Genesis of the Russia's economy innovative development

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Abstract. The innovative development of economy in Russia is possible only if the way of development will be based on the objective basic components, i.e. the corresponding system of premises and factors determining the innovative process. Namely the latter ensure a transformation of the fundamental processes into the application ones, as well as the dynamic development of the economy under the new trends and patterns influence.
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Introduction

The state of the country's economy innovative component, the intensity of its development and the position in the global space are determined by the availability of the human potential, natural, production and management resources. The innovative development of each definite country depends largely on the character of its resources use and has such distinctive features as the existing structure of private and public property, peculiarities of the organizational and economic management mechanism, the established individual infrastructure [1]. According to the resources condition Russia can still be attributed not only to the raw materials countries-exporters, but also to the developed countries with the predominantly innovative economy and to the developing countries of the late industrialization [2]. From our point of view, considering the existing human capital and some parameters of the domestic economy development, the country can be attributed to the group of the developed countries. But these parameters may soon disappear, if the meaningful measures to innovative economic development are not taken.

Materials and methods

At the present stage the steady tendency of reducing the number of personnel engaged in research and development is being observed. An average number of employees of one organization involved in the innovative activity amounts on the mean to 270 people, of the organization not involved in the innovative activity it is 1,287 people. The qualification of workers, characterized by the higher professional education possession, is slightly higher in the innovative organizations where the number of such specialists is 22.1%, versus 19.5 % in the noninnovative organizations. Of course, these data induce positive emotions, but do not inform us about the tendency of the innovation component of the economy evolution. Thus, the number of employees engaged in research and development decreased by more than twice from 2007 to 2011, moreover the largest decrease was noted in the number of the research scientists, rather than in the number of support staff. Table 1 data show that the decrease in the number of technicians was not that significant.

Table 1. Dynamics of the number of employees, engaged in scientific research and development, change

Number of employees	Years				
	2007	2008	2009	2010	2011
Total including:	887729	705568	610878	558470	441932
technicians	445312	442003	420312	408149	309432
researchers	442417	263565	190566	150321	132500

Analyzing the data presented in this paper, it can be concluded that the threat to the national science consists not in the number of researchers reduce, but in the qualitative structure of the remaining in the science staff, i.e. the most qualified and capable professionals, mainly, leave the research sphere. Even with the renewal of the young scientists drift, the process of science and engineering personnel aging is continuing nowadays. The average age of the Russian researchers in 2011 reached 48 years and 30 per cent of researchers in Russia are people of the preretirement age [3].

But despite these negative trends, for the time being Russia is on the third-fourth place in the world in the number of people employed in the field of science, research and development activities.

Besides the problem stated above there is a number of factors slowing slow down the rates of the innovative economic development growth. One of such factors is the innovation activity financing [4], which is characterized today by the insufficient

amount of public spending on scientific research and development (table 2).

Table 2. Appropriation of funds from the federal budget on the science development

Federal budget expenditures, mln. rub.	2007	2008	2009	2010	2011	2012	2013
Total including:	23677,7	31045,8	41476,3	47469,1	76929,3	97362,2	132503,4
on fundamental researches	11676,6	15301,5	22073,3	26850,3	32125,1	43773,4	57769,4
on applied scientific researches	12121,1	13754,4	21503,0	21627,8	43884,2	53589,8	76934,0
to the federal budget expenditures, %	1,78	1,50	1,75	1,75	2,18	2,26	2,23
to the gross domestic product, %	0,25	0,28	0,30	0,27	0,35	0,35	0,40

