Prospects for the Use of Private Sector Capital in the Development of High-Tech Industry

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Abstract: *Relevance*: The solution to the problems of competitiveness of innovative technologies and products in global markets, accelerating the process of import substitution (if existing international economic sanctions by Russia) perhaps with the active using the capital of private business. This calls for the formation of certain financial and economic conditions of overcoming the barriers of innovative development of enterprises.

The novelty of the present scientific research is in the following: the main vectors of transformation of innovative development of high-tech industrial enterprises, the necessity of wide use of capital of private business in the form of portfolio investments co-financed by the innovative projects.

Practical usefulness. The increase in the share capital of private business in implementing innovative programs will reduce the financial burden on the federal budget. To increase the possibility of accelerating the processes of development of public-private partnerships and venture financing. Will expand the scope of use of the capital of private business in creating science-based dual-use products, implementation-oriented private commercial contracts in various sectors of the economy.

The future economic development of the country depends on the development and implementation of new technological researches that can make a certain breakthrough in providing technological and economic growth. The life cycle (LC) of any innovation embodied in specific correlation: *Innovative idea → Conducting of fundamental research studies →R&D → Pilot production → Mass production →* G*radual elimination of aging equipment and technology with better analogues.*

Keywords: Life cycle of an innovation, transformation of management, innovative infrastructure, portfolio investments, innovative appeal.

As technical progress accelerates, priority areas of investments are not extractive industries, but science-intensive ones such as rocket-space, defense, nuclear, aviation, shipbuilding, radio-electronic, chemical-pharmaceutical, genetic engineering, microbiological industry, etc.

In science-intensive industries, the share of research and development costs in total costs or sales volume is at least 3.5-4.5%; and the index of science-intensive production is 1.2-1.5 times higher than its average level in the manufacturing industry of the country (Fomina, 2014).

According to Rosstat (Russian Statistical Yearbook, 2017), in the conditions of the unstable economic situation in a country, with relative reduction in the financing of fundamental research of science-intensive industries by the government, there is an objective necessity for active involvement of private business funds in the production of science-intensive products.

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This process is especially relevant for such parts of LC as conducting of basic research and R & D. Specifically these parts can be more attractive for private businesses, which in the long term provides entrepreneurs with the required profitability along with minimal risks.

Innovations accelerate the process of scientific and technological progress: new types of machinery and technology are being introduced in the market of goods; their competitiveness is increasing; labor productivity is growing, and the scientific organization of labor and production is improving.

According to the former minister of oil industry of Saudi Arabia, Ahmed Zaki Yamani, "Stone age ended not because there were not enough stones, but because new technologies have appeared. Similarly, the oil age will end not because we will not have enough oil." (Russian Statistical Yearbook 2017). In fact, these words clearly indicate the constantly acting trend of steady improvement of innovation processes. Unlike other businesses in the economy, companies in high-tech industries, as a rule, do not receive instant

