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STRATEGIC MANAGEMENT OF INNOVATION DEVELOPMENT: INSIGHTS INTO A ROLE OF ECONOMIC POLICY

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Abstract. This article justifies the necessity and inevitability of the innovative development of the Russian economy in the transition to a new technological paradigm. The authors substantiate the determining influence of the innovation potential in Russia's GDP growth against the background of the insolvency of other factors – labor, capital – in giving a powerful impetus to economic growth and development. The paper presents the results of comparative analysis of labor productivity in Russia and in the most economically developed countries. The authors conclude that Russia has the greatest growth potential in the field of scientific research and development. Prognostic values of GDP growth are analyzed in three scenarios – basic, optimistic, and ambitious. The study reveals the key success factors and possible barriers to the creation and development of innovations, providing convincing evidence of their influence on the companies' efficiency. Moreover, the paper provides an expanded understanding of the modern innovation tools and stresses the critical importance of their correct choice in solving strategic tasks of the company's innovative development. The authors analyze the role of strategic target-setting in the scale and speed of innovative development of Russian industry. They stress the urgency of Russia's transition to a new technological paradigm, requiring innovative and technological renewal of the entire economic landscape, making the economy truly innovative.

Keywords: innovations; innovative development; industry; business; modernization of the economy; GDP; development scenarios; industrial policy; technological paradigm; Russia

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1. Introduction

Radical changes in most industries happen under the influence of such global trends as the emergence of breakthrough technologies, digitalization, and acceleration of the product life cycle. The purpose of this work was to conduct a scientific analysis of the state and prospects for the innovative development of Russian industry and to present a new vision of strategic goals to bring Russia to the list of most technologically developed countries. In this case, the assessment of the impact of the innovation potential in Russia's GDP growth and the choice of innovative tools to adapt companies to the new reality deserves special attention. Today, Russia finds itself on the highway of movement towards an innovative economy. However, its path is complicated by the accumulation of negative factors of internal and external genesis. Therefore, the relevance of this study is due to the search for ways out of this unique situation.

2. Literature Review

Modern economic processes are characterized by a high rate of transformation. The use of traditional scientific approaches and management models does not provide an opportunity for economic actors to respond quickly to the challenges of the economic environment, as noted by C.K. Prahalad and G. Hamel G in "Strategy as a field of study: Why search for a new paradigm?" (Prahalad, & Hamel, 1994). The crisis shocks of the Russian economy, increasing in number and severity, as well as the persistence of the global challenges that are gaining strength, require new proposals in the field of modern methods of analyzing economic processes, which are more and more often based on the theory of strategic management with the formulation of priorities for innovative development.

The problem of increasing the innovative activity of companies, attention to which is manifested in works by both Russian and foreign scientists, is considered in several aspects. The work "Innovative aspects of development of the waste recycling industry in the new economic context: Problems and prospects" by Y.V. Morozyuk, A.V. Sharkova, I.A. Merkulina and O.N. Vasilyeva (Morozyuk et al., 2017) presents detailed results of a study concerning the problems and prospects of the innovative development of the processing industry in the context of the technological transformation taking place in Russian economy. A broader approach to forecasting the innovative future of the Russian economy can be noted in the series of works by the academician S. Glazyev, one of which is "The economy of the future: Does Russia have a chance?" (Glazyev, 2017). Both of the aforementioned works, as well as this research, are based on the scientific works by N.D. Kondratiev, presented in the book "Problems of economic dynamics" (Kondratiev, 1989). The scholar considers a wide range of the problems of economic cycles, forecasting and planning of economic processes and market conditions, which remain relevant today.

The scientific work "Flexibility and Endogenous Innovation" by R.M. Solow is useful when choosing approaches to the strategic management of innovative development of the industry (Solow, 2005). Solow, the author of the neoclassical theory of economic growth, recognizes the dominant role of physical capital in economic growth and doesn't have a definite position on the attempts to create a theory of endogenous economic growth. On the one hand, he notes the partly endogenous nature of technical progress for the economy. On the other hand, he emphasizes that in the R&D process, there is an exogenous component in relation to the economy as well. Technical progress, as defined by Solow himself is "any kind of change in the function of production". As a result, Solow concludes that the real value of the endogenous growth theory is related to its attempt to model the endogenous component of technical progress as an integral part of the theory of economic growth.

