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STATE REGULATION OF TAX STIMULATION FOR INNOVATIVE ACTIVITIES OF ENTERPRISES

Abstract. There are modeling the implications of introducing tax incentives for innovative enterprises. The appropriateness of tax incentives for innovation at the expense of incremental tax credit on corporate profit tax has been confirmed. There was proved that state regulation of incremental tax credit causes positive changes both for enterprises and for the state. There was determined that an increase in the amount of taxpayers' tax liabilities does not affect the increase of tax burden. The results prove the high capacity of incremental tax credit to stimulate innovation. Moreover, the role of the private sector is to transform the available financial resources (ie, net profit) into an investment and innovation resource. And the role of the public sector is to invest in the development of innovations through indirect funding (that is, "directing" those who have not received as a result of preferential taxation of capital investments). At the same time such "direction" is carried out by providing tax incentives to innovative enterprises on the target conditions.

Keywords: state regulation, innovations, incremental tax credit, tax incentives, privilege, simulation modeling.

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ДЕРЖАВНЕ РЕГУЛЮВАННЯ ПОДАТКОВОГО СТИМУЛЮВАННЯ ІННОВАЦІЙНОЇ ДІЯЛЬНОСТІ ПІДПРИЄМСТВ

Анотація. Здійснено моделювання наслідків впровадження податкової пільги для інноваційних підприємств. Підтверджено доцільність державного регулювання податкового стимулювання інновацій за рахунок прирістного податкового кредиту з податку на прибуток

підприємств. Доведено, що впровадження прирiстного податкового кредиту обумовлює позитивнi зрушення як для підприємств, так i для держави. Визначено, що збiльшення суми податкових зобов'язань платників податкiв не впливає на посилення податкового навантаження

Ключові слова: державне регулювання, iнновацiї, прирiстний податковий кредит, податкове стимулювання, пiльга, iмiтацiйне моделювання.

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ГОСУДАРСТВЕННОЕ РЕГУЛИРОВАНИЕ НАЛОГОВОГО СТИМУЛИРОВАНИЯ ИННОВАЦИОННОЙ ДЕЯТЕЛЬНОСТИ ПРЕДПРИЯТИЙ

Аннотация. Осуществлено моделирование последствий внедрения налоговой льготы для инновационных предприятий. Подтверждена целесообразность государственного регулирования налогового стимулирования инноваций за счет приростного налогового кредита по налогу на прибыль предприятий. Доказано, что внедрение приростного налогового кредита обуславливает положительные сдвиги как для предприятий, так и для государства. Определено, что увеличение суммы налоговых обязательств налогоплательщиков не влияет на усиление налоговой нагрузки.

Ключевые слова: государственное регулирование, инновации, приростный налоговый кредит, налоговое стимулирование, льгота, имитационное моделирование.

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Introduction. For successful innovation, an appropriate financial base is required which, in market conditions, should be shaped not only through direct financing methods, but also on the use of indirect levers, such as taxes. In Ukraine tax incentives for innovation during all years of independence were not sufficiently effective, and therefore did not bring the expected results. That is why the activation of tax incentives for innovation is of particular importance today. The issue of stimulating innovation activity of enterprises is widely considered in the economic literature. The necessity and significance of such stimulation are substantiated, its separate directions and methods are considered. However, a number of important aspects of this problem are still beyond the attention of scientists. Thus, an important direction in overcoming the problem of excessive tax burden and adaptation to the uncertainty of the tax environment is the formation of a set of measures to manage tax burden at the level of individual enterprises in order to make effective management decisions in the field of taxation. At the same time, the important condition for the harmonization of relations between taxpayers and the state is the use of those mechanisms and management criteria that do not oppose the current legislation and do not lead to a reduction in budget revenues at all levels. This becomes possible due to the use of economical and mathematical methods and models based on adaptive principles.

