

3.5. The impact of sanctions on small technology companies in Russia¹

The sanctions and trade restrictions imposed on Russia limit access to sales markets and high technologies, lead to disruptions in value chains and complicate access to capital.² The Russian business sector's adaptive capacities play a significant role in overcoming various kinds of shocks and crises in the Russian economy.³ In particular, technological entrepreneurship makes it feasible to push back the boundaries of the economy's production capacities through implementation of scientific and technological solutions in products which are in demand on the market.

Within the scope of development of national technological leadership projects in accordance with the national goal of achieving "technological leadership"⁴, it will be required to increase at least sevenfold the revenues of small technology companies by 2030 compared to the level seen in 2023. The status of a small technology company (STC) is determined by a number of regulatory acts.⁵ By the end of 2024, about 4,000 STCs⁶ were registered in Russia; by 2030 their number is expected to increase to 11,000. It is believed that in future STCs may contribute greatly to technological development and import substitution, as well as facilitate competitive exports.

At the same time, at an early stage of development STCs may become more vulnerable to external constraints and face multiple growth challenges, in particular, a lack of capital for rapid scaling.⁷ In this regard, a "registry model" of support is being im-

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2. The Russian economy in 2023. Trends and Outlooks. (Issue 45) — Moscow: Gaidar Institute Press, 2024. 456 p.; *S.P. Zemtsov*. Sanction risks and regional development (on the example of Russia) // *Baltic Region*. 2024. Vol. 16, No. 1. pp. 23–45; *V.A. Barinova, S.P. Zemtsov, P.A. Levakov*. Russia and China: motives, opportunities and risks of scientific and technological convergence // *Economic policy*. 2024. Vol. 19. No. 3. pp. 118–153.
3. *S.P. Zemtsov, A.V. Voloshinskaya*. Shock resistance of Russian regions' economies amid sanctions // *Journal of the New Economic Association*. 2024. No. 3. pp. 54–83.
4. Executive Order No. 309 of May 07, 2024 of the President of the Russian Federation "On the National Development Goals of the Russian Federation for the period up to 2030 and for the perspective up to 2036." URL: <http://www.kremlin.ru/events/president/news/73986>
5. Federal Law No. 478-FZ of August 04, 2023 "On the Development of Technology Companies in the Russian Federation." RF Government Decree No. 1847 of November 2, 2023 "On the Classification of Technology Companies as Small Technology Companies and on the Termination of the Status of Small Technology Companies, the Formation and Maintenance of the Register of Small Technology Companies and on Information Interaction."
6. The Ministry of Economic Development of the Russian Federation. URL: https://www.economy.gov.ru/material/news/minekonomrazvitiya_srednyaya_vyruchka_malyh_tehnologicheskikh_kompaniy_sostavlyayet_pochti_200 mln_rubley.html
7. *Cantamessa M., Gatteschi V., Perboli G., Rosano M.* Startups' roads to failure // *Sustainability*. 2018. Vol. 10. No. 7. P. 2346.

plemented. It is noteworthy that 17 support measures are already available to STCs on special terms: grant programs of the Innovation Assistance Fund; industrial mortgages; acceleration and accreditation of IT companies; faster patent registration; from 2025 the regions have the right to set a reduced income tax rate for STCs.

The survey of STCs conducted by RANEPa experts in summer 2024 within a scope of a government assignment reveals the overall picture in terms of risk assessment and outlooks for STC development. Overall, representatives of 248 companies took part in the survey. According to the survey results, the impact of sanctions on small technology companies is negative: 68% of the surveyed firms were affected by sanctions, while only 3% of the total number noted the positive impact. Relations with foreign suppliers and consumers in most cases deteriorated after 2022. Sanctions slow down considerably the entry of companies into global markets, as well as create problems with import substitution. At the same time, sanctions increase overall economic uncertainties, which significantly worsen the business climate in the country.