Today, the agenda of the priority problems of Russian companies experiencing a high degree of competition, both in the national market and globally, more and more often includes issues of strategic management of innovative development of the economy. The classical construction of the innovation system at the national and regional levels in their historical perspective became the object of economic analysis in the work by C. Freeman "The

National System of Innovation in Historical Perspective" (Freeman, 1995). Abstracting from globalization processes and not diminishing the importance of foreign international relations of companies, the scientist reveals the importance of implementing innovations by any firm based on the network of relationships that it establishes with its partners. Freeman reveals the fundamental role of state policy, cultural traditions, industrial relations, technical and scientific institutions, as well as national institutions in the innovative development of a country. Historical examples of Germany, Japan and the former USSR are given, illustrating the formation and development of innovative processes. The existing contrast between the state of innovation in the countries of East Asia and Latin America is described as well.

The strategic approach to innovative development is the subject of analysis in "Looking at Innovation Strategies" by S. Mendell and D. Ennis, (Mendell, & Ennis, 1985). This work presents the results of an extensive study and a generalized assessment by the expert community concerning the state of the US industry, which in the second half of the 20th century demonstrated a downward trend in innovative activity. On this basis, the scientists attempt to study the life cycle of the innovation process and its interaction with the life cycle of the company. Understanding of innovation is not given as a process of scientific and technical change, but as its result. The authors suggest using the term "innovation" in relation to truly new and unique products, processes or services.

The development of the understanding of the impact of innovation on economic development can be found in "The Theory of Economic Development" by J. Schumpeter (Schumpeter, 1995), which argues that innovation has a dual effect on the dynamics of economic growth. On the one hand, it opens up new opportunities for economic expansion. On the other hand, it makes it impossible to continue this expansion in traditional directions. Innovations destroy economic equilibrium and bring disturbances and uncertainty into economic dynamics. According to Schumpeter, innovation is accompanied by the creative destruction of the economic system, causing its transition from one state of equilibrium to another.

The work by Y. Salleh and W.K. Goh entitled "Managing Human Resources Toward Achieving Knowledge Management" (Salleh, & Goh, 2002) is devoted to the role of a person in the creation of innovation. The authors emphasize that the individual plays a fundamental role in the creation of new knowledge, creates an increment in the pool of organizational knowledge, which acts as an engine for the growth and training of an organization, increasing its innovative activity. Similar claims can be found in "Manager's perceptions of learning in new product development" by U. Koners and K. Goffin (Koners, & Goffin, 2007). According to the researchers, companies must ensure that every project developing a new product leads not only to its successful creation but also to the training for the entire organization. The continuation of these views can be found in the work by Russian scientists V.D. Sekerin and A.E. Gorokhova "Assessment Technique of Innovative Production Competitiveness" (Sekerin, & Gorokhova, 2016), suggesting ways of assessment of the competitiveness of innovative products from the standpoint of the formation of key competencies of the learning organization.

A critical assessment of the narrow view on innovation, which is often found in scientific publications of the end of the last century, is given in the work by M. Sawhney, R.C. Wolcott and I. Arroniz "The 12 different ways for companies to innovate" (Sawhney et al., 2006). The scholars believe that a narrow approach to understanding innovation blinds companies and makes them vulnerable to competitors with broader perspectives. This is explained by the fact that single-industry companies, having the same customers with the same needs, make similar proposals, while using undifferentiated capabilities and processes, demonstrating the tendency to recurring innovations. Asking what innovation is, the researchers tried to find the answer from the position of corporate management: faced with slow growth, commercialization and global competition, many CEOs see innovation as something critical for corporate success. It is emphasized that the general director should avoid short-sightedness when constructing strategic priorities in the field of innovative solutions.

