



## THE RELATIONSHIP BETWEEN STATE BUDGET REVENUES FROM CORPORATE INCOME TAX AND THE AMOUNT OF PRIVATE INVESTMENT BY SMALL, MEDIUM AND LARGE ENTERPRISES

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### Abstract

Investing is inherent in the budgetary decisions of legal entities regardless of their size. Macroeconomic, financial and institutional factors affect the environment of investment activity. The article considers one of the elements of the macro environment of enterprises which is the relationship between state budget revenues from corporate income tax and investment outlays of small, medium and large enterprises in the private sector of the national economy. The aim of the study is to identify the relationship between state budget revenues from corporate income tax and the amount of outlays in the private sector of the national economy among enterprises with more than nine employees in Poland in the years 2010-2020 on the basis of data from the Central Statistical Office and reports approved by the Council of Ministers on the implementation of the state budget in the period from 2010 to 2020 contained on the website of the Ministry of Finance. The Pearson correlation analysis method was used to verify the research hypothesis. Based on the obtained value of Pearson's correlation coefficient, it was found that there is a very strong stochastic positive relationship between state budget income from corporate income tax and investment expenditures in the private sector of the national economy among small, medium and large enterprises.

**ZWIĄZEK MIĘDZY DOCHODAMI BUDŻETOWYMI PAŃSTWA  
Z TYTUŁU PODATKU DOCHODOWEGO OD OSÓB PRAWNYCH  
A WYSOKOŚCIĄ INWESTYCJI PRYWATNYCH MAŁYCH,  
ŚREDNICH I DUŻYCH PRZEDSIĘBIORSTW**

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Słowa kluczowe: podatek dochodowy od osób prawnych, inwestycje prywatne, neutralność podatkowa, dochody podatkowe, korelacja.

A b s t r a k t

Investowanie jest nieodłącznym elementem decyzji budżetowych podmiotów prawnych, niezależnie od ich wielkości. Czynniki makroekonomiczne, finansowe i instytucjonalne wpływają na otoczenie działalności inwestycyjnej. W artykule rozważono jeden z elementów makrootoczenia przedsiębiorstw, jakim jest związek między dochodami budżetowymi państwa z tytułu podatku dochodowego od osób prawnych a nakładami inwestycyjnymi małych, średnich i dużych przedsiębiorstw w sektorze prywatnym gospodarki narodowej. Celem badania jest identyfikacja zależności między dochodami budżetowymi państwa z tytułu podatku dochodowego od osób prawnych a wysokością nakładów w sektorze prywatnym gospodarki narodowej wśród przedsiębiorstw zatrudniających powyżej dziewięciu pracowników, w Polsce w latach 2010-2020, na podstawie danych Głównego Urzędu Statystycznego oraz zatwierdzonych przez Radę Ministrów sprawozdań z wykonania budżetu państwa od 2010 do 2020 roku, zawartych na stronie Ministerstwa Finansów. Do weryfikacji postawionej hipotezy badawczej wykorzystano metodę analizy korelacji Pearsona. Na podstawie uzyskanej wartości współczynnika korelacji Pearsona stwierdzono, że między dochodami budżetowymi państwa z tytułu podatku dochodowego od osób prawnych a nakładami inwestycyjnymi w sektorze prywatnym gospodarki narodowej wśród małych, średnich i dużych przedsiębiorstw występuje bardzo silna stochastyczna zależność dodatnia.

## Introduction

In planning tax policy, government authorities should pay particular attention to the type and strength of its relationship with private investment, since in the future the relationship between the two may determine the level of government tax revenues. The functioning of an enterprise in market economy conditions is determined by various factors, which may have a stimulating or destructive impact on it. In general, the macroeconomic environment is a factor that determines the functioning of an enterprise, a particular element of which is the tax burden. These burdens constitute a significant limitation in the company's operations (both current and future), as they reduce the resources remaining at its disposal. Among them, the most important is income tax.

