Regional system of financial support for innovation in the conditions of macroeconomic turbulence

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Abstract. Issues of regional development caused by significant volatility of macro-level socio-economic situation form new requirements to executive authorities, responsible for economic growth and the innovation activity increase in regions. The innovative sphere is one of the main recipients of investment in the economy of developing countries, and the current need to increase the number of innovative developments in the context of import substitution in the Russian economy only reinforces this trend at the regional level. The purpose of this study is to form a set of measures to improve the regional system of financial support for innovation in an unstable economic situation. As elements of novelty, the author's interpretation of the concept of a regional system of financial support for innovation, which is an open, holistic and self-reproducing set of efforts of the main stakeholders of innovative development of the regional economy, can be highlighted. This system develops under the influence of changing factors of exogenous and endogenous environment, which determine the financial constraints and institutional features of state financial support for innovation at the meso-level. The influence of the identified factors was analyzed by means of SWOT-analysis – the strategic planning tool. It allowed highlighting the key areas for the work of regional executive authorities in the sphere of innovative development of the economy. The authors proposed several measures to improve the regional system of financial support for innovation in the Rostov region in conditions of macroeconomic turbulence.

Keywords: Innovation · Financial support · Economic turbulence · Regional economy.

1. Introduction

The availability of a wide range of financial instruments for supporting innovation activities of organizations is one of the key aspects of efficiency in regulating innovation processes in any territory (Tsyganov, 2016). Due to economic turbulence and extremely high competition for limited investment resources in both foreign and domestic markets, the dynamic development of territories, regions in particular, characterized by multi-vector trajectory is becoming increasingly difficult (Lapygin, 2019). It is necessary to determine the current situation on the financial market and analyze the strategic position of the innovation sphere of the regions in the Russian Federation in the conditions of new challenges and threats formation to determine the key directions of improvement of the current system of financial support for organizations engaged in R&D. These trends form the prerequisites for the research and determine its relevance.

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Back in the 20th century, J. Schumpeter identified in his numerous works devoted to this problem (Schumpeter and Redvers, 1934) the key manifestations of innovation (new or improved products, production processes, market openings, forms of industrial organizations), which are reflected in many existing descriptions of innovation. Accordingly, the innovation policy of the region is a set of efforts of the executive authorities aimed at increasing scientific and technological activity in the region, manifested in the growth of the number of innovations developed and implemented in the market.

Within the framework of the region's economic policy, aimed at promoting the successful implementation of breakthrough areas and projects of scientific and technological development of the territory in the global markets, it is possible to identify an innovative model of development, which is chronologically and essentially the most relevant in modern conditions (Abramyan, 2021). Current international research shows that the inequality of regional innovation capabilities within countries remains high, and the correlation between the level of development of regional innovation infrastructures and the level of economic development has increased (Bernier and Plouffle, 2019; Aiting and Keyanh, 2022). Several scientists point out that research into the possibilities of reducing differentiation in the financial provision of innovation infrastructure and the factors influencing it in terms of intracountry inequality is socially necessary and important for an accurate assessment of regional innovation systems (Asheim et al., 2016; Capello and Lenzi, 2019). Such assessment, in turn, contributes to more effective sustainable development and rational formation of regional innovation policy by public authorities.

Accordingly, the financial infrastructure of support of active innovative organizations, which become the drivers of scientific and technological progress and competitiveness of the regional economy, becomes of key importance for economic development of the region (Yano abd Shirashi, 2020).

The novelty of the research is due to the author's definition of the regional system of innovation activity financing, as well as a set of measures proposed to increase innovation activity in conditions of macroeconomic turbulence.

The author's hypothesis is that the system of financial support for innovation in the regions should be dynamic and adaptable and should include measures to increase the availability of funding sources for innovative projects and research and development work, as well as reduce other associated costs of innovation implementation.

2. Materials and Methods

The aim of the research is to find measures for improving the existing system of financial support for innovation research and development at the meso-level in an unstable economic environment.

The objectives of the study include:

- review of the theoretical and methodological basis of the research;
- consideration of the macroeconomic environment, which determines the conditions for the financing of innovation;
- conducting SWOT-analysis of the regional innovation sphere on the example of Rostov region;
- formation of measures to improve the regional system of financial support for innovation in conditions of macroeconomic turbulence.

In the framework of the study, both quantitative and qualitative analysis methods were used. Quantitative analysis allowed considering the dynamics of indicators of financial market stability, determining the availability of external sources of financing for organizations engaged in innovation activities. The system approach should be highlighted among the methods of qualitative analysis used by the authors. SWOT-analysis was also used as the method of strategic planning, by means of which strengths and weaknesses, as well as threats and opportunities for the development of the innovation sphere in the Rostov region were identified.