Previous research on the subject. Many scientists tackled about tax incentives for innovation. The influence of taxation, as a whole, on certain types of taxes, on innovation activity

was investigated in his writings by VP Vishnevsky, O. D. Danilov, L. S. Grinov, A. G. Zagorodniy, Yu. B. Ivanov, M I. Karlin, A. I. Krisovaty, S. M. Lobozyanskaya, T. V. Medinskaya, V. M. Melnyk, I. R. Myssuk, G. A. Partin, D. M. Serebryansky, L. P. Siddelnikov.

Purpose of work is the development of adaptive integrated approach to tax incentives management of enterprises, which will allow forming effective managerial decisions to improve their innovation activity.

Results of the research. For countries that are eager to enter the trajectory of sustainable economic development, the priority task of economic policy is to stimulate innovation development [1, p. 131]. OECD countries use a variety of direct and indirect means of supporting and stimulating R&D. Spain, the Russian Federation, Slovenia, the United States and the Czech Republic are more reliant on direct support, while Australia, Belgium, Ireland, Canada, the Netherlands, Portugal, France and Japan mainly use tax incentives for R&D. Austria, Great Britain, Denmark, China, Korea and Turkey use both directions of state regulation almost equally. The largest public stimulus of R&D by fiscal and tax resources is characteristic of Korea, the Russian Federation and France. Instead, in Estonia, Israel, Mexico, Germany, New Zealand, and Sweden, tax regulations for innovation are not used at all [8; 11]. Among the R&D tax instruments of the OECD countries, tax exemptions and tax credits are often used, as well as accelerated depreciation of capital expenditures related to R&D.

In addition to the corporate income tax, tax incentives for innovation are also used within employer deductions for social security, as well as tax deductions from R&D [8]. National differences in the use of indirect state support for R&D are determined by the total volume of R&D expenditures and the level of profitability and scale of activity of innovative enterprises. For example, Australia, Canada, Korea, the Netherlands, Norway, Portugal, France and Japan prefer to invest in small and medium-sized enterprises (direct and through tax incentives) in R&D.

In some countries, benefits are provided to enterprises with a low level of profitability – to stimulate R & D. An example is Austria and Norway [8]. The most widespread tax incentives for stimulating innovation are those that are embedded in the corporate income tax mechanism (Table 1).

Table 1

State regulation of R&D tax incentives in OECD countries

Tax incentive tool	Country
Volume tax credit from corporate income tax	Australia, Austria, Belgium, United Kingdom Denmark, Canada, Spain, Italy, Netherlands, Norway, South Korea, Portugal, USA, France, Chile, Japan
Incremental tax credit	USA, Ireland, Spain, Portugal, Japan
Tax deduction from individual income tax	Belgium, Brazil, United Kingdom, India, China, Lithuania, Malaysia, South Africa, Poland, Singapore, Turkey, Hungary, Croatia, Czech Republic
Exemption (full or partial) from taxation of income tax	China, Colombia, Malaysia, South Korea, Finland, Czech Republic, Chile, Japan
Accelerated depreciation of fixed assets	Brazil, Lithuania, Par, France
Tax incentive tools for small businesses	Australia, Great Britain, Canada, Korea, Netherlands, Norway, Portugal, Hungary, France, Japan
Targeted tax incentives	USA (in the field of energy); Belgium, the Netherlands, Portugal, France (for newly created companies)
Reduction of corporate income tax rate	Israel, China
Exemption from social contributions	Belgium, Hungary
Privileges from individual income tax	Ireland
Exemption from VAT	China

Consequently, the most common instruments of tax incentives for innovation in foreign countries are tax credits and tax deductions. The distribution of tax incentives granted to small innovative enterprises should also be noted. This is a good practice, because small commodity producers are more maneuverable and flexible in adapting to the requirements of innovative development.

If we talk about fiscal and tax support for innovation in Ukraine, we have not succeeded enough in its results. For most types of economic activity in Ukraine, the ratio of fiscal support and the total amount of funded technological innovations and fixed capital investment is less than 1. Thus, only a small part of the state financial support is transformed into an investment and innovation resource of production. This indicates a lack of strategic views on the technological upgrade of the national economy [6, p.248]. A similar situation is observed with respect to the ratio of net profit after deducting the amounts of corporate profit tax to the total amount of financing of technological innovations and investments in fixed assets. The value of this ratio of less than 1 allows us to assert that a small part of the net profit of commodity producers is spent on financing capital investments and innovations.

