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VARIATIONS OF RUSSIAN ECONOMY INNOVATIVE GROWTH

***Abstract:** to build an integral innovation ecosystem that allows organize the building up of innovative potential, effective use and increase the competitiveness of Russia in a dynamically changing market environment it's necessary to require a systemic transformation of all spheres of human activity. The paper analyzes different variations of conditions that determine the formation of an innovative economy and an increase in the country's rating at the global level. The main factors that have the maximum impact on the innovation activity resulting indicators are investigated. Innovative development forecast models are constructed depending on the changes intensity in factors that are sensitive to variations in global trends. The need for a systemic restructuring of the traditional economic structure is argued. Scientific and practical recommendations are proposed for increasing innovative activity and increasing the digital culture of Russian economic entities taking into account the existing opportunities and potential of world leadership.*

***Keywords:** crisis, efficiency, gross domestic product, innovation ecosystem, crisis management, innovative development.*

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ВАРИАНТЫ ИННОВАЦИОННОГО РАЗВИТИЯ РОССИЙСКОЙ ЭКОНОМИКИ

***Аннотация:** для того, чтобы построить интегральную инновационную экосистему, которая способствовала бы росту инновационного потенциала, более эффективному использованию и увеличению конкурентоспособности России в условиях динамично развивающегося рынка, необходима систематическая трансформация всех сфер человеческой деятельности. В данной работе анализируются различные условия, которые должны определить развитие инновационной экономики, а также рост показателей страны на глобальном уровне. Рассмотрены основные факторы, оказывающие максимальное воздействие на итоговые показатели инновационной деятельности. Приведены примеры моделей прогнозов инновационного развития, зависящие от интенсивности изменений факторов, склонных к таковым в мировой тенденции. Доказывается необходимость системообразующего реструктурирования традиционной экономической системы. Предложены научные и практические рекомендации для увеличения инновационной активности и сущностей цифровой культуры российской экономики в условиях существующих возможностей и потенциалов мирового первенства.*

***Ключевые слова:** кризис, продуктивность, валовой внутренний продукт, инновационная экосистема, антикризисное управление, инновационное развитие.*

The economic development of Russia in the current conditions of increasing globalization and world technological evolution is characterized by a significant tightening of the requirements for the formation and justification of the strategy of

innovative activity and the definition of its priority areas that determine the growth of scientific and technological progress and status in the world market. According to the estimates of foreign rating agencies the level of efficiency of the development of the Russian economy is significantly lower than the indicators of the leading countries (Switzerland, Sweden, the USA, Great Britain, the Netherlands) [1, 4]. Dynamics of key indicators of innovativeness of the Russian economy (fig. 1) reflects the absence of positive effects from the ongoing changes in the field of transformation of economic structures and ongoing programs of innovative development. In the period 2018–2020 there is a decrease in the values of indicators of innovative resources, digital competitiveness, and the possibility of superiority in a competitive market.

