



PhD, Assoc. Professor Tatyana Kuznetsova¹⁾
PhD, Assoc. Professor Leonid Sipailo²⁾

*¹⁾Department of Economics Enterprise, National University of
Water and Environmental Engineering (Rivne, Ukraine)
kyznezova_tv@ukr.net*



*²⁾Department of Economics Enterprise, National University of
Water and Environmental Engineering (Rivne, Ukraine)
l.h.sipailo@gmail.com*

**STATE SYSTEM OF STIMULATION AND REGULATION OF INNOVATIVE
ACTIVITIES OF ENTERPRISES IN DEVELOPED COUNTRIES OF THE
WORLD**

**SYSTEM STIMULACJI I REGULACJI PAŃSTWOWEJ DZIAŁAŃ
INNOWACYJNYCH PRZEDSIĘBIORSTW W KRAJACH ROZWINIĘTYCH**

**ГОСУДАРСТВЕННАЯ СИСТЕМА СТИМУЛИРОВАНИЯ И
РЕГУЛИРОВАНИЯ ИННОВАЦИОННОЙ ДЕЯТЕЛЬНОСТИ
ПРЕДПРИЯТИЙ В РАЗВИТЫХ СТРАНАХ МИРА**

Abstract

This article presents basic principles of formation of the state system of stimulation and regulation of innovation activity in developed countries. The main forms of state regulation and stimulation of innovative processes are investigated. The basic tools of the state influence on tax, price, depreciation, investment policy of enterprises with the purpose of activating innovation activity are highlighted.

Keywords: *innovation activity, state system of stimulation, regulation of innovation activities, forms of state incentives, mechanism of stimulation of innovations.*

Streszczenie

Artykuł dotyczy głównych zasad kształtowania państwowego systemu stymulacji i regulacji działalności innowacyjnej przedsiębiorstw w krajach rozwiniętych na świecie. Zostało przeprowadzone badanie głównych form państwowych regulacji i stymulowania innowacyjnych procesów. Opisane główne narzędzia oddziaływania państwa na politykę fiskalną, cenową, amortyzacyjną oraz inwestycyjną przedsiębiorstw dla celów aktywizacji innowacyjnej działalności.

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Słowa kluczowe: działalność innowacyjności, państwowy system pobudzania, regulacja działań związanych z innowacjami, formy zachęt publicznych, mechanizm stymulowania innowacji

Аннотация

В статье рассмотрены основные принципы формирования государственной системы стимулирования и регулирования инновационной деятельности предприятий в развитых странах мира. Исследованы основные формы государственного регулирования и стимулирования инновационных процессов. Освещены основные инструменты воздействия государства на налоговую, ценовую, амортизационную, инвестиционную политики предприятий с целью активизации инновационной деятельности.

Ключевые слова: инновационная деятельность, государственная система стимулирования, регулирования инновационной деятельности, формы государственного стимулирования, механизм стимулирования инноваций

Statement of the problem in general outlook and its connection with important scientific and practical tasks.

The stimulation of innovation in European countries goes beyond national boundaries and is becoming the prerogative of EU countries that use certain innovative investment policy tools to attract investment to finance innovation. In particular, it is the creation of an infrastructure favorable to innovation; direct government funding, primarily through grants, loans, subsidies, etc.; fiscal or tax incentives, state guarantees, special schemes for supporting risk financing (Mizhinsky M.Yu. 2005).

The development of the scientific-technological and innovation sphere is of practical importance, since it faces the challenge of transforming the national economy and integrating into the world economy. The creation of an innovation system based on the use of market mechanisms and an active state science, technology and innovation policy should be the basis for the development of knowledge-based industries and sectors, their long-term competitiveness within national boundaries and on the world markets.

Analysis of latest research where the solution of the problem was initiated.

