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TAX IMPACT ON INVESTMENTS IN RESEARCH AND DEVELOPMENT OF INDUSTRIAL ENTERPRISES

Abstract

The article substantiates the feasibility of using fiscal incentives to stimulate business investment in research and development (R&D) to intensify production innovations and ensure high-quality economic growth. In order to determine the potential impact of tax instruments, the author assesses the dependence of R&D expenditures on changes in the tax burden using econometric modeling methods. This approach has not yet been adopted by Ukrainian researchers. The present study sought to investigate the non-linear negative effects on R&D investment by enterprises from an increase in the tax burden. The statistical estimates obtained confirmed the significance of tax instruments in stimulating industrial business investment in R&D. This finding provides a rationale for recommending the introduction of appropriate incentives, which are currently absent within the Ukrainian legislation.

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Key Words:

effective tax rate, investments in production innovations, knowledge intensity of industries, research and development expenditures, tax burden, tax incentives for business innovation.

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2 tables, 3 formulas, 33 references.

Problem Statement

Tax incentives for research and development (R&D) are a common tool to promote innovative entrepreneurship. R&D projects are financed by companies in order to obtain scientific knowledge that, when implemented, will improve the productivity, reliability, quality and functionality of a product or software. The scientific knowledge implemented in the industrial sector in the form of production innovations ultimately becomes a source of financial prosperity and economic growth, a factor in establishing a competitive position in the market. However, significant costs, as well as considerable uncertainty and the inability to guarantee the desired result in advance, discourage companies from investing in R&D.

Recognizing the social importance of science and its ability to provide opportunities for accelerating economic growth and development, many governments not only invest in scientific activities themselves, but also encourage companies to do the same. Government support in the form of direct funding and tax incentives is intended to reduce the burden of R&D and innovation costs on businesses. In doing so, governments seek to compensate for the lack of market incentives for the private sector to invest in R&D at socially optimal levels.

The provision of tax incentives involves a deliberate temporary loss of current budget revenue that the government agrees to spend for a specific purpose. By using tax incentives to stimulate business innovation, the government helps businesses strengthen their financial capacity to invest in R&D (using tax-exempt funds) and then to apply scientific achievements in production. At the same time, the subsequent growth in corporate profits compensates the government for past revenue losses, ensuring a positive budgetary impact of tax incentives.

The task of maintaining the sustainability of the Ukrainian economy in the face of the confrontation with the Russian aggressor and future post-war reconstruction is impossible without large-scale investment in R&D and innovation. The introduction of innovations based on the results of internal research and development serves as a source of productivity and economic growth, guarantees the strengthening of the national economy's resistance to adverse external influences and asserts its self-sufficiency in the face of global shocks and uncertainties. In order to stimulate the inflow of the above-mentioned investments, it is necessary to apply appropriate mechanisms that would ensure an effective impact on innovation processes. Accordingly, the need to review the impact of fiscal instruments to promote investment in R&D is becoming increasingly relevant.

Literature Review

Conventional theoretical frameworks concerning innovation underscore the significance of market competition and business profitability for innovative change, while concurrently underscoring the necessity for government intervention to address market failures. Tax incentives represent a critical component of fiscal policy, serving to enhance the structural design of the economy by fostering business innovation. In contrast to the discretionary and selective direct forms of support, such as public funding of specific research areas, grants, and public procurement of scientific services, tax incentives are typically available to most firms engaged in R&D that meet predefined criteria.

International surveys, regularly conducted under the auspices of the OECD, examine the mechanisms of tax incentives for R&D and innovation in different countries. These surveys systematize data on the spread of various forms of tax incentives, track the effectiveness of their application, and the directions of changes in tax policy (OECD, 2023a; González Cabral, Hanappi et al., 2023; OECD, 2023b). Consequently, an increasing number of countries worldwide have adopted the strategy of leveraging tax instruments to incentivize business R&D. Additionally, there has been a notable rise in the significance of tax losses in public finances over recent decades (González Cabral et al., 2021; OECD, 2023c).

Although the landscape of tax incentives for companies to conduct R&D is very heterogeneous, generally, the schemes for determining benefits are tied either to R&D expenditures (including current and capital expenditures) (González Cabral et al., 2021) or to the income from intellectual property and innovations generated by R&D (González Cabral, Appelt, et al., 2023; González Cabral, O'Reilly, et al., 2023). In OECD countries, the first scheme of tax incentives for R&D, i.e., the one based on expenditures, is more commonly used (González Cabral, O'Reilly, et al., 2023; González Cabral et al,, 2021). In particular, tax support for business R&D expenditure is provided in 90% of OECD countries and 80% of EU countries. The amount of such support is on average 60% and 58% of the total amount of direct government funding for business R&D, respectively.

