Advances in Economics, Business and Management Research, volume 131
"New Silk Road: Business Cooperation and Prospective of Economic Development" (NSRBCPED 2019)

Modern Approaches to the Regional Innovation Potential Study

Sergey Bolgov
Chair of Management and Logistics on Transport
Samara state transport university
Samara, Russia
Bolgov1910@gmail.com

Julia Veselova
Chair of Management and Logistics on Transport
Samara state transport university
Samara, Russia
veselova-uv@yandex.ru

Oxana Zurina
Chair of Management and Logistics on Transport
Samara state transport university
Samara, Russia
zurina80@mail.ru

Alexandra Klimova
Chair of Management and Logistics on Transport
Samara state transport university
Samara, Russia
Kli-90@mail.ru

Valentina Klimova
Chair of Management and Logistics on Transport
Samara state transport university
Samara, Russia
vklimova@mail.ru

Svetlana Chekuldova
Chair of Management and Logistics on Transport
Samara state transport university
Samara, Russia
chekuldova-sv@mail.ru

***Abstract*— In this article, the development of the innovative potential of the region as a factor in the sustainability of the national economy is described. The regional component of this problem is particularly important because the resources and potential opportunities for innovative development are concentrated in the regions. The necessary condition for the occurrence and spread of innovation is the creation of an enabling environment that creates "innovative comfort" in the region. The authors evaluated the factors that impede innovation for the Samara region, examined modern approaches to assessing the state of innovation potential, finding its strengths and weaknesses, and found that it is advisable to create innovative comfort in the region. When analyzing factors affecting innovative comfort, socio-economic systems, it is necessary to take into account both economic and technological, organizational and managerial, political, legal, socio-psychological and local criteria. This approach will allow making effective management decisions in the field of regional regulation of innovation.**

Keywords: innovation potential, innovation activity, innovation comfort, economic development, technological innovation, marketing innovation, organizational innovation

I. INTRODUCTION

The production and productive power evolution shows that scientific and technological development is a crucial factor of efficiency nowadays. It is based on the innovations development, which are the main means of competition for consumers. Innovation activity involves the research transformation and development into a new product or process, which are more convenient for economically independent regions with sufficient financial, human and intellectual resources. The necessity of the problem development of the relationship between innovative development and living standards and assess indicators that impede innovative activity makes the research topic relevant.

Despite the existing developments of scientists, some problems of the development of an innovative economy require more in-depth study. The development of the regional economic system based on the use of innovative potential determined the need for additional research and development aimed at improving economic relations aimed at improving the innovative characteristics of systems of different levels.

To achieve this goal, the following problems were set and solved: the features of the interpretation of the concept of "innovative potential" and approaches to its research were examined, the concept of "innovative comfort of the region"

was highlighted, the components of the region innovative potential, tools for increasing it for the Samara region and factors hindering it development were identified.

II. Background Paper and Research Methods

Innovation policy and scientific and technological development determine the direction of development of the country; they are strategic growth factors in the region's economy. The theoretical foundations of the regional innovation policy development and innovative management approaches are considered in the works of Tkachenko E. and Bodrunova S. [1], Tatiana K., Margarita B. [2], M. Dudina and N. Lyasnikova. The competitiveness of states, regions and enterprises in an advanced economy is determined not only by the innovative attractiveness of products, but also by the quality of labor, the level of professional education of employees, the competitiveness of personnel capable of quickly mastering new technologies and producing products that meet the individual needs of consumers.

Innovative competitiveness of Russian regions studied by Golova I.M. [4], in the territorial context of Germany, B. Gehrke and H. Leg1er considered these issues [5]. They suggested highlighting the variety of different specializations in high-tech industries and high-quality services, as well as strengthening existing innovative potentials in the regions, rather than creating new ones. Modern approaches to the study of the innovative potential of the region are presented in the works of Kolmykova T.S., Emelyanov S.G. [6], Tekueva M.T., Bayzulayev S.A. [7]. Parshukov D.V., Khodos D.V. [8], Parakhina V.N., Boris O.A. [9], Anikina I.D., Gukova A.V. [10], R. Huggins, P. Thompson [11], reviewed the methods and tools used to assess innovative potential.