The analysis of modern determinants of innovative activity of companies is the topic of the study presented in the article by M. Hermann, T. Pentek and B. Otto "Design Principles for Industrie 4.0 Scenarios" (Hermann et al., 2016). The researchers associate innovative development and change with the entry of industry into a new phase of Industry 4.0, associated with the development of computer technology in order to increase profitability and productivity. The authors believe that the growing use of social networks in recent years has forced companies to show their presence on these platforms and use social media as the main source of information that is meaningful to them. The evidence base of the study is associated with a comparative analysis of leading companies providing research/consulting services in the field of information technology, as well as companies working in the field of enterprise resource planning.

A broader view of the factors of innovation development, also related to the Fourth Industrial Revolution, is reflected in the article by G.P. Li, Y. Hou and A. Wu "Fourth Industrial Revolution: Technological Drivers, Impacts and Coping Methods" (Li et al., 2017). In addition to digital technology, the authors draw attention to physical and biological technologies that have reached unprecedented development and have found their application in various industries. The researchers do not just describe the specific technological niches of each type of technological driver; they assess the impact of the Fourth Industrial Revolution on global industrial, economic and social development as well. The authors also suggest possible measures and policies for governments and firms, which would help them overcome modern technological challenges.

In the work "Relationship between cooperation networks and innovation performance of SMEs" by S.X. Zeng, X.M. Xie and C.M. Tam (Zeng et al., 2010), the complexity of innovation processes is noted, which has led to a significant increase in the use of external networks by small and medium-sized enterprises. The study found that there are significant positive relationships between inter-firm cooperation, cooperation with intermediary institutions, research organizations and the innovation activities of small and medium-sized enterprises. Of all the interactions, only inter-company cooperation has a significant positive impact on the innovative activity of enterprises, while relations and cooperation with government agencies do not have a significant impact. In addition, the work indicates a more prominent role in the innovation process of enterprises of vertical and horizontal cooperation with customers, suppliers, rather than those of horizontal cooperation with research institutions, universities or colleges and government agencies. There are a lot of other works, which analyze various facets of clustering phenomenon and its impact on technology transfer and innovation creation and regional development (e.g. Tvaronavičienė, Razminienė, 2017; Bublienė et al., 2019; Eddelani et al., 2019).

3. Methods

The study is based on a synthesis of scientific positions of foreign and domestic researchers and economists, whose interests lie in the sphere of innovations, including the innovation and technological modernization of industrial enterprises. The authors rely on the concept of periodic fluctuations in economic activity (Konratiev, 1989), the concept of national innovation systems (Freeman, 1995), innovation theory (Schumpeter, 1995); process (Glazev, 2017) and objective (Mendell, & Ennis, 1985; Baltgailis, 2019) approaches to understanding the essence of innovation. The statistical data of the World Bank, the International Monetary Fund, the Federal State Statistics Service, the international consulting firm McKinsey & Company, and other authoritative organizations served as an information base for this study. Formalization and generalization of the research findings were conducted using general scientific methods of cognition: the dialectical method, the method of analogy, analysis, and synthesis, as well as using special methods of empirical knowledge: scientific forecasting, analysis of economic and statistical indicators, comparative analysis and Delphi exercise.

4. Results

4.1 The determining influence of the innovation potential in Russia's GDP growth

Today Russia faces ambitious goals to increase GDP growth by introducing innovations because other factors do not have significant potential (Russia: Commitment to Innovations, 2015). After the rapid growth in the early 2000s, the crisis of 2008, the subsequent slow growth and the current recovery from the 2014-2015 crisis, the issues of accelerating GDP growth come to the fore within the context of a decline in working-age population and a turbulent economic environment. In 2017, the global GDP grew by 3%, which is significantly higher than Russian growth rates (Figure 1). In recent years, the role of the working age population – one of the GDP drivers – is rapidly declining. At the same time, in terms of unemployment, Russia is comparable to developed countries (5.1% in Russia versus 4.4% in the UK in 2017). In general, the current situation correlates with the global trend of the aging population. Therefore, this factor does not imply a significant contribution to GDP growth. Since 2008, there is an increasing trend for declining investments in fixed assets (Glazev, 2017). In the coming years, its dynamics may change to the opposite (Figure 2). However, despite the gradual recovery of investment volumes to the level of 2013-2014 and a positive attitude in the business environment, geopolitical risks and a high degree of uncertainty regarding its contribution to GDP persist.

