

# PROBLEMS OF DEVELOPMENT OF SCIENTIFIC AND TECHNICAL POTENTIAL OF RUSSIA AND THE CREATION OF AN INNOVATIVE ECONOMY

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## ABSTRACT

Russia's economic development over the past two decades has low rates. This situation is due to technological many systems, which complicates the timely reallocation of resources for the development of new techniques and technologies. Technological backwardness of Russian production entailed finding ways to update the scientific and technical potential, active transition to an innovative economy, methods of redistribution of resources to the development of new techniques and technologies. In the article the practice of implementing different directions out of the situation of scientific and technical gaps and create an innovative economy. As one of the most effective ways of saving the author considered scientific-industrial complex in the nuclear and aviation industries. The problem is to create a macroeconomic environment for the development of new technology industries, a further expansion that would generate intellectual rent worldwide. To resolve this issue on a priority basis to overcome a decline in innovation potential through the sharp increase investment in science and education.

## JEL CLASSIFICATION & KEYWORDS

■ O38 ■ SCIENTIFIC AND TECHNICAL POTENTIAL  
 ■ INNOVATIVE ECONOMY ■ TECHNICIAN ■ TECHNOLOGY  
 ■ HIGH TECHNOLOGIES ■ COMPETITIVENESS

## INTRODUCTION

Development of the Russian economy for nearly two decades has a relatively low rate. This provision is only fair due to its technology reproduces many systems, complicating the timely reallocation of resources for the development of new techniques and technologies (Glazyev, 1993; Glazyev, 2010).

Increasing since the mid 80s of last century, technological lag led to search for ways to reform at that time the Soviet economy, which ended with a refusal from a centrally planned economy. However, as experience has shown, this does not lead to the automatic creation of effective mechanisms and development institutions. On the contrary, the elimination of the major industrial and economic structures led to the destruction of high-tech industries: microelectronics and electronic engineering, radio engineering, opto-electronics, civil aviation, stainless steel, composites and new materials, industrial equipment for high-tech industries, accurate and electronic instrumentation, devices and systems for communication systems and modern communications systems, computers and other components of computer technology (Fedosov, 2006). As of scientific and industrial potential of Russia caught up with the countries of the industrial development level (Yakovets & Yun, 2001).

Despite the fact that the Russian scientific-industrial complex keeps leading position in the nuclear, aviation, defense industries, overcoming the technological gap with the key technologies requires huge investments. The acquisition of imported equipment will enable faster course to meet existing needs, but the expansion of basic industries, based on import of equipment and technology, deprives the national economy the chances of an adequate

development of key industries (Golichenko, 2006). This means the involvement of the Russian economy into the trap of unequal exchange with samples of techniques and technologies generated by fundamentally different way of technology, which generates the bulk of the intellectual rent.

## The ways of development of scientific and technical potential of Russia

In our view, it is necessary to the national scientific and industrial base to develop new technologies of production, which will allow further expansion to obtain intellectual rent on a global scale. Russian science has sufficient capacity for this knowledge and have received very promising advances, the timely development of practice which can provide the leadership position of Russian companies on the crest of the next long wave of economic growth. Russian scientist was the first to open a Technology cloning of organisms, stem cells, optoelectronic measurements. Review of existing research results suggests that the Russian scientific and technical potential has the necessary prerequisites for the development of advanced new technological order (Ratkin, 2006).

Despite this, the problem remains the timely practical development of existing scientific and technical experience in the key areas of becoming an innovative economy. Russian science and education are sufficient for the human resources, lack of funding leads to brain drain and technological knowledge abroad. During the reform period has left nearly 5 million professionals. We have to admit that with the exception of nuclear and aerospace industries, has a collection of competitive advantage, the Russian industry does not have the production of the new technological order. Their speedy establishment is a crucial factor for the future development of the country.

Despite taking place in recent years, the economic recovery, its general condition by the consequence of the preceding long and sharp drop in production and investment. By 1998, the level of production in Russia has decreased compared to 1990 by 42%, and investment in fixed assets by 79%. Although since 1999 has been a steady growth in gross domestic product, and by early 2010 it barely amount to pre-reform levels and is lower than in any of the post-industrial countries (Glazyev, 1986, 1993, 2010).

This significantly deteriorated the structure of production, unlike other successful developing countries, to increase production of goods with high added value, an increase in Russia's gross domestic product is provided mainly by energy exports and the growth of trade. The structure of industrial production sharply increased the share of fuel and energy and chemical and metallurgical complex in reducing the share of engineering. Industries with high added value continues to deteriorate. The greatest damage occurred in the high-tech industry, investment and agricultural machine building, light industry and the production of industrial consumer goods, where production levels dropped many times, as well as in industrial science (Myasnikova, 2006).

The fall in production is not accompanied by an equally large scale disposal of fixed assets, the benefit of reducing the level of business investment worn close to 50%.

The coefficient update of 3.4%, the growing technological gap prejudging the Russian economy (FSSS, Russian Statistical Yearbook, 2008). The average age of the equipment over 30 years, which is twice as much as in developed countries. The most serious setback embraced the most modern production and due to the ongoing worldwide scientific and technological progress puts a lag in Russia is 15-20 years in terms of the development of key technologies of the modern technological order (Glazyev, 2010).

