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MODERN ASPECTS OF RUSSIAN ECONOMY MODERNIZATION

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Abstract

The article discusses the matters of modernization of the Russian economy. The modern world economy is developing on the basis of new global commodity markets and new technologies. The key condition for the sustainable development of the national economy is the modernization of the economy based on the definition of key industries, science and education areas. The basis of this process is the scientific potential, which in modern conditions has turned into a determining element of the productive forces of society. Effective practical use of scientific potential makes it possible to increase the competitiveness of the national economy and ensure sustainable rates of economic growth. The isolation of the Russian economy from the latest created technologies leads to the organizational, administrative and technical lag of the national business, which results in the loss of Russia's position in the world markets of high-tech products. The formation of a balanced Russian economy is possible on the basis of an economic model based on modern industry, focused primarily on domestic consumptive and industrial demand. It will also allow Russia to transform export in favor of high-tech products with high added value. The most important target setting of innovative transformations in Russia is progress in the social sphere, improving welfare of the population, and human capital development.

Keywords: Economic modernization, innovation policy, technological transformations.

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1. Introduction

The technological lag, typical for Soviet economy intensified as a result of the negative consequences of radical market reforms in the early 90s, but, on the other hand, there was a certain cleansing of the technological structure from obsolete industries under the influence of external competition. The economic down-turn, a fast decrease in investment activity, a decrease in effectual demand led to the formation of socio-economic problems of a systemic nature, many of which have not yet been overcome.

State macroeconomic regulation and significant budget expenses were aimed, first of all, at overcoming crisis processes and gradually transferring the national economy to a state of sustainable economic growth. Due to this, the problems of modernization of the Russian economy did not arise immediately. As the economic situation of the Russian economy stabilized, the need for a transition to an innovative type of development, which was recognized by both the state and representatives of business and science, increased. In the second half of the 90s, federal government bodies began to develop drafts of legal documents aimed at supporting and developing innovative activities in order to ensure balanced growth of the national economy.

Modernization of the economy contemplates the formation of a complex set of interactions between representatives of the state, science and business in the context of the national innovation system, the construction of which is one of the strategic goals of economic policy.

The most significant program documents that determine the course of innovative economic policy at present include the Innovation Development Strategy of the Russian Federation for the period until 2020. It summarizes the problems of innovative development, states priorities for the development of the Russian economy, defines priority areas for the development of innovations, sets out the goal of strengthening the role of Russia as one of the world economic leaders.

The modernization potential lies in the transition to economically sustainable development, structural and technological restructuring of the economy, which allows for efficient resource saving and reduction of environmental pollution. The implementation of innovations, scientific and technological progress, development of information technologies, new materials, products and technologies can reduce costs of natural resources and pollution per unit of output and services by several times. Technological rationalization of the economy and its structure can free up 30–50% of the total volume of currently used inefficient and wasted natural resources with an increase in the final results and a significant reduction in the pollution level. Modernization of the economy will significantly increase economic resources use efficiency, move towards sustainable and balanced economic growth, and increase level of well-being of the population.

2. Problem Statement

The characterization of modern areas of modernization of the Russian economy with the identification of problems and the assessment of the prospects for the formation of a balanced, sustainable and competitive national economy is stated as the research problem.

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3. Research Questions

This article raises the following key questions:

- define the concept and constitutive elements of the economy modernization process;
- review the features of the Russian economy modernization process at the current stage;
- bring out the problems of the Russian economy modernization;
- define the promising areas of the Russian economy modernization.

4. Purpose of the Study

The aim of research is to define the promises of the Russian economy modernization from the perspective of ensuring sustainable and balanced economic growth.

5. Research Methods

The framework of studies consists of general scientific methods, such as system, logical, historical, comparative, predictive, as well as the method of complex economic analysis.

6. Findings

Modern economic literature presents many approaches to the definition of modernization (Polterovich, 2010). The most important is the concept of modernization as a renewal of all components of economic growth, formation of economy of an innovative type (Anosova, 2010).

Modernization involves structural, technological and institutional changes aimed at improving the competitiveness of the national economy. The main components of modernization are:

-structural changes in the economy aimed at increasing the share of high-tech products in GDP;

- development of human and intellectual capital;

- integration of the country into global innovation processes.

A special place in the modernization of the economy is given to the state. Foreign and domestic economists note that the methods of state regulation of economy executed in the industrial economy do not correspond to the current stage of economic development (Blyakhman, 2013). The concept of market self-regulation justified by A. Smith, that has never really been the only economic regulator, has also shown its insolvency (Stiglitz, 2003).