3. Results

The volatility of the financial infrastructure in the country can be identified as the most expressed negative factor decelerating the investment activity of organizations in innovative development. It leads to an increase in the total credit burden (including overdue) as a result of an increase in the cost of loan capital. The volatility of the financial market, in its turn, is caused by macroeconomic instability, which is reflected in the unstable dynamics of the key rate of the Bank of Russia (Fig. 1) and the growth of interest rates on loans for businesses, particularly, for organizations engaged in R&D (Fig. 2).

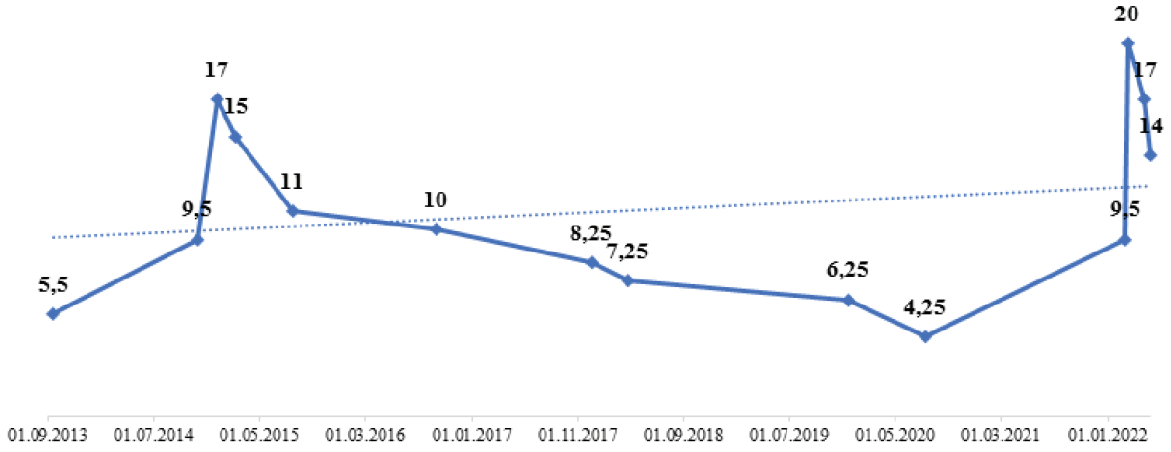

Fig. 1. Changes of the key rate of the Central Bank of the Russian Federation for the last 10 years, % per annum (Key rate of the Bank of Russia, 2022).

Thus, the maximum value of the key rate for the analyzed period was 20%, and the minimum – 5.5%. According to experts, during the second half of 2022, with the normalization of the geopolitical and macroeconomic situation, it may be reduced to the level recorded in January 2022. This will make it possible to increase availability and reduce the cost of funding for the organizations engaged in innovation activities.

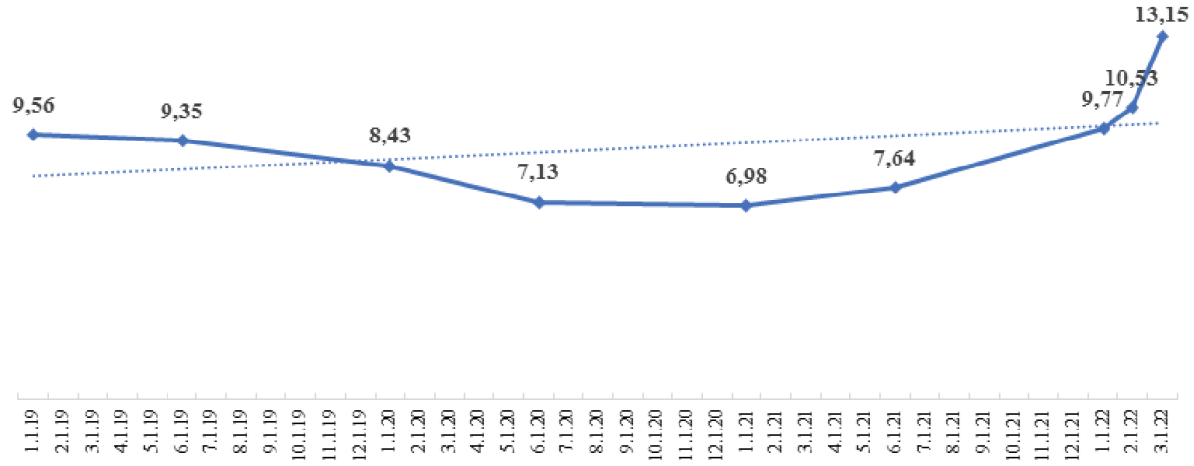

Fig. 2. Changes of interest rates on credits granted to organizations engaged in R&D, % per annum (Interest rates on loans and deposits …, 2022).

As of today, interest rates on credits for organizations engaged in implementation of R&D show high level of volatility with a general tendency to increase: as of March 01, 2022, the weighted average interest rate was 13.15% per annum, which is almost twice higher than the value as of the beginning of 2021.