Though in recent years, according to the statistics data, there is an increase in the science funding, yet this dynamic has not broken the steady negative trend affecting the workforce capacity development. Science has happened to be underfunded even in the conditions of the economic growth, when there relatively free financial resources have appeared, but former channels of funding out of the export industries proceedings have not been restored, as it happened in the middle of the XX century, and the channel of funding out of the large industries has not appeared [5]. In the authors' opinion, the restoration of these channels of financing would contribute to the innovative development of the national economy; to the transfer of the raw resources industries in science through the budget or through the state-owned corporation. Self-financing, for the time being, remains the main investment source of the innovative activity. 79.6 % of the total expenditure on technological innovation was financed in 2012 out of the organizations' own capital. On this type of activity, the index of the organizations involved in mining operations amounted to 98.9 % of the total, of the enterprises involved in metallurgical production and metalwork manufacturing – 88.9%, of the enterprises involved in electrical power, gas and water generation and distribution – 81.2 %.

The federal budgetary means do not exceed 5.0 % of the total amount of expenditure on the technological innovations and are mainly used in the electrical, electronic and optical equipment manufacturing [6].

The budgetary means of the subjects of the Russian Federation and local budgets are of a fractional amount – 0.4% of the total expenditure on the innovative activity. Foreign investments make up 0.3% of the total expenditure and are used in the food production and the automobile manufacture. 13.7% of the total expenditure of organizations on technological innovation was financed by means of the credit and loan proceeds attraction, 0.04% – by means of the venture fund.

Costs for the purchase of machinery and equipment amount to 57.5 % of the total expenditure structure on technological innovations (Fig. 1). In various organizations costs for this type of activity are in the range of 39.3 %, this includes the electronic, optical, and electrical equipment manufacture, fuel and energy minerals extraction (90%).

In the structure of expenditure on technological innovation share of spending on research and development of the new types of products, services, new production processes and methods of their production has virtually been unchanged for four years and amounts to 16-18 %. In the organizations with a separate economic activity, this index is much higher. In the enterprises of the fuel and energy complex, this index is about 40%, in the organizations involved in the production of electronic, optical and electrical equipment – 42.2% .

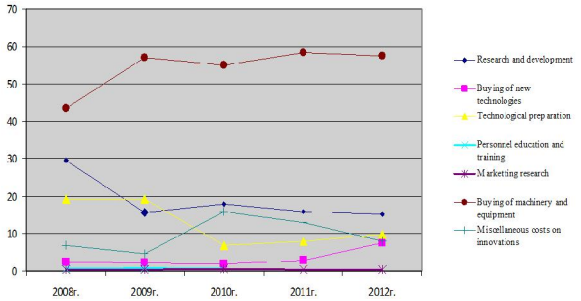

Fig. 1. Expenditure structure on the innovative activity types

Costs directly related to the preparation, manufacturing processes design, the other developments of the innovative products design make up a small part of the cost, to the extent 7%, the software purchase – 3%, the innovative technologies purchase – 2.5%. Over the past four years a very low proportion of the cost has been falling to the share of the staff training and retraining – 0.5% and market research cost – 0.4 %.

The cost structure on technological innovation is changing very slowly, thus in the sector of the costs on research there a decrease of 1.3 percentage points has been observed, which, of course, has a negative impact on the pace of the innovation development of economy and even an increase of 2.8 percentage points on the machinery and equipment purchase costs related to the technological innovations, is not able to make the situation in the modern domestic economy a different.

Basic part

As can it can be seen from the data presented, the development of innovative component of Russia's economy process is characterized by the slow pace, therefore the domestic economy in a range of areas has the technological dependence on some of the leading countries of the world. The number of technologies created for the application in microelectronics and intended for use as a software in design, manufacture or processing of goods has decreased and amounted to about 6%.

Sharp differences in the technological activity indexes are also observed in the production branch plan. For example, in the nuclear energy the level of the technologies used, is on average 95% in relation to the world level, in the rocket-space complex – 82 %, in metallurgy – 73 %, in the aircraft application industry – 59 %. At the same time, in machine-tool manufacture the technological level is estimated only at 34 % compared with the world, in the electronics industry – 19 %, in the chemical industry – 56 %, in the forestry and textile industries – 21 %. Analyzing this aspect, it should be noted, that some directions and developments of the Soviet period, able, at present stage, to ensure the release of high-tech production, have been lost. The factors, negatively influencing the process of the innovative component formation, include the deterioration of the experimental and test facilities, military science workforce aging, which in its turn calls into question the ability to update and expand the scientific reserves, establishment of the priority directions of development in the field of the armaments system: the high-precision weapons, strategically important information gathering and processing means, directed energy weapon.

