

Research potential as a basis for innovative development of the region

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Abstract. Purpose of work is to determine an amount of influence from region's innovative activity on effective usage of current scientific-research potential. Innovative activity of regions in many respects depends on the availability and efficient use of the existing research capacity. The main components of the research capacities in the region are: interest of universities, employers and society in research and development and their implementation in practice; development of research infrastructure; and a focus of higher education on the innovative activity of students; financial and tax support of enterprises engaged in innovative activities, from the state. Changing of market situation make region's enterprises to seek for economic, flexibility. Region's quantity of small innovative companies, established by universities and scientific organizations, has increased.

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Introduction

Innovative way of development of Russia largely depends on effective solution to the problems of improving the use of research capacity at the regional level. Currently, the difficulties of implementing innovations, low demand for them not allow you to implement them at a rapid pace, focus on the external market.

The implementation of innovative development enterprises and organizations of updated increasingly due to the increasing competition in most sectors of the Russian economy. Innovative technology, products, services ensure high rates of economic development [1-3].

Currently, the weight and influence of R&D potential constantly grow in world economy. Specifically, scientific-research potential, intellectual potential becomes driver of region's economy development; it significantly determines the structure of region's economy, quality of goods and services that are produced, and also the functioning of households at all levels [4-6]. However, the scientific-research potential itself may not lead to the economic results. Creation of conditions, existing of impulse for development of scientific research and developments, implementation of R&D activity's results in production processes are important questions in management of region's development.

Current events or recent decades brought to decreasing of general R&D potential of the regions. The reasons are: government took off from itself the responsibility for educational level of growing generation; not called for intellectually enhanced

labor; persistently low financing of scientific-research activity; decreasing of prestige of professions in intellectual activity, etc. [7,8]

Reconstruction and rational usage of R&D potential, development of knowledge-intensive industries, creation of conditions for growing the quantity of highly intelligent specialists is the basis for innovative development of region.

Materials and methods

A main structural component of the research potential was studied Russian and foreign scientists from two positions. On the one hand, the research potential is quantitatively measured individual parameters (number of scientific personnel, the amount of financing of fundamental and applied research, the cost of equipment and materials, etc). On the other hand, the research potential is the existence of real possibilities, implementation of which is provided objective and subjective conditions (material-technical, financial support and other).

Dualistic understanding of the essence of research potential is found in the literature [7-9] and in practice the region, industry, and research institutions. Modern approach to the definition of "research potential" is based on the relationship and interdependence versatile components (scientific potential, material and technical basis of science, the number of employees engaged in research work, etc.). Exactly the interaction of diverse components, research capacity may have features that are not contained in each component.

Innovative development is frequently identified with concepts such as “innovation process” and “innovation activity”. Innovative activity is considered as the process I.T. Balabanov, V.P. Vorobyov, E.F. Denisov, G. A. Denisov, M.I. Kamenetsky, E.M. Rogova, R.A. Fatkhutdinov and others.

In federal law «About science and state scientific-technical policy» innovative activity is determined as «activity (including scientific, technological, organizational, financial and commercial activity), directed to implementation of innovative projects, and also to creation of innovative infrastructure and maintenance of its activity» [10].

At the same time, international standards (Frascati Manual) interprets the innovation activity as a “kind of activity associated with the transformation of ideas (usually the results of research and development) to a new or improved product introduced on the market in new or improved technological process, used in the practical activity, or in a new approach to social services.” Deepening structural reforms in the economy and the redistribution of powers across levels of state power of the Russian Federation identify new approaches to the understanding of research potential and its role in the innovation processes taking place in the regions.

The main part

Unpredictable market change forcing businesses to build their positions on economic policy flexibility and rapid response to external changes. Moreover, flexibility and mobility involves three components of enterprise activity: economic, organizational and technological.

Economic flexibility is the ability to quickly update the range of products (services) offered by the company on the market. Updating of assortment entails changes in the structure of the organization itself, and in the system of material-technical supply, personnel management, sales processes. Increasingly important is the possibility of dividing the organization of production process on the elements of the transition from production exploded block-modular. In this case, the costs associated with the issuance of new or modified products. Such approach to organization of the production process, first developed and introduced in practice Japanese car Assembly of Toyota group, is the most promising direction for innovation at every stage of production.

Organizational flexibility is based on the organizational ability of the system to change the volume of production depending on the market requirements.

Technology mobility associated with the use of intellectual work for the improvement of

production equipment, technical re-equipment of production [8].

Innovative activity of modern enterprises depends on the availability of financial resources, intellectual potential of the employees, as the enterprise itself, and the region in general. Moreover, research and development programmes implemented in the region should be supported by the government. The future state of the innovation economy of the region should be a priority in planning and practical implementation of the plans of the regional government. To create a favorable innovative climate the government should:

- to improve the regulatory-legal base, system of the taxation, involving the promotion of investment in innovative production;
- to increase the efficiency of the safeguards system, protection of intellectual property rights and investment insurance;
- to develop system of information and consulting, software, marketing of innovative programs and projects.

