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EFFECTS OF FISCAL PREFERENCES ON PROFITABILITY OF ENTERPRISES AGAINST THE GROSS DOMESTIC PRODUCT IN POLAND

Abstract

Fiscal preferences belongs to the measures of public policy which aim is supposed to fix the market failures. However, there is a shortage of studies which evaluates the effects of the fiscal instruments on enterprises from all sectors. Moreover, it is not clear how strong their influence in comparison to other external factors. One of the most important of the external determinants is the economic growth. Therefore, the aim of the paper is to analyze the effects of fiscal preferences on profitability of enterprises against the Gross Domestic Product (GDP) and its components in Poland. We set three hypotheses but only two of them could be confirmed and only in some part. The effects of the fiscal instruments on profitability is positive although only for some kinds of enterprises. It was a little stronger impact than for selected macroeconomic variables connected with GDP. However, one must take into consideration that the impact of GDP or some of its components is negative and regards medium-sized companies.

Keywords: fiscal preferences, profitability, enterprises, Gross Domestic Product, evaluation impact

JEL Classification: H21, J11

Paper type: Theoretical research article

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Introduction

Fiscal preferences belongs to the measures of public policy which aim is supposed to fix the market failures. Therefore, the goals could be very wide - support of creation of new ventures, increase the value of investments or strengthen the financial efficiency of companies. In Poland the value of fiscal instruments³ amounted about 5% of Gross Domestic Product (GDP). In connection to this, some studies about the evaluation were provided (Woźniak and Lisowski, 2016; Lisowski et al, 2019). Although the preferences are neutral for tax payers - both revenues and costs - they may have influence on the profitability of enterprises. There is an extensive literature about the issues (Conor and Kopczuk, 2017; Yiang, et al, 2018; Glogower and Kamin, 2018), particularly for banking sector (Siudek and Drabarczyk, 2015) or insurance industry (Ortyński, 2016). However, there is a shortage of studies which encompass enterprises from all sectors. Moreover, it is not clear how strong the influence of fiscal preferences is in comparison to other external factors. One of the most important of the external determinants is the economic growth. Therefore, the aim of the paper is to analyze the effects of fiscal preferences on profitability of enterprises against the Gross Domestic Product (GDP) and its components in Poland.

The paper is organized as follows. In the next section the literature review was conducted. Then, the methods and data were presented. In the next section, the results of statistical analysis was provided. The conclusions, recommendations and direction for further research was presented in the end of the paper.

1. Literature review

The literature review concerns the quantitative studies, we decided to conduct in two parts. First the evaluation of the effect of fiscal instruments on performance of enterprises were scrutinized. Then, the publications about influence of GDP on enterprises were analyzed. After that, we presented the conclusions.

Some studies (Howell, 2017; Gramillano and Floria, 2017; Cadil, 2018) have used counterfactual approach to evaluate the influence of subsidies on performance of companies. The results suggest there is positive impact of such instruments on the revenue of beneficiaries. Another study (Woźniak and Lisowski, 2016) shows positive relationship between the majority of tax instruments and the value of investments of the industrial small and medium-sized enterprises (SMEs) in Poland. However, further research (Lisowski et al, 2019) with more advanced statistical methods confirms these

³ The terms: fiscal preferences and fiscal instruments are used as synonymous in the paper.

findings only in some cases. The research of Yang et al (2018) reveals also that some of the fiscal and tax incentives positively influence on the technological innovation of Chinese enterprises listed on the stock exchanges.

Assragaf and Ali (2017) studied whether government subsidies are determinants of financial performance of state-owned companies (SOE) in Indonesia. They used purposive sampling method of seven SOE for 11 years and linear regression for a statistical analysis. The results revealed negative effect of the subsidies on the financial performance of these enterprises. They also notice that the government encouraged state-owned companies to apply for loans in order to decrease the burden of the subsidies. Nevertheless, the research evaluated the effects only for SOE whereas most of enterprises are private.

Koniewski et al. (2015) analyses also influence of grants on performance of SMEs in Poland. They uses the counterfactual approach. The findings confirm that in some cases there is a positive impact of grants on financial efficiency. However, they also try to evaluate such impact against selected macroeconomics indicators. They decided to use the regression panel method. The findings shows a negative and significant correlation between GDP and profitability. The results are but confine only to the enterprises which were the beneficiaries of public grants over five years.

Lisowski and Woźniak (2019) analyses the influence of chosen fiscal preferences on profitability of enterprises in Poland. They decided to use the casual relationship of Granger. The findings indicates that in some cases there is a positive impact of the value of fiscal preferences on the profitability of companies, particularly SMEs. However, the tests had low power and the research confines only to one of external determinants.

