GROWTH OF THE RUSSIAN INDUSTRIAL COMPANIES EFFICIENCY AT TRANSFORMATION OF NATIONAL INNOVATIVE SYSTEM

Anna E. Gorokhova – Vladimir D. Sekerin

Abstract

In the paper value of national innovative system as success factor of activity of the Russian industrial enterprises is considered. The structure of the Russian national innovative system modeling productive interaction of scientific, production, financial institutions, bodies of authority and management in processes of new cost reproduction is offered.

For the modern Russian industrial enterprises institutional factors act as the major limiting factors of their economic growth. In the paper the directions of the state impact on formation of innovative climate are investigated: creation of innovative infrastructure, improvement of low institutes, financial institutes. Problems of development of the Russian national innovative system are defined, the directions their solutions are proposed.

The assessment algorithm of influence of national innovative system development on efficiency of the industrial enterprises is offered. Process of an assessment of efficiency of the industrial enterprises innovative activity is structured. The assessment of innovative activity efficiency of the industrial enterprises based on understanding of efficiency as functions of three components is structured: technical, economic and marketing, and the formalizing process of an assessment of efficiency.

Key words: efficiency of the industrial enterprises, management technologies, innovative environment, innovative climate, innovative infrastructure

JEL Code: O31, O32

Introduction

In modern conditions the main objective of the industrial enterprises activity consists in accumulation of economic potential for to provide a stable and sustainable development in

long temporary aspect, but not in maximizing profit on short time intervals. Potential of managing subject economic growth is defined, first of all, by existence of natural resources, a condition of the physical and human capital belonging to it, quality of the institutional environment, and also geographical factors and an environment. But modern practice testifies that there is one more important component influencing the economic capacity of the industrial enterprises. This factor explains why in the countries with similar operating conditions of economy and factors of resource base different performance level and various rates of economic growth is noted. It is caused by a different level of national innovative systems development, innovative activity of economic subjects, and, as a result, unequal scales of introduction and diffusion of innovations.

Questions of efficiency increase of innovations commercialization by the industrial enterprises are one of priority for innovative development in all world community. Now commercialization of innovations caused achievement of a leading position in the international market of the knowledge-intensive production by many developed countries, it became the main condition of success of innovative introduction in practice of the industrial enterprises.

1 Perspective structure of the Russian national innovative system

For optimization of innovations commercialization on the market each of the developed countries created own environment of commercialization or the innovative environment (Carayannies & Grigoroudis, 2014). In the Russian economy the lack of innovative qualities and mechanisms represents a serious problem, and without its decision it is impossible to build innovative economy. In Russia the innovative environment which would promote generation of innovative ideas and their commercialization isn't created yet (Babikova et al., 2014). Competitiveness of national economy is defined by the saved-up scientific and technical potential, institutional factors of scientific and technical progress, existence of large knowledge-intensive enterprise structures (Zhang & Yang, 2013). For modern Russian realities as the limiting factor the institutional component acts. In many respects it is explained by the short period of market economy during which in Russia only there is an active formation of market infrastructure institutes (Sekerin & Gorokhova, 2013).

The institutionalization of interaction of science and equipment, acquisition of systematic, steady and natural character by it is a significant factor of economic growth in modern conditions. The national innovative system promotes a transfer of innovations from

the science sphere to the production sphere, causes efficiency of this transfer (Dudin et al., 2014). In each country innovative systems have the national features dictated both a geographical arrangement of the country, and its history (Merton, 1968). However in all countries innovative systems passed some stages in the development.

The national innovative system is the social and economic system formed by set of the interconnected economic entities of scientific and production spheres and government bodies which enable generation and product sales or services, set of institutes of financial, legal and social character which provide realization of innovative processes and are characterized by existence of strong national roots, traditions, political and cultural features, and also a complex of the actions interfaced to it based on the innovative principles of conducting economic activity and cooperation and reflecting interests of national economy development.

Development of structure of national innovative system of Russia which will allow to increase efficiency of processes of commercialization of innovations as a result of structurization and formalization of interactions of economic entities of scientific and production spheres, government bodies of the power and institutes of financial, legal and social character is represented expedient.