3.5.1. The specifics of small technology companies

The status of a small technology company can be received by companies, with revenues of maximum Rb4 bn per year, operating in priority sectors, such as: manufacturing; production and distribution of electricity, gas and water; information and communication activities; professional, scientific and technical activities; tourism and tourism industry activities in order to develop domestic and inbound tourism; activities in the field of education; activities in the field of healthcare and agriculture.¹

STCs act as sources of innovative ideas and technologies, contributing to the speed-up of scientific and technological progress. Their flexibility and ability to quickly adapt to changes in the market allow them to implement new solutions faster as compared to larger companies.² Technological startups outside Moscow contribute to the preservation of human capital in the regions, which helps to balance the spatial development of the country.³ Import substitution po-

1. Approved by RF Government Decree No.1847 of November 2, 2023 "List of Economic Activities for Small Technology Companies in Accordance with the All-Russian Classifier of Economic Activities." URL: <http://static.government.ru/media/files/acckypbyEVJnuyYLj41TtgYFoioBCzth.pdf>

2. *Baumol U.* The Microtheory of Innovative Entrepreneurship. Moscow: Gaidar Institute Press. 2013. 432 p.; *Chernikova A. A., Kozhitov L. V., Kosushkin V. G., Sonkin V. S., Shereiin M. L., Liev R. A.* The role of small and medium-sized high-tech companies in the Russian economy // *Innovations*. 2017. No. 9 (227).

3. *Barinova V. A., Zemtsov S. P., Tsareva Yu. V.* In Search of Entrepreneurship in Russia // Part I. What Prevents Small and Medium-Sized Businesses from Developing. Moscow: Delo. 2023. 300 p.; *Alkhazov A. A.* The Influence of Small and Medium-Sized Businesses on the Economic Potential of the Region // *Finance: Theory and Practice*. 2016. No. 5. pp. 37–44.