Technological developments of the Russian science are rather poorly represented on the global markets of high technology products. Their share on the high-tech products market is less than 1 %, and in the civil sphere it is even less – about 0.2%. It is comparable with the positions of such countries as the Czech Republic, Norway and Portugal. Activities of organizations involved in the innovative production, are mainly aimed at meeting the domestic consumers demand. In 2011 the innovative goods, products and services delivered to the domestic market amounted to 639.9 billion rubles (69.8% of the total volume), those exported – to 276.3 billion rubles (30.2%).

Russia does not rank among the world's leading exporters on any of the civil high-tech production product groups.

The problem of the innovative component of the economy development is that it has lost its technological leadership, experiencing difficulties in maintaining the scientific and technical capacity created in the Soviet period. According to experts, Russia has had the developments, able to compete on the global market with only the third of the 34 most important areas of technological development. It should be noted that in the domestic economy there are promising technological reserves that have not been widely applied and commercially used. Only 16 % of technologies meet the international standards. A significant gap between the creation of technologies in research and development and their use in mass production has been formed in the modern domestic economy. In this connection venture capital as a specific type of innovative projects financing plays an important role. It is necessary to create its own culture of innovation in Russia enabling to overcome the Russia's inertia on the economic growth path. In our opinion, it is necessary to define a set of conditions for the development of the domestic capital investment in the innovative production:

- creation of some sorts of funds, in a perspective allowing to put the intellectual property, created earlier by the public research centers and institutes, into the commercial turnover. If we are able to provide financing of the funds out of the budget and attract large corporations' financial resources, then by means of a new type investment structure constructing, a radical change of the Russian business's attitude to the innovations can be expected;
- creation of a number of venture capital funds, operating in the interests of the individual innovation clusters, with the state participation;
- revision of the tax regime for the small technology businesses;
- reinvestment of the state's participation in the venture projects into the a high-risk business.

By the level of the venture business today's Russian can be compared with Europe at the turn of 1970-1980. Private investors are reluctant to invest in the real sector. In Russia, the task of the systematic approach to the organization of the venture capital investment was set in the main directions of development of the non-budgetary financing of the high-risk projects in science and technology worked out by the Russian Ministry of Industry and Science. The authors of this document consider the lack of resources for the scientific and technical sphere to be the main reasons for the venture investment development in Russia.

In Russia, the venture business is remaining fairly inert, as some facts presented by the information edition "Expert" prove: for instance, within the first half of 2009 there was not a single transaction fixed. And caution of the investors who are not sure in the stability of the economic situation

has been remaining the main reason of the low activity.

Many of the factors hampering the innovative economy development are quite well known in the scientific circles. The risky nature of the innovative processes is completely ignored in the current legislation, benefits and other incentives and support for the venture funds investors are not provided. It is possible to single out the factors hindering the venture capital industry development in Russia, in the following order:

- the absence of venture capital sources;
- the low liquidity of venture capital investments;
- the absence of specialized stock market;
- the poorly developed infrastructure;
- the absence of incentive measures to attract venture capital to the high technology projects implementation;
- the undeveloped venture business information support;
- the problems of institutional and legal order;
- the lack of highly skilled managers [7].