Analytical reviews of the effectiveness of fiscal policy demonstrate that tax incentives reduce the cost of capital for R&D investment by average 3.5%, while reducing the effective average corporate tax rate by 8.8% (González Cabral et al,, 2021; OECD, 2023c). The cost of capital for R&D investments is reduced compared to the cost of capital for other types of investments, as well as to the real interest rate in most OECD countries (in 36 out of 38 countries with R&D preferences). Investments in R&D are typically considered tax deductible, thereby reducing the tax obligation associated with these expenditures.

When taking into account the various incentives, the effective tax rate for R&D-intensive firms in OECD countries is on average 12.5%, which is lower than the statutory corporate tax rate. The variation in rates extends from 0.3% to 19.4%. Consequently, fiscal preferences have been shown to reduce the cost of investment in R&D, concurrently increasing its profitability for business entities. This, in turn, enhances the ability of business to invest further.

The allocation of tax incentives to encourage business investment in R&D has been shown to have unintended consequences, including the potential for a decline in budget revenues. Observations indicate a propensity to augment the magnitude of tax incentives for business R&D and its proportion in the aggregate state support. Specifically, expenditures on tax incentives increased from 0.02% to 0.10% of GDP in the EU-27 countries during 2000-2021, and from 0.04% to 0.12% of GDP in the OECD-38 countries (OECD, 2024). Typically, the provision of substantial tax incentives for R&D is accompanied by a corresponding decline in direct government funding for R&D. For instance, the total government support for business R&D in the UK constitutes 0.48% of GDP, including 70% in tax incentives, 0.46% and 79% in Iceland, and 0.42% and 67% in France, respectively.

Another variant of the preferential taxation regime is focused on income derived from R&D results embodied in intangible assets, such as intellectual property rights (IPR, which enjoys formal protection—patents, software, etc.). The benefits encompass various forms of income derived from the commercialization of R&D within the national jurisdiction, the ownership of a license to IPR, the sale or transfer of IPR, and are expressed in the form of royalties, lump sums, and so forth. This regime has been implemented in 22 out of 38 OECD countries and in 17 out of 27 EU countries (González Cabral, O'Reilly, et al., 2023). Concurrently, the tax rate undergoes a reduction averaging 7.4%, equivalent to 65% of the stipulated full corporate tax rate.

Both preferential tax regimes (based on either R&D expenditures or income) coexist in many countries, which improves the operating environment for research-intensive businesses and the science sector.

A study of the macro-level effects of tax incentives for R&D investment found that scientific achievements are spillovers between industries and thus contribute to the growth of aggregate productivity in a country's economy (von Brasch et al., 2021). Using a macro-model of a small open economy in Norway, the authors revealed the sequence where tax incentives reduce the cost of capital for R&D (by at least 23%), significantly increase R&D investment, and then knowledge and scientific capital flows between industries, ensuring long-term growth in production, real wages and household consumption.

The authors of an analytical study on the dependence of economic innovation on the composition of tax and institutional factors based on data from 36 OECD countries in 1996-2013 concluded that the importance of good quality regulatory institutions (in terms of governance, rejection of corruption) is essential for preferential taxes for knowledge-intensive companies to work as part of innovation change strategies (Balsalobre-Lorente et al., 2021).

A plethora of studies have demonstrated that the stability of R&D tax incentives enables companies to enhance the efficiency of R&D investments and the effectiveness of innovation in general. A study based on a sample of companies from various non-financial sector industries listed on the stock exchange and OTC market in Taiwan shown the benefits of generous R&D tax incentives and convincingly proved the economic feasibility of maintaining long-term stability of tax policy in this area (Chen & Li, 2018). The central question of an analytical study based on a sample of manufacturing firms in Spain was whether the number of innovative products launched depends on the length of time firms have been using R&D tax credits (Labeaga et al., 2021). Analytical modeling has demonstrated that the sustainability and duration of tax credit measures for business R&D expenditures (ranging from 1-2 to 13-14 years) are nonlinear but positively correlated with the actual amount of these expenditures, as well as with the number of product innovations in the group of large firms. In the group of small firms, similar correlations are more intense but last for a shorter time.