The assessment of the impact of taxes on the level of private investment of enterprises in the macroeconomic scale is very complex, so for the purpose of this study the consideration was limited to corporate income tax. It was hypothesized that there is a stochastic relationship between state budget revenues from corporate income tax and the level of investment expenditures in the private sector of the national economy of small, medium and large enterprises. The Pearson correlation analysis method was used to verify the research hypothesis. The study examined the relationship between state budget revenues from corporate income tax and the amount of investment outlays in the private sector of the national economy among enterprises employing more than nine employees in Poland in 2010-2020.

This article deals with the fundamental aspect of the policy environment of Polish enterprises, which has so far been neglected by domestic researchers. The results and conclusions contained in the article are the basis for further research on the macro environment of enterprises and its relationship with the amount of investment expenditures of small, medium and large enterprises in the private sector of the national economy.

## **Taxation and the financial result of a company**

For businesses, taxes are a tool that regulates the level of monetary resources. The enterprise can adopt different attitudes towards the tax, which will result in differential effects for both the public authority and the enterprises themselves (Dębniak, 2016, p. 87-95). According to public finance literature, the optimal rate of income taxation should be zero because it distorts the inter-temporal allocation of resources in the economy between the present and the future, which negatively affects economic growth (Kate & Milionis, 2019, p. 758-805). As demonstrated by R.J. Barro and followed by P. Aghion, U. Akcigit, J. Cage, and W. Kerr, the overall impact of taxation on corporate performance depends on the design and efficiency of taxation (Aghion *et al.*, 2016, p. 24-51). P. Egger, K. Erhardt and C. Keuschnigg presented a model depicting the interrelation between the size of the company and the response to different forms of taxation. According to the results of their research, small firms are credit constrained, which makes investments sensitive to cash flow and amount of collateral. As a result, higher tax rates reduce internal funds and lower investment levels (Egger *et al.*, 2014, p. 512-538). As a result of the reduction in the income tax burden, the ability to finance business activities through the accumulation of earned profits increases. The conducted scientific research proved that small business entities are burdened with higher corporate income tax due to limited opportunities to apply tax optimization (Adameczyk, 2012, p. 31-39).

## Tax neutrality principle versus investment tax preferences

Corporate taxation is subordinated to the monetary and fiscal function. The share of income taxes in the tax revenues of the state budget is dominant, so the public authority should pay special attention to the proper construction of the tax system so that it effectively performs its functions (Sosnowski, 2016, p. 14-52). Among the tax principles formulated by A. Smith, the principle of neutrality of taxation is particularly relevant to the topic under consideration (Smith, 1954, p. 200-584). According to this principle, taxation should not affect the market choices of economic agents, because they make decisions on the basis of comparison of revenues and costs. If taxation affects the value of one of the above mentioned items, this situation may lead to distortion of market choice. The postulate of tax neutrality states that taxes should not unduly interfere with market mechanisms. A manifestation of tax neutrality in this area would be a situation in which equal benefits would be obtainable by different market entities regardless of their legal form or other factors indicated by the legislator (such as place of business) (Hiort af Ornäs Leijon, 2015, p. 4-21). Tax preferences may stimulate the development of such investments, which without the functioning of a given investment incentive would not be undertaken by a given entity at a given time. Tax instruments should not determine situations in which less profitable investments would be made instead of those that would have been made if the preferential regulations had not been introduced (Devereux & Mooij, 2011, p. 7-29).

Tax policy making and the relationship between corporate taxation and investment are of interest to scholars who have produced a body of empirical research on the relationship between corporate taxation and investment. Most of the research is based on a pioneering article by R.E. Hall and D.W. Jorgensen (Hall & Jorgensen, 1967, p. 391-414). The subject of their research was a measure of tax-adjusted cost of capital. Research by J.G. Cummins, K.A. Hassett, and R.G. Hubbard focused on the short-run responses of firm-level investment to tax reforms (Cummins *et al.*, 1996, p. 1-69). Their study was extended to include the results that for the first time did not rely on a theoretical model of optimal firm investment (Djankov *et al.*, 2010, p. 31-64). Empirical evidence of the strong effect of tax preferences on capital output ratio was presented in a sectoral panel study of fourteen OECD countries (Bond & Xing, 2015, p. 15-31).