The research of the necessity of state incentives and regulation of innovative activity of enterprises in market conditions is devoted to the scientific works of leading domestic and foreign scientists: G. Avigdor, A. Amosha, G. Androschuk, G. Assonova, Y. Bajal, B. Burkinski, V. Geyets, B. Danilishina, M. Gorokhovatskaya, R. Ennana, P. Zavlina, B. Lanovik, B. Malitskogo, E. Makarenko, O. Novitskaya, S. Onyshka, O. Samotugi, I. Silchenko, L. Fedulova, I. Fedorenko B. Yatsenko and other scholars. These scientific achievements highlight the main methods and levers of state incentives and regulation of innovation activities of enterprises. At the same time, the special interest of scientists is the experience of the formation and use of the state system of stimulation and regulation of innovation processes in foreign countries.

Aims of paper. The purpose of the work is to distinguish the features of the formation and implementation of the state system of stimulating innovation activity in the developed countries of the world.

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Exposition of main material of research with complete substantiation of obtained scientific results.

An important prerequisite and a guarantee of rapid economic growth with the least losses and minimization of economic risks is the development and immediate implementation of the complex various levels of state incentives and regulation of innovation activity. A special role in the realization of this strategic task lies in the effective use of stimulatory tools, which proved to be effective in the developed countries of the world. In foreign countries with a lower level of scientific and technological development than the average in the EU, as a rule, measures of general nature are used, allowing to support a wide range of directions in all sectors of the economy. In this case, the government focuses on fiscal stimulus measures, which differ in that they allow the market and its participants to independently decide which sectors of the economy need to be actively developed. The worldwide experience shows that the methods of state stimulation of innovation activity are divided into direct and indirect ones. Direct stimulation methods include:

- provision of preferential loans to enterprises and organizations carrying out scientific developments;
- free transfer (or preferential terms) of state property and land plots for the organization of innovative enterprises; development of innovative infrastructure;
- functioning of various programs aimed at increasing the innovative activity of business;
- Government orders, mainly in the form of R & D contracts and provision of initial demand for innovations;
- creation of scientific and technical zones with a special regime of innovation and investment activity.

Indirect methods of stimulating and regulating innovation processes entail:

- tax incentives for investments in the innovation sector;
- development of science and higher education system;
- legislative norms that stimulate the development of research activities.

It is noteworthy that countries with traditionally high levels of scientific and technological development (Finland, Sweden, Germany) give priority to measures of direct financial support. Unlike indirect incentive methods, financial assistance in these countries has targeted nature. Under such conditions, the state, and not the market, determines in which cases additional stimulation is necessary, and in which - no (Samotuga O.O., 2006). It is also worth noting that in different countries of the world certain forms of research and development support are used, in particular tax discounts, tariff and non-tariff barriers, government procurement, loans and subsidies. Thus, in the United Kingdom, the low level of taxation of technical corporations is supported, considering it a powerful incentive for risky technological changes. In Germany, Spain and Italy, low rates of basic taxes are supplemented by special incentive schemes for the implementation of risky projects. In France, various special tax incentives are used in innovation entrepreneurship (Makarenko Ye.V., 2008).

The state system for stimulating the development of innovative entrepreneurship in economically developed countries also covers depreciation allowances, incentives for R & D, the formation of reserve funds, and tax credits. For example, in the UK, government policy instruments include tax-exempt funds aimed at research and development and providing risk financing or grants (Onyshko S.V., 2004). However, in recent years, many countries have doubts

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about the effectiveness of investment tax incentives, since such benefits provide unequal conditions for individual industries and firms. Therefore, these countries began to apply widespread reduction of tax privileges with a significant reduction in the rates of income tax for legal entities. In addition, industrialized countries use such a mechanism to intensify the investment activities of commercial banks, as a subsidy to the interest rate on a loan granted by the state to banks in the conditions of investment in the development of priority industries and industries. Also, foreign experience can be used to create target institutional investors - long-term lending banks. These measures can also be used in Ukraine (Fedorenko I.L., 2008).

The experience of state incentives for innovation in Australia, Austria, Belgium, the United Kingdom, Denmark, Hungary and the Czech Republic, among the main mechanisms, involves the use of benefits in the form of deductions from the tax base of enterprise profits calculated according to the amount of R & D expenditures. In addition, tax incentives in Australia and Austria make it possible to make tax deductions depending on the amount of R & D spending growth. As you can see, the stimulating effect of this privilege is that, when taxing profits, gross expenditure is a larger sum than the actual costs incurred on R & D (OECD Science).