Undoubtedly, rapid innovative growth of the economy depends on the availability of innovative developments and the degree of development of innovative infrastructure, comprising universities, technology parks, research centers, centers of assistance to entrepreneurs, producing innovative products and other.

The most effective in this case is the development of regional university sector. It is the universities that have a high concentration of research staff and require a relatively small investment.

Between innovative development of the region's economy and high education are closely linked [9, 11]. Modern innovations require a certain level of knowledge, possession of a maximum volume of scientific-technical information. The higher education system in the region should also be innovative. In developed countries most innovations are created in universities, research results and developments translate into commercial products and services.

Innovation in the current environment is a process of transformation new ideas and knowledge into new products, technologies which subsequently lead to a specific socio-economic result of. In this regard, higher education should be directed at obtaining practical results.

This focus is implemented by effective linking university scientific and research centers with financial sources (public, private, venture capital, etc) [12], and also with production enterprises. Effectiveness of joint actions in the region depends on the provision of highly qualified personnel.

Moreover, the higher education system should supply professional personnel who have not only high quality knowledge, but also the ability to innovate. Comparative advantage in science, innovative orientation of education will allow new sources of economic growth in the region and expand its competitive potential.

In the Strategy of socio-economic development of the Belgorod region till 2025 year, one of the main priority directions of economic activities, providing competitiveness of the region, is “the formation of the new economy - economy of knowledge and high technologies on the basis of the conversion of innovations into the leading factor of economic growth to all sectors of the economy as a competitive sector with access to the national market” [13]. Some steps have already been taken.

In order to create an institutional environment, inducing innovative activity and attracting investments to the economy and social sphere in the region of formation is effected intellectual innovation system, including the development of innovative infrastructure, institutions of intellectual property, creation of information-communication environment between developers, governmental and municipal structures and business.

In order to develop scientific, technical, technological and production base in the sphere of nanotechnologies and nanomaterials launched investment projects in the long-term target program “Development nanoindustry Belgorod region for 2010-2014” and the regional target program “ROSNANO” in the Belgorod region in 2010-2012.

During 2010-2012 adjusted release of innovative nanotechnological products “Experimental plant VladMiva”, “SKIF”, “Plant of Paint “QUIL” and “Taksifoliya” in Belgorod, “Belgorod plant sapphire “Monocrystal” in Shebekino, “Plant fibers” in Alekseyevka. In the short term is planned to launch “Rosana” in Vauyiki region, “UNIKOM” in Gubkin. Applications of products of these industries are agriculture, machine building, construction, including road, dentistry and others.

Since 2009 year in the region increases the number of small innovative enterprises created by universities and research institutions in accordance with Federal law #217-FL [14]. These businesses provide the commercialization of scientific-technical and technological development of universities, their replication and placing on the market. In 2012 in the area were 114 small innovative enterprises.

However, it should be noted that the magnitude of domestic expenditure on research and development is too small to be the basis of the growth of innovative development of the Belgorod region. Moreover, if during the last five years, their

relationship to the GRP of the oblast increased by 17.6 % [15], in 2011 decrease is observed. Domestic expenditures on research and development in 2011 amounted to 0.18% of GRP of the Belgorod region. At the country level, this indicator is 0.82% of GDP.

In Russia is extremely low level of spending on research and development (R & D). The share of expenditures on science in Russia's GDP is 3-4 times less than in developed countries. The leaders in R & D spending is set to increase spending on science to 3% of GDP (USA, Germany, France) and even up to 4% of GDP (Finland, Sweden, South Korea, Japan).

According to scientists of the RAS Russia, countries and regions -the biggest problem is not so much the lack of funding and lack of demand of science in the country. In the Belgorod region, and elsewhere in the country, has decreased the number of research institutes and laboratories. From 1992 till 2011 number of research organizations in Russia decreased by almost 30% (with 4555 to 3682); the number of commercial organizations with research and design offices - by 18% (from 340 to 280). The number of design offices decreased 2.4 times (from 865 to 364), the number of design organizations - 13 times (495 to 38) [16].

Employment in the scientific sector in Russia in 1992-2011 decreased by 2,5 times - from 1943 thousand people to 735 thousand people and the number of researchers is almost 3 times (992 thousand people to 374 thousand). In the Belgorod region in research in 2001 worked 26 organizations in 2011 their number amounted to 16 organizations. In the research field at this time in 1198 working people. At the scientific research deals 866 people [17].