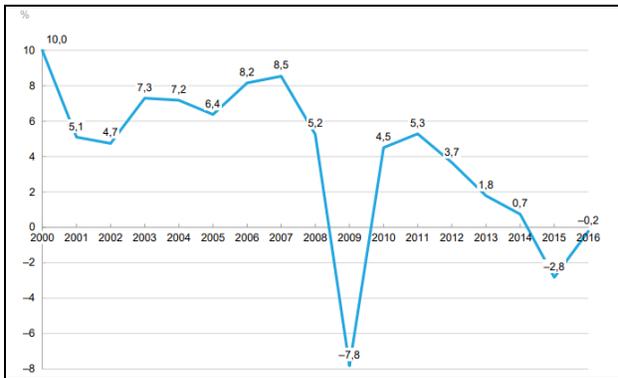


Fig.1. GDP dynamics in Russia

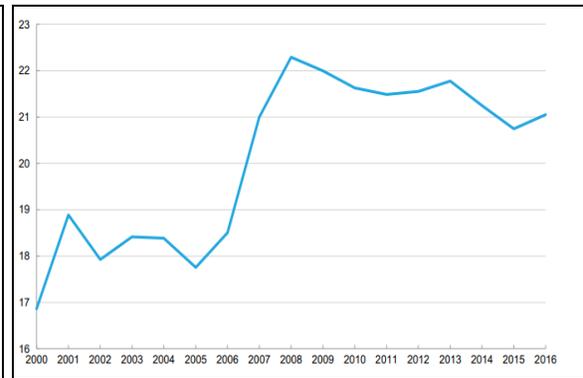
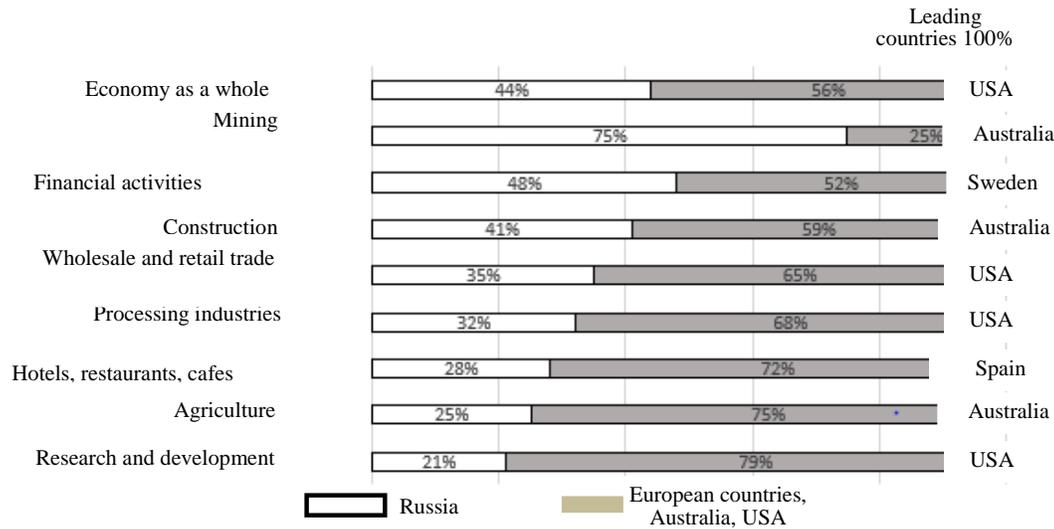


Fig.2. Investments in fixed capital in Russia, % of GDP

Source: World Bank www.worldbank.org

The analysis of trends in the availability of financing, based on the key rate of Central Bank in recent years, shows an increase in this indicator since the last crisis (17% at the beginning of 2015 and 7.25% in June 2018). A similar situation is observed in many other countries. In terms of labor productivity in various sectors of the economy, Russia retains a significant growth potential being the most tangible in the field of research and development (Figure 3). As follows from the example of South Korea (Li et al. 2017), this factor is amenable to transformation in the foreseeable time horizon. Thus, it is the productivity increase achieved through innovation that can become a driver in GDP growth in Russia.



