



ENHANCING THE EFFICIENCY OF FINANCING INNOVATIVE PROCESSES IN CHEMICAL INDUSTRY ENTERPRISES

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Abstract. *This article examines the existing challenges in financing innovative activities in chemical industry enterprises, as well as the sources of support for innovative projects and financial incentive mechanisms. Based on the experience of foreign countries, the importance of tax incentives, preferential lending, accelerated depreciation, and state support mechanisms in stimulating innovation activities is highlighted. In addition, scientific and practical recommendations have been developed to improve the financing system of innovative activities in chemical industry enterprises.*

Keywords: *innovation, chemical industry, financing, investment, tax incentives, innovative projects, preferential lending, accelerated depreciation, research and development (R&D).*

The intensification of competition in the global economy, the rapid development of digital technologies, and the emergence of advanced production technologies have made the development of innovative activities a strategic priority in industrial sectors. In particular, the chemical industry is considered one of the high-tech manufacturing sectors, and its competitiveness largely depends on the level of research and development (R&D), the creation of new products, and the implementation of modern technologies.

At the same time, effective organization of innovative activities requires a sustainable financial support system. In practice, several challenges exist in financing innovative projects, including the shortage of long-term investment resources, strict collateral requirements for bank loans, and limited demand for innovative products from the private sector.

The existing challenges associated with the introduction of innovations in chemical industry enterprises are largely related to the insufficient development of state financing mechanisms for scientific research, experimental design, and innovation processes. The relatively low demand for innovative products from the private sector also negatively affects the attraction of additional sources of financing.

Moreover, the use of bank loans as an additional financial source is complicated by high collateral requirements and the complexity of lending procedures, particularly for short-term loans. Commercial banks usually provide loans under established regulations, requiring property collateral and fixed repayment periods. As a result, small and medium-





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sized enterprises often face significant difficulties in financing innovative activities due to the lack of sufficient collateral and limited access to financial resources.

One of the main obstacles to the implementation of innovations in chemical industry enterprises is the limited access to sufficient financial resources. In particular, the insufficient participation of the public and private sectors in financing research and development (R&D) and experimental design activities contributes to the slowdown of innovation processes.

Loans provided by commercial banks often require substantial collateral and are generally short-term in nature, which creates additional financial barriers for small and medium-sized innovative enterprises. Furthermore, the underdevelopment of co-financing mechanisms for large-scale innovative projects increases investment risks and limits the opportunities for attracting the necessary financial resources.

The experience of developed countries demonstrates that tax policy is one of the key economic instruments for supporting and stimulating innovative activities. In particular, China has introduced a system of tax incentives for high-tech enterprises, which provides additional deductions for expenditures related to research and development (R&D) activities.

In Japan, incentive mechanisms such as accelerated depreciation of scientific equipment and tax deductions for research and development expenditures have been effectively implemented. These mechanisms contribute to the technological modernization of industrial enterprises and enhance their competitiveness.

Therefore, it is necessary to strengthen government support for innovative activities through tax incentives and other financial stimulation mechanisms. Tax incentives create a favorable environment for the development of innovation and encourage enterprises to increase investments in research and technological advancement. Support for innovation through tax benefits and other preferential measures plays a significant role in transforming a country into a technologically advanced and industrially developed economy.

In chemical industry enterprises, the implementation of accelerated depreciation mechanisms can serve as an effective practical tool for stimulating innovative activities. It is advisable to establish higher standards whereby the depreciation period for most fixed assets does not exceed 4–5 years, and enterprises should be allowed to write off certain categories of fixed assets during the first year of acquisition. The effective application of accelerated depreciation to eligible fixed assets can significantly enhance investment activity and encourage the introduction of advanced technologies.

Based on this, innovation development strategies should focus on creating stable conditions for continuous investment activities in the innovation sector and strengthening mechanisms aimed at supporting sustainable technological modernization.

As the national economy develops, the implementation of measures aimed at increasing the country's innovative capacity through direct influence on innovation processes is becoming increasingly important. In this regard, establishing a strong system for the





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financial support and financing of research and development (R&D) activities in the chemical industry plays a crucial role in enhancing national economic competitiveness.

In our opinion, within the framework of a comprehensive innovation policy, the state support system for financing innovative activities should include the following measures:

- direct government participation in investment activities through budgetary financing;
- the application of macroeconomic approaches aimed at creating favorable conditions for the development of innovative activities;
- the attraction and targeted allocation of investment resources to innovative projects.

In chemical industry enterprises, the systematic formation of the financing structure for innovative activities is determined by the enterprise's innovation development strategy and objectives, the organization and regulation of production processes, the duration of the development cycle, production programs, and the scale of the enterprise.