In the world markets of high technology products Russia is less than 0.3% - more than two orders of magnitude smaller than the USA. According to experts, the production of high-tech consumer electronics, instrument and machine tools were in the area of uncompensated technological gap that has accelerated the rapid destruction of the technological foundation for sustainable economic growth, fixed the backwardness of the Russian economy (Ministry of economic development and trade, 2006).

The fall of the competitiveness of individual industries and the economy as a whole, in our opinion, the result is that the most significant problems have arisen in the scientific and technical potential of the country, the main source of modern economic growth. At the same time subjected to the greatest destruction of the sphere of industrial science.

One of the main causes of the systemic crisis of the domestic economy has been its growing technological gap between world leaders. At the transition to a market economy were pinned hopes that competition will be under the influence of the conditions for full realization of the accumulated intellectual potential in society. Contrary to expectations, the Russian economy has lost much of its scientific and technological potential. Expenditure on research and development activities at constant prices, according to various estimates, down from 5 to 12 times (Centre for Social and Economic Issues of Federalism Institute of Economics, 2005). To date, their share in the gross domestic product of less than 1%.

In recent years there has been a definite change in the state's attitude towards science. At present, expenditure on research and experimental development in Russia is 3-5 times lower than in 1990-1991 despite the recommendations of the International Academic Council for the developing countries on the need to increase funding for research and development activities up to 1.5% of gross domestic product (Scientific Council for Basic Research Program of the Presidium of the Russian Academy of Sciences, 2007).

Number of personnel engaged in research and development for the period 1990-2007 decreased from 1 943.4 thousand to 801 thousand people, which is more than twice. At the same time, researchers have been the greatest reduction (by 59.6% over the same period) and technology (in 70.2%, respectively) (Analytical statistical compilation, 2007). There is a sharp decline in prestige of the profession of a scientist. According to opinion polls, is a prestigious profession of a scientist in the estimates of only 9% of the population (Scientific Council for Basic Research Program of the Presidium of the Russian Academy of Sciences, 2007).

According to expert estimates Russia has left 6% of the number of personnel of the scientific potential of the country. Who have left are generally more competitive academics who are in their most productive years. The main reason for the vast majority of those who left to live and work abroad is the low pay of scientists at home.

Reducing the need for research and development, due to structural changes in the economy and a corresponding

reduction in funding, personnel losses and the privatization process (in almost all industries were included in the scientific-production associations enterprises were privatized separately) led to the loss of established relationships. Production units, businesses were without scientific support, and research institutes and design bureaus - without orders. After the privatization of enterprises, industry research institutions in the reduced number of lost intellectual potential. As a result, in the presence of backlogs in applied research and experimental development the corporate sector remained without science.

Against this background, specific experiences produce evidence of foreign experience. In developed countries, corporate industrial structures hold two thirds of research and development activities, while in Russia - only 6% (Leirih, 2006). The share of innovation active enterprises in Russia in the last three years stands at 9% (FSSS, Russian Science in Figures, 2008), which is significantly lower than in the Organization for Economic Co-operation (60%), but also in Eastern Europe (Romania - 28%, Slovenia - 32%, Poland - 38%).

The results show that the vast Most of the industrial enterprises prefer to finance projects applied with a payback period of up to one year and spends more on research and development of less than 1% of its budget (Fedosov, 2006).

These facts - evidence that in relation to the economic environment, new techniques and technologies - other people's items. However, the generation of scientific and technological capacity continues. Saved the average rate of inventive activity (number of patent applications is higher than in Eastern Europe), the results of which are commercialized mainly abroad (Karacharovskiy, 2006, Salytkov, 2004).

In modern conditions the reduction of scientific and technological potential of the country leads to irreversible loss of opportunities for future economic and social development. Further reduction in the competitiveness of the Russian economy is predetermined profile of its innovation system - all indicators of innovation activity, it lags far behind developed countries in economic cooperation. At the same time reducing the country's scientific capacity continues, as evidenced by the reduction in value of fixed assets research and development and the deterioration of their performance. Compared with 1997 the number created in 2008 of new production technologies in Russia decreased by 1.4 times, and the production of fundamentally new technology by world standards - a factor of 1.6. (Nizhegorodtsev, 2008).

## Conclusion

To overcome the reduction of the innovative potential of the country should be a sharp increase in investment in science and education. However, government efforts do not go beyond maintaining the existing scientific and technical potential, the overall level of which continues to fall relative to advanced countries. For example, investing in the knowledge sector in economic cooperation were the beginning of the twenty-first century an average of about 4.7% of GDP compared with 1.6% of gross domestic product in Russia. On the contribution of knowledge-based industries in the gross domestic product of Russia's economy lags behind more than twice the average level of economic cooperation, and their share in exports - by 20 times compared with the average European level (Makarov, 2003, Lvov&Glazyev, 1986, Yakovats, 2001).

Reduction of the scientific and productive potential of the country determines the drift of the Russian economy on the

periphery of the global economic system. The raw material specialization, low wages, small amounts of research funding, capital flight and brain drain, washing out of the national income through the foreign debt service - all these features of the peripheral countries are now fully characterized the Russian economy. In terms of average labor productivity, life expectancy, the share of wages in your gross domestic product, an index of human capital, the share of exported capital accumulation fund Russia corresponds to the third countries.

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