The US government in the 40-50's was determined by technological trajectories of innovation development, and technological policy was conducted in two directions: support of fundamental research and implementation of applied scientific and technological programs within the framework of the activity of separate federal agencies.

When forming the economic mechanism of state incentives and regulation of innovations in Ukraine it is expedient to use

the experience of Japan, where the mechanism of economic incentives for enterprises to undertake innovation is based on the provision of preferential (at the rate of 5-7% per annum) long-term (for 10-20 years) loans through state loans corporation for the acquisition of modern equipment and equipment in general. Small and medium-sized private enterprises receive such loans up to 80% of the cost of the necessary equipment, and large enterprises up to 50%. Enterprises producing modern technologies may be exempt from local taxes by special permits from regional administrations. Widely applied preferential treatment of accelerated depreciation for innovative technologies, in particular in the first year is allowed to write off 50% of their value. For small and medium enterprises that use technical innovations, in the first three years it is allowed to depreciate by 30% of their value. The amortization policy of Japanese enterprises allows you to quickly rotate investment resources and constantly update the technology base in accordance with the level of scientific and technical progress (Kuznetsova T.V., Sipailo L.G., 2010).

The functioning of the state system of incentives and regulation of innovation and research activities in the state of Israel has recently attracted the attention of the broader community. In order to improve the interaction between the state and the private sector in the field of innovation in the early 1970's, the Chief Scientist's Office under the Ministry of Industry, Trade and Labor, which today is the main coordinator of research and innovation activities in the country, has been established and provides for the effective interaction of a number of other subjects. In addition to this the tax privileges were granted to enterprises with a high share of innovative products, especially if their offices or production are in

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priority development areas (at the periphery). The Chief Scientist's Office has a special "Foundation for Research and Development", as well as a number of national and international programs, agreements and joint ventures. This "NDF Fund" provides grants for projects for one or more years, the final result of which should be the development of a new product or significant improvement of the existing one. Grants amount to 20-50% of the agreed estimate for the innovation project. The company applying for grants undertakes to pay the "NTD Fund" royalties if the project becomes profitable (3% during the first 3 years of profit and 3.5% during all subsequent ones, but the total amount of payments cannot be more than the amount of the grant provided plus interest, except for transfers of production rights abroad, which are subject to other rules). Royalties are directed towards financing other grants and promoting the development of innovation activities in the country (Novitska O.V., 2012). Stimulation of innovation activity is carried out at the expense of two technological centers in the south of the country, dealing with problems of resource conservation and renewable energy sources. The mentioned Centers promote the cooperation of higher scientific institutions, research institutes and industry with regard to the development of new technologies in the field of environmental protection. The government authorities have already allocated 25 million US dollars for the next 5 years for the implementation of environmental innovation projects (Novitska O.V., 2012). In Japan, the state is pursuing a course to overcome technological lag due to: import of foreign technology, a consistent transformation of the economic structure, the combination of innovation factors with the economic mechanism, support for the concept of forecasting, which allows choosing and

stimulating those technologies which will be prioritized in 10-15 years. In Western European countries, such tax benefits as extra-concessions (at their expense, firms can fund their tax base more than 100% of innovation costs) and a tax credit, which allows you to finance only a certain percentage of innovation. The financing of scientific and technical work by the state in Japan is 0.58% of GDP, in the USA - 0.76%, Germany - 0.79%, France - 0.80%, the United Kingdom - 0.55%. In France, direct financing of innovation costs in leading firms is 50%, as many as free loans in Germany.

Thus, the stimulation of innovation activity of enterprises has shown that in the countries of Europe various tax privileges are used, namely:

– extra tax allowance) – special privileges that enable firms to finance more than 100% of their innovation costs from their tax base;

– «tax credit» – a privilege that enables firms to finance a certain percentage of their innovative spending on tax liabilities.