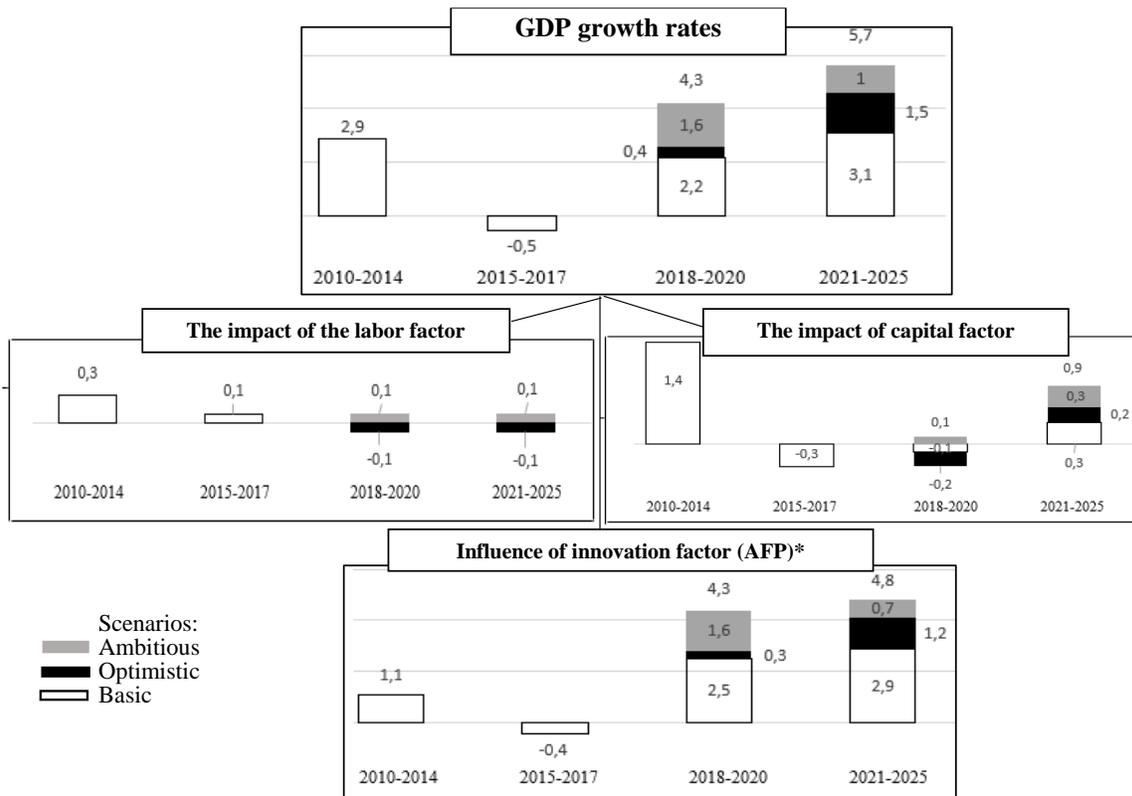
The average for countries: United Kingdom, Germany, Spain, Italy, Finland, France, Sweden
 The average for countries in research and development: Great Britain, Italy, Finland, France

Fig.3. Labor productivity in Russia in 2016 compared to the European countries, Australia and the USA (GDP in terms of purchasing power parity per employee, % of the leading country)

Source: IMF; Rosstat; Australian Bureau of Statistics; Eurostat; IHS Markit Comparative Industry 2018q1; U.S. Bureau of Statistics

Since 2010, the contribution of the productivity factor – innovation – has had significant impact on GDP growth: in 2010-2014, it provided 1.1% of the country's annual GDP growth. Depending on the scenario, the predicted values of GDP growth differ significantly (Figure 4).