Allocate four main types of innovative models is the euroatlantic, East Asian, alternative and model of "a threefold spiral". But in modern conditions there is a further evolution of national innovative systems – the new model – model of the fourth spiral arises. In figure 1 the developed structure of Russian national innovative system which will allow to increase efficiency of innovations commercialization in the industry as a result of structurization and formalization of interactions of economic entities of scientific and production spheres, government bodies of the power and institutes of financial, legal and social character is presented.

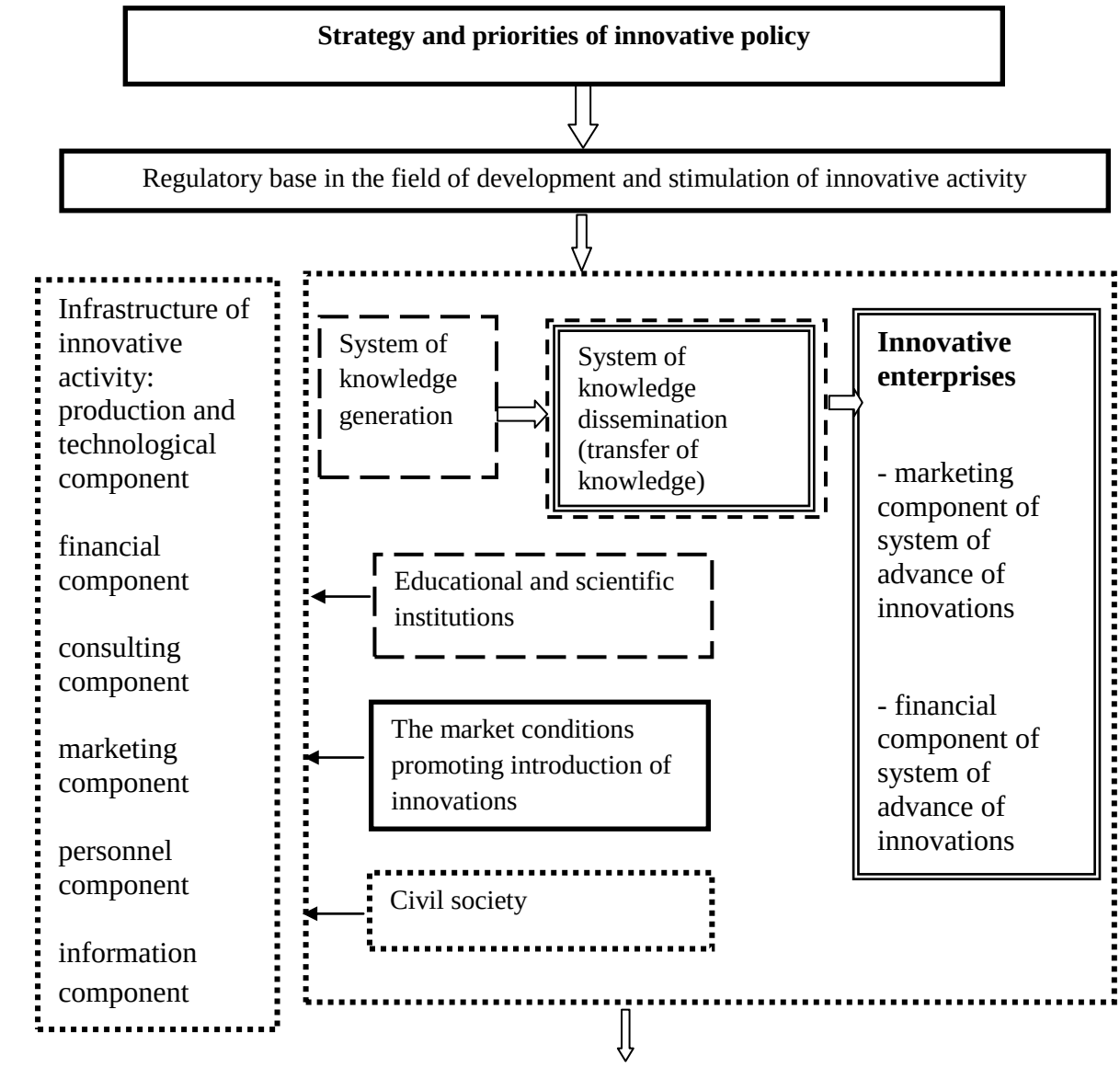
2 Problems of the Russian national innovative system development and direction of their decision

The following problems of the Russian national innovative system development are revealed (Lyasnikov et al., 2014):

- dissociation between segments of scientific community: the higher school, academic sector, sector of applied researches,
- lack of innovative infrastructure, insufficient attention to its construction,

- introduction in production of the outdated imported technologies and replacement of domestic perspective innovations.