Focusing on the formation of their own sources of economic growth, developing countries are adopting the experience of tax incentives for technological innovation. A study of the effectiveness of such a policy in Brazil, based on a sample of more than 13,000 firms benefiting from the law on fiscal incentives for business innovation, showed its positive effects on the science sector (increased investment in R&D, increased number of research staff) (Gama e Colombo & Nogueira da Cruz, 2023). However, a lack of substantial changes in innovation spending or the production of new products was observed. Therefore, the study's findings have yielded recommendations that relate to the enhancement of tax instruments and the elucidation of qualification requirements. These recommendations are intended to ensure a more precise impact on business innovation.

In the context of structural industrial policy, tax regimes have become increasingly prevalent, wherein benefits are allocated to taxpayers engaged in specific domains of research and innovation or technological industries. In particular, Taiwanese biotechnology companies benefit from favorable tax conditions that promote innovation (Chen & Li, 2018). This phenomenon is also evident in the promotion of new industries within the high-tech sector in the United States, Japan, South Korea, China, and other countries (Juhász et al., 2024). Businesses pay close attention to tax incentives because they are the main investors in research and development in many countries. In the United States, for example, the business sector performs 78% of the total volume of research and development, and contributes 76% of total R&D funding (National Science Foundation, 2024).

A review of foreign literature indicates that the use of tax incentives constitutes a prevalent innovation policy in the contemporary world, which is characterized by rapid technological change. However, in Ukraine, tax incentives for business sector investments in R&D are seldom utilized. Consequently, it is not unexpected that the level of spending on R&D and innovation has been declining for an extended period (the knowledge intensity of GDP fell to 0.4% of GDP in 2021 and 0.3% in 2022-2023), while the structural structure of the economy was weakening (Yehorov & Kindzersky, 2023). The state bears the primary financial responsibility for R&D (67%), whereas the business sector allocates a significantly smaller proportion of its financial resources to this purpose (12%) (Shovkun, 2024).

In the absence of adequate tax incentives for business R&D in Ukraine, domestic researchers prioritize a meticulous examination of pertinent foreign practices (Frolova, 2021; Sokolovska & Rainova, 2017), and the periodic updates of OECD thematic reviews are instrumental in this regard. In accordance with the prevailing consensus among experts regarding the pivotal function of innovation in enhancing productivity and economic growth, as well as in ensuring the long-term solvency of the state, there is a strong agreement on the necessity to implement tax incentives for private sector investment in R&D within the Ukrainian economy. Consequently, there is a concerted effort to adapt the most effective foreign practices on a national scale (Sokolovska & Rainova, 2017).

It is important to note that alternative approaches do exist. These approaches involve the consideration of «innovation tax incentives.» These incentives would take the form of income tax benefits for a certain share or increase in innovation expenditures in general, not just R&D expenditures, as is commonly accepted. At the same time, these approaches calculate budget losses from the proposed measures (Lunina & Bilousova, 2018). However, the authors of this approach estimate budget losses and additional benefits for enterprises based on hypothetical rather than real tax benefits. Conversely, the necessity for such uncertain calculations would be eliminated if the statistical authorities of Ukraine were to acknowledge the information regarding tax incentives related to R&D and innovation (Bohdan & Svyrydovska, 2018).

Indeed, there is ample evidence to suggest that the national practice of statistical assessment of scientific, technological, and innovation activities does not align sufficiently with international standards and exhibits deficiencies in several domains (Yehorov & Kindzersky, 2023). A significant portion of the text is dedicated to a comprehensive overview of tax incentives for R&D in general, along with a range of associated subjects. These include the various categories of incentives, the sectors that utilize them, and the types of economic activities they concern.

The prevailing scholarly focus in Ukraine is on the contemporary utilization of tax instruments to bolster fundamental industries that are of critical importance for the economic restructuring process, particularly in the context of technological advancement (Sokolovska, 2021; Frolova, 2021; Sokolovska, 2022). Analytical material relevant to this issue was published, for example, in the Accounting Chamber's report on the investigation of the effectiveness of the use of tax incentives by business entities and their impact on the development of aircraft manufacturing (The Accounting Chamber, 2019). Despite the rather controversial results of sectoral tax preferences (as evidenced in the aforementioned report), they retain a prominent place in the list of tools to support the development of new priority industries (Lunina et al., 2023).