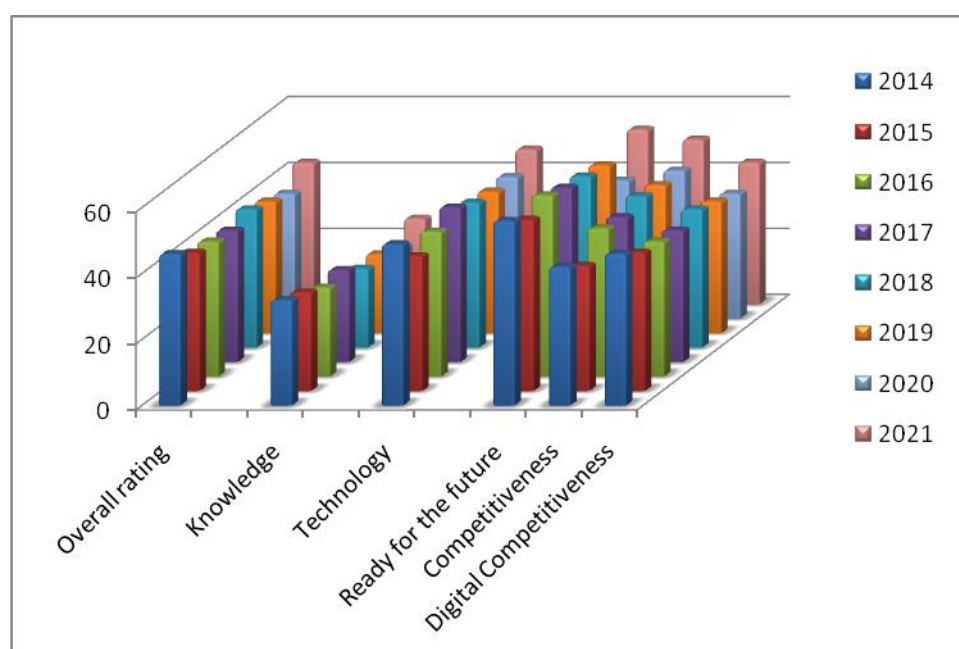


Figure 1. Russian economy development effectiveness dynamics

Considering the ways out of the country from the current situation, the Ministry of Economic Development of Russia identified two scenarios for increasing the country's competitiveness in the global market by 2030:

Conservative: not involving fundamental changes in existing approaches to the functioning of the economic system and based on the exploitation of energy and raw materials.

The main drawback of this scenario is the lack of effective measures to improve strategic planning, stimulate investment in changing organizational and managerial

structures and the interest of economic entities in innovative transformations and the formation of a competitive market, to increase human resources and management quality at all levels of the production hierarchy.

Innovative: requiring reaching a new level of efficiency through the innovative transformation of the traditional economic system, the formation of an innovative ecosystem based on the IIS triad (innovation, information, intelligence) and allowing a high-level organization of building up innovative potential, its effective use and increasing the country's competitiveness in a dynamic changing market conditions.

In our opinion, which coincides with the opinion of the majority of domestic economists, the second scenario is more promising and guarantees real economic growth. However, its implementation is accompanied by an increase in risks, the presence of a large number of barriers and insurmountable problems. As a result, the achievement of the planned indicators by 2030 requires significant efforts, both on the part of the state and on the part of business, science and education.

The purpose of this article is the economic interpretation of the predicted results of Russia's innovative development, the argumentation of the need for a systemic restructuring of the traditional economic structure and the development of scientific and practical recommendations for increasing innovative activity, increasing the digital culture of economic entities, taking into account the existing opportunities and potential of world leadership.

According to the innovation scenario outlined above by the end of 2021 the economy is supposed to enter the trajectory of gradual improvement and achieve national development goals. In accordance with this it is necessary to form a basic model of innovative development focused on building an innovative ecosystem as a backbone component for the implementation of national plans. Its main purpose is to initiate and stimulate the economic entities innovative activity, build up nanotechnologies and diffusion of innovations into all areas of economic activity.

Analyzing presented in fig. 2 the dynamics of the main indicators of the Russian economy development effectiveness we can note a downward trend in their growth rates in the period 2019–2021, which leads to a low degree of resistance to external

factors and a decrease in competitiveness [2] Building an innovation ecosystem will contribute to the elimination of low-performance attributes of economic development and increase the effects of the impact of innovation growth drivers which will positively affect the dynamics of these indicators and the growth of gross domestic product (GDP).