## **Tax preferences as an encouragement to make investments**

A significant part of tax preferences related to the Polish corporate income tax is directed at increasing the level of investment. Taking into account the income tax burden on enterprises, attention should be paid to the importance of instruments incorporated into the structure of the Polish corporate income tax system. An example of such instruments are basic pro-investment mechanisms functioning in the framework of CIT aimed at increasing material investments in an enterprise. Support is granted in the form of exemption from CIT in connection with the realization of new investments. The percentage of preference depends on the size of the enterprise and its location. In addition, the possibility of deducting the tax burden can be used by entrepreneurs for up to a dozen years (Ministry of Development and Technology, 2022). The size of the investment activities undertaken may also be linked to the availability of subjectively cheap sources of financing in the company. One of the most significant elements affecting the size of a company's bottom line is income tax, as it can shape the size of the bottom line in many ways. Tax rates, the construction of the tax base, applied depreciation solutions, the deduction of losses from previous accounting periods, as well as solutions for taxing leasing affect the profitability of the investment and the assessment of its profitability (Corporate Income Tax Act, 1992). Research conducted by A. Adamczyk (2019, p. 9-22) confirmed that tax preferences introduced into the Polish tax system consisting in the application of a reduced income tax rate for small taxpayers may affect optimization activities. The application of optimization did not cause a decrease in the dynamics of net profits but influenced its improvement. On the other hand, if the level of investment of economic entities in the country is high, the state authorities are not interested in applying tax preferences that would encourage decisions aimed at raising this level within the instruments of fiscal and monetary policy (Ucham, 2014, p. 45-56).

Investment decisions are made under alternative assumptions about variables that include the interest rate, inflation rate, and financing methods (debt or equity). The decision diagrams also consider depreciation rules for different types of capital investments provided by tax laws. In terms of private business investment, the statutory corporate tax rate has been found to be the most empirically relevant measure of taxation (Gemmell *et al.*, 2018, p. 372-399). Economist M. Kalecki conducted an exhaustive analysis of the driving forces behind investment activity. According to M. Kalecki's thesis, investments depend more on expected profitability and less on interest rates. In the model of the Polish economist, investment decisions were determined by the amount of expected profit, i.e. the resultant of total demand and total capital stock (Klimiuk, 2020, p. 7-36). The thesis that profits are the main determinant of investment was also voiced by J. Pen (1972, p. 120-205). The statement proclaiming that profit

is the goal and creates the main incentive for investment, and furthermore serves to finance a significant part of investment, was also confirmed by J. Tinbergen's research (Klimiuk, 2020, p. 7-36).

## Methodological assumptions of the study

The Pearson correlation analysis method was used to verify the existence of a relationship between state budget revenues from corporate income tax and the amount of investment expenditures of small, medium and large enterprises in the private sector of the national economy. Micro-enterprises were not included in the study in order to exclude entrepreneurs taxed with personal income tax. The division of enterprises according to their size was made in accordance with the recommendations of the European Union Commission of 6 May 2003 on the definition of micro, small and medium-sized enterprises (Official Journal of the European Union, L 124/39).

Pearson's linear correlation coefficient is the most often used measure of relationship when both characteristics in a study are quantitative and the relation between them is linear. Two variables were used in the study. The variable  $X$  denotes the amount of government revenue from corporate income tax, and the variable  $Y$  denotes investment expenditures in the private sector of the national economy among enterprises with more than nine employees.

The formula for the  $r$ -Pearson correlation coefficient has the following form:

$$r_{xy} = \frac{\sum(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sqrt{\sum(X_i - \bar{X})^2 \cdot \sum(Y_i - \bar{Y})^2}} \quad (1)$$

where:

- $r_{xy}$  –  $r$ -Pearson correlation coefficient between variables  $x$  and  $y$ ,
- $X_i Y_i$  –  $i$ -th values of variables under study,
- $\bar{X}, \bar{Y}$  – averages of population  $X$  and  $Y$ .

The correlation was evaluated along with the coefficient interpretation based on the Table 1.