The impact of tax incentives on investments in innovation, including research and development, is a well-established phenomenon in the Ukrainian economy. The budgetary efficiency of tax incentives for innovation is also generally accepted as a given. A similar logical guideline can be seen in the methodology for substantiating the budgetary effect of tax incentives for innovation (Nykyforov, 2021), as well as in the economic and mathematical model for forecasting the budgetary consequences of providing innovative tax benefits (Lunina & Bilousova, 2018). However, it should be noted that the methodology and model have not been evaluated using real data from the Ukrainian economy. A thorough review of the existing scientific literature reveals a lack of sufficient evidence regarding the actual impact of tax instruments. The issue of whether the intensity of innovation spending in the Ukrainian economy is contingent on taxes remains unresolved. This is due to the absence of reliable estimates.

The purpose of this study is to estimate the effects of changes in the tax burden on business investment in R&D. The results of this study will determine whether there is a reason to propose and whether it is advisable to introduce tax preferences for such investments in the range of manufacturing industries.

Data Sources and Methodology

The information for this study was taken from the annual observations of the State Statistics Service of Ukraine. The key data on R&D expenditures by type of economic activity come from the statistical tables «Input-output» in basic prices by year (State Statistics Service of Ukraine, 2024). The sample population consists of enterprises of the main manufacturing industries. The observation period was chosen on the basis of available statistical information, which at the time of writing is limited to 2013-2021.

The remaining information was derived from data concerning the performance of business entities. The lack of direct statistical data on the amount of current income taxes paid by industrial enterprises (corporate income taxes) created difficulties for the study. Consequently, we were compelled to calculate the relevant indicators using indirect data that was available. According to the instructions for completing the income statement (Ministry of Finance of Ukraine, 2013), net profit (loss) differs from financial result before tax by the amount of income tax. The annual observations on “Financial results before taxation of enterprises by types of economic activity” and “Net profit (loss) of enterprises by types of economic activity” were utilized to calculate the amount of income tax (Equation 1). The calculation results show the annual amount of total corporate income tax liabilities for the respective types of industrial activity.

$$TAX_{it} = FRBT_{it} - NFR_{it}, \quad (1)$$

Where:

Tax_{it} – corporate income tax expense for the type of economic activity *(i)* for the calendar year (*t*),

$FRBT_{it}$ – financial result before the taxation of enterprises within the type of economic activity *(i)* for the calendar year *(t)*,

NFR_{it} – net financial result of enterprises within the type of economic activity *(i)* for the calendar year *(t)*.

Therefore, the effective corporate income tax rate was calculated for the entire set of enterprises by type of industrial activity, as well as for the group of profitable enterprises. According to the TCU, the effective corporate income tax rate is calculated by dividing the amount of income tax expense by the amount of profit before tax according to the financial statements for the respective calendar year and multiplying by 100% (Equation 2). Since the effective tax rate represents the total tax rate paid by an enterprise on its profits, it is used to assess the tax burden.

$$TAXEFS_{it} = (TAX_{it} \div FRBT_{it})*100\%, \quad (2)$$

Where: $TAXEFS_{it}$ – the effective corporate income tax rate for the type of economic activity *(i)* for the relevant calendar year *(t)*.

Thus, the information for further research was prepared. The correlations were estimated using semilogarithmic regression models given by the formula:

$$Log(RD_{it}) = \beta_0 + \beta_1\, TAXEFS_{it} + \varepsilon\,, \quad (3)$$

where: i – designation of a certain type of economic activity;

t – designation of the calendar year;

RD – expenditures on research and development, UAH million;

$TAXEFS_{it}$ – effective income tax rate, %.

$\beta_0, \ldots, \beta_n$ – unknown regression coefficients to be estimated;

ε – unobservable error.

Research Results

The theory of technological change suggests that economic growth is contingent upon the transformation of all sectors, rather than just a select few, on an innovative basis (Ding, 2024). The potential for innovation is related to the diffusion of new technologies in each sector of the economy and, in the aggregate, directly depends on their knowledge intensity. In the absence of such diffusion, the economy's capacity for growth will persistently remain inadequate.