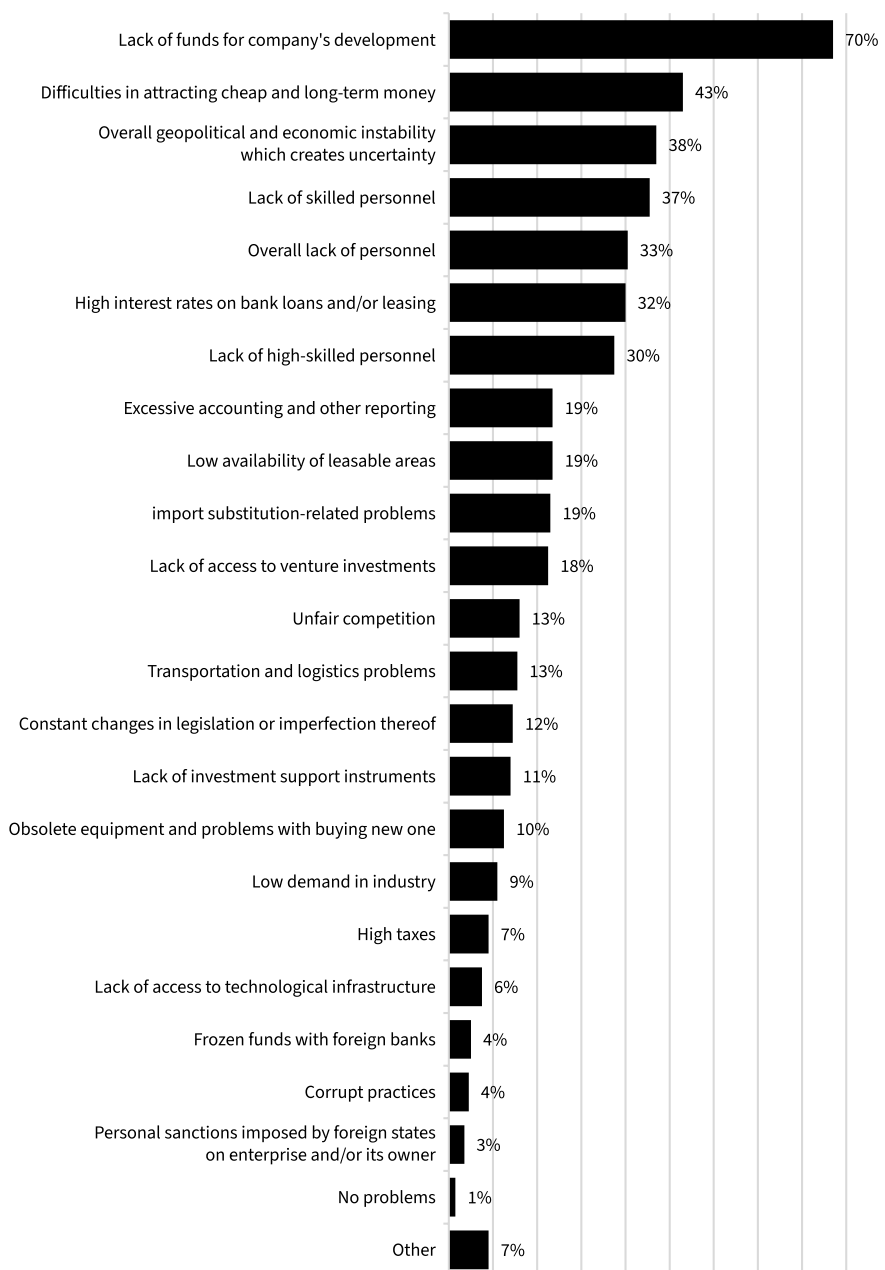


Fig. 17. Respondents' answers to the question:
"What are the main problems faced by your company?"

Source: Own compilation.

licies associated with the support of domestic technology companies can enhance the country's economic security and technological sovereignty by reducing dependence on foreign supplies. This is particularly important in the context of economic sanctions or instability in international markets. Import substitution can contribute to GDP growth by increasing production and consumption in the domestic market.¹

The development of export activities by small and medium-sized enterprises contributes to economic diversification growth. This is particularly important for countries dependent on commodity exports, as STCs can offer innovative and specialized products, which reduce the risks associated with fluctuations in commodity prices.² Active export activities contribute to promotion of economic ties with other countries. This can lead to a greater participation in international value chains and the expansion of sales markets for domestic producers.

In addition to common risks associated with insufficient access to finances, sales markets, personnel shortages and uncertainty, small technology companies are experiencing an increased sanctions pressure due to a limited access to foreign technologies and disruption of established supply chains (*Fig. 17*).

3.5.2. The results of survey of small technology companies

In 2024, a survey was conducted to identify the impact of sanctions on STCs. The survey involved 248 small technology enterprises; the respondents were company owners or hired managers.

Represented in the survey were companies from the following industries:

- Information technology and software: 20%;
- Industrial equipment and mechanics: 18%;
- Automotive industry: 15%;
- Medical technologies: 12%;
- Energy and electronics: 10%;
- Chemical industry: 9%;
- Environmental technologies: 8%;
- Space technologies: 3%;

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1. Import Substitution in the Russian Economy: Yesterday and Tomorrow. Analytical Report of the NRU Higher School of Economics / *Kuzminov Ya. I., Simachev Yu. V., Kuzyk M. G., Fedyunina A. A., Zhulin A. B., Glukhova M. N., Klepach A. N.* Moscow: Higher School of Economics Press, 2023. 272 p.; *Malgina I. V.* (ed.) Entrepreneurship and National Security. Minsk, 2024. 352 p.; *Zemlyansky D. Yu., Chuzhenkova V. A.* Production Dependence on Imports in the Russian Economy: Regional Projection // Bulletin of the Russian Academy of Sciences. The geographical series. 2023. Vol. 87. No. 5. pp. 651–665.
 2. *Malysheva E. V.* Trends in the Development of Export Activities of Small and Medium-Sized Businesses: International Experience and Russian Practice // International Trade and Trade Policy. 2021. No. 4 (28); *Barinova V. A., Zemtsov S. P., Knobel A. Yu., Lashchenkova A. N.* Small and Medium-Sized Businesses as a Factor of Russia's Economic Growth. Moscow: Gaidar Institute Press, 2019. 308 p.