Siudek and Drabarczyk (2015) shows that there is a negative and statistically significant relationship between the economic development measured in GDP per capita and the financial performance of commercial banks in the countries of the European Union (EU). Another study (Ortyński, 2016) reveals positive relationship between the growth of GDP and profitability of technical activity in insurance companies in Poland.

Misztal (2015) analyses also the influence of selected external factors on the profitability of two Polish companies listed on the Warsaw Stock Exchange. He argues that there is positive and strong correlation between the GDP and efficiency but only in case of one enterprise from manufacturing sector. The regression analysis confirmed the finding. The study was, however, made only for two companies and for short time span (10 years: 2005-2014).

Datu (2016) studied the incentives that affect the profitability of insurance business in Philippines. In connection to this, he used ordinary least square, model as well as fixed effect and random models for statistical analysis.

The results reveals no evidence that GDP affects profitability of these enterprises. The research was conducted only for insurance industry and for a very short space of time - 5 years: 2008-2012.

Berhe and Kaur (2017) also verifies the factors that affects profitability of insurance companies but in Ethiopia. They decided to use regression analysis as a statistical method. The findings shows that growth rate of GDP was among the key factors that significantly affect the profitability of these enterprises. The research was but constrained to the insurance sector, too. Moreover, it was conducted for relatively short time space – 10 years: 2005-2015.

Dewi et al. (2019) tried to determine the influence of macroeconomic factors on firm profitability in Indonesia. They decided to use multiple regression method for statistical analysis. The findings reveal that only GDP has significant impact on company profitability. The study was constrained, however, to fast moving consumer good enterprises listed on the stock exchange although for quite long period of time – 18 years: 2008-2016.

The relationship between the profitability of companies and GDP and its components is widely accepted in the literature. It is explained by the theory of economic growth. However, there are inconclusive findings whether it is positive or negative. That is the research gap which should be analysed. The effect of fiscal instruments on performance of companies is still the subject of debate. The findings suggest that only some of them are effective. However, there is a shortage of reliable results for different types of fiscal instruments. Moreover, it is not clear if their effect on profitability of enterprises is higher than in case of economic growth. That should be clarified. In connection to this, the authors decided to set the following hypotheses:

- H1: There is a positive effects of the chosen fiscal preferences on the profitability of enterprises in Poland.
- H2: There is a positive effects of GDP on the profitability of enterprises in Poland.
- H3: The positive effects of the chosen fiscal preferences and GDP on the profitability of enterprises in Poland is different.

In order to verify the hypotheses, we collected the necessary data and chose the appropriate research methods.

2. Data collection and research methods

In order to achieve the goal of the paper, we collected (partly estimated) the data and assigned to three groups. The first one includes the value of the selected fiscal preferences that were chosen based on the findings of the previous studies (potential independent variables) from the reports about the fiscal preferences published by the Polish Ministry of Finance:

- Total revenues exempt from Corporate Income Tax (CIT): nominal value and preference value,
- Losses from previous years deducted by corporates,
- Income deductions in CIT,
- Tax deductions in CIT.

The second group includes the value of selected macroeconomic indicators (potential independent variables) published by the Polish Central Statistical Office:

- gross national income,
- gross domestic product,
- gross value added,
- domestic demand,
- total consumption (broken down into household and public consumption),
- gross accumulation,
- gross fixed capital formation
- increase in tangible assets,
- export,
- import,
- GDP per capita,
- GDP per capita as a percentage of average GDP per capita for EU countries.

The third group includes the following values of financial data of all enterprises (excluding micro-enterprises) and broken down into small, medium and large-sized enterprises (dependent variables) published by the Polish Ministry of Finance:

- Net financial result per an enterprise (wfn_1f),
- Net financial result per an employee (wfn_1p),
- Total net financial result (wfnl),
- Total gross financial result (wnbl),
- Gross turnover profitability rate (wrob),
- Return on net turnover (crows).

The authors decided to focus on companies that pays CIT. Although the third group of the selected variables includes also small number of enterprises that pays Personal Income Tax (PIT). Eventually, we collected the data for the years 2003-2017 including 43 variables.