At the same time, certain types of economic activity, in particular "Extraction of minerals, except for fuel and energy", "Metallurgical production and production of finished metal products", "Machine-building", "Trade; repair of cars, household appliances and personal items", "Financial activity", the value of the ratio of net profit after deducting the amounts of corporate income tax to the total amount of financing of technological innovations and investments in fixed assets considerably exceeds 1. Given the overall level of innovation development in Ukraine such results suggest that, having the disposal of a net profit, commodity producers do not transform their own financial reserves into investment-innovation resource. This is a consequence of the imperfection of the mechanism of tax incentives for innovation and investment.

The insufficiently high level of innovative development of the economy of our country points to the need to attract both public and private capital to finance development and innovation, that is, there should be mixed financing of innovations. At the pre-commercial stage, innovation must be 100% financed by public funds. And with each successive stage of the life cycle of innovation, it should decrease. Instead, the share of private investment in innovation should gradually increase. And at the commercial stage, full financing of innovation should be achieved only at the expense of private capital [3]. However, the unfavorable investment climate in our country makes it necessary to support innovation at the expense of budget funds at all stages of the life cycle of innovation. Especially important is the state support for the stages of the innovative project "fundamental research" and "applied research", which are mainly implemented by specialized scientific institutions and innovative organizations. The next three stages of the innovation life cycle – "research and development", "implementation" and "growth" should be financed both from public funds and from private capital. As a result, various tax incentives for investment and innovation acquire a special significance at these stages. Innovative projects at the "deceleration" and "downturns" stages require minimal government support, as at the same time, revenue from the sale of innovative products and enterprise profits is shrinking, a gradual "collapse" of the project takes place. And, therefore, state incentives for new innovations and reinvestments become more appropriate.

One of the key factors for the development of enterprises of any kind of economic activity is technological innovation and investment in fixed assets [1, p. 248]. Therefore, special means of public stimulation of innovation processes are of particular interest, primarily due to tax regulation instruments.

To confirm the expediency of tax incentives for innovation, a simulation of the implications of introducing tax incentives for innovative enterprises has been carried out. As a privilege, an incremental tax credit on corporate profit tax has been selected, since, on the one hand, this privilege is quite widespread in the practice of tax regulation of innovation processes in foreign countries. On the other hand, the mechanism of this privilege provides for the right to taxpayers to reduce the amount of income tax on a certain percentage of the growth of qualified investments compared with the basis. If an increase in the amount of capital investments does not occur, the taxpayer loses the right to use this tax regulation instrument. In today's conditions of innovation development in Ukraine, this privilege is considered the most expedient, since, first, it really provides a significant reduction in the tax burden on the taxpayer (by reducing the amount of tax payments).

Secondly, it stimulates commodity producers to enter the trajectory of sustainable innovation with a steady increase in the scale of innovation and an increase in the amount of

investment in innovation. Thirdly, the limited scope of this privilege (only for those enterprises that are constantly increasing investment in innovative projects) will not cause excessive budget losses due to lack of tax revenues. In particular, the volume tax credit and the volume tax deduction from the corporate income tax are widely distributed in the foreign countries, which involve reducing the amount of tax or tax base (respectively) for the full or partial amount of qualified investments (especially, if the legally determined mechanism of such privileges involves reducing the amount of tax or tax base by 100% (or more) from the amount of the cost of innovation). This is especially true for Ukraine in the conditions of chronic budget deficit.

The initial data for modeling were official statistics on the results of innovation activities in Ukraine (namely, the results of the activities of innovative enterprises in the Statistical Collections "Scientific and innovation activity in Ukraine" for the specified years [4]).

In addition, it assumes that the amount of net profit earned is fully invested by the enterprise – partly on fixed assets, partly – on the purchase of additional production resources (the targeted nature of the tax breaks is provided).