The research methods included the analysis and synthesis of approaches to the essence of innovative potential, inductive and deductive reasoning were used to determine the priorities of the regional innovative economy. The method of economic statistics was used to select indicators for assessing innovative potential, the expert assessment method identified factors that impede the innovative development of the region and the structure of production methods products, using the semantic analysis of approaches to the study of the problem, the evolution of science is considered good publications.

III. Results and Discussion

The analysis and synthesis method showed the absence of existing approaches to determining the innovative potential of the region. In the framework of the first approach, it represents the totality of the innovative potential of its constituent entities, and also includes estimated or already developed resources [10]. The second approach is shared by the authors Kravchenko S.I., Kladchenko I.S. [12] - this is the totality of the system to transform into a new state to satisfy needs. Our approach is based on the conceptual apparatus of the economic theory of potentials, which applies a whole class of definitions of potential [13], which allowed us to conclude that the innovative potential of the region consists of various potentials related to areas of activity, its main components are production, technological, personnel, information, financial, managerial, scientific, technical and organizational potentials. Assessing the results, we believe that in these areas there are aspects that require in-depth analysis and development.

Scientific publications analysis indicates the absence of universal guidance papers that make it possible to assess the innovative activity of the region adequately. As a rule, the practice of innovation activity measuring is carried out using statistics at the enterprise level. The main indicators of innovation activity are considered the following [14]: the presence of completed innovations, the level of enterprise participation in the development of these innovations, and the presence of specialized units performing research and development in enterprises. Within the framework of this scientific attitude, an analysis of the indicators of the Samara region showed that completed innovations are available at the enterprises of manufacturing, production and distribution of electricity, gas, water and communication enterprises. Private research and development departments exist mainly at large industrial enterprises, and the implementation of innovative processes is actively taking place in the production of coke and oil products, electrical equipment, electronic and optical equipment, vehicles and equipment, in the chemical, textile and clothing industries. T.V. Pogodina offers a model for assessing the innovative activity of regions using the system of the following statistical indicators [15]: internal research and development costs as a percentage of GDP or GRP; the share of those employed in research and development in the total number of employees; the share of fixed assets of research and development in their total value; costs of technological innovation as a percentage of GDP or GRP. We believe that the areas of application of these provisions are the Volga Federal District of the Russian Federation, and this may lead to inaccurate calculations of innovative activity for other regions, besides, a limited range of indicators is used here.

P. Orekhovsky [16] uses the following indicators: the number of research personnel; volumes of internal costs for research and development; the number of patent applications and issued documents. It is authors' opinion that different indicators for the analysis are not comparable for the regions, with this approach, the regions should be almost the same, and therefore the results are inaccurate.

Jarmila Hudáková, Milan Fiľa, Milan Maroš [17] highlighted five indicators for evaluation of the innovation potential:

- Number of workplaces in science and research (NWP)
- Number of research employees (NRE)
- Number of patents granted (NPG)
- Number of students of doctoral studies (NDS)

In our opinion, they can only be an addition to the main set of indicators.

All innovations are discovered in the product or services, and the consumer wants to get them with an orientation to individual demand, they can be created based on different levels of technology, both through the development of artisanal and mass and individualized production. The development of these theorem is presented in the work of

Tretyak V.P. [18], they can be used to assess innovative potential using the existing "growth points" of the post-industrial structure in the region's economy. In the study of the innovative potential of the Samara region in this way, expert estimates were obtained and the composition of the products in the volume of GRP produced in various ways was determined. The result showed that the volume of products manufactured using technologies of post-industrial technological structures is growing, but the main share falls on industrial technologies and mass production. This approach made it possible to see that an indicator of innovative potential characterizes the degree of readiness of the region for the creation, development and dissemination of technologies of post-industrial structures. Despite the fact that the tendency to form post-industrial technological structures is inclined to increase, the actual absence of further innovative development threatens the economy of the region. Weaknesses and strengths of activity were revealed to assess the innovative activity of either enterprises or the region. The strengths of enterprises in the Samara region are highlighted: partnership with regional enterprises, commercialization of innovative projects, and the coherence of enterprise policies with state innovation policies. Weaknesses are the following:

- innovation policy - requires administrative and legal resources for development;
- instability of the number of created advanced production technologies;
- depreciation of the basic production assets (51.3% on average);
- the exports fall suggests that the products of regional enterprises are becoming less competitive.