Determining the optimal structure for financing innovative activities in chemical industry enterprises requires the following stages:

- assessment of the cost of the innovative project;
- identification and analysis of potential risks;
- determination of the sources and volume of internal financial resources;
- justification of the sources and amount of borrowed funds;
- selection of the most appropriate form of financing for innovative activities.

The establishment of an optimal financing structure enables chemical industry enterprises to use financial resources more efficiently, reduce financial risks, and ensure the successful implementation and commercialization of innovative projects.

The sustainable formation of such a financing structure requires consideration of numerous influencing factors. Creating appropriate conditions based on the effective utilization of financial resources makes it possible to develop an optimal financing structure for innovative activities. The successful creation, adoption, and dissemination of innovations largely depend on the efficiency of the optimal structure of financing innovative projects. Therefore, chemical industry enterprises should apply various financing options and combine different sources of financial resources depending on the characteristics and requirements of innovative projects.

In evaluating the adequacy and effectiveness of the financing structure of innovative activities in chemical industry enterprises, it is recommended to apply the following criteria:

- the criterion of targeted orientation, which determines the provision of financial resources aimed at achieving the objectives of scientific, technological, and innovation policies, including the financing of research and experimental development activities;





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- the flexibility criterion, which reflects the ability of the financing system and its components to rapidly adapt to changes in the external economic environment and dynamic development conditions;
- the consistency criterion, which evaluates the compatibility of selected financing forms with specific directions and objectives of innovative projects;
- the efficiency criterion, which assesses the effectiveness of economic mechanisms that stimulate the attraction of financial resources from both budgetary and extra-budgetary sources.

In general, in our opinion, there is no universal approach to determining standard values for each of the proposed criteria when developing an optimal financing structure. The selection of appropriate financing parameters should be based on the specific characteristics of innovative projects, enterprise capabilities, and the conditions of the economic environment.

When determining the methods and sources of attracting financial resources for the development of innovative activities, industrial enterprises should take into account the specific characteristics of various financing mechanisms and comprehensively assess the consequences of using different forms of financing. The effective combination of multiple financing sources and adherence to appropriate financing principles should ensure the growth of financial returns from innovations and facilitate their rapid and efficient commercialization.

Thus, the formation of an optimal financing structure enables industrial enterprises to gain competitive advantages by introducing innovations earlier than other market participants and by conducting their own research and development (R&D) activities. As a result, enterprises can strengthen their financial capacity, improve their competitiveness, and increase their level of economic sustainability. This process creates favorable conditions for enhancing the efficiency of chemical industry enterprises and attracting additional financial resources for financing innovative activities.

To increase the scientific sustainability and international competitiveness of chemical industry enterprises in our country, special attention should be paid to the creation of scientific developments, expansion of financing sources for innovative activities, and further development of innovation processes. In our opinion, the main directions for supporting and stimulating innovative activities in chemical industry enterprises should include the following:

- encouraging large state-owned enterprises, as well as companies operating in natural monopoly sectors, to directly develop and implement innovation development programs;
- providing competitive grant support to small, medium-sized, and large enterprises in the chemical industry based on priority areas of innovative activities;
- supporting research activities in chemical industry enterprises, including assistance in enterprise development and ensuring access to testing and certification services for new products and unique research equipment;





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- improving the system of tax incentives for innovative enterprises operating in the chemical industry;
- strengthening cooperation with international and domestic financial institutions to increase the innovative potential of chemical industry enterprises;
- improving support mechanisms for the export of high-tech and innovative chemical products and services;
- promoting the import and implementation of advanced foreign technologies that contribute to increasing efficiency in the chemical industry.

In our opinion, it is essential to utilize a wide range of advanced international practices aimed at enhancing innovative activities and improving the financing system in chemical industry enterprises. Through an effective tax policy, the government should expand its role in promoting innovation development and further improve the system of continuous tax incentives. Tax incentive mechanisms should be designed to enhance efficiency at all stages of the innovation reproduction process, ranging from capital investments in fundamental research to the commercialization of innovative developments and increased investment in production modernization projects.

In conclusion, the establishment of an effective financing system is one of the priority tasks for ensuring the innovative development of chemical industry enterprises. In this process, strengthening government tax and financial incentives, expanding access to bank credit resources, and adapting successful international practices to national economic conditions are of great importance. The implementation of modern mechanisms for financing innovative activities will contribute to the development of new technologies, improve the competitiveness of chemical products, and ensure the sustainable economic growth of the chemical industry.

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