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**METHODOLOGY FOR MANAGING THE REGION'S  
INNOVATION POTENTIAL**

Speciality: 5.2.3 - Regional and sectoral economics

**Abstract**

of the dissertation for the degree of Candidate in Economic

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Doctor of Economics, Professor  
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**Relevance of the research topic.** Innovation is the main engine of economic growth and increasing competitiveness at the global level. In the context of globalization and rapid technological progress, regions with a high level of innovation potential are able to attract investment, develop new industries and improve the quality of life of the population. Research shows that the level of innovation activity at the regional level directly affects the overall economic performance of the country.

Innovation potential, determined mainly by technological development, is considered a key factor in effective economic growth, improving social well-being and competitiveness of the country in the global economy.

Modern economic conditions are characterized by instability and variability, which requires regions to be flexible and able to adapt to new challenges. The relevance of studying the innovation potential of territories lies in the need to develop effective strategies aimed at stimulating innovation and creating conditions for sustainable development. This includes both internal factors (investments, human resources) and external factors (global trends, international competition).

The existing differentiation in the level of innovative development between the regions of Russia requires a detailed analysis of the reasons for these differences. Research shows that factors such as geographical location, availability of resources, and investment policies of local authorities significantly influence innovation activity. Understanding these factors makes it possible to develop targeted measures to improve the situation in less developed regions.

The study of the innovation potential of territories contributes to more effective strategic planning at the regional level. This includes analyzing the current state of the innovation infrastructure, assessing business needs, and developing programs to support scientific and technical activities. This approach allows not only to improve the standard of living of the population, but also to create conditions for long-term economic growth.

### **The degree of scientific development**

Leading Russian economists and scientists are engaged in research on innovation potential: A.A. Auzan, Yu.S. Vasiliev, S.Y. Glazyev, Yu.I. Kotlyarova, N.N. Moiseev, V.M. Polterovich, S.N. Egorenko, K.A. Bondarenko, S.V. Solovyova, V.V. Vlasova.

Among the foreign scientists involved in innovation research, we can single out: K. Christensen, J. Schumpeter, G. Mensch, K. Perez, E. von Hippel, G. Chesbro, M. Mazzucato, R. Adner, M. Porter, R. Florida, B.O. Lundvall, S. Helper, R.E. Freeman, T. Amabile, D. Thies, M. Dodgson, S. Kaplan, S. Stern, M. Feldman, N. Weber, T. Veblen, P. Drucker, M. Kutz, V. Sombart, F. Knight, J.B. Say, A. Smith, J. Tunen, N. Yunus.

Methodological approaches to assessing the level of innovation potential are considered in their works by: E.V. Fedorova, I.E. Nadutkina, M.S. Lapina, M.G. Karelina, D.P. Olishevsky, V.S. Zharov.

Issues of management of innovative development of territories are analyzed by: T.V. Ignatova, S.N. Pavlova, L.H. Abazova, Yu.O. Baklanova, E.A. Merzlyakova, T.A. Medvedeva, Yu.V. Savelyev, O.V. Yemelyanova.

Leading Russian scientists such as A.M. Margolin, V.V. Kuimov, Y.Y. Suslova, E.V. Shcherbenko, D.A. Tolstoy, V.A. Goremykin, T.S. Bronnikova, A.G. Bodunkova, I.P. Chernaya, L.D. Kiyanova, I.L. Litvinenko made a significant contribution to the development of the problems of innovative development.

The works of scientists substantiate the essence and features of innovative development in accordance with certain realities of a particular period. At the same time, the authors focus on certain features of innovation, as a rule, at the state, enterprise, and industry levels, paying little attention to the regulation and development of regional innovation policy. At the same time, we believe that we should agree with the opinion of individual scientists that it is advisable to pay special attention to the analysis of the innovative potential of the region's leading

industries, because they are primarily high-tech, budget-forming, export-oriented subjects of the national economy. Paying tribute to the research of scientists, we can highlight a number of disadvantages of regional features of innovative development.

