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Sustainable Development of Russia in the Global Innovation Index System

Abstract:
Research background: At the end of the 20th century, both foreign and domestic scientists substantiated the need for a transition from an industrial to an innovative economy. The introduction of innovations increases production efficiency, improves product quality, makes it possible to withstand market competition and thereby ensure economic security. On the other hand, ensuring economic security is the basis for sustainable development. Thus, innovative development and economic security are interconnected. Currently, the results of innovative development in Russia cannot be considered satisfactory for a number of indicators in comparison with developed countries of the world level.
Purpose of the article: The purpose of the study is to improve public policy in the innovation sphere to ensure sustainable development of the economy and protect it from real and potential threats. In this regard, the state of innovative development of Russia in the Global Innovation Index (GII) system is considered. A comparative analysis of the levels of innovative development of Russia and the leading countries in the GII ranking is given.
Methods: The work was accompanied by the use of general scientific methods: analysis and synthesis, deduction and induction, detailing, comparison, analogy, scientific abstraction and logical laws. The methodological basis of the study is based on the use of a practical approach, functional-structural analysis, and the use of the methodological approach of innovative economics.
Findings & Value added: The study analyzed institutional factors that influence innovation activity and are threats to Russia's economic security. Possible ways to increase the

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level of innovation activity that ensures the economic security of the Russian Federation are proposed.

Keywords: *innovative development*, *economic security*, *innovation index*, *institutional indicators.*

JEL Classification: *L2; R13*

1 Introduction

Based on historical experience, each state, under the influence of changing geographic information factors, has to introduce new or change old institutions of society in order to accelerate socio-economic development (Carleton et al., 2022). In the conditions of modern global economic activity, it is necessary to understand how to determine the requirements of the global economy, what impact can and should be expected if these requirements are met (Zhulega et al., 2018).

In the 21st century, innovative technologies are one of the key and most promising areas of competition for economic influence between countries. Positioning a country as competitive ensures economic security (Zhulega et al., 2021). National competitiveness, determined by socio-economic and political factors, ultimately determines the level of well-being of society that can be achieved by economic growth and innovation, which is a strategic growth factor. With the exhaustion of growth opportunities for each technological structure and a change in the structure of demand for scientific discoveries and inventions, the need for fundamentally new technologies arises, the competitive selection of which forms the basis of new technological trajectories (Sycheva et al., 2020).

Global competition poses completely new goals for the state in the field of ensuring economic security. The key one is the development of innovative technologies.

In the context of the global crisis and the strengthening of economic sanctions against the Russian Federation by the United States and the European Union, the innovative orientation of the state's economic policy is of paramount importance, since the achievements of science and technology, more than ever before, determine the dynamics of economic growth, the level of well-being of the population, the competitiveness of states and the degree of security their national

security. This makes the study of problems of development of innovation activity in our country especially relevant.

2 Economic Security in the Context of Innovation Policy

The development of innovative technologies that affect the economic security of the country is included among the main directions of state policy in the field of ensuring economic security by the Decree of the President of the Russian Federation "On the strategy of economic security until 2030." section III, clause 15, clause 3. (Bergh et al., 2022). The study of Russia's position in the field of innovation in comparison with other countries contributes to decision-making on the management of innovation activities in areas of priority for the state, their support and financing.

Assessing the level of institutional factors of innovative development, including the political stability of the country, the efficiency of the government and legal system, and the degree of complexity of starting a business, largely determines the level of economic security and requires constant monitoring and comprehensive research (Bierbrauer & Boyer, 2016).

The purpose of the study in this case is to analyze the institutional aspects of innovative development based on indicators that are used when comparing innovation systems on the world stage to ensure the economic security of the country, taking into account current global changes and for future forecasts. The block of institutional indicators contains indicators that allow one to assess the quality of institutions, as well as indicators by which one can judge the effectiveness of institutions (Helliwell et al., 2023).

3 Selection of Indicators to Measure the Dynamics of Innovative Development

The methodology for measuring the level of use of innovative technologies that ensure economic security is reflected in the development and use of a system of indicators. There are currently no generally accepted criteria for assessing the level of innovative development. In Russian and international practice, there are different approaches used to monitor the dynamics of innovative development in modern conditions.

Based on the study of available statistical sources, it is proposed to use indicators for analysis – the Global Innovation Index (GII) innovation development

indices (Global Innovation Index, n.d.). According to experts, GII is the most comprehensive set of indicators for assessing the effectiveness of innovation in the global economy. GII includes indicators of innovation activity, which are grouped into areas covering the main elements of the national economy.

The total number of points in the GII ranking received by a country is determined as the average of two sub-indices: the sub-index of innovation costs (institutions, human capital and research, infrastructure, domestic market development, business development) and the sub-index of innovation results (results of technology development and knowledge economy, results of creative activity) (Franzi, 2018).