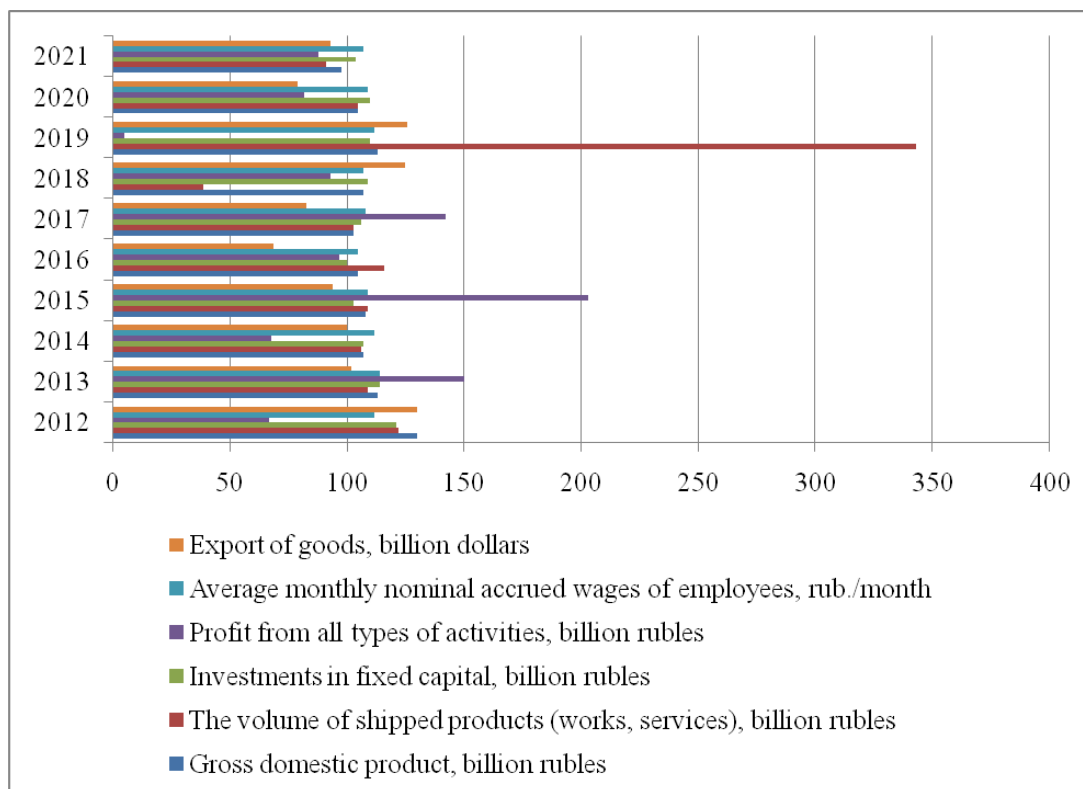


Figure 2. Dynamics of the economy efficiency development

Studies of the Russian economy effectiveness based on the analysis of the works of modern economists and statistical data allow us to conclude that the most significant impact on GDP growth of progressive technologies developed at enterprises of the military-industrial complex. The development of an innovation ecosystem involves the spread of existing innovations to all sectors of the domestic economy and a shift in the focus of innovation development to other areas of scientific and technological developments [3] For this purpose it is necessary: to improve the regulatory and legal framework; to build up the scientific and human potential of economic entities; to stimulate the domestic enterprises personnel innovative activity; to develop the interaction between the state-science-education-business; to reduce of administrative barriers that impede the development of innovative activities of economic enti-

ties; to stimulate relationships between enterprises of industries on the issues of commercialization of innovations and innovative projects; to increase digital literacy and culture of economic entities; to improve the quality of management through the modernization of organizational and managerial technologies and the implementation of structural changes in the activities of economic entities; to develop the R&D&I structures that ensure the growth and spillover of knowledge, the effective use of human and innovative potential, the achievement of strategic goals, etc.

Modeling the efficiency of the Russian economy taking into account the impact of the proposed recommendations on the formation of an innovation ecosystem on the resulting indicator of the effectiveness of its development (Gross domestic product, billion rubles – Y) based on the selection of factors from the set of X_i that have the maximum impact on Y , made it possible to overestimate the possibilities of its growth, not fully explored in the well-known simulation models. All the studied factors were normalized during the study. As part of the factor analysis by the method of principal components, the factors reflecting the relationship between the indicators of the model at a level below 10% were excluded from the data set. Selected factors X_2 (investment in fixed capital), X_5 (export of goods) and X_6 (import of goods), whose contributions to the total dispersion are respectively 49%, 15% and 22% (i.e., in total explaining 86% of the total variance) according to the Bartlett criterion, do not correlate with each other. The subsequent regression analysis was carried out using the Statistica program (Table 1). The resulting economic and mathematical model has the form: $Y = 735,1 + 5,9X_2 + 79,1X_5 - 156,1X_6$ (1)

The reliability of the model is confirmed by the indicators presented in Table 1, which characterize its adequacy and significance: $R^2 = 0.986$, $F_{fact} > F_{tabl}$, $P\text{-value} < 0.05$.