In the basic scenario of the Ministry of Economic Development, GDP growth until 2020 is about 2.2%, which is higher than the GDP growth rates of recent years, but not enough to achieve the average global growth rate. In the optimistic scenario, GDP growth rates are close to the world average (about 2.6% per year) with innovations and an increase in the capital factors as the main contributors to GDP growth. The ambitious scenario assumes implementation of the target to increase GDP per capita by 1.5 times due to the activation potential of innovation in the coming years with a view to increasing the annual GDP growth to 5.7% in 2021-2025. This would allow Russia to enter the fifth place among the global economies and outpace the global average growth rate (The Ministry of Economic Development of the Russian Federation, 2017).



* Aggregate factor productivity reflects the impact of innovation on the economy in a broad sense and is calculated as the total GDP growth minus the factors of production (labor and capital)

Fig.4. The change in the influence of three factors on GDP growth

Source: The World Bank; the Ministry of Economic Development of the Russian Federation; Rosstat; FRED

The fact that the dynamics of innovation development in Russia based on the assessment of the innovation component of the World Economic Forum global competitiveness rating demonstrate a positive trend (an increase of 29 points over four years) speaks in favor of the optimistic and ambitious scenario. However, the growth potential compared with the leading countries (in terms of GDP) still persists (Table 1).

Table 1. Innovative component of the global competitiveness ranking

Country	Place in 2013	Place in 2017	Dynamics
Switzerland	2	1	↑ + 1
USA	7	2	↑ + 5
Israel	3	3	0
Finland	1	4	↓ - 3
Germany	4	5	↓ - 1
Korea	17	18	↓ - 1
China	32	28	↑ + 4
Czech	37	36	↑ + 1
Spain	34	42	↓ - 8
Russia	78	49	↑ + 29

Source: The Global Competitiveness Index, World Economic Forum

Therefore, the emerging positive trend of Russia's innovative development is a clear testimony of its global competitiveness under the conditions of the new reality.

4.2 Innovations as instruments for flexible adaptation of companies to the new reality

Best practices in the development of innovations include both specific principles for working with innovations (Sawhney et al., 2006), and specific tools (Salleh, & Goh, 2002; Koners, & Goffin, 2007). Global experience shows that innovations require systematic management of each of the following five success factors:

1. Innovative strategy and ambitious goal-setting is a key success factor for innovations. A business strategy and goals should include innovative priorities, key instruments to achieve them, as well as quantitative and qualitative key performance indicators (Mendell, & Ennis, 1985; Prahalad, & Hamel, 1994).
2. It is important for companies to conduct the broadest possible search for opportunities (tracking trends, identifying consumer interests and expectations) for early identification of opportunities and threats to the business, for creation and development of new business models based on competitive advantages, for systematic work with better opportunities, to define a set of external partners providing access to a large number of advanced approaches and technologies (Marsh, 2015).
3. To ensure the successful development of innovations, companies need to implement an appropriate organizational structure; have the resources (finance, personnel, skills); be flexible in redistribution of resources for the development of innovations (Solow, 2005).
4. Companies need to pay particular attention to the system and management processes. It is important to ensure effective technologies for working with innovative projects and the mechanism of portfolio management, to master the principles of risk management (Hermann et al., 2016).
5. Companies need to create an internal culture of innovations, give them high priority, involve all employees in this process, stimulate the search and elaboration of new ideas (Zeng et al., 2010; Sekerin, & Gorokhova, 2016).

Furthermore, companies need to efficiently reallocate resources. Those companies that redistribute resources more often achieve greater success in implementing long-term breakthrough innovations. Thus, the share of budget redistribution among high-performing innovative companies is 5-20%, among low-performing ones – up to 5% (McKinsey Innovation Practice Development Center, 2018). High-performance companies spend much more resources on introducing radical (38% of the innovation portfolio resources) and breakthrough (28%) innovations. For low-performing companies, these values account for 23% and 10%, respectively. World experience shows that even the introduction of one key factor to the success of innovations can significantly increase the average performance of the company, and the introduction of 3-4 factors provides a significant competitive advantage (Figure 5).