Great interest, and at the same time a lot of controversy, causes the use of a tax credit. There are two schemes for its application. In the first case, the firm has the right to reduce the accrued income tax in proportion to the amount of the cost of innovation (volume based tax credit). So, with statutory discounts, for example, at 30%, the company has the ability to reduce the total amount of tax liabilities by 30 euros from every 100 euros spent on a particular type of innovation. The advantage of a tax credit under such a scheme is the ease of its use by tax authorities and subjects of innovation activity. At the same time, the disadvantage of such a tax credit is the lack of any guarantees on the part of the companies that they will reinvest the funds that were additionally due to the use of a tax

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credit to innovate. Under the second scheme, the accrued income tax decreases, based on the company's increase in the cost of a particular type of innovation compared with the level of the base year or incremental tax credit. In this case, with a discount rate of 30%, the company's tax payments will be reduced by 30 euros from every 100 euros of incremental costs for a separate type of innovation process in the current

year. The advantage of applying such a tax credit scheme is to provide even greater benefits to companies whose innovative activity is increasing. The obvious drawbacks of this scheme are: the lack of an unambiguous solution to the problem of choosing the level of expenditure, which determines the growth of future costs, and, consequently, the introduction of the administration of income tax.

Table 1. Forms of state stimulation of innovative processes in developed countries of the world

Countries	Forms of stimulation	Organizational structures of the innovation process
USA	Preferential taxation, investment tax credit, preferential treatment for depreciation, subsidies, targeted budget allocations, reimbursement of R & D expenditures related to basic production and trade, from the amount of taxable income	Technological capital network (MTK): technopolises, scientific and technical parks, quasi-risk form of corporation organization, small innovation firms, research consortia and organizations, business incubators, scientific and technological centers, scientific and engineering centers, joint industrial-university research centers, venture companies
Germany	Targeted free subsidies, subsidies, fees for technical expertise, preferential loans, credit insurance system, tax deductions and benefits, accelerated depreciation, targeted bank loans	Science and technology parks, small innovation firms, research consortia, venture firms, technopolises
France	Grants, subsidies, long-term loans, tax credits, credit guarantees, preferential taxation	Grants, subsidies, long-term loans, tax credits, credit guarantees, preferential taxation
Japan	Favorable loans, preferential taxation, subsidies	Japanese Research Development Corporation, Technopolis, Science and Technology Parks, Small Innovative Firms, Research Consortia and Organizations
United Kingdom	Preferential taxation, subsidies, write-off of R & D expenses on the cost of production (services, credit guarantees)	British technology group, technopolises, small innovative firms, science and technology parks, venture companies, research consortia
Canada	Loans on concessional terms, subsidies, technical assistance, tax credit, preferential taxation	Technopolis, science and technology parks, small innovative firms, venture companies, research consortia

Source: compiled by the authors based on (Shmigelskaya Z.K., 2007).

In the EU, the following forms of state incentives and regulation of innovation activities are used, such as: subsidies for the creation of funds for the introduction of innovations taking into account the potential risk and reduction of state fees for individual inventors (Germany, Austria). According to experts, in the late 1990s, Germany,

France and the United Kingdom spent the same amount of money on innovation as Japan.

It is worth noting that there is the practice of issuing free licenses in the United States for the commercial use of inventions; formation of state innovation infrastructure; monitoring by state authorities;

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forecasting and expertise of innovative projects; awarding scientists and innovators of state awards and awarding honorary titles.

Managing innovation activities in different countries varies by the degree of state intervention, the needs of society and the level of scientific and technological progress. The most common forms of stimulation and regulation of innovation processes in a number of countries of the world are preferential taxation, investment tax credit, subsidies, reimbursement of R &

D expenses, payment for technical expertise, accelerated depreciation (tabl. 1) (Avigdor Ed. G., Kapitsy Yu. etc., 2011).

The system approach has become the key to the success of innovation policy in Finland. In particular, it is the establishment of cross-sectoral links between science, universities, enterprises, industry associations and state agencies by stimulating various partnerships between them, which has made it possible to prioritize investments in R & D, an effective system of coordination and cooperation between research institutes and funding organizations.