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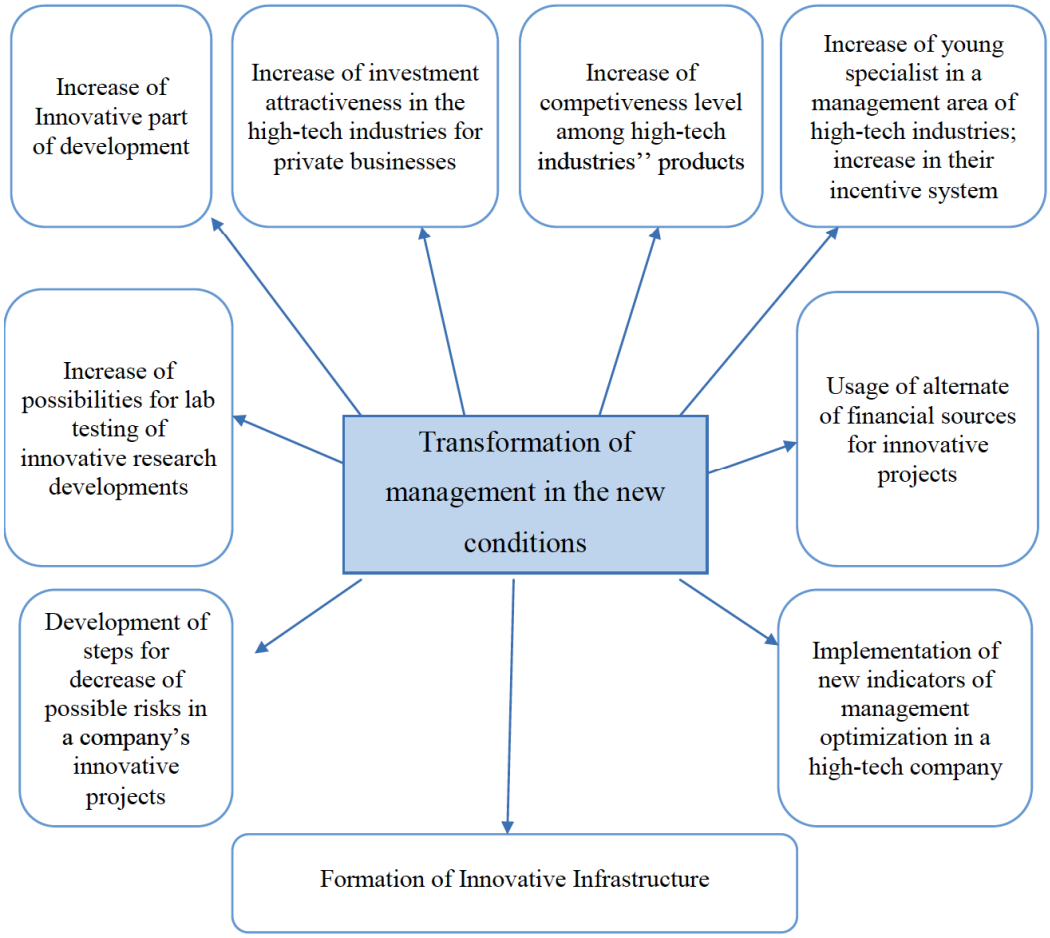
profit from their financial and economic activities (for example, companies in rocket-space and defense industries), but this does not diminish their importance in the economic development of all other sectors and the strengthening of the country's defense capacity. The problem remains in the finding and rational implementation of various financial sources of innovative development, including funds of private investors.

The inclusion of private funds to the sphere of high-tech industries is linked with *transformation of management* of innovative activity in high-tech enterprises. Its *vectors* are shown in Picture **1**. Taking them into account in practice makes it possible to ensure, on the one hand, the attractiveness of the innovations being carried out in the country for external investors. On the other hand, they allow stable development of high-tech enterprises in science-intensive industries.

A special place in the system of transformation of management of high-tech enterprises is the formation of an innovative infrastructure. A government can reduce the initial risks of private companies engaged in high-tech industries by taking over the costs of creating the required infrastructure, including the costs of production and social infrastructure.

The process of transformation of innovation management is implemented through the constant progressive steps by companies to preserve their investment attractiveness for representatives of private business in the field of high-tech industries. Attractiveness can be considered at the level of the region, industry, project, product, etc. For the region there may be some factors, for the industry others, for third products some others, etc. Conditionally, all the factors of innovation attractiveness can be distinguished by the following criteria: internal and external, economic and social, etc.

Analysis of the problem of the attractiveness involves considering the degree of novelty of the project for the existing market of similar products, as well as taking into account the company's ability to



Picture 1: Transformation of management of high-tech enterprises (Proskurin, 2017).

adapt to the external environment: changes in the political situation in the country and the world, changing market conditions (especially in connection with international sanctions and anti-sanctions), exchange rates, fluctuations of the base rate of the Bank of Russia, etc.

Every attractive target for private businesses is evaluated by different indexes. Table **1** gives their comparative analysis. Conventionally, two groups of indicators were identified: financial and social.

An important issue of using *private businesses' funds* is in the creation of favorable conditions for its participants in order to reduce the level of entrepreneurial risks. A government should provide informative and administrative support to private businesses, as well as take on a certain part of the expenditures, especially at the start-up period. Specifically, the government should cover part of the expenses involved in the creating a production infrastructure and create a favorable tax system (possible exemption from payment of taxes), etc.

One of the less studied additional sources of financing innovations in the high-tech production industry is inclusion of private businesses in the form of portfolio investments. Structural changes in the economy create prerequisites for their wider usage. This type of investment allows private investors to receive additional financial resources and direct them to the real sector of the economy, associated with the implementation of innovative developments.

Portfolio investments allow private business participants to receive a future income from resale of their financial assets at a higher market value. The received money inflow will allow increase of their own capital and refinance it into production. In this case, direct investment plays an important role in the innovative development of enterprises.