Within the framework of abovementioned it should be noted that one of the key conditions for the modernization of the Russian economy is the formation of an effective mechanism of state regulation in the following areas:

-institutional modernization;

- technological modernization;

- innovative modernization.

The implementation of these areas is possible under the condition of a new model of relations between the key elements of the innovation system - the state, business and science, the formation of the so-called “triple helix” of relations between subjects of innovative activity (Itskowitz, 2010). This model is common for post-industrial stage of economic development and involves close interaction between state,

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business and science, where the active role of the state is executed through knowledge production and advanced technology support, the formation of infrastructure for innovation. The key positions in the production of knowledge are given to universities.

A spectacular example of execution of the "triple helix" model is Silicon Valley in the United States. First the model introduced a "double helix" – "business-science" and "science-state". The key scientific base is formed by Stanford University and the Massachusetts Institute of Technology. Universities conducted not only fundamental, but also applicative developments focused on real business. Later the "triple helix" model – state-university-business - was formed. The state provides the transfer and protection of intellectual property of development rights and financial support (Kasenov, 2013). In modern conditions the "triple helix" model acts as the basis for the formation of a national innovation system.

In Russia, the "triple helix" model is in stage of formation. In a socialist economy, the relationship between science and production was completely controlled by the state. The specific features of the formation of the "triple helix" in Russia are determined by the following:

-often copying foreign experience without taking into account national specifics. In particular, priority is given to the development of scientific research on the basis of higher educational establishments. At the same time, the base quantity of scientific research in Russia falls on the institutes of the Russian Academy of Sciences (Ivanov, 2012). At the same time, higher educational establishments carry out the most of training of specialists, including the highest qualifications, with a rather weak scientific base and small amounts of R&D funding;

- the scientific and technical policy and organization of certain R&D areas is carried out by ministries and agencies, which often duplicate each other's functions;

- low innovative business activity. In the leading economies of the world, 85% of GDP growth is provided by new technological developments, in Russia this index is about 25%. The United States accounts for 36% of high-tech products, while the share of Russia is about 0.5%. Instead of its own developments, Russian business prefers to import new technological developments and equipment, that is, technological updating is done by borrowing of foreign knowledge, which is not always advanced. This situation can result in the persistence of technological lag;

- insufficient public R&D funding. Analyzing the distribution of world R&D expenditures, the leading position of the United States should be stand out, which accounts for 35% of world expenses, the countries of the European Union with a share of 24%, Japan – 12%, China – 12%. Russian share is lower than 2% of the world R&D expenses. In terms of nanotechnology funding, Russia ranks 19th in the world. In recent years, there have been positive trends associated with the growth of R&D funding by large companies that form their own research structures or fund R&D carried out in state organizations and higher educational establishments;

- weak interaction of scientific structures between themselves and the business sector. The executed scientific developments do not always meet the interests of business structures.

The "triple helix" model has a significant flaw due to the inability to use the creative potential of the whole society. In 2009 American economists Carayannis and Campbell (2012) proposed a concept of "quadruple helix". The subjects of "quadruple helix" are state, science, business and society. Society is

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reflected in the activities of various organizations (parties, public associations, unions), the media, individual citizens who belong to the “creative class” (Kleiner & Petrosyan, 2005).

The interaction between the state and private business is carried out through the placement of state orders, co-financing of business projects. Public companies interact with private ones, often being their direct competitors. The interaction between the society and business occurs in the line with companies owned by public organizations, as well as national enterprises. The interaction between the society and state is carried out in the line with legislative, executive and judicial authorities.

The "quadruple helix" model allows more fully harmonizing the interests of participants of the innovation process and expanding the pool of participants by attracting various social strata.

In Russia, at the executive branch of the government level, clear understanding of modernization of the economy from the point of view of realism and systemacity, is absent. Most often, certain sectors of the economy that act as priorities for economic development are indicated: aerospace, shipbuilding, energetics, medicine, information technology. At the same time, it is necessary to implement modern technologies in traditional industries (Tsvetkov, 2010). Assessing the prospects of modernization of various industries, it is necessary to compare resource capabilities, namely the availability of capacities for the production of high-tech equipment, the quality of training of specialists, sources and volumes of funding. We can agree with the opinion of economists that a haphazard interpretation of the essence of modernization will not allow to achieve significant positive results (Kablov, 2010).