The assessment of factors hindering the development and implementation of innovations was carried out by the method of expert evaluations of organizations in 2018 and is given in Table I.

TABLE I. ASSESSMENT OF FACTORS HINDERING THE SAMARA REGION INNOVATION ACTIVITY

Factors	**Number of organizations rated by importance**				
	Insignificant	***Significant***	***Basic***	***No answer***	***Factor***
Economic forces					
Lack of own funds	81	196	194	117	70
Lack of state financial support	105	154	91	153	155
Low demand for new products, services	178	112	52	169	147
High cost of innovation	46	245	127	149	91
High economic risk	94	176	87	188	113
Internal production factors					
Low innovation potential	173	121	61	176	127
Lack of qualified staff	206	143	35	136	138
Lack of new technologies information	237	99	26	146	150
Lack of market information	243	78	29	158	150
Underdeveloped cooperative ties	204	68	26	195	165
Other factors					
Insufficiency of legislative and regulatory documents regulating and stimulating innovative activity	151	115	54	218	120
Underdeveloped innovation infrastructure	178	94	32	229	127
Uncertainty of the economic benefits of using intellectual property	137	102	41	250	128

So, according to Table I, the main factors hindering innovation in the Samara region are: the high cost of innovations (37%), lack or absence of own funds (29.8%), high economic risk (26.75%), lack of state financial support (23.4%), as well as low payment demand for new products and a long payback period.

The dynamics of innovative activity of enterprises in the Samara region over the years shows a decrease in this indicator; only in 2017 its growth is observed. Economic instability and a large amount of costs necessary for the development and implementation of innovations explain this situation. Indicators characterizing the potential capabilities of the region are given in Table II.

TABLE II. KEY INDICATORS OF INNOVATIVE ACTIVITY OF THE SAMARA REGION ENTERPRISES,% [19]

Indicators	2015	2016	2017
Innovative activity of enterprises	5,0	3,9	4,3
The proportion of enterprises engaged in technological innovation	4,7	3,6	4,2
The proportion of enterprises engaged in organizational innovation	1,6	1,2	1,0
The proportion of enterprises engaged in marketing innovation	0,7	0,5	0,6
The proportion of innovative goods, works, services in the total volume of goods shipped, work performed, services	19,1	17,7	15,6
The share of technological innovation costs	5,0	2,9	2,3

The study revealed that the creation of competitive innovative products and their market promotion is possible in the region if some conditions and factors are associated with the development of post-industrial technologies and a positive attitude of the administration to the innovative activity of economic entities. We defined this concept as "innovative comfort of the region", that is, the attractiveness of the region for existing innovative and active business entities and for creating new ones. It is necessary to take into account a system of factors affecting its level to create innovative comfort in the region. Using L. S. Leontyeva [20] methodological approach, it was concluded that different regional economic systems differ from each other in the level of "innovative comfort of the region", that is, by the presence of conditions and factors that are associated with the state of post-industrial technology and attitude towards innovation. Identified factors are the following:

- organizational and managerial: organizational structure flexibility, democratic management style, decentralization, autonomy, quality management, organizational development;
- economic, technological: scientific and technical progress, financial and material and technical support for advanced technologies, scientific and technical infrastructure, an effective system of stimulation of innovatively active subjects;
- political, legal: legislative measures encouraging innovation, lobbying for interests in government, measures to stimulate the design of research and development;
- socio-psychological, cultural: the formation of an environment conducive to the creation and implementation of innovative projects, the development of a training system, the employment of enterprises in the implementation of innovative projects.

Ignoring the indicated factors entails a decrease in the level of innovative comfort and innovative potential of the region.

O. Petrova and D. Malyshev consider the use of statistical indicators to assess the innovative development: cost expression of gross regional product, average per capita income, production structure, the role of basic technologies [21]. In our opinion, the indicator studied in the work is not equivalent to the proposed indicators characterizing the scale of the region's economic activity. We can agree with it when taking into account and analyzing a number of parameters proving the development of innovative potential in terms of its components - production, technological, human resources, information, financial, management, scientific, technical and organizational potential in the context of identified factors. We support the views of E. Kharchenko, E. Alpeeva, and O. Ovcharova in this field [22], who determine the development of regions either by the growth of the gross regional product and also by maximizing the output of innovative products in terms of employment, information potential, and new approaches to social services.