It should be noted that the influence of the X_6 factor on the change in GDP in the period under review has a negative elasticity coefficient which characterizes the underdevelopment of the import substitution process which slows down the replacement of imported goods with domestic ones and GDP growth. This suggests that the Russian economy is still highly dependent on imported goods, investments in innovation

do not bring the expected effects, import substitution plans are not fully implemented, and domestic innovative products have low competitiveness in foreign markets.

Table 1

Regression analysis of empirical data

Regression Summary for Dependent Variable: Y						
R= ,99327143 R ² = ,98658813 Adjusted R ² = ,98084019						
F(3,7)=171,64 p<,00000 Std.Error of estimate: 2763,4						
N=11	b*	Std.Err. of b*	b	Std.Err. of b	t(7)	p-value
Intercept			735,100	7678,401	0,09574	0,04926
X2	0,998529	0,050107	5,945	0,298	19,92807	0,00000
X5	0,350747	0,128869	79,123	29,071	2,72174	0,02969

Thus an economic-mathematical model (1) has been obtained which provides ample opportunities for interpreting the performance indicators of the Russian economy innovative development. In particular the work recalculated the GDP forecast for the period 2021–2024 taking into account the influence of the parameters of the innovation ecosystem (Fig. 3). The graph clearly shows its positive impact on GDP: growth for the period 2021–2024 is 53%.

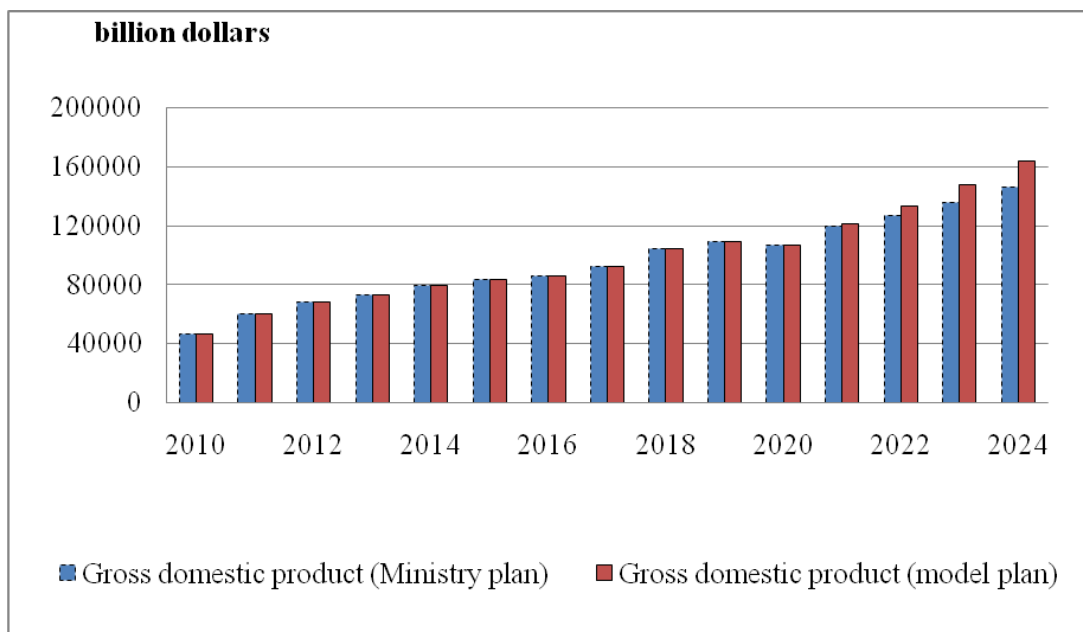


Figure 3. Forecast of the GDP dynamics calculated in accordance with the model (1)

Summarizing the study we can conclude that the innovative scenario for the development of the domestic economy is a priority since it guarantees better results compared to the conservative scenario. The development of an innovative economy

will allow shifting the existing accents of the functioning of economic entities towards progressive cooperation and creating favorable conditions for the formation of an innovative ecosystem that enhances competitive advantages through scientific, technical and technological development.

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