Table 1

Correlation coefficient values and their interpretations

Correlation coefficient values	Interpretation
0.00 – 0.19	no linear relationship
0.20 – 0.39	weak linear relationship
0.40 – 0.59	moderate dependence
0.60 – 0.79	strong dependence
0.80 – 1.00	a very strong relationship

Source: own elaboration based on Swinscow & Campbell (2002).

The data used for the purpose of the study was sourced from the Central Statistical Office and the Council of Ministers approved reports on the implementation of the state budget from 2010 to 2020 featured on the website of the Ministry of Finance. To achieve the intended objectives, linear correlation was tested at a significance level of  $p < 0.5$ . The following hypothesis set-up was therefore verified  $H_0: r(x, y) \neq 0$  and  $H_1: r(x, y) = 0$ . The verification of the null hypothesis will indicate whether there is a relationship between the variables under study.

## Obtained results

Pearson correlation analysis of  $X$  and  $Y$  variables was performed in Statistica program. As a result of the analysis, the correlation coefficient  $r(x, y) = 0.8592$  at the significance level  $p < 0.5$ . The attained result is statistically significant because the obtained value falls within the critical area determined on the basis of the table of critical values of Pearson correlation coefficient. Based on the Pearson correlation coefficient value, it can be concluded that there is a very strong stochastic positive relationship between the variables  $X$  and  $Y$ . Figure 1 shows a graphical interpretation of the correlation.

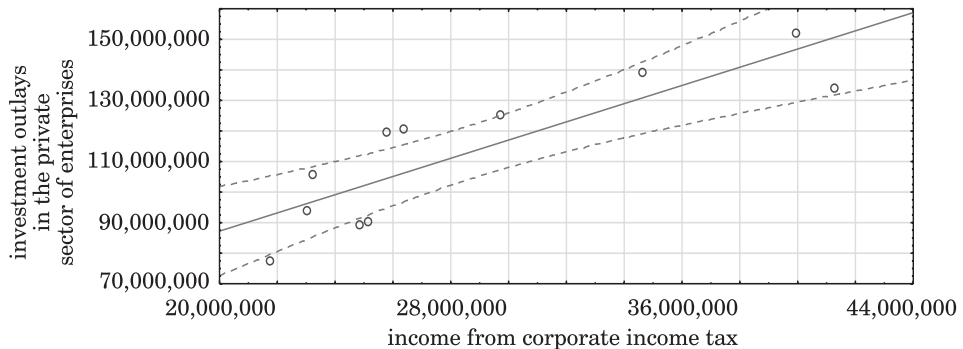


Fig. 1. Scatter plot of investment expenditures in the private sector of the national economy among enterprises with more than nine employees against corporate tax revenue  
Source: developed in the Statistica program.

The generated scatter plot shows the mutual relationship between the studied variables and confirms the presence of a positive relationship. In a statistically significant way, the value of the correlation coefficient is different from 0, which confirms the hypothesis.

## Private investment in Poland

Analyzing the data on investment outlays in the private sector of small, medium and large enterprises in Poland, it should be noted that the dynamics of private investment fluctuated in the years under study. However, its uninterrupted growth from 2011 to 2019 is noticeable.

Table 2  
Dynamics of private investment in Poland in 2010-2020 (previous year =100)

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Investment outlays	93.89	115.89	100.98	103.85	112.57	113.12	100.91	104.15	110.80	109.50	88.18

Source: based on data from Statistics Poland.

In 2020, there was a significant decline in the value of dynamics in private investment in Poland. When analyzing the dynamics of private investment in Poland in 2010-2020, it should be mentioned that in 2020 the COVID-19 pandemic broke out, which undoubtedly affected the decrease in the extent of private investment. The global COVID-19 pandemic is described as one of the most important and dangerous economic and social events of recent decades (Czech *et al.*, 2020, p. 12-44).

National economies are complex systems whose construction is determined by a variety of factors that have been the subject of research scientists' studies for many eras. The accepted measure of economic growth of countries is gross domestic product (GDP) (Akcigit, 2017, p. 1736-1747). One of the most fundamental factors in economic progress is private investment. When studying the issues related to private investment in Poland, it is necessary to verify the share of private (business) investment in GDP.