The simulation is carried out for 5 years. It should be noted that the calculation of income tax was made according to the rules that were in force till 2015, according to which the basis of taxation of income tax was determined by reducing the amount of income of the reporting period to the cost of goods sold, works performed, services rendered and the sum of other expenses of the reporting tax period.

As a method for modeling the effects of introducing incremental tax credits, the concept of the method of system dynamics was chosen, and as a software package, simulation model Vensim PLE 5.0. The advantages of this software package are the ability to study a particular system in a dynamically high degree of visibility and without cumbersome calculations, which allows you to quickly build flow diagrams of causal relationships between variables. In addition, it provides the opportunity to simultaneously analyze the system under study and conduct experiments with the constructed model by adjusting the input data [2; 9].

Created in the Vensim PLE model consists of a set of interrelated variables implemented in the form of diagrams. It includes such structures as levels, flows, additional variables. The levels (displayed in a rectangular frame) represent the accumulation of input influences in the system under study. Their values are formed as the accumulation of differences between incoming and outgoing flows. The corresponding calculations are made at each step of the simulation, so the value of each level at the appropriate moment of time is equal to its value at the instant moment of time plus all input streams, minus all output streams. With the help of streams, the transport of quantitative quantities to the level, between level and between levels is realized. They represent material or informational processes. Additional variables are used to simulate elements of a real system that affect other variables. They are formulated using algebraic equations [2; 9].

The scheme of the interconnection of the variables model of the impact of incremental tax credit on the results of the activities of innovative enterprises for the basic taxation regime is presented in Fig. 1.

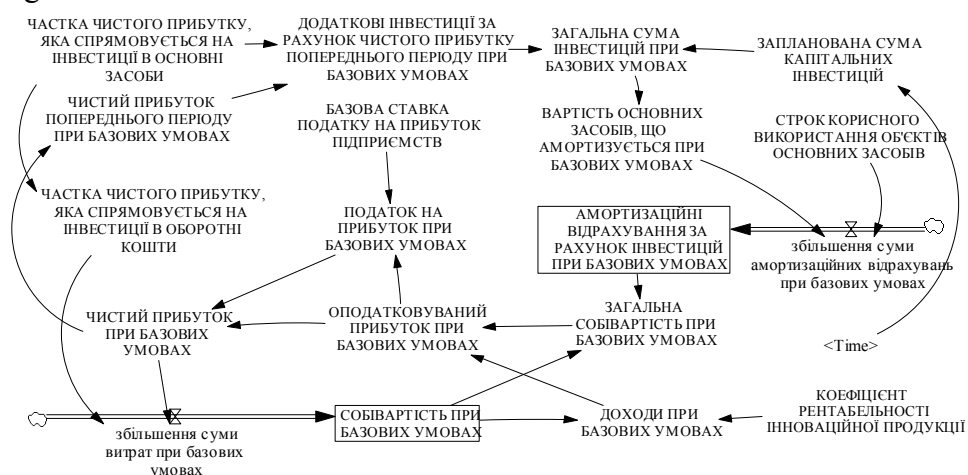


Fig. 1. Flow diagrams fragment of the impact model of incremental tax credit on the results of the innovative enterprise activity for the basic taxation regime

Note that the selection of the indicators given in Fig. 1 and was carried out on the basis of the methodology for calculating the amount of income tax when applying incremental tax credit in accordance with European practice [12], as well as the procedure for determining net profit of enterprises.

Thus, the introduction of an incremental tax credit on corporate profit tax provides significant improvements in the results of innovation activities at both enterprise and state level.