- Construction and Architecture: 3%;
- Other industries, including food industry, agriculture, etc.: 2%.

Unfortunately, based on the survey results, it is impossible to judge on the basic indicators (profit, revenue, etc.) of the surveyed companies, however, in 2023, companies with a STC status demonstrated the following results: average revenues amounted to Rb 194 mn, the average salary of an employee exceeded Rb 200,000, and there were on average about 30 workplaces per enterprise.¹

Unlike most companies, STCs are focused on innovations: 39% of companies allocate more than 25% of their revenues for these purposes. For comparison, R&D costs in Russia, including budget expenditures, do not exceed 1% of GDP. It is noteworthy that 98% of the respondents carry out R&D on their own, 27% — with participation in government programs, 21% — with the support of development institutes and venture funds, 14% — through university orders. Among the respondents, 66% received support from the Innovation Assistance Fund and 48% from the Skolkovo ecosystem.

As 50% of STCs do not participate in foreign economic activities, this may slow down somewhat their entry into global high-tech markets, but 90% of STCs plan to enter new markets. Regulatory intervention is required, possibly prioritizing the support of STC on the part of the Russian Export Center (REC). REC's measures are needed to overcome barriers to entry to foreign markets: 41% of STCs specified certification as a barrier, 40% — ignorance of markets, 27% — ignorance of the legislation of another country.

3.5.3. The impact of sanctions on STCs

The survey put questions about the impact of sanctions on the activities of small technology companies in general and problems and risks associated with import substitution.

When answering the question about the impact of sanctions on the activities of companies, the respondents were allowed to indicate several possible answers (*Fig. 18*). A significant portion of the respondents noted negative consequences: 26% of the companies faced problems with foreign trade logistics and about 25% of the respondents reported overall costs growth, which probably reduced their competitiveness. In addition, 18% of the companies referred to the severance of contacts with Western partners, and another 18% of the companies indicated lack of access to Western markets. A small portion of the companies (5%) lost foreign partners, and 3% of the companies reported the exit of their key technology partner, which fact points to STC's high vulnerability amid sanctions pressure.

1. According to the data of the RF Ministry of Economic Development. URL: https://www.economy.gov.ru/material/news/minekonomrazvitiya_srednyaya_vyruchka_malyh_tehnologicheskikh_kompaniy_sostavlyayet_pochti_200_mln_rubley.html

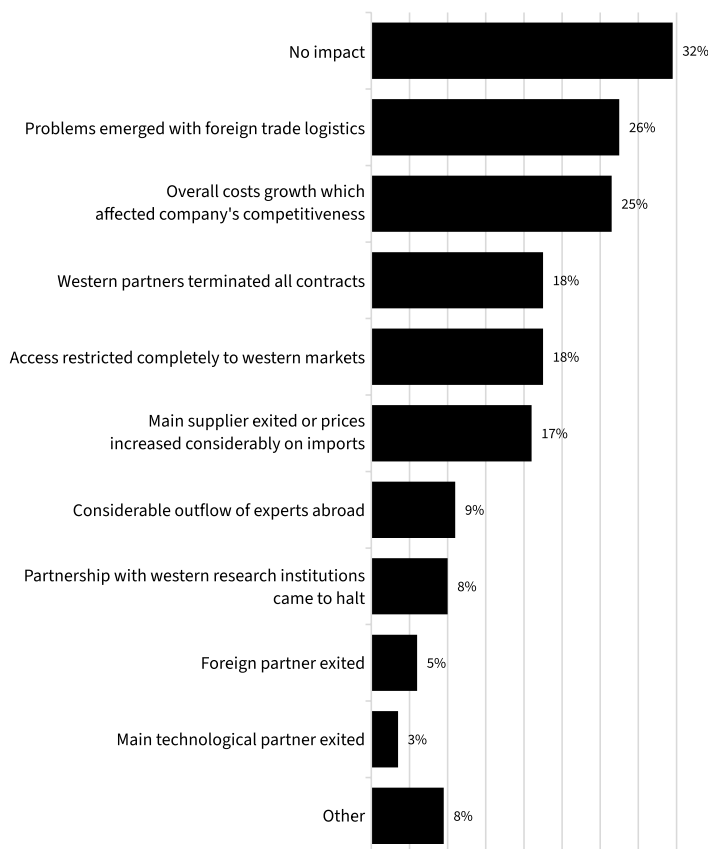


Fig. 18. The respondents' answers to the question: "How have the sanctions affected your company?"