At the same time, an analysis of the literature on the issues we are considering has shown that, despite a sufficient number of works and a high overall level of theoretical sophistication, a number of methodological and especially applied aspects of integrated assessment and modeling of innovation potential at the present stage require their concretization and improvement.

**The purpose of the dissertation research** is to identify priorities and development factors, quantitative and qualitative characteristics of the region's innovation potential, build a model of the Rostov Region's innovation potential for the medium term, and propose a number of measures to improve the activities of regional authorities based on the example of the Southern Federal District.

To achieve this goal, the author sets and solves a number of **problematic tasks** in the study.

1. To systematize the various approaches of well-known foreign and Russian academic economists to the economic category "innovation potential".
2. Identify the factors determining the magnitude and dynamics of innovation potential.
3. To substantiate the mechanism of innovation potential management and formulate the main directions of government activities to strengthen it.
4. To analyze the methodology and tools for quantifying the innovation potential and present in the form of an integrated system the characteristics and assessment of the innovation potential of the regions of Russia in dynamics.
5. To build an econometric model of the innovation potential of the Rostov region and make point and interval forecasts for the period 2024-2031.
6. To analyze the dynamics of development and prospects for improving the innovative potential of the Rostov region in the context of the Southern Federal District through classical methods of pattern clustering.

**The object of the dissertation research** is the regional socio-economic system.

**The subject of the dissertation research** is the innovation potential as an element of the regional innovation subsystem and its indicator assessment.

**The dissertation research corresponds to the passport of the scientific specialty 5.2.3 "Regional and sectoral economics"** in the following areas:

- 7.1. Theoretical and methodological foundations of the analysis of problems of innovative development and innovation policy.
- 7.3. Innovative potential of countries, regions, industries and business entities.

**The theoretical and methodological basis of the dissertation research.**

The theoretical basis was the scientific work of Russian and foreign economists and scientists in the field of innovation research, innovative development of territories and assessment of the innovative potential of the region.

The theoretical basis of the innovation potential research includes the following concepts:

1. Innovation as a key factor of economic development. The concept of innovation involves the creation, development and implementation of new products, technologies, processes and practices. Innovation can increase production efficiency, improve product quality, reduce costs, and create new markets and ways to interact with customers.

2. Resource theory of innovation. It is based on the concept of innovation potential as a set of resources that contribute to the development and implementation of innovations. The key resources are scientific knowledge, technological capabilities, human capital, infrastructure, financial resources and other conditions, including socio-cultural and political ones.

3. The institutional environment. It can promote or hinder innovation activities. Achieving a high level of innovative development depends on the right combination of public, private and public initiatives.

4. Classification of innovations. Innovations can be of various types,

including process innovations, product innovations, combinational innovations, positional innovations, organizational and social innovations. Each type of innovation can have a different impact on the development of business and the economy as a whole.

5. Assessment of innovation potential. Various methods are used to assess innovation potential, including innovation audit, statistical analysis methods, expert assessments, source data analysis, etc. These methods help to determine the level of innovative development of the region, monitor the dynamics of changes and identify problematic issues.

The methodological basis of the innovation potential research includes the following principles:

1. A systematic approach – the analysis of innovation potential is carried out taking into account all its elements and the interrelationships between them.

2. Integrative approach – the innovation potential is considered in a complex and its interrelation with other subsystems of the region is taken into account.

3. SWOT analysis methodology – this method allows you to identify the strengths and weaknesses of the territorial development of a region, as well as the opportunities and threats associated with its innovative potential.

4. The method of mass surveillance is a method of monitoring research through the use of various sources of information and data collection.

5. Econometric and statistical methods – for assessing the innovation potential of the regions of the Russian Federation; building models and making point and interval forecasts.

6. Classical methods of pattern clustering - the method of pattern analysis is based on machine learning algorithms that allow you to automatically detect and isolate characteristic features and properties in data. In the process of pattern analysis, data is broken down into small fragments called patterns, which are then compared with each other and with reference data to find common features and differences.