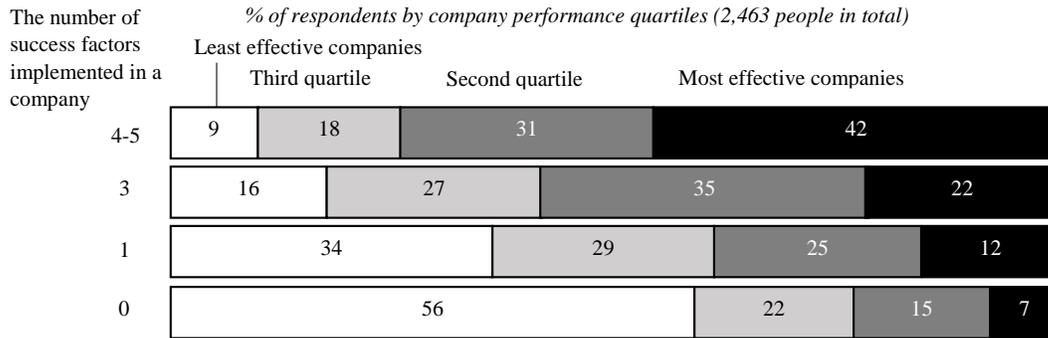


Fig.5. The influence of success factors on the effectiveness of innovation

Source: Compiled by authors

The above implies a very important conclusion about the critical importance of the proper choice of adequate innovation tools (Schumpeter, 1995) corresponding to the strategic objectives of the company's innovative development. Despite the fact that a company's executives understand the need to manage innovations, not all of them are confident of its success. This is because from time to time they face several difficulties – among which the most significant are: traditional corporate culture (36% of the respondents), poor understanding of trends (26%), lack of professionals (25%), inefficiency of the organizational model (24%), lack of the necessary IT infrastructure (23%), lack of funding (21%) (CB Insights University, 2018).

The global practice shows that obstacles to creation and development of innovations in companies are observed in each of the five key success factors (in Russia as an inexhaustible source of growth):

1. In terms of goal-setting, companies often lack an innovative strategy for capturing target customer segments and targeted customer service awareness, which would entail an innovative strategy, as well as ambitious goal-setting.
2. Working with the sources of ideas for innovation is often chaotic and reactive in nature and is done only following negotiations with clients or the introduction of a new product to the market by competitors. Work on innovation is often limited by the scope of the company.
3. The organizational structure of a company often lacks resources and personnel with the necessary skills to manage innovations. Operational goals and innovations come into conflict when the same people are involved in both processes.
4. Innovation managers often skip a preliminary assessment of potential and avoid prioritization in building the innovation portfolio. The elements of project management are not used systematically, while there is a shortage of methods and competencies.
5. In a corporate culture, there is a poor understanding of common goals, which is necessary for effective cross-functional interaction, as well as low risk-tolerance when testing innovations at all company levels. Business managers should regularly assess the effectiveness of innovations in the company, develop a targeted strategy of innovation, identify priorities, and build a systemic work on success factors for innovations.

5. Discussion

Earlier, the government's role in the innovation process was to create an innovative environment in which all market participants could effectively develop and introduce innovations, as well as to sponsor basic research and new developments. In today's increasingly complex world, with a high degree of mutual penetration of industries and a growing rate of change, the government's role becomes even more significant (Morozuk et al., 2017). By

pursuing the policy of innovative development of the country, including the development and implementation of an industrial development strategy, the government does not only provide financing to strategically important promising projects but also directly affects industries' innovative development.

Conclusions

In today's reality, innovations serve as an effective tool for solving strategic tasks throughout the national economy (Freeman, 1995) and each specific company, because they determine the acceleration of development rates, strengthening leadership and competitive advantage, and provide timely protection from damage to the industry in the case of introducing radical innovations that make economically inexpedient the entire areas of business. Several industries in the Russian economy are promising for the development of innovations. They have the necessary scale of production (oil and gas, energy, metallurgy, etc.) and can become the driving force behind the introduction of breakthrough technologies and the national innovation centers (Knyaginina, 2017).

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