Systematic approach to the modernization of Russian economy is required to execute based on the following principles:

-definition of the main areas of modernization;

- the selected areas of modernization should have the complementarity with each other;

- the selected areas of modernization should rely on the achieved base and further shape Russia's advantages in the system of the international division of labour;

- it is required to define the sequence and interconnection of the stages of modernization in order to cover most of the Russian economy in accordance with the strategic objectives of development.

There are different points of view on the determination of priority areas for the modernization of the Russian economy. From the point of view of a systematic approach, four main areas can be defined.

1. Modernization of traditional industries, primarily the fuel and energy complex. Many economists and politicians consider the raw material model of the Russian economy unpromising. Although based on existing realities, the fuel and energy complex retains the status of a key sector of the Russian economy, influencing the level of its global competitiveness. Therefore, the fuel and energy complex should be the first area of modernization. The implementation of modern technologies will increase the hydrocarbon recoverability, increase the degree of processing of raw materials from 72% to 90%, obtain additional 25% of oil products, and increase labor productivity and environmental friendliness of production (Tsvetkov, 2010). Modernization of the fuel and energy complex will lead to an increase in demand for high-tech engineering products, electronics, and qualified specialists. The modernization of raw materials industries will serve as a starting point and will provide an opportunity to accumulate financial resources for the modernization of other sectors of the Russian economy.

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2. "Catching-up" and "advanced" modernization. The essence of “catching up” modernization is to restore the industry of Russia at the modern technological level, reducing the gap with leading economies. This area of modernization causes a lot of discussion, having supporters and opponents. The main arguments of the opponents of this area are that the ongoing reforms will persist the technological lag of the Russian economy and will not allow it to achieve competitiveness in high-tech industries (Glazyev, 2009).

"Advanced modernization" involves occupying a niche in promising areas of technological development (nanotechnology, biotechnology, genetic engineering, etc.). When assessing this area, it should be noted that in modern conditions it can be implemented in the military-industrial complex and the aerospace industry (Inozemtsev, 2010). At the same time, there are separate areas where disruptive developments exist in Russia (supercomputers, nuclear reactors). The implementation of the area of "advanced" modernization is possible subject to the following conditions:

-creation of competitive industries on the basis of innovative developments;

- the formation of innovative clusters – a complex of complementary industries.

3. Reindustrialization of the Russian economy. This area of modernization involves acceleration of technological development of the Russian economy, restoration and modernization of production based on disruptive innovation, the creation of new high-tech industries. The main problem of this area is the selection of priorities, since reindustrialization cannot be carried out on the scale of all traditional industries of the country's economy. The following industries can be the priority: military-industrial complex, agriculture, construction, transport, energetics, pharmaceutical industry, consumer product manufacturing, infrastructure. Reindustrialization will have a positive impact on the labor market, creating additional jobs.

The implementation of this area is possible subject to the following conditions:

-the state develops a mechanism for attracting investment in high-tech industries;

- the formation of infrastructure for the location of economic activity at the regional level;

- creation of a legal base and social conditions for the implementation of high-tech business projects.

4. Formation of a system of state strategic planning for economic development. In the context of the global economic crisis of 2008, many countries have revised approaches to state planning of social and economic development. As mentioned above, the concept of market self-regulation is forever filed as a history. Most highly developed countries consider strategic planning as priority area for state regulation of the economy. An absence of strategic planning on the scale of the national economy can lead to uncertainty of social and economic development for extended periods of time. This is also confirmed by the Russian practice of the first twenty years of market reforms. In counterweight, there is the experience of economic reforms in China over the past forty years, which were based on state strategic plans. Therefore, we can conclude that state strategic planning is an important area of modernization and consists in developing a long-term economic strategy, fixed in plans and programs, with their subsequent phased implementation.

In 2011 The Government of the Russian Federation approved the “Strategy for the innovative development of the Russian Federation for the period until 2020”. There are 3 options for the innovative development of the Russian economy (Strategy of innovative development of the Russian Federation for the period until 2020, 2020) in this document:

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1. Inertial import-oriented technological development. This option involves maintaining macroeconomic stability with low levels of funding for science, innovation and investment in the development of human capital. The implementation of this option will result in increased dependence of the economy on foreign technologies and in further technological lag, which makes it unacceptable.

2. Catching-up development and local technological competitiveness. It is focused on rearmament of the economy based on imported technologies with local stimulation of Russian developments. The option of catching-up development was implemented in Japan, South Korea, China. The flaws of this option include the fact that the imported technologies are not the most advanced, which retains the risk of fixing the technological lag. At the same time the implementation of this option is tied with minimal innovative risks and the possibility of receiving, along with technologies, the entire range of related services.