Thus, the study of innovation potential is based on an integrated approach to



conceptual synthesis, which takes into account various aspects of innovation and the institutional factors determining its success. The research results can be used to develop strategies for further business development and the economy of the region as a whole.

**The information and empirical base** consisted of data from federal and regional ministries and departments of Russia (the Federal State Statistics Service, the Ministry of Economic Development, the Government of the Rostov Region, etc.); the results of Russian and foreign research; reports and analytical reviews published in scientific literature and periodicals, the media and the Internet, and author's calculations using application software.

**The scientific novelty of the dissertation research** is represented by the development of the theoretical and methodological foundations of the study of the innovative potential of the territory and the development of a practice-oriented method of econometric modeling of the assessment of the results of innovation activity in the region.

**The main provisions submitted for defense and having scientific novelty**

In the course of the dissertation research, the author obtained the following theoretical and practical results:

1. The interpretation of the "innovative potential of territories" has been supplemented from the standpoint of resource and effective approaches as the resulting set of scientific, technical, personnel, technological, educational, financial, economic, and informational potentials that ensure the development, creation, and implementation of innovations in order to increase the socio-economic level of development of the region. Based on a critical analysis of the numerous interpretations and theoretical approaches considered (techno-institutional, geographical, strategic, matrix), the author's classification of innovation potential according to 7 criteria is proposed.

2. A system of indicators of the innovation potential of regions is presented, consisting of 3 groups of indicators (development of socio-economic and financial potentials of the territory; competitiveness of the territory; scientific and technical

potential of the territory), each of which has 6-7 indicators. For further calculations, a matrix of correlations between the indicators of individual groups and the groups of indicators themselves has been compiled. Based on the construction of a diagram in the Cartesian system for the federal districts and the Russian Federation as a whole, a positive correlation (0.5-0.8) of the effective and factor indicators of the sustainable development of the region and the level of transformation of its innovation potential is proved.

3. The author's step-by-step staging of the development and implementation of the strategy for the development of the innovation potential of the region is proposed.

The first stage contains actions aimed at forming a strategy and includes the following stages:

- defining a system of criteria-goals of innovation policy in a region characterized by the properties of modernity (relevance), hierarchy, completeness, inconsistency, dynamism. An important part of this stage is setting acceptable and desired values;

- development of a system of indicators that adequately characterize the situation under study, what is being investigated, and a mechanism for assessing the state and dynamics of selected innovative facilities;

- analysis of the internal potential of the strategic development of the region;
- development of an innovation development strategy and its coordination with other components of the strategic portfolio of the region;

The second stage, the implementation of the strategy, involves the following stages:

- the stage of organizational actions with the indication of those responsible for strategic directions;

- situation monitoring, which consists in measuring current values and data preceding collection and reflecting the composition and dynamics of indicators, and various combinations of this scheme are presented in management theory.



- organization and controlling in the management process involves solving a number of additional tasks: goal setting, environmental monitoring, calculation of control actions, analysis of management results;

The third stage is the monitoring and adjustment of the region's innovation development strategy. It includes the following processes:

- modeling of innovative development, and this process can be formally written in the form of a matrix;

- assessment and forecast of values both for the current moment and for the future;

- making decisions about the nature of changes that may occur and taking them into account;

- implementation of changes in accordance with the proposed algorithm;

4. The author's algorithm for multi-level aggregated calculation of indicators for assessing the innovative development of the region has been developed, which provides for a multi-level procedure and consists of the following key stages:

- defining research objectives, such as analyzing the current state of innovation potential, identifying the region's strengths and weaknesses, and making recommendations to increase innovation activity;

- collection of quantitative and qualitative data on various indicators reflecting innovative development;

- selection of indicators and identification of key indicators to be used for evaluation;

- the use of rationing methods to bring indicators to a single scale;

- aggregation of indicators and combining normalized indicators into an integral index;

- development of recommendations on the creation of a monitoring system for regular updating of data and revision of indicators, taking into account changes in the economic situation and policies approved for testing by the Ministry of Industry and Energy of the Rostov Region

