in which $Y_k$ is the summary indicator of k project;
$Y_{ik}$ – is the ball score of k project;
$C_i$ – coefficient of importance (expert ranking).

$$Y_{ik} = \frac{Y_{ik}}{Y_{max}} \tag{6}$$

if the i-indicator is aimed at reducing
or

$$Y_{ik} = \frac{Y_{min}}{Y_{ik}} \tag{7}$$

if the i-indicator is aimed at reducing
in which $Y_{ik}$ is the value of the i-indicator for k project;
$Y_{max}$ – is the maximum value of the indicator for the projects compared.
$Y_{min}$ – is the minimum value of the indicator for the projects compared.
$Y_{ik}$ should aim for max.
The probability of success of the project:

$$E_x = 1 - R_x \tag{8}$$

where $R_x$ is the risk ratio; $0.33_{max}$ / $0.07_{min}$
When substituted into formula 5, it takes the form of:

$$Y_k^E = E_x \cdot \sum_{i=1}^{n} Y_{ik} \cdot C_i \tag{9}$$

The project with the highest $Y_k^E$ value is selected for implementation of the management decision.

**Conclusions**

Logistics management in an integrated system is a management approach to the organization of its operation which ensures that time and space factors are taken into account to the fullest extent possible in optimizing the management of logistics flows to meet the strategic, tactical and operational objectives of a given enterprise in the marketplace. In this context, management decisions defining as projects, are aimed at the following objectives in the area of improving the efficiency of the enterprise's operations:
- increasing control over the activities of the transport company's links;
- reducing the time needed to find the «weakest link» area of the logistics system;
- improving the efficiency of logistics processes.

The authors' methodological approach allows to identify problem areas and active areas of the integrated transport and logistics system. Also it makes possible to make management decisions aimed at improving the

efficiency of the system's functioning in the interests of all participants.

**References**

1. Anikin, B. A. & Rodkina, T. A. (Eds.) (2013). *Logistics and supply chain management. Theory and practice. Fundamentals of logistics*. M.: Prospect (in Russian).

2. Gadzhinskiy, A. M. (2006). *Logistics*. M.: Dashkov and Co (in Russian).

3. Nerush, M.Yu. (2006). *Logistics*. M.: Prospect (in Russian).

4. Wardlow, Daniel L., Wood, Donald F. Johnson, James, & Murphy, Paul R. Jr. (2002). *Contemporary Logistics*. (7th ed.). M.: Williams (in Russian).

5. Sergeev, V. I. (1997). *Management in business-logistics*. M.: Filin (in Russian).

6. Mirotin, L. B., & Sergeev, V. I. (Eds.) (2000). *Fundamentals of Logistics*. M.: INFRA-M (in Russian).

7. Rodkina, T. A. (2001). *Information Logistics*. M.: Examen (in Russian).

8. Stepanov, V. I. (2006). *Logistics*. M.: Prospect (in Russian).

9. Johnson, James S., Wood, Donald F., Wardlow, Daniel L., & Murphy Paul R. Jr. (2002). *Modern Logistics*. N.A. Korzh (Ed.). (7th ed.). M.: Williams (in Russian).

10. Winkelhaus, S., & Grosse, E. H. (2020). Logistics 4.0: a systematic review towards a new logistics system. *International Journal of Production Research*, *58*(1), 18-43.

11. Samal, S. K. (2019). Logistics and supply chain management. International *Journal of Psychosocial Rehabilitation*, *23*(6), 361–366. https://doi.org/10.37200/IJPR/V23I6/PR190779

12. Tijan, E., Aksentijević, S., Ivanić, K., & Jardas, M. (2019). Blockchain technology implementation in logistics. *Sustainability*, *11*(4), 1185. https://doi.org/10.3390/su11041185

13. Rubio, S., Jiménez-Parra, B., Chamorro-Mera, A., & Miranda, F. J. (2019). Reverse logistics and urban logistics: Making a link. *Sustainability*, *11*(20), 5684. https://doi.org/10.3390/su11205684