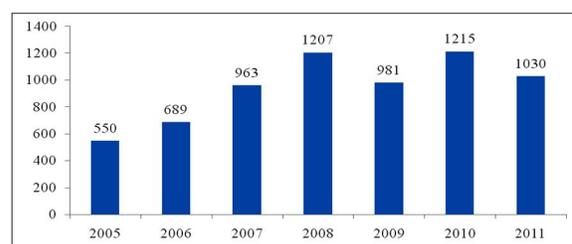


Figure. Dynamics of number of advanced production technologies in the Belgorod region in 2005-2011.

The volume of innovative products and services in the Belgorod region was in 2011 15457 million rubles, that in total amount of shipped goods does not exceed 3.7%. The number of advanced technologies in the field in 2011 is 1030. Dynamics of number of advanced production technologies in the Belgorod region in 2005-2011 shown in the figure.

In 2011 use of advanced technology had decreased by 15%, a factor that indicates the increase of the specific problems in this sphere.

In the Belgorod region makes certain efforts to promote innovation in enterprises. From 2012 companies that invest in R&D more than 1% of total costs, received benefits in three percentage points for the profit tax, in the amounts payable to the budget of the Belgorod region.

Enterprises of the region in 2012 directed on R&D 956 million rubles, the most of 640 million rubles (67%) came from the universities, 166 million rubles from the organization with a government stake, 132 million rubles - for entrepreneurs and a total of 27 million rubles, or 0.15% - by industrial enterprises.

It is assumed that benefits will increase expenditures of enterprises on R&D is not less than eight times during the period 2012-2015 [18].

Besides budgetary financing of the funds for R&D comes from extra-budgetary funds. The dynamics of domestic expenditure on research and development by sources of financing is presented in the table 1.

Table 1. Domestic expenditures on research and development by sources of financing, %

	Domestic expenditures on research and development by sources of financing:					
	budget funds			extra-budgetary funds		
	2010	2011	2012	2010	2011	2012
Russian Federation	68,8	65,6	66,0	31,2	34,4	34,0
Central Federal district	72,2	67,4	68,8	27,8	32,6	31,2
Belgorod region	53,2	43,2	40,1	46,8	56,8	59,9

In Belgorod region, as in the whole Russia observed decline of the share of budget funds for research and development and increase the share of extra-budgetary funds.

Conclusion

Despite the improvement the situation in the Belgorod region there are a number of problems hindering efficient innovative development:

- limited effective demand in the domestic market for advanced technologies and innovations;
- imperfect special financial mechanisms to support specific elements of innovation infrastructure, innovative entrepreneurship and self-innovation projects;
- low information transparency of the innovation sphere;
- low level of innovation activity of leading enterprises in the region (currently R&D employed a total of 8 largest companies of the region);

- insufficient level of development of small innovation entrepreneurship; lack of professional managers;

- insufficient level of development of material-technical base of scientific organizations; -ageing of scientific personnel.

Connect innovative activity in the economy of the region with scientific-research potential, quality of higher education is observed in all developed countries. The main principles of communication innovation and international quality standards in the Russian higher education system include: joint interest of students, employers and society in high quality higher education; institutional autonomy of universities, which increases the responsibility of all participants in the educational process for quality professional training of students; the goals of innovation activity in accordance with the changing needs of the developing Russian society.

Activation of innovation activity can be ensured by taking into account some requirements:

1. Strengthening innovation orientation of vocational training as the basis of educational process activation.

2. Realization of the complex approach to educational and research activities of the university with the positions of innovative training of specialists, competitive on the labour market.

3. Increase of efficiency of educational activities through the introduction of results of scientific research that will provide opportunities for faculty to continuously improve and enhance their professional knowledge, practical experience, enrich innovation educational process.

4. Permanent monitoring of the quality of vocational training in the system "entrant - student - specialist" in the unity of purpose and content of educational process, which is realized through educational programs with the use of innovative technologies and methods of management university .

Russian scientists have conducted studies which was concluded that the pace of innovative development of territories have a strong connection with increase of cost of research. The research activity of the university is evaluated differently by the number of doctoral and candidate's dissertations in a year; number of graduates; direct expenditure on research and development, number of scientific articles are published each year. Moreover, universities or colleges play a dual role from the point of view of innovative activity - as researchers and as a source of fresh ideas", "innovators" for the industry, to whom are university graduates.

Issues of increasing the prestige of scientific-research workers were not observed within

current research. Current topic can be put for further examination of factors influencing the development of R&D potential of region as much as country.

Thus, for the active implementation of scientific-research potential of the region should:

- active business involvement in R&D, increasing the share of private capital in financing of expenditures on science. Innovative activity in the region will increase when the business will be profitable to invest in innovation, getting some encouragement by the state (for example, by indirect methods - through taxes);

- increase of budget expenditures on priority fundamental research and applied R&D;

- association of efforts of bodies of state power and local self-government, the business community and population. This will enhance the competitive capacity of the economy of the region by increasing its comparative advantage in science, education development, high technology and on this basis to involve new sources of economic growth, productivity growth and welfare improvement.

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