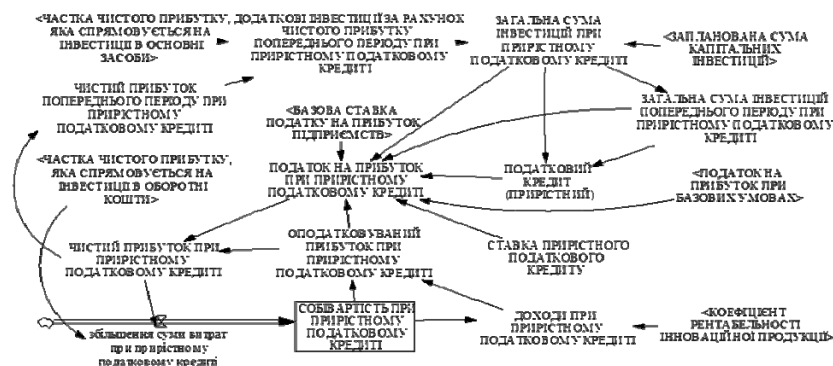


Fig. 2. Flow chart fragment of the impact of incremental tax credit on the results of the innovative enterprise activity for the preferential tax treatment

As a result, it is fast enough, namely, within 3 years (or 12 quarters), to achieve the return on budget losses due to preferential taxation. It clearly shows the value of the indicator "accumulated amount of increase in the amount of tax revenue".

Moreover, despite initial budget losses due to a lack of tax revenues, we have a fairly rapid increase in the amount of income tax (due to the direction of tax-deductible funds to increase the scale of innovation, which results in a gradual increase in the tax base). If we compare the performance of innovative enterprises at preferential and basic conditions, then it is obvious that the introduction of incremental tax credit causes positive changes both for enterprises and for the state.

At the same time, despite the increase in the amount of tax liabilities of taxpayers, there is no increase in the tax burden (calculated as the ratio of the amount of income tax to the amount of income of the enterprise). This is due to the faster dynamics of the amount of income producers in comparison with tax liabilities on income tax. And the gradual reduction of the tax burden once again proves the high impact of tax privilege.

Moreover, it should be noted that in both cases we have a gradual slowdown in the reduction of tax burden. And under the basic taxation conditions at the end of the studied period, we see even a gradual increase (Fig. 3).

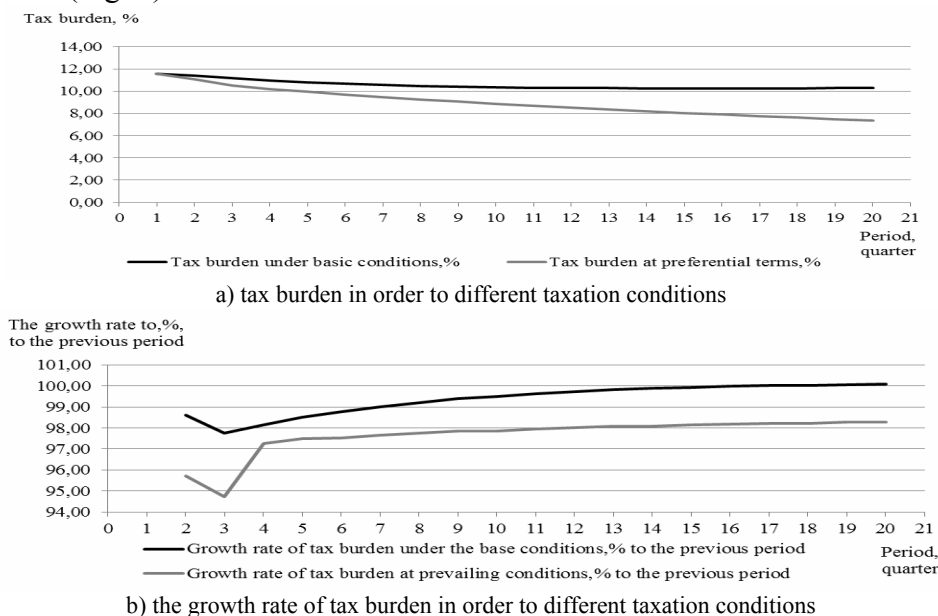


Fig. 3. Tax burden for innovative enterprises in order to basic and preferential terms

It should be noted that the "jump" in the dynamics of the level of tax burden at the beginning of the investigated period is due to a significant difference in the amount of tax liabilities of the taxpayer, which is the consequence of the tax exemption. Informative from the point of view of the effectiveness of the tax privilege is the ratio of the amount of net income to the total investment (Figure 4). The value of this coefficient above 1 under preferential tax conditions is achieved at the time of recoupment of budget losses, which is much earlier compared with the basic taxation regime. This indicates that when introducing tax privileges, payers are witnessing a more active transformation of financial resources of enterprises into an investment and innovation resource. In both cases there is a gradual slowdown in the dynamics of the ratio of net income to total investment, which may indicate, on the one hand, the gradual depletion of innovation projects (and hence the need to invest in new innovations), and, on the other hand, taking into account the stable growth of the net amount profits and tax revenues, and the withdrawal of enterprises on the trajectory of sustainable economic growth and development.