We think an assessment based on statistical data of innovative potential can be carried out according to the following indicators:

1. Production and technological potential:

- production of gross regional product;
- investments in fixed assets;
- the cost of enterprises basic production assets;
- the level of depreciation of the basic production assets, in%;
- the number of enterprises and organizations;
- the level of economic activity of the population;
- labor productivity.

2. Scientific and technical potential:

- the volume of innovative products by the degree of novelty;
- the proportion of innovative newly introduced and improved products in the total gross regional product;
- the number of organizations performing research and development;
- the number of people employed in research, including doctors and candidates of sciences;
- the number of students in higher educational institutions;
- the number of created advanced technologies;
- the use of advanced technologies.

3. Financial potential:

- research and development costs;
- R&D expenses for GRP in %;
- the education expenses for GRP in %;
- investments in fixed assets aimed at the development of education to the total in %;

- education expenses of total expenses in %;
- -domestic current costs for research and development.

4. Human resources:

- the number of economically active population;
- the number of personnel with a college degree;
- the number of employees of organizations performing research and development;
- the proportion of doctors, candidates of sciences in the total number of employees doing research and development;
- the proportion of students in the population of the region;
- the number of organizations with post-graduation programs.

5. The information potential is assessed by the availability of documents related to the regulatory framework in the field of innovation, the availability of information and communication technologies, as well as indicators:

- the number of organizations using information technology;
- the number of employees of organizations using information technology;
- the number of organizations with web sites, including for scientific research;
- the presence of personal computers in organizations using information technology.

6. Organizational capacity:

- the presence of such a regional body with which any organizations can interact in the formation of innovative strategies and development programs;
- the presence of an organization coordinating scientific and technical activities in the region;
- the presence of technology parks, special economic zones, clusters, and other centers;
- the availability of funds to finance innovation in the region.

7. Management capacity should include modern forms of innovation management, optimal organizational and planning structures, as well as methods and control procedures. It is possible to evaluate the management activities of an administration by developing innovative activities, the degree of coherence and efficiency of interaction between federal and regional authorities.

IV. Conclusion

The development of an innovative economy in the regions requires quality and informed the choice of policy and effective innovation management tools. There are important differences between the public and the private sector that should be reflected in a measurement framework, there is also considerable common ground that can be drawn upon [23].

The research methods used allow us to conclude that the innovative potential of the region is a combination of potentials associated with the lines of activity. The results showed that to assess the innovative potential of the region, it is necessary to use several indicators and methods which help to identify the strengths and weaknesses of the innovative activities of the Samara region and the factors hindering it. The main factors are the high cost of innovations, lack or lack of own funds, high economic risk, lack of state financial support, low payment demand for new products and a long payback period. Even though the trend towards the formation of postindustrial technological structures tends to grow, the actual absence of further innovative development threatens the economy of the region.

Today it is impossible to single out the best approach to this problem, but in our opinion, when developing a program for innovative development of the region, it is necessary to analyze and improve the factors that contribute to increasing the level of innovative comfort proposed by the authors. The concept of “innovative comfort of the region” is presented as a set of effective institutional factors and conditions conducive to the development of the innovative component of the regional socio-economic system. When analyzing factors affecting the innovative comfort of this system, it is necessary to take into account economic, technological, organizational and managerial, political, legal, socio-psychological and cultural criteria. This approach will make it possible to make effective management decisions in the field of regional regulation of innovation.

References

[1] E. Tkachenko and S. Bodrunov, "Development of the knowledge economy and regional innovation policy: Russian practice", Proceedings of the European Conference on Knowledge Management, ECKM 15th, Proceedings of the 15th European Conference on Knowledge Management, ECKM 2014, pp. 964–973.

[2] T. Kashitsyna and M. Berkovich, "Strategic development of the innovative infrastructure of a region", Asian Social Science, 2010, vol. 10, no. 21, pp. 145–151.

[3] M. N. Dudin, N. V. Lyasnikov, V. N. Tsasko, M. Ya. Veselovsky, L. S. Leontiev and et al., "Innovative Approaches to Energy Resource Saving and Use of Renewable Energy Sources to Reduce the Costs of Agro-Industrial Enterprises", Amazonia Investiga, 2019, vol. 8, no. 19, pp. 149–158.