Results and discussion

Trends of the innovative economic development of Russian regions have a number of peculiarities connected with the dramatic market changes and crisis state of that period's economy. The following factors can be subsumed under these features:

1. In the scientific and technical sphere an ample supply of the research papers, tried and tested during the Soviet period, has been formed, but mechanism of their commercialization and additional research and development financing has not been developed, and consumers-customers can not afford to implement them.
2. Innovative domestic market does not consist of the innovative products, but contains a set of groups, organizations and individual specialists able to potentially carry out research and production activity.
3. In most cases at the present stage the innovative enterprises can not carry out research work, by means of both, their own funds as well as funds attracted.
4. Currently, technical and technological level of production is low, the degree of the wear and tear of equipment in operation is high, investments for reconstruction of the outdated capacity are not enough, the volumes of output are insufficient, intensification of production is low.

Conclusion

In this article we have touched upon the issues related to the low innovative activity, explaining it as a result of the low level of human resources in the innovative production, but it is necessary to mention another serious barrier hindering the innovative development of Russia's economy, it is the unacceptable terms of credit and venture capital funds weak functioning. The reason of this phenomenon is connected with the fact that the innovative projects are costly and long-term, while bank loans allow you to get high interest rates and have the short-term nature. Analyzing the main causes of the innovative activity growth rate slowing down in the period of the radical economic reforms, we have come to the conclusion that the main factor appears to be the destruction of the interacting system of the NTP management and implementation in the country and a sharp decline of the real economy investment. These processes affected all levels of the socio-economic relations [8].

At the micro level the following factors have been singled out:

- the absence of the long-term innovation policy with the elements of the economy in the industrial, scientific and technological spheres structuring;
- the insufficiently effective financial policy carried out, depressing the demand on the investment reserve, these are inflation , and high refinancing interest rate, and high efficiency of the speculative operations, which particularly affects the high-tech products production in the following aspects:
- the centralized financial investments through the budget system decline;
- the absence of the point distribution mechanism and the innovative production financing control;
- the nature of the carried out fiscal policy has an anti-investment character.

At the meso level in the form of:

- the violation of control in the scientific and technological and innovation process, expressed in the dissolution of the territorial management structures;
- the lack of the investment reserves;
- the uncertainty of the regional goals and objectives of the innovation policy while the structure disbanding and violation of the interconnections of the industrial complex between the subjects of the federation and the center [9];
- the absence of the system approaches to the innovation process management, including the approach of the investment reserves accumulation.

Based on the enumerated factors, reducing the intensification of the innovation activity, it is

possible to distinguish their internal and external aspects.

Insufficient attraction of financial instruments in the investment of the various innovative projects, imperfectly working legislation, imperfect system of innovation activity by various funds, banks financing, underdevelopment of the guarantee mechanisms for the investment activity carrying out, poor development of the innovation infrastructure – we regard all these factors relating to the external ones.

To the internal factors we relate: a very small number of specialists in the field of the innovative production; absence of the mechanisms to encourage enterprises and individual workers to the development, creation and use of the innovative technologies; organizational and psychological factor acts as one more factor, which is a consequence of the latter and which has little been spoken about, but it must be taken into account; absence of the innovation culture. The production changes being executed do not always cause a positive reaction, organizational changes cause confusion.

There are difficulties in the perception of the new being introduced technologies that require intense retraining, especially if there is no noticeable anticipated payoff. Consequently, the problem of the innovation perception takes place and plays a significant role in the innovation activities of businesses entities [10].

Findings

The genesis of the Russia's economy innovative development being analyzed, it is possible to make the following conclusions.

In Russia traditional methods of the innovation management prevail, the factor of attention lack to the innovation processes and the high-tech production importance is characteristic, integrative forms of management are undeveloped and not used. A favorable investment climate, both at the federal and regional levels, contributing to the enhancing of the innovation process is not created. The innovative development strategy is of a declare nature, there are no innovative territories development forecasts, there is no manufacturing corporations' evaluation of the innovation projects. The integrative interaction between the subjects of the innovation process remains the most important problem, especially since its effective development can significantly affect the level and nature of economic development of the Russian economy.

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