Fig. 1: Structure of the Russian national innovative system



Source: authors research.

The following solutions are proposed (Boyko, Sekerin & Šafránková, 2014):

- formation of the developed infrastructure of national innovative system for what certain mechanisms of integration of science, educations are necessary, production and business,
- development of business for increase in intensity of processes of commercial use of innovations.

Formation and development of the innovative environment in the country from a position of government bodies of management should be considered as the major task promoting the economic growth based on introduction of scientific and technical, research activity and developmental development.

The decisions and actions public authorities have possibility of direct influence on formation of the innovative environment. In modern conditions and significant the following mechanisms are the most important:

- formation and development of innovative infrastructure,
- improvement of legal institutes,
- development of financial institutions,
- development of social institutions.

We investigate the listed directions in more detail.

3 State support of formation of national innovative system

Infrastructure providing represents one of mechanisms of formation and development of the market environment of innovations introduction. In all economically developed countries this mechanism consists in creation of special organizational structures – agencies, the centers and funds, which main objectives (Sun, 2015):

- to render financial, marketing, legal, personnel, information services and the other help to developers;
- to create favorable conditions of innovative activity implementation and realization of innovations commercialization;
- to coordinate innovative activity, etc.

The innovative infrastructure can be classified by a range of services which provide the enterprise structures making it – financial, material, information, personnel and expert and consulting.

The second direction consists in improvement of legal institutes which has to be focused on the following actions:

- to stimulate and encourage development of commercialization and innovative activity in general (Kucharčíková, 2014);
- to promote involvement of talented workers in innovative activity (Šikýř, 2011);
- to differentiate functioning interests of all participants of innovations commercialization;
- to establish an order of coordination of the main participants activity;
- to establish an order of fixing of the rights for results of intellectual activity;
- to enter an order, ways and norms of interaction of the scientific organizations and establishments, enterprise structures and public authorities;
- to enact standards on innovative production (quality, safety of use, compliance to environmental standards), etc.

Besides, in economically developed countries one of significant instruments of support and stimulation of innovative activity are the state contracts which consist with various enterprise structures for carrying out research activity by them (Park et al., 2013). The specified contracts allow to coordinate carefully all main conditions of the organization, performance and receiving results – since terms of implementation of research activity and finishing with the demanded costs of their realization, thus the customer guarantees receiving future results and their subsequent introduction on the market.

Not created favorable environment stimulating generation of innovative ideas and realization of innovative processes represents a fundamental problem at implementation of effective innovations by enterprise structures. As the main factor of innovative activity by enterprise structures existence of a complex of intellectual, infrastructure, material, financial, personnel, information and other types of the resources forming base for creation of innovative ideas and execution of innovative projects acts.

Efficiency of innovations commercialization is determined also by institutes of social character. One of them is a consumer loyalty. At the same time achievement and strengthening of consumer loyalty represents a main goal of the concept of marketing of relationship. On the other hand, consumer loyalty acts as a component of the institutional environment of innovative climate. According to authors, the innovative climate is defined by the reached level of usefulness of research and production and institutional factors to which it is possible to refer consumer loyalty for formation and development of innovative climate.

4 Influence of national innovative system on efficiency of the industrial enterprises

Efficiency of innovations commercialization is defined not only a level of development of the innovative environment, but also productivity by actions of the industrial enterprises. To the industrial enterprises for to improve the innovative potential it is necessary to develop the external and internal innovative environment. The developed innovative environment forms for them opportunity to generate and introduce innovations on the market. Efficiency of formation of the innovative environment by industrial structures is determined by existence of purposeful efforts which support innovative climate, develop system interactions between their innovative personnel structure and their consumers.