[4] I. M. Golova, "Innovative competitiveness of Russian regions", The economy of the region, 2015, no.3 (43), pp. 294–311.

[5] B. Gehrke, H. Legler, U. Schasse, and C. Grenzmann, "Regional distribution of innovation potential in Germany: selected indicators for research and development, sector structures and use", 2010 [Electronic resource]. Available at: http://www.econstor.eu.

[6] T. S. Kolmykova, S. G. Emelyanov, and E.A. Merzlyakova, "Research of innovative potential of the region", Journal of Applied Engineering Science, 2017, vol. 15, no.3, pp.276–279.

[7] M. T. Tekueva, S. A. Bayzulayev, M. V. Volov, and E. G. Shurdumova, "Methods of estimation of innovative potential of the region", International Journal of Economic Perspectives, 2017, vol. 11, no. 1, pp. 212–219.

[8] D. V. Parshukov, D. V. Khodos, N. I. Pyzhikova, K. E. Ivanovna, and V. E. Yuryevna, "Tools for assessment of innovation potential of the

business environment development in the region", Biosciences Biotechnology Research Asia, 2015, vol. 12, no 3, pp. 2983–2994.

[9] V. N. Parakhina, O. A. Boris, and E. A. Midler, "Evaluation of Innovative Regional Development Russia", Asian Social Science, 2015, vol. 11, no. 5, pp. 201–207.

[10] I. D. Anikina, A. V. Gukova, A. A. Golodova, and A. A. Chekalkina, "Selecting top-priority tools of financial incentives and support for organization's innovative activities at the regional level (by the example of Volgograd oblast, Russia)", 2017, pp. 475–482.

[11] R. Huggins and P. Thompson, "Entrepreneurship, innovation and regional growth: a network theory Robert Huggins and Piers Thompson", Small Business Economics, 2015, vol. 45, pp. 103–128

[12] S. I. Kravchenko and I.S. Kladchenko, "Investigation of the essence of innovative potential", Scientific Proceedings of the Donetsk National Technical University, Ser.: Economic, 2007, vol. 68, Donetsk: DonNTU, pp. 88–96.

[13] P. M. Gureev and V. N. Grishin, "Innovation potential: the problem definition and assessment innovation", Transfer Innovation, St. Petersburg, 2017, no. 4 (222), pp. 89–92.

[14] V. I. Vinokurov, "Key terms and definitions in the field of innovation", Innovation, 2005, no. 4 (81), pp. 6–12.

[15] T. V. Pogodina, "Economic analysis and assessment of innovative activity and competitiveness of the regions of the Volga Federal District", Economic analysis: theory and practice, 2004, no. 5, pp. 16–22.

[16] P. Orekhovsky, "Evaluation of the effectiveness of innovation in the regions: a comparative analysis", Society and economics, 2007, no. 5–6, pp. 203–215.

[17] J. Hudáková, M. Fiľa, and M. Maroš, "Innovation potential of the regions in the Slovak republic", Acta Oeconomica Universitatis, ActA OecOnOmicAUniversitAtis selye International scientific journal, 2017, vol. 6, no. 2.

[18] V. P. Tretyak, "Criteria for an innovative economy", New knowledge, Moscow, 2009, no. 1, pp. 30–33.

[19] "Territorial authority of the Federal state statistics services in the Samara region" [Electronic resource]. Available at: http://samarastat.gks.ru (Accessed: 06 November 2019).

[20] L. S. Leontieva, "Organizational Culture: Regional Aspect", Monograph, Moscow, 2004, pp. 99–101.

[21] O. S. Petrova and D. P. Malyshev, "Innovative activity in the subjects of the Russian Federation: problems and prospects", Pskov State University (Pskov), 2013, no. 15, pp. 48–62.

[22] E. Kharchenko, E. Alpeeva, and O. Ovcharova, "Innovative Potential of Russian Regions: Methodological Aspects of Analysis and Development Trends", Procedia Economics and Finance, 2014, vol. 14, pp. 313–319.

[23] C. Bloch and M. M. Bugge, "Structural Change and Economic Dynamics Public sector innovation", From theory to measurement – Structural change and economic dynamics, 2013, vol. 27, pp. 133–145.