Table 2. Mechanisms of tax incentives for innovation

The mechanism of tax incentives	Object of stimulation	Countries that use these tax incentive measures
Write-off of R & D expenses	The volume of R & D investment, the growth rate of investment in R & D	Austria, Australia, Belgium, United Kingdom, Hungary, Germany, Denmark and others.
Tax Research Loan	The volume of R & D investment, cooperation between private business and the research community	USA, France, Norway, United Kingdom, Canada
Special methods of depreciation of fixed assets	Investing in the road of research equipment	Austria, Belgium, Denmark, Italy, Spain, Ireland, Portugal, USA, Sweden
Investment tax credit	Investments in technological modernization of the company	USA
Tax privileges on income from a foreign source	Technology Transfer	OECD countries
Tax benefits on the sale of shares	Investments in high-risk long-term projects, diffusion of innovations	USA
Tax credit for wages	Investment volume, investment in human capital	Netherlands

Source: formed by the author on the basis of (Avigdor Ed. G., Kapitsy Yu. etc., 2011).

Comparing the mechanism of the tax credit in foreign countries with the mechanism of the implementation of preferential taxation of profits from innovation activities in Ukraine, we can conclude that there is one fundamental difference. In industrialized countries, a company gains the right to use a tax credit after it has incurred costs for innovation, whereas in Ukraine, an enterprise, having registered an innovation

project, first receives the right to a profit tax benefit, and subsequently implements the costs of innovation activities.

We have investigated the most effective mechanisms of tax incentives used in world practice (Table 2). Thus, the main tax instruments that proved to be effective are: write-off of R & D expenses, special depreciation of fixed assets, tax breaks and

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loans. Using these tax breaks, an innovative company reduces the taxable base, has the ability to quickly update fixed assets and expand its business, gaining more profit.

A significant level of resource intensity of products of industrial enterprises of Ukraine in the conditions of growing world prices for industrial resources requires the transition of domestic enterprises to resource-saving and environmentally friendly technologies. On the one hand, it will allow to achieve economic growth, gain competitive advantages by domestic business entities in the world market. On the other hand, the use of innovative resource-saving technologies will contribute to reducing the resource intensity of industrial production and the rational use of natural resources involved in economic activity and reduce the technogenic load on the natural environment. Ecologization of innovation activity of industrial enterprises is an important component of the ecological development of any country, therefore the state system of regulation of innovation activity should provide tools for reducing the resource intensity of production, creation of closed material and energy cycles, orientation towards recovery and environmentally friendly energy sources. To date, the world practice has proved that ecologization of innovative activity of industrial enterprises should include the use of such ecological and economic instruments as: environmental tax, payment for natural resources, pollution charges, environmental pollution fines, etc.

Describing the Ukrainian model for stimulating innovation, it is worth noting that it tends to be more relevant to the Anglo-American model, since the government relies more on market mechanisms to stimulate innovation than to directly support

the innovation process.

At the same time, it should be emphasized that none of the above models can be applied in its pure form due to the specificity of the formation of an innovative environment in individual countries of the world. If the tools of innovation policy and the mechanisms of their use are effective in one country, then they are completely unsuitable for use in another. Therefore, most states, as a rule, implement state policy in the innovation field, combining methods of direct and indirect influence, the level of application.

Conclusions. Consequently, the analysis of the experience of state incentives and regulation of innovation in a number of developed countries of the world allowed to distinguish the most common methods of stimulating innovation processes. Public incentives should provide encouragement for the development and implementation of innovations, as well as incentives for negative motivation, the main task of which is to re-equip the existing industries through the use of innovations. The first one includes state subsidies, subsidies, preferential lending, state-owned enterprises, various tax incentives, accelerated depreciation, government contracts, state-owned loan insurance, successfully used in developed countries. The incentives for negative motivation include emission valuation, fines, fees for the use of natural resources and environmental pollution, and so on. Studies have shown that the Ukrainian model of stimulating innovation activity of the enterprise is more oriented towards the Anglo-American model, since state regulation and stimulation relies on market mechanisms for stimulating innovation processes.

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