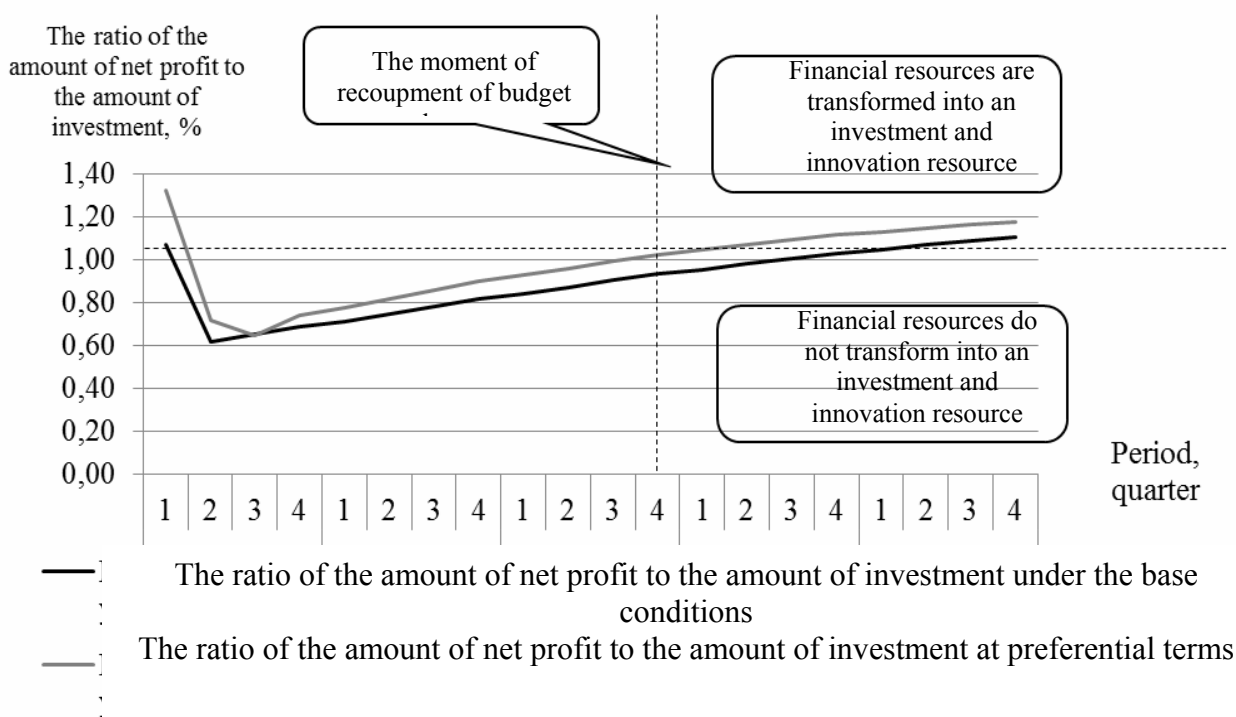


Fig. 4. Dynamics of the ratio of the amount of net profit to the total investment under different tax conditions

Conclusions. Thus, the results prove the high ability of incremental tax credit to stimulate innovation. Moreover, the role of the private sector is to transform the available financial resources (net profit) into an investment and innovation resource. And the role of the public sector is to invest in the development of innovations through indirect funding (that is, "directing" those who have not received as a result of preferential taxation of capital investments). At the same time such "direction" is carried out by providing tax incentives to innovative enterprises on the target conditions.

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