Source: own compilation based on the results of STC survey carried out in 2024.

Note that 3% of the companies specified the positive impact of sanctions (Fig. 18), with almost the same result received in the 2022 survey.¹

It is noteworthy that when asked about changes in relations with foreign suppliers/consumers, 27% of STCs noted that this cooperation intensified in 2024 as compared to 2022. Despite the fact that sanctions were aimed, in particular, at isolating Russia and restricting access to markets and technologies, in 2024 90% of STCs planned to enter new foreign markets in the next 5–7 years.

1. Simachev Yu.V., Yakovlev A. A., Golikova V. V., Gorodny N. A., Kuznetsov B. V., Kuzyk M. G., Fedyunina A. A. Russian industrial companies amid the "second wave" of sanctions: response strategies // Voprosy Ekonomiki (Economic Issues). 2023. No. 12. P. 5–30.

The impact of sanctions on STC import substitution

One of the main functions of STCs in the economy is to facilitate import substitution, as STCs are considered the most promising companies in the field of development of new technologies that can quickly occupy vacant market niches. In the survey, import substitution was understood as accelerated development of import-independent technologies and localization of well-known foreign technologies. Note that 24% of the surveyed companies do not experience problems caused by sanctions in import substitution (*Fig. 19*).

At the same time, for the rest of STCs, the main barriers to accelerated import substitution are the following: lack of own financial resources (46%), unwillingness

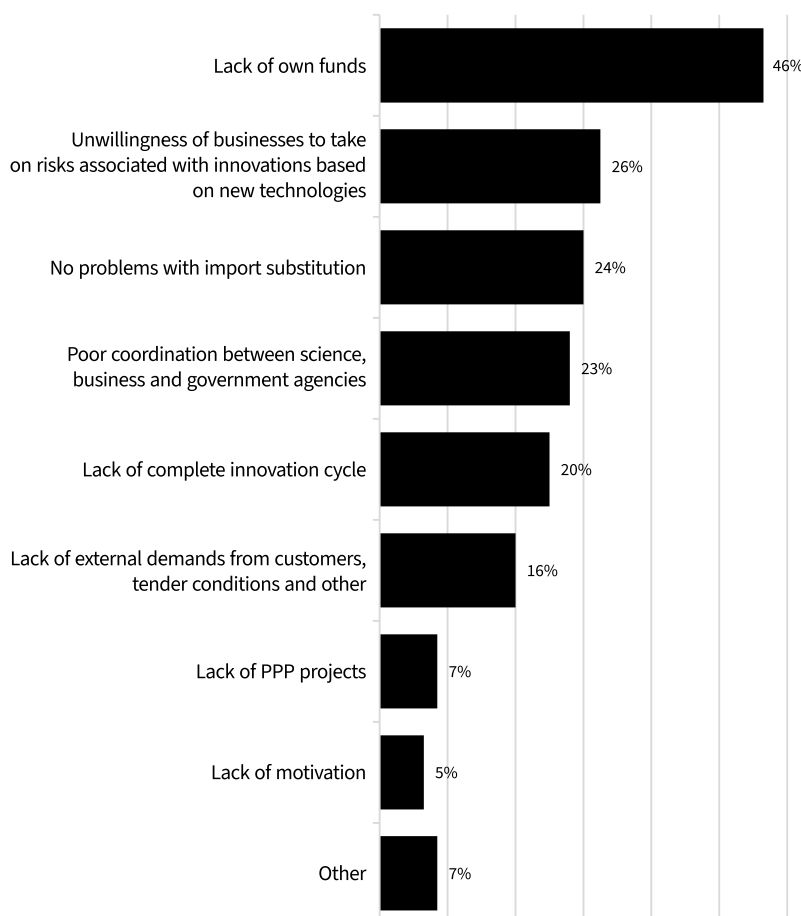


Fig. 19. The respondents' answers to the question: "What prevents import substitution in your industry?"