3. Achieving leadership in leading scientific and technical sectors and basic research. This option involves focusing on the most prospect scientific and technological areas, allowing to increase Russia's position in the world market of high-tech products and services. The priority areas are the aerospace manufacturing, composite materials, the development and application of nano- and biotechnologies, software, and nuclear energetics. The implementation of this option will contribute to the development of the national innovation system and the restoration of the leading positions of Russian fundamental science. This option involves large-scale government funding and assistance of the commercialization of fundamental scientific research. This option is associated with significant innovative risks involved with the novelty of developments, as well as the possibility of their usage in other countries.

The most likely and preferred area of innovative development of the Russian economy is a combination of the second and third options.

Modernization of the economy involves both technological and organizational transformations aimed at reforming the public administration system. Rather than anywhere else, there are many problems concentrated in government control area, which currently are extremely difficult to resolve. The key problems are the large number of state administration apparatus, insufficient qualifications, lack of a system of personal responsibility for decisions made, bureaucracy and corruption.

As for technological transformations, a significant problem of their execution is the significant wear of fixed assets, approaching 50%. The average service life of technological equipment in Russia is 18 years, while the period of obsolescence is determined by 10 years or less. In developed economies, the average life of technological equipment is an average of 8 years (Mayevsky, 2010).

At the same time, technological changes in the ferrous metallurgy, pipe and tube production, communications, electrical engineering, and the polymer materials industry should be noted. But these changes affect approximately 10% of all industries of the national economy (Aganbegyan, 2012). The remaining share of industries is characterized by a high level of technological lag. The most problematic are energetics, consumer goods manufacturing, heavy engineering, machine tool industry, oil refining, petroleum processing industry, and transportation. Modernization of these industries will require about 2 trillion rubles annual investment (Petrakov, 2010).

One of the conditions for modernizing the Russian economy is the access to domestic and foreign markets for national producers in accordance with a set of competitive advantages and the capacity of a particular market. As for domestic market, taking into account the markets of the countries of the Eurasian

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Economic Union, it is quite capacious. The possibility to open up foreign markets depends on the level of competitiveness of products and the effectiveness of marketing policy.

The most important condition for the transition to an innovative development path is the import substitution of capital, which makes it possible to ensure GDP growth on the basis of increasing technological and industrial competitiveness of the national economy. The impetus to this process was given by the economic sanctions executed in 2014 by the United States, the European Union and several other states. Within the framework of these events, Russian government developed an import substitution plan for 18 industries. There were federal and regional government bodies, scientific organizations, business structures and development institutions (Rostec, Rusnano, Skolkovo science city) involved in the development of the plan. The import substitution of process equipment is able to create a multiplier effect, increasing investment opportunities for the development of key industries of the national economy.

Despite of ongoing positive changes, there are no enough shifts in the qualitative parameters of economic growth of Russian economy. The raw material sector continues to play a key role in the economy, maintaining Russia's status as a global supplier of raw materials. There are significant structural changes required in the area of science-intensive industries, primarily in the processing industry. This contemplates a more active role of the state in the implementation of economic diversification plans. The fact can be stated that currently the state is not able to act as a key subject of modernization, despite the availability of financial resources. The innovation system of Russia is at a transitional stage, the characteristic features of which are the availability of economic resources with low quality of state regulation.

7. Conclusion

Currently executed modernization strategy of Russian economy is characterized by a number of significant flaws that take a toll on its effectiveness, which is also confirmed by the results achieved. Among the most significant problems are the following:

-absence of a well-defined strategic goal setting;

- absence of a mechanism of business interest in innovation;

- main focus is not on the innovative development of the economy, but on the development of the innovation area without the interconnection of innovative processes with the solution of the primary objectives of social and economic development. The processes of modernization of the Russian economy should be complex, determined by their main areas. The implementation of four main areas of modernization may provide an opportunity to move to a sustainable and balanced growth of the Russian economy. The modernization of raw materials industries will serve as the first step towards the transition to high-tech development and allow to form the financial resources for the execution of subsequent areas. The second area is catching-up modernization and advanced modernization, aimed at restoration of the current technological level of Russian industry. The third area is reindustrialization of Russian economy, aimed at modernization of production based on disruptive innovation, the creation of new high-tech industries. The fourth area of modernization of Russian economy is formation of the formation of the mechanism of state strategic planning in order to develop long-term economic development programs. Strategic plans must be aligned with the interests of the business and the entire society.

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The implementation of these areas will allow making the processes of modernization of the Russian economy complex and moving to sustainable and balanced economic growth.

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