We offer the following algorithm of an assessment of influence of a level of development of national innovative system on efficiency of the industrial enterprises:

1) development of financial and economic mechanisms and instruments of support and motivation of an innovative component of financial and economic activity of the industrial enterprises;

2) creation of conditions for integration of science, education, the industry by means of formation of the integrated structures aimed at development, the organization of a mass production and sale of innovative goods, production, works, services;

3) assistance to development of infrastructure of national innovative system;

4) rational application from positions of development of national economy of the available innovative capacity of the scientific organizations, enterprise structures, state organizations and enterprises, assistance of commercialization of results of their intellectual activity;

5) formation and development of system of training for the innovative sphere;

6) generation in a business sector of the competitive environment, formation of conditions for increase of efficiency of interaction of the organizations and establishments of the scientific sphere, enterprise structures, the state and active civil society in the innovative sphere;

7) development and implementation of the complex innovative projects aimed at production and realization of hi-tech competitive production, works, services;

8) increase in speed of a transfer of scientific knowledge and technologies between civil and defensive economy sectors.

Innovative activity differs in high degree of uncertainty of results that complicates an assessment of its efficiency. The assessment of efficiency of innovations in the industry has to

be various at different stages of life cycle of an innovation as these stages are characterized by different types of effect, target criteria.

In a general view function of efficiency of innovative process of the industrial enterprise can be written down as follows:

$$\textbf{Efficiency of innovative process} = f\begin{cases} \text{tech} = t = \begin{bmatrix} \text{value if it is positive} \\ \emptyset, \text{if value is negative} \end{bmatrix} \\ \text{mark} = m = \begin{bmatrix} \text{value if it is positive} \\ \emptyset, \text{if value is negative} \end{bmatrix} \\ \text{econ} = e = \begin{bmatrix} \text{value if it is positive} \\ \emptyset, \text{if value is negative} \end{bmatrix} \end{cases}$$

where

tech – a technical component,

mark – a marketing component,

econ – an economic component.

At such assumption efficiency of innovative process takes place only when all three components are positive

$$\textbf{Efficiency of innovative process} = f\begin{cases} \text{tech} = t = [\text{positive value} \\ \text{mark} = m = [\text{positive value} \\ \text{econ} = e = [\text{positive value} \end{cases}$$

It is expedient to take this functional dependence as a basis when developing modern methodical tools of justification of innovative process efficiency at the industrial enterprises. Accounting of efficiency three components: technical, marketing and economic, will allow to give an objective assessment to efficiency which can be reached only at simultaneous achievement of efficiency on the specified three elements.

Conclusion

The institutionalization of interaction of science and equipment, acquisition of systematic, steady and natural character by it is a significant factor of economic development and increase of the industrial enterprises efficiency in modern conditions. The national innovative system promotes a transfer of innovations from the sphere of science to the sphere of production, causes efficiency of this transfer.

Introduction of innovations on the market by the industrial enterprises is carried out on the basis of the debugged tools and mechanisms which reflect and use all features, both industrial structures, and innovations. Thus participation of public authorities represents the integral condition of formation and improvement of the effective innovative environment.

Foreign experience confirms existence of considerable potential at measures of state regulation of innovative activity not only from a position of their balance as a result of direct state participation, but also as a result of actions of indirect support and development of innovative infrastructure. In modern conditions and significant the following mechanisms of the state support of formation and development of national innovative system are the most important: formations and developments of innovative infrastructure; improvement of legal, financial and social institutions.

The assessment algorithm of influence of national innovative system development on efficiency of the industrial enterprises is offered. Process of an assessment of efficiency of the industrial enterprises innovative activity is structured. The assessment of innovative activity efficiency of the industrial enterprises based on understanding of efficiency as functions of three components is structured: technical, economic and marketing, and the formalizing process of an assessment of efficiency.

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Contact

Anna E. Gorokhova, Dr.Sc.
Moscow State University of Mechanical Engineering (MAMI), Humanitarian and Economic Institute of V.S. Chernomyrdin Department of Economics and Industrial Management,
107023, Moscow, Bolshaya Semenovskaya str., 38, Russian Federation
agor_80@mail.ru

Vladimir D. Sekerin, Dr.Sc., Prof.
Moscow State University of Mechanical Engineering (MAMI), Humanitarian and Economic Institute of V.S. Chernomyrdin Department of Economics and Industrial Management,
107023, Moscow, Bolshaya Semenovskaya str., 38, Russian Federation
bcintermarket@yandex.ru