According to the GII results in 2022, Russia ranked 47th out of 131. Based on modernization opportunities, according to Western experts, the Russian economy can be classified as a "catch-up" model. The results of the GII ranking of the ten leading countries and Russia are clearly summarized in Figure 1.

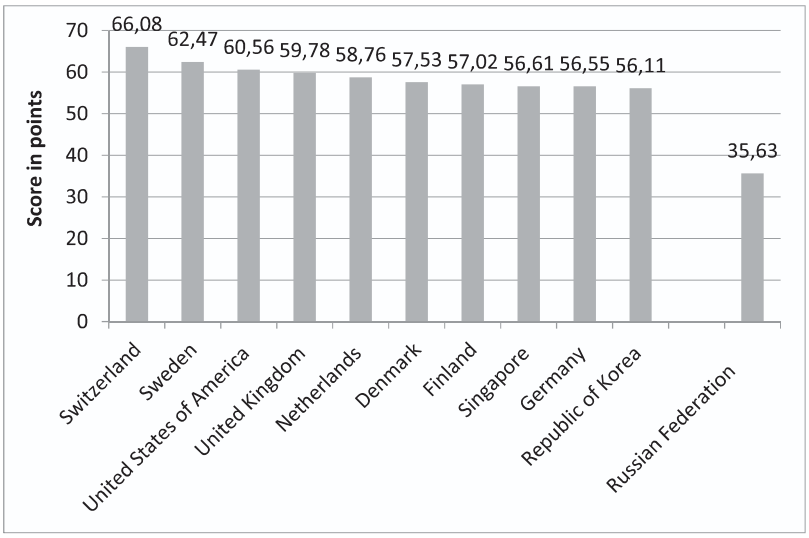

Figure 1. Comparative analysis of innovative development ratings 10 leading countries and Russia in the GII system.

Information on Russia's place in GII in the main areas of innovative development over the past five years is given in Table 1.

Table 1. Russia's place in the GII system for the period 2018–2022.

Indicators (directions of innovative development)	Place in the ranking				
	2018 г.	2019 г.	2020 г.	2021 г.	2022 г.
Place in Russia's ranking	43	45	46	46	47
1. Institutes	73	73	74	74	71
2. Human capital and research	23	23	22	23	30
3. Infrastructure	60	62	63	62	60
4. Market development	63	60	56	61	55
5. Business development	37	33	33	35	42
6.Results of technology development and knowledge economy	40	45	47	47	50
7. Results of creative activity	66	62	72	72	60

Source: author based on Global Innovation Index data.

Higher rankings indicate poor performance. An analysis of Russia's position in the GII for the period from 2018 to 2022 shows a slight change in innovation activity in almost all areas. According to Table 1, Russia in the overall ranking worsened its position by 4 points (in 2018 it took 43rd place, and in 2022 – 47th place out of 131). The worst in the ranking among the directions of innovative development is the direction "1.Institutions." Information about the indicators of the direction "1.Institutions" is presented in Table 2.

Table 2. Values of indicators of the institutional direction of innovative development in the GII system.

		Score/Value	Rank
	INSTITUTIONS	**61,5**	**71**
1.1.	Political environment	54,5	75
	1.1.1 Political and operational stability	66,1	76
	1.1.2 Government effectiveness	48,8	75
1.2	Regulatory environment	54,0	95
	1.2.1 Regulatory quality	27,5	105
	1.2.2 Rule of law	25,4	114
	1.2.3.Cost of redundancy dismissal, salary weeks	17,3	69
1.3	Business environment	76,1	45
	1.3.1 Ease of starting a business	93,1	38
	1.3.2.Ease of resolving insolvency	59,1	52

Source: authors based on Global Innovation Index data.

An analysis of Table 2 shows the weaknesses of the innovation system in the institutional direction according to the "Regulatory environment" criterion, occupying 95th place among 131 countries, according to the "Regulatory quality" and "Rule of law" indicators, occupying 105 and 114 places in the ranking, respectively (Armin et al., 2018).

A visual comparison of Russia and Singapore, the leader in the factors of institutional direction of innovation activity, in the GII system, is presented in Figure 2.

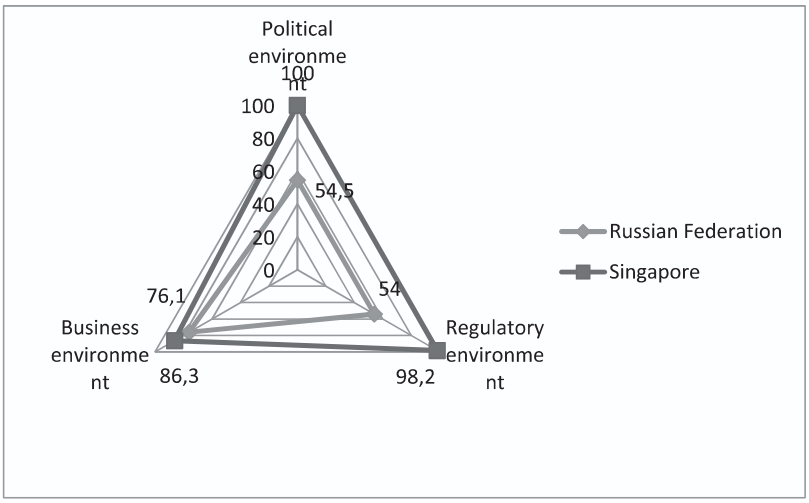

Figure 2. Comparative analysis of indicators of the institutional direction of innovative development of Russia and Singapore in the GII system.