In economic literature, there is no unity in understanding the content of direct investment. To draw a factual border between direct, real and financial investments is not usually possible. Thus, sometimes investors, who specialize in direct investments do not possess an authority to manage a company. Although, there can be an opposite situation when portfolio investments can become a direct one, for example, through the purchase of a major percentage of a company's shares.

It is necessary to take into account the fact that direct investments are involved, "when a company sells it's shares or bonds directly to persons carrying out savings without resorting to the services of any financial structures" (Brigham, Erhardt, 2011).

Table 1: P Service Providers of Innovative Attractiveness (Proskurin, 2017)

An object	Financial and economic indicators	Social indicators
Region (region, region, country)	Specific weight of government financing of the region; inflation; base interest rate; energy prices; availability of natural resources; market infrastructure; level of development of science; innovative infrastructure; development of fundamental science; country risk	Social infrastructure; availability of labor resources; ecological environment; nominal and real incomes of the population; employment of labor resources; unemployment level; aggregate demand of the population; innovative climate
Industry	Specific weight of government financing of the industry; technical and economic development prospects; labor productivity; industry risk	Average salary of employees; branch social infrastructure (own sanatoria, hospitals, holiday homes, etc.)
Company	Innovative infrastructure; revenue; net profit; labor productivity; business activity (asset turnover); structure of funding sources; liquidity; number of patents for innovative products; R & D and implementation of their results; dynamics of total production; production risk	Qualification level of employees; income level; material and moral stimulation; image of a company; level of management; working and production conditions; turnover of staff; organizational structure of management; payment of dividends; availability of growth prospects for young professionals; socio-psychological atmosphere.
Project	Profitability; efficiency (expected profitability and costs); the life cycle of the project; commercial risk	Social results of implementation; compliance with environmental standards
Production		Conformity of innovative products with international quality standards; dynamics of demand for innovative products.

Direct investment is often attributed to investments, from which investor receives a stake in the authorized company's capital equal of at least 10%. This gives him or her an opportunity to directly participate in the management, have his or her representative on the board of directors, etc. At the same time, possession of 10% of votes is not a strict criteria for classifying investments as direct.

The direct investment may include as real and as well as financial investments. It would be a mistake to completely oppose them. It would be also incorrect to put a sign of absolute equality between direct and real investments.

On the one hand, private organizations have a right to invest money in the purchase of companies' shares of various sectors in innovation industries, including high-tech industries, and thus, ensure a certain *profitability of their financial (portfolio) investments*. On the other hand, enterprises of these industries can generate revenues in the creation of new machinery and technologies, gradually gaining sales markets for their products both domestically and abroad. This could be done through issuing and placing shares and bonds among legal entities and individuals, and thereby creating opportunities for *growth of investment efficiency of innovation orientation.*

Enterprises of science-intensive industries, using foreign experience, can attract investments of private businesses through direct investment funds. Practice shows that the most profitable investment is the concentration of financial assets in companies' investment portfolio with different levels of risk and profitability. Accordingly, it is important to find a compromise between them. For this, the share of assets is usually strictly limited and accounted for by the risk manager. Analysis of a financial performance of each issuer and regular assessment of market risks is conducted, for example, using the calculation technique **VaR** (Value-at-Risk).

This methodology allows us to calculate the level of possible losses and assess the risks of various portfolios with different financial instruments, and form reserves for these losses. Liquidity risks are necessarily taken into account, stress testing is conducted. At the end, this process ultimately allows private investors (both individuals and legal entities) create an expected profitability with an acceptable level of risk.

Management of portfolio investment in high-tech industries (with a relatively high cost of R & D) assumes a priori positive dynamics of indicators of achievement of specific objectives, which enables a private investor to obtain the following:

- Protection of initially invested funds;
- Achievement of possible profitability level coming from portfolio placement;
- Decrease of risk level of investments and others.

The implementation of the selected targets for increasing the efficiency of portfolio investment management reflects the content of the portfolio strategy as part of the innovation *strategy* private high-tech companies, aimed at developing and implementing advanced technologies.

Prospects for the effective use of private capital began to appear in the country to a large extent in the processes of commercialization of science-intensive industries, including rocket and space industry. Thus, at the end of 2015, Russian private space company **Dauria Aerospace** completed the sale of its two microsatellites.

The American company Aquila Space, which creates its own group, purchased spacecraft series **Perseus-M** operating in orbit, as well as the necessary licenses for the use of technology. It's proposed, by 2025, to attract 230 billion. rubles from not-out of budget sources such as companies' funds and commercial projects. Only in 2016, Russia sent more than 53 billion rubles for the maintenance, development and usage of the GLONASS system and more than 37 billion rubles for the development and construction of launch sites (Burmistrova, Proskurin, 2016).