Previous studies have revealed how the Ukrainian economy is simplifying and structurally bogged down in the primary sector against the background of continuous technological progress of the global economy (Yehorov & Kindzersky, 2023; Shovkun, 2022). The current analysis of R&D intensity indicators provides some insight into the innovation potential of the manufacturing industry and its sectors (Table 1)[1]. The analytical data show a rather low overall level of R&D intensity and its significant stratification among manufacturing industries. In particular, the statistical characteristics of the mean and median range from 0.34 to 0.97% and 0.10 to 0.31%, respectively, over the observation period, and the range of variation in the total sample exceeds 10%. The average indicators show a weak demand for R&D by manufacturing firms compared to firms in other countries (Holt et al., 2021; National Science Foundation, 2024). The pharmaceutical industry (rank 21) is the leader in terms of R&D intensity, outperforming the next ranked industry (rank 26) by more than 5 times and the manufacturing industry as a whole by almost 16 times. The structural distribution of R&D expenditure is also skewed towards the pharmaceutical industry, which accounts for almost half of the total. Thus, the estimates of R&D intensity presented here indicate an urgent need to improve the technological capabilities of industrial firms and, accordingly, the desirability of taking appropriate measures to do so.

The central objective of our study was to test the hypothesis that R&D expenditures by enterprises are sensitive to tax policy, specifically to changes in the tax burden. The hypothesis suggests that an increase in the tax burden on enterprises will result in a decrease in their R&D expenditures. To accomplish this objective, we constructed simple regression models (Table 2) that relate to a specific type of economic activity from a high category of knowledge intensity.

As previously stated, the model equations are specified in semi-logarithmic form, with the dependent variable being the only element that undergoes a logarithmic transformation (Hayashi, 2017, p. 26-27). The transformation procedure enabled the representation of the nonlinear relationship between the factor and the regressed variable in a linear form.

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[1] The R&D intensity of an industry is measured as the ratio of total research and development expenditure to the gross value added of that industry.

Table 1

Indicators of R&D intensity of economic activities in the process industry of Ukraine for the period 2015-2021 (%, ranked by the average)

Types of activities of the process industry (Classification of economic activities)	R&D intensity			Share of R&D expenses, %
	average	min	max	
Manufacture of basic pharmaceutical products and pharmaceutical preparations (C21)	5.32	2.13	10.08	48.3
Manufacture of computers, electronic and optical products (C26)	1.01	0.41	2.66	3.6
Manufacture of chemicals and chemical products (C20)	0.52	0.25	0.77	4.0
Manufacture of other vehicles (C30)	0.50	0.12	0.81	6.0
Manufacture of fabricated metal products, except machinery and equipment (C25)	0.46	0.11	0.81	5.3
Manufacture of machinery and equipment n.e.c. (C28)	0.34	0.17	0.55	5.5
Process industry (C)	***0.33***	***0.19***	***0.51***	***100***
Manufacture of motor vehicles, trailers and semi-trailers (C29)	0.21	0.05	0.70	1.1
Manufacture of wood, paper; printing and duplication (C16-C18)	0.21	0.09	0.36	4.7
Manufacture of electrical equipment (C27)	0.20	0.05	0.86	1.8
Manufacture of furniture; other products; repair and installation of machinery and equipment (C31-C33)	0.13	0.05	0.39	4.0
Manufacture of rubber and plastic products (C22)	0.09	0.03	0.15	0.7
Manufacture of food; beverages and tobacco products (C10-C12)	0.09	0.04	0.16	8.2
Manufacture of other non-metallic mineral products (C23)	0.08	0.03	0.17	1.3
Metallurgical production (C24)	0.06	0.04	0.09	2.8
Textile production, manufacture of clothing, leather and other materials (C13-C15)	0.02	0.00	0.03	0.2
Manufacture of petroleum products (C19.2)	0.01	0.00	0.06	0.1

Source: calculated by author based on State Statistics Service of Ukraine (2024).

Table 2

Estimates of linear least squares regression models for aggregates of enterprises by type of economic activity. Dependent variable: Log(RD)

Variable, indicator	M1 (C21)	M2 (C26)	M3 (C30)
TAXEFS	-0.311**	-0.352**	-0.086***
Constant (C)	12.109***	9.437***	5.878***
Assessment period, years	2013-2021	2013-2021	2013-2021
Number of observations	9	9	9
R-squared	0.445	0.552	0.648
Durbin-Watson stat	1.593	2.362	1.400
F-statistics	5.610	8.631	12.882
Prob(F-statistic)	0.050	0.022	0.009
Breusch-Godfrey Serial Correlation LM Test:			
F-statistics	0.708	0.675	0.297
Prob. F	0.536	0.550	0.755
Obs*R-squared (Prob. Chi-Square)	1.987	1.914	0.956
Prob. Chi-Square	0.370	0.384	0.620
Heteroskedasticity Test: White			
F-statistics	0.416	0.339	1.828
Prob. F	0.677	0.725	0.240
Obs*R-squared	1.096	0.914	3.407
(Prob. Chi-Square)	0.578	0.633	0.182
Heteroskedasticity Test: Glejser			
F-statistics (1)	0.702	1.109	4.523
Prob. F	0.430	0.327	0.071
Obs*R-squared (1)	0.820	1.231	3.532
(Prob. Chi-Square)	0.365	0.267	0.060
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistics	0.959	0.418	2.874
Prob. F	0.360	0.539	0.134
Obs*R-squared	1.084	0.507	2.620
(Prob. Chi-Square)	0.298	0.477	0.106