Figure 2 clearly shows Russia's significant lag in terms of the "Political environment" and "Regulatory environment" indicators.

4 Results and Discussion

Thus, the results of the study make it possible to assess the current level of innovation activity in the Russian Federation in comparison with other countries. Indicators – indices of innovative development in the GII system allow you to see the weaknesses of institutional factors of innovative development and formulate priority development directions in the future to ensure sustainable economic development and thereby ensure economic security (Novikov & Gregova, 2017).

In the 21st century, positioning a country as competitive ensures economic security. The key and most promising areas of competition for economic influence between countries is the development of innovative technologies, provided for among the main directions of state policy in the field of ensuring economic security by Decree of the President of the Russian Federation No. 208 of May 17, 2017 "On the Economic Security Strategy of the Russian Federation for the period until 2030" (Decree of the President of the Russian Federation, 2017).

5 Conclusions

The results of innovative development in Russia cannot be considered satisfactory. Russia ranks 47th in the Global Innovation Index system. Particularly weak positions in the direction of institutional factors. Such indicators as "Regulatory quality" and "Rule of law" require attention, occupying 105 and 114 places in the ranking, respectively, out of 131 countries. This poses a threat to economic security. Therefore, it is necessary to intensify innovation activities, taking into account legislative and regulatory documents that regulate and stimulate innovation activities.

References

Armin, F., Becker, A., Dohmen, T., Enke, B., & Huffman, D. (2018). Uwe Sunde global evidence on economic preferences. *The Quarterly Journal of Economics, 133*(4),

Besley, T. & Persson, T. 2007. https://ideas.repec.org/p/nbr/nberwo/13028.html The Origins of State Capacity: Property Rights, Taxation, and Politics, https://ideas.repec.org/s/nbr/nberwo.html NBER Working Papers 13028, National Bureau of Economic Research, Inc.

Bergh, D. D., Boyd, B. K., Byron, K., Gove, S., & Ketchen, D. J. (2022). What constitutes a methodological contribution? *Journal of Management, 48*(7), 1835–1848.

Bierbrauer, F. J., & Boyer, P. C. (2016). Efficiency, welfare, and political competition. *The Quarterly Journal of Economics, 131*(1).

Carleton, T., Jina, A., Delgado, M., Greenstone, M., Houser, T., Hsiang, S., Hultgren, A., Kopp, R., McCusker, K. E., Nath, I., Rising, J., Rode, A., Seo, H. K., Viaene, A., Yuan, J., & Zhang, A. T. (2022). Valuing the global mortality consequences of climate change accounting for adaptation costs and benefits. *The Quarterly Journal of Economics*, *137*(4), 2037–2105.

Decree of President of Russian Federation 208. (2017). On the Stratagy of Economic Security of the Russian Federation for the Period until 2030.

Franzi, S. (2018). The great convergence: Information technology and the new globalization. *Journal of Politics*, *80*(1).

Global Innovation Index (n.d.) *What is the future of innovation-driven growth?* Global Innovation Index. https://www.globalinnovationindex.org/

Helliwell, J. F., Layard, R., Sachs, J. D., De Neve, J.-E., Aknin, L. B., & Wang, S. (Eds.). (2023). World Happiness Report 2023. New York: Sustainable Development Solutions Network.

Novikov, A., & Gregova, E. (2017). Institution features of economic development during globalization. *Proceedings of the 17th International Scientific Conference of Globalization and its Socio-Economic consequences*, 1757–1764.

Sycheva, E., Budagov, A., & Novikov, A. (2020). Urban infrastructure development in a global knowledge-based economy. *Globalization and its Socio-Economic Consequences 2019,* 74.

Zhulega, I. A., Gagulina, N. L., & Samoylov. A. V. (2018). Sustainable development under conditions of the sanction world order. *Proceedings of the 18th International Scientific Conference of Globalization and its Socio-Economic consequences*, 468–475.

Zhulega, I. A., Sycheva, E., & Samoylov, A. (2021). The use of innovative technologies to ensure economic security of the Russia in the context of globalization. *Proceedings of the 20th International Scientific Conference Globalization and its Socio-Economic Consequences, 92.*