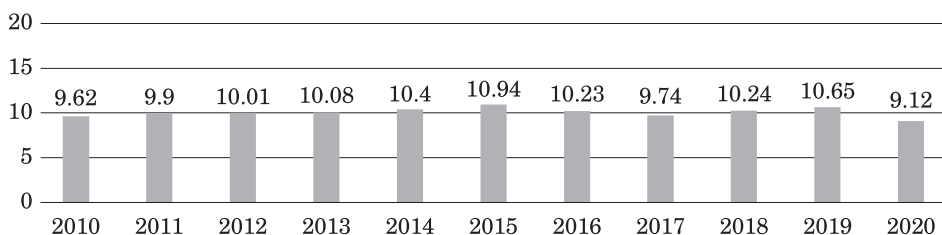


Fig. 2. Share of business investment in GDP between 2010 and 2020 (in %)

Source: based on data from Eurostat (2010-2020).



Based on the data presented in graph 2, it can be concluded that the share of private investment in GDP is small. In the surveyed period the value of the share fluctuated slightly. Attention should be paid to the lack of a significant increase in this value in 2010-2020. Based on the data presented in the chart, it ought to be concluded that private investment of enterprises in Poland should be of interest to state bodies, because, as shown, the ratio of fixed asset outlays to GDP is at a consistently relatively low level.

## Conclusions

On the grounds of literature analysis, the drawn conclusion is that taxes are an important tool for regulating the level of financial resources in enterprises. Taxation, on the other hand, has a significant impact on the financial result of an enterprise because investment decisions are made based on it. Tax preferences provide an incentive to make investments. A significant part of tax preferences related to corporate income tax is directed at stimulating the growth of investment expenditures in the private sector of the national economy. In Poland, within the framework of CIT, the functioning basic pro-investment mechanisms testify to the interest of government authorities in the low share of business investment in GDP (as shown in Table 2).

The impact of the amount of investment on economic growth is important especially in the short term. The greatest motivation for the investors from the private sector of the national economy to undertake material investments is simple economic calculation. Limited financial resources available to investors pressure them to undertake specific actions. For the state, taxes are the most important economic instrument through which the basic functions of public finance are realized. Tax revenues are the most important source of financing state activities. The amount of tax revenues also indicates the strength of the state, its independence and predisposition to free action and development (Lubaś, 2019, p. 50). A similar informational value can be attributed to the GDP indicator, which is the modern measure of the size of the national economy. Its growth is identified with the prediction of dynamic economic and social development, while a decline as a harbinger of crisis. Private investment is considered the most important factor of economic progress, therefore it is the subject of interest of government authorities, that want to stimulate its growth by introducing tax preferences. The amount of tax revenue and outlays on private investment are important for the state because of the important functions they perform.

The aim of the study was to identify the relationship between state budget revenues from corporate income tax and the amount of outlays in the private sector of the national economy among enterprises with more than nine employees in Poland in 2010-2020. The correlation analysis carried out showed the existence

of mutual dependence between the studied variables. Due to not taking into account the factor distinguishing enterprises, which would be their division by size, the analysis of the relationship did not allow to confirm the research of P. Egger, K. Erhardt and C. Keuschnigg (2014, p. 512-538), which concluded that higher tax rates reduce internal funds and lower the level of private investment of small businesses. It was hypothesized that there is a stochastic relationship between state budget revenues from corporate income tax and the amount of investment in the private sector of the national economy of small, medium and large enterprises. Pearson correlation analysis for variables  $X$  (state budget income from corporate income tax) and  $Y$  (the amount of investment outlays in the private sector of the national economy of small, medium-sized and large enterprises) performed in the fourth part confirmed the existence of a very strong positive stochastic relationship between the variables under study. A change in the value of one variable generates an identical change in the value of the other one. Showing the occurrence of a given dependence is a confirmation of the statement contained in the introduction of the article. State authority should pay special attention to the type and strength of the relationship between tax policy and investment outlays of enterprises operating in the private sector of the national economy.

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