Source: own compilation based on the results of STC survey carried out in 2024.

of businesses to take on the risks associated with the introduction of new technologies (26%), poor coordination between science, business and government agencies (23%), lack of a closed innovation cycle, i.e. in the process of development and implementation of innovations the stages necessary for the successful commercialization and integration of new technologies or products into the economy are not fully completed (20%). The latter highlights the importance of creating more effective mechanisms for interaction between all participants in the innovation process. Further, 16% of the respondents indicated a lack of external demand, which means that it is important to stimulate demand for import-independent technologies through public procurement and other mechanisms. Also, it is to be noted that 19% of the respondents referred to an import substitution problem as the main one faced by their company.

The impact of sanctions on technological development of STCs

Despite the fact that companies from various industries participated in the survey, which implies the existence of different risks and threats, it is feasible to make some generalizations about the impact of sanctions on high-tech and promising companies

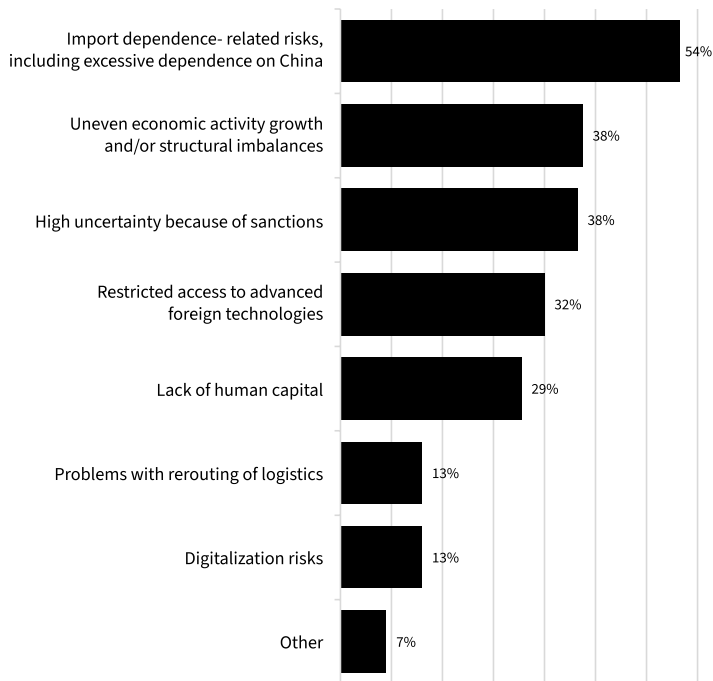


Fig. 20. The respondents' answers to the question: "What risks of the country's technological development do you see in your industry?"

Source: own compilation based on the results of STC survey carried out in 2024.

for the development of the industry as a whole. For almost all industries whose representatives were interviewed, excessive import dependence is regarded as an actual risk (54% of the respondents pointed to this factor), especially dependence on China (Fig. 20). This can be explained by the fact that most promising high-tech industries use foreign raw materials, equipment, technologies and often service specialists.

The same risk also includes restricted access to a number of advanced foreign technologies, but only 32% of the respondents referred to it.

Traditionally, a substantial risk is high uncertainty (38%), which is typical not only for the STC, but also for the business climate as a whole.

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Small technology companies are currently considered entities which develop new technologies capable of restoring disrupted value chains, facilitating import substitution and competitive exports, and ultimately contributing to Russia's technological sovereignty and leadership in a number of areas in future.

External restrictions have an explicit negative impact on STCs in all of the listed areas of their activities.