Promising direction of the usage of private businesses' capital in the high-tech industry is a venture financing, which role, as more and more of its involvement in the co-financing of R & D, can increase with the improvement of the political and economic situation in the country and in the world. Meanwhile, in Russia, annual venture capital investments average 0.02% of GDP (for comparison, in the US - 0.62).

Practice shows that the financing of projects of an innovative orientation involving development of venture businesses and attracting capital from the private businesses has not received a proper development in our country. Refusal or inability to apply risky, but at the

same time, promising areas of innovative growth of enterprises can significantly reduce the competitiveness of products' development.

In the last decade, the use of private investors' funds in the development of science-intensive production is spreading in the form of government-private partnership (GPP). Calculated for long periods of existence innovation's life cycle, GPP projects connected with venture business and assume the existence of large sums of money in circulation can be afforded by only large investment funds and some government structures[1].

Involving GPP which have innovative orientation, makes it possible to actively attract private investment capital into the economy, including in high-tech industries:

- Projects GPP are created for a specific object with the set time for completion;
- Projects are financed through private investments, supplemented by governmental financial resources or joint investment of several participants;
- Projects are implemented in conditions of creating an obligatory competitive environment for the further conclusion of a contract or concession;
- Rights and obligations of the government and private partners are determined in accordance with the interests of counterparties;
- Distribution of risks between the parties of an agreement (public and private partners) is carried out on the basis of relevant agreements between the parties.

In the new economic conditions, all organizations are tied to each other and interact so in the process of creating new products; work in conditions of self-financing. At the same time, economic factors determine the interest of performers in achieving the minimum cost, therefore, the maximum profit in the shortest possible time after the commencement of the serial production of a new product (Chursin, Okatiev, 2010).

A feature of *science-intensive industries* is their dependence on the government financing and distribution of finance in accordance with the social importance of the industry for the country. They have large "start-up" costs, including expenses for basic research, whose long-term payback period is obvious, if it's all possible (for example, investing in strengthening the defense capacity of the country).

It should be noted that expenses of the federal budget and the budgets of the Federation subjects on the development of R & D may not always have a decisive impact on innovational activities of private companies and their involvement in the co-financing of projects of an innovative orientation. Even in the case of a sharp increase in R & D spending (which is unlikely in the near future), with weak consideration of the elements of strict state control over expenditures, it will be difficult to achieve expected positive results.

Implemented Russian measures to mitigate international sanctions at the same time accompanied by a reorientation of our economy to the innovative way of direction, which is expressed on one hand, in gradually replacement of imported productions by local goods. On the other hand, it helps in activation of the processes of using the private sector in the development of high-tech industries. Accordingly, there is a redistribution of cash flows with is depended on the following factors in effectiveness of management:

- Ensuring "financial health" and achieving planned financial results of an organization;
- Financial equilibrium of a company in the process of its strategic development by using financial instruments that regulate profit and profitability indicators;
- Acceleration of the turnover of an organization's capital (Kemenov, 2015).

It is possible to ensure the growth of the volume of import-substituting products with the following conditions: ***first***, with a significant increase in the number of innovative developments that can become "catalysts" for the Russian economy. ***Secondly***, taking into account in practice all the factors hindering the acceleration of the innovative way of development. ***Thirdly***, with the active participation in the innovation process of the private businesses.

At the present time, the planned expenditures of the Federal Budget can provide 80% of the development of

[1]On the problems of venture capital financing and public-private partnerships in high-tech industries is published s work s domestic authors: AN Kashirina, D.B. Payson, R.M. Nizhegorodtseva and others.

science-intensive industries. By attracting private businesses, it is possible in the long term to increase the 20% share. However, taking into account the significance of the development of science-intensive industries for the country the need to preserve its defense capability, the development and introduction of new types of equipment and technology, the prevailing role of the state in any case will continue for a long time.

Certain successes of Russia in the development of the innovative economy are clearly seen in the example of the development of the space industry. The practical importance of this sector of the economy is reflected in the expansion of the boundaries of commercial proposals: space television, photography, navigation services, communications, remote sensing of the Earth, etc.

In the long the financial burden on the federal budget will decrease; the structure of funding sources will change in the direction of increasing the share of private sector's funds. This process can be facilitated by strengthening international scientific and technological cooperation, which will become possible after the removal of international economic sanctions against Russia.

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