5. Based on the conducted research on the advantages and disadvantages of

various standardization methods, the results of innovation activity in the regions of the Russian Federation were evaluated using an integral indicator based on a taxonomic method consisting of a set of the following  $m$  indicators:  $P_t = P\{p_1^t, p_2^t, p_3^t, \dots, p_m^t\}$ . The system of such indicators should reflect the region's ability to independently implement all stages of innovation activity – from the emergence of an idea to the practical use of innovation. This system includes the following indicators: the number of scientific organizations, the number of industrial enterprises; the number of small enterprises; the introduction of fixed assets; industrial production indices; expenditures of regional budgets per scientific organization; investments in fixed assets per scientific organization; foreign direct investment in the regions per scientific organization; the number of higher education institutions and the number of students in them.

6. The assessment of the innovation potential of the Southern Federal District regions was carried out using three main original methods: ordinal-fixed, ordinal-invariant and diffusion-invariant pattern clusterizations, which made it possible to identify regional pattern clusters and propose specific directions of innovation policy for each of them. The method of pattern analysis is clearly demonstrated using the example of data assessing the innovation potential of the regions of the Southern Federal District consisting of 6 subjects (Rostov Region, Krasnodar Territory, Volgograd Region, Astrakhan Region, Republic of Kalmykia, Republic of Adygea). Based on the collected data, a model of the innovation potential of the Rostov region was built (and a point and interval forecast of the innovation potential of the Rostov region for the period 2024-2031 was proposed).

#### **The theoretical significance of the research lies in:**

1. the development of mathematical tools that make it possible to identify certain patterns of regional economic development from the initial set of objects;
2. assessment of the innovation potential of territories, which was carried out through an ordinal pair-by-pair model of pattern identification, implemented in the form of three main original methods

#### **Practical significance**

The use of the algorithm developed by the author for assessing the innovative development of the region expands the methodological basis of such an assessment, which can be adapted to form appropriate software for monitoring the development of innovative processes in the region. Based on the analysis of indicators of innovation activity and the receptivity of the region, it is possible to develop strategies aimed at improving the investment climate, stimulating scientific research and introducing new technologies. Assessment methods allow for comparative analysis between regions, which helps identify leaders and outsiders in the field of innovation. This approach will allow not only to evaluate current achievements, but also to set targets for further development.

### **Approbation of research results**

The results of the research (in 2014-2024) were presented at various international scientific and practical conferences and All-Russian competitions, the main of which are:

1. International Scientific and Practical Conference Social Science "Strategy of development of society and economy in the new reality" (17-18.10.2024, Rostov-on-Don)
2. International Conference session "Public Administration and Development of Russia: Global trends and National perspectives" (16-20.05.2022, Moscow)
3. Expert foresight session "The world, economy, society and technology in the context of complex sustainability problems: forecasts of the probable future by 2100" (16-17.06.2022, St. Petersburg)
5. Expert session "The Future of Science of the XXI century: development strategies", (25.08.2022, Moscow)
6. XXIII International Scientific Conference of students, postgraduates and young scientists "LOMONOSOV", section "Economics of Innovation" (04.2017, Moscow)
7. All-Russian Scientific Conference "Problems of the development of a multiethnic macroregion: geopolitical, economic, socio-cultural processes" (19-23.09.2016, Rostov-on-Don)

8. The All-Russian educational Forum "Territory of meanings" on Klyazma. Direction - "Young scientists and teachers of economic sciences" (14-20.08.2015, Klyazma)

9. XXII International Scientific Conference of Students, postgraduates and young Scientists "LOMONOSOV", section "Innovative Economics and Econometrics" (04.2014, Moscow)

10. XVII All-Russian Youth Research Competition "Economic Growth of Russia" of the Free Economic Society of Russia (VEO of Russia) and the Central Research Institute of the Russian Academy of Sciences, (04.2014, Moscow)

64 articles were published as a result of participation in international and Russian conferences.

**The structure of the work.** The dissertation research includes: introduction, three sections, 8 paragraphs, conclusion, biographical list. The total number of figures is 43, tables – 24.