First, sanctions make it difficult to interact with foreign suppliers and consumers and this means they hinder foreign trade.^{1,2}

Secondly, they reinforce existing barriers to import substitution, including mainly domestic problems of access to financial resources and weak links between education and science, business and the state. In addition, sanctions significantly increase uncertainty³, which in itself is one of the key negative factors for the business climate.

Thirdly, with access to technologies from unfriendly countries restricted, sanctions push companies to make quick decisions to find alternative suppliers, thus increasing in the current environment the risk of higher import dependence on China.

At the same time, the presence of a large trading partner reduces the effectiveness of sanctions.^{4,5} After the exit of foreign companies, competition in the mar-

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1. *Knobel A.Yu., Bagdasaryan K. M., Proka K. A.* International economic sanctions: theory and practice of their application // Journal of the New Economic Association. 2019. No. 3. pp. 152–162; *Ushkalo D. I.* Russia's foreign trade under sanctions pressure // Journal of the New Economic Association. 2022. Vol. 3. No. 55. pp. 218–226.
 2. *Fedyunina A. A., Simachev Yu.V.* Do international sanctions always achieve their goal? Sanctions policy limitations // ECO. 2023. No. 7. p. 95. 2023. Vol. 107.
 3. *Chernykh A. A.* Review of the methods for analyzing the effectiveness of economic sanctions and their adaptation to assess the impact on Russia in a new information context // Bulletin of the Plekhanov Russian University of Economics. 2024. No. 4. pp. 48–62.
 4. *Haidar J. I.* Sanctions and export deflection: evidence from Iran // Econ. Policy. Oxford University Press, 2017. Vol. 32, No. 90. P. 319–355.
 5. *Le H. T.* Global economic sanctions and export survival: Evidence from cross-country data // Entrep. Bus. Econ. Rev. Uniwersytet Ekonomiczny w Krakowie, 2022. Vol. 10, No. 1. P. 7–22.

kets decreased and demand for domestic products¹ increased, but only 3% of STCs noted the positive effect of sanctions.

To create favorable conditions for the development of STCs within the framework of the government policy of supporting entrepreneurship, it is important to focus on expanding access to sales markets, creating complete value chains, expanding access to capital, as well as advising on the commercialization of innovations, while maintaining existing incentive mechanisms, including grant programs from the Innovation Assistance Fund, industrial mortgages, measures facilitating acceleration of IT companies and faster patent registration.

An important area of support for STCs should be the promotion of these companies' export products through expansion of measures of the Russian export center and its regional divisions, as well as organizations offering similar services. In addition to certification and accreditation, information and consulting support is needed in terms of foreign legislation and market analysis, logistical support for foreign trade relations, organizational support for establishing interaction and contacts with foreign suppliers, consumers and partners.

To promote the ties between science and business, it is important to expand the range of measures to support university entrepreneurship, including specialized forums and platforms, mentoring programs and university business incubators in order to successfully commercialize innovations.

3.6. Foreign trade²

3.6.1. The state of world economy and world trade

The last four years have been a major test for the global economy. Pandemic, geopolitical conflicts and extreme weather disrupted supply chains and triggered energy and food crises. However, in 2024, the global economy demonstrated stability, inflation was declining, and international trade was gradually recovering.

The International Monetary Fund's January 2025 estimate³ of global economic growth for 2024 stands at 3.2%, almost identical to the estimates presented in previous editions of the World Economic Outlook for 2024. The world economy is expected to grow at 3.3% in 2025 and 2026, below the historical average (2000–1919) of 3.7%.

Persistent structural impediments, such as aging populations and low productivity growth, are holding back potential growth in many economies. Experts note

1. Zemtsov S. P., Barinova V. A., Mikhailov A. A. Sanctions, exit of foreign companies and business activity in the regions of Russia// *Economic Policy*. 2023. Vol. 18, No. 2. pp. 44–79.

2. Author: Volovik N. P., Senior Researcher, Center for Real Sector, Gaidar Institute.

3. The IMF official website. World Economic Outlook// Global Growth: Divergent and Uncertain. URL: <https://www.imf.org/en/Publications/WEO/Issues/2025/01/17/world-economic-outlook-update-January-2025>