Notes*:* statistical significance of p-value: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Classification of economic activities according to NACE-2010: Manufacture of basic pharmaceutical products and pharmaceutical preparations (C21), Manufacture of computers, electronic and optical products (C26), Manufacture of other vehicles (C30).

Source: calculated by the author.

Logarithmic functions are frequently employed by researchers to specify models that assess the role of tax instruments in promoting innovation. This is due to the non-linear form of the relationship between variables (Balsalobre-Lorente et al., 2021; Holt et al., 2021; Álvarez-Ayuso et al., 2018).

The results obtained (see Table 2) are reliable, and all the regression coefficients are statistically significant (at a level of at least 5%, which supports hypothesis H1). Furthermore, random deviations of the models (residuals) are free from autocorrelation[2] and heteroscedasticity[3]. The models are considered to be true (statistically significant), and the regression equations are reliable and adequate. Consequently, the null hypothesis, H0, that there is no relationship between the dependent variable and the regressor is rejected. Conversely, the validity of the working hypothesis H1 is confirmed.

The findings suggest a correlation between industrial business investment in R&D and fluctuations in the income tax burden. A review of industry-specific estimates indicates a negative correlation between the effective tax rate and investment in R&D. Specifically, higher rates are associated with reduced investment in R&D. Despite the uniformity of the response, differences emerge among industries in terms of the intensity of the tax impact. Specifically, a 1% increase in the tax burden is associated with a 31% decrease in R&D expenditures for pharmaceutical products (C21), a 35% decrease for computers, electronic, and optical products (C26), and a 9% decrease for other vehicles (C30) (Table 2).

In the latter case, we see the lowest elasticity coefficient. The reason for the weaker response to changes in the tax burden is due to the relatively low level of knowledge intensity of enterprises producing other vehicles (C30) compared to enterprises in other industries (C21, C26), as demonstrated earlier (Table 1). In general, the elasticity of the response to the same change in the tax burden in knowledge-intensive industrial activities is stronger. Thus, it can be expected that the tax incentives proposed here will be effective in increasing business investment in R&D, and their effectiveness will be manifested primarily in knowledge-intensive sectors.

Conclusions

This study has laid the foundation for the formation of an evidence base for the impact of taxes on business investment in research and development in the context of the innovative development of the Ukrainian economy. Analytical calcu-

[2] The tests for autocorrelation of random deviations of the models (residuals), performed using the Durbin-Watson statistic and the Breusch-Godfrey criterion, showed that the models do not have first- and second-order autocorrelation.

[3] Applying the White, Glaser, Breusch-Pagan-Godfrey tests, we found that the random deviations of the models are not heteroscedastic, so the model residuals are homoscedastic and have constant variance.

lations using regression models confirmed the hypothesis that there is a relationship between the tax burden on corporate income and R&D expenditures, and simultaneously demonstrated that this relationship is inverse – the higher the effective corporate income tax rate, the less money is invested in R&D. In particular, a negative relationship was found in knowledge-intensive manufacturing industries. Therefore, taxation matters, and it does affect business innovation.

The developed analytical material facilitates the formulation of rational proposals regarding the feasibility of implementing targeted tax preferences for business investment in R&D within domestic practice. Among the options for incentive models, tax benefits for qualified R&D expenses and/or income from intellectual assets (created as a result of R&D) should be considered. The implementation of the aforementioned proposals would address the existing gaps in innovation policy measures. These measures would contribute to strengthening the effective business demand for scientific products and improving the conditions for investing in innovation.

The proposed incentives are designed to achieve several objectives: to augment the flow of investment in R&D, to strengthen the role of business in the structural distribution of R&D costs between it and the state, to encourage the development of R&D entrepreneurship, and most importantly, to generate positive effects from the development and consumption of domestic scientific achievements for innovation and technological progress and growth of the national economy. The result of this initiative will be the activation of the innovation factor, which will support the resistance of the Ukrainian economy in the fight against the Russian invader. This will establish the economy's resilience and ability to recover after the war.

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