It is obvious that the sphere of innovations in the regions requires additional financing from the executive authorities and various development institutions in order to meet the emerging demand on the part of business representatives.

Further in Table 1 there is SWOT-analysis of innovative sphere of the region on the example of Rostov region.

Table 1. SWOT-analysis of innovation sphere in Rostov region. *Source:* Compiled by the authors (Federal State Statistics Service, 2022; Territorial body of the Federal State Statistics Service for the Rostov region, 2022; Strategy of socio-economic development …, 2018).

Strengths	**Weaknesses**
1. High level of innovative goods, works and services produced (top-10 in the country). 2. Developed research infrastructure – 11 innovation-oriented educational institutions of higher education. 3. High quality of human capital, large number of researchers with science degrees (top-10 in the country). 4. Presence of modern centers of collective use in the region.	1. Insufficient financing of the innovative activity of organizations. 2. Low efficiency of existing measures for stimulation of innovative projects and start-ups. 3. Insufficient level of effectiveness and commercialization of R&D. 4. Weak cooperative ties between organizations and scientific-educational, innovative organizations. 5. Low level of innovation management in small and medium-sized organizations.
Opportunities	**Threats**
1. Large-scale financing of state programs for the digitalization of the economy. 2. Simplification of bureaucratic procedures for protection and commercialization of innovative solutions. 3. Popularization and raising the prestige of innovative activity among young people. 4. Financial support of innovative projects through federal development institutes. 5. Economic clustering as a mechanism to stimulate scientific and innovation cooperation in the region.	1. Deterioration of foreign economic conjuncture and decline in living standards. 2. Breakdown of partner relations with foreign research and innovation centers. 3. An outflow of high-quality human capital from the region and the country as a whole. 4. Limitation of access to foreign technologies and scientific development. 5. Further increase of borrowing costs. 6. Decrease in the volume of the state financial support of innovations because of reduction of incomes of the state budget.

To maximize the highlighted positive factors and minimize the negative ones, it is advisable to propose a number of measures to improve the regional system of financial support for innovation in the Rostov Region under the conditions of macroeconomic turbulence:

1) Increasing the limit of regional state subsidies to compensate the costs incurred associated with the production of innovative products (goods, works, services) through the implementation of investment programs of the Ministry of Economic Development of the Rostov Region.

2) Creation of preferential conditions for granting microloans for the implementation of innovative and high-tech projects to the participants of the Youth Innovation Creativity Centers (YICC) on the basis of the Rostov Regional Entrepreneurship Support Agency.

3) Introduction of credit vacations for organizations engaged in innovative activities. It would be reasonable to consider the possibility of granting a grace period for

representatives of the innovation sphere on credits obtained before February 28, 2022, when the key rate of the Bank of Russia was increased to 20%. When granting credit vacations, commercial banks will not charge penalties for loan defaults, as well as demand early repayment from borrowers.

4) Additional capitalization of existing regional development institutions that implement measures of financial support on a repayable and non-repayable basis. It is proposed to increase grant support for the creation of import-substituting software products in the IT-sphere in the amount of not less than 50% of the cost of the project implementation on the basis of the Rostov region Innovation Agency.

5) Deferment for 12 months on the fulfillment of obligations under previously subsidized projects for innovative organizations that face the outflow of human resources from March 1, 2022 (at least 5% of employees

6) Subsidies for employment of young people in the amount of 5 minimum wages increased by the regional coefficient and the amount of insurance contributions. In view of a rather young average age of employees in innovative organizations (especially in the IT industry) the measure should be applied to organizations which employ people under 25 years old inclusively.

4. Discussion

Previous studies of regional innovation environment conducted by the authors focused on a broad list of measures aimed at stimulating innovation development in the Rostov region and increasing their importance in the regional economy (Abramyan, 2021; Shevchenko and Bolotin, 2021). These measures are of institutional nature and solve rather organizational and managerial tasks that public authorities responsible for increasing investment activity in the regions face. Proposals were made to form a register of enterprises and a register of innovative products, to establish interaction with various federal institutions of innovation development, etc.

The practical recommendations for introducing measures of financial support for innovations presented in this paper complement previous research by considering the macroeconomic environment in general and the volatility of the financial market in particular.

5. Conclusion

Review of the 2022 credit market environment in the Russian Federation leads to an obvious conclusion regarding the necessity of state support for investments into innovation activities.

Strong and weak sides, threats, and opportunities of innovative development of the regional economy were highlighted as a result of the SWOT-analysis of the innovative sphere of the region, with Rostov region taken as an example. A high quality of human capital and a large number of researchers with academic degrees (top 10 in the country) was noted, while the authors also pointed out the insufficient level of performance and commercialization of R&D and the threat of breaking foreign scientific-innovative ties.

The authors proposed several measures to improve the existing system of financial support to innovative organizations in the regions.

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