Although many research which evaluate the impact of public aid uses a counterfactual approach, others analyses the relationship with use of statistical methods like correlations or regression. We decided to choose the second strategy. The reason is that a counterfactual approach is quite expensive and appropriate rather for specific types of support instruments. While evaluating the much bigger population of companies, like in case of taxpayers, it is advisable to choose the statistical methods. Therefore, we decided to conduct the analysis according to the following scheme:

- verification of stationarity of the time series (using trend analysis and ADF tests),
- differentiation of non-stationary variables,
- calculation of linear correlations between various dependent and independent variables (both not delayed and delayed by one and two years),
- Granger causality study,
- attempt of construction of single-equation econometric models.

We decide to use two programs: *Statistica* and *Gretl* for statistical analysis.

3. Results and discussion

First, we to check the stationary stability of variables by trend analysis and the ADF test. All variables have proven to be non-stationary and, therefore, we calculated first differences of variables (prefix "d_"). That was the basis for further calculations. The only exception was the variable "increase in tangible assets", which is stationary due to its specificity. In order to pre-assess causality, linear correlations of Pearson between the dependent and independent variables were examined. However, none of the calculated coefficients appeared to be significant.

Then, the correlations between the values of the potential independent variables delayed by 1 year and the values of the dependent variables were examined. In the result 29 significant values of correlation coefficients were obtained. They included the relationship between the following independent variables:

- differences in the nominal value of tax deductions (d_oop_wn_1),
- differences in the value of GDP (d_PKB_brutto_1),
- differences in the value added (d_value_added_to_1),
- differences in the value of accumulation (d_Akumulacja_brutto_1),
- differences in the value of GDP per capita (d_PKB_brutto_per_capita_1),

and some types of differences in the values of the dependent variables but mainly for medium-sized enterprises.

After that, the correlations between the values of the potential independent variables delayed by 2 years and the values of the dependent variables were examined. In the result 12 significant correlation coefficients were obtained. Relationships were found between:

- differences in the value of preferences obtained from total revenues exempt from CIT (d_PZog_wp_2),
- differences in nominal values of losses from previous years deducted in a given year (d_SLU_wn_2),
- differences in value added (d_wartosc_dodana_2),
- differences in the value of public consumption (d_Spozycie_publiczne_2),

and some types of differences in the values of the dependent variables but mainly for small and medium-sized enterprises.

Then, the causality of correlations in the Granger sense was conducted. Correlation means a relationship, but it may be accidental. The variable x is, however, the cause in the Granger sense of the variable y if the current values of the variable y can be more accurately predicted taking into account the past values of the variable x . In the study we applied the delay for independent variables equal to 1 or 2 years, according to the previously calculated correlation coefficients. On this basis, the vector auto regression model (VAR) was estimated: VAR (1) or VAR (2).

In table 1 the results of the causal relationship between the considered variables are summarized. However, only the pairs in which a causal relationship can be found at a significance level of at least 5 % are presented. In the cases of the causal relationship, the data on the selected delay in the VAR model and on the p - value in the causality test was provided. Bilateral causality between variable pairs was not found.

Table 1. Causal relationships between the selected variables: p-values

	d_PZog_wp VAR (2)	d_SL U_wn VAR (2)	d_oop _wn VAR (1)	d_PKB_ brutto VAR (1)	d_wartosc_ dodana VAR (1)	d_PKB_per _capita VAR (1)	d_spozycie_ publiczne VAR (2)
d_wfn_1f_ pow9	-	-	0.000 1				
d_wfn_1f_ 50_249	-	-	0. 0001	0.0195	0.0301	0.0192	
d_wfn_1p_ pow9	-	-	0. 0001				
d_wfn_1p_ 50_249	-	-	0. 0001	0.0265	0.0357	0.0270	
d_wfbl_po w9	-	-	0. 0002				
d_wfbl_50 _249	-	-	0. 0002	0.0134	0.0161	0.0153	0.0422
d_wfnl_po w9	-	-	0. 0001				
d_wfnl_10 _49	-	0.023 5	-				
d_wfnl_50 _249	-	-	0.000 1	0.0191	0.0247	0.0223	
d_wrob_po w9	-	-	0.000 1				
d_wrob_10 _49	-	0.032 4	-				
d_wrob_50 _249	-	-	0.000 1	0.0329		0.0456	
d_wron_po w9	-	-	0.000 1				
d_wron_10 _49	-	0.028 4	-				
d_wron_50 _249	0.0803	-	0.000 1	0.0434			

Source: own study

The names of the variables in the second section of the paper were already explained. The endings in the names of the dependent variables mean:

- pow9 - all enterprises (excluding micro-enterprises),
- 10_49 - small enterprises,
- 50_249 - medium enterprises.

There were 32 causal correlations out of previously described 41 significant correlations. The table 1 presents a significant and causal impact of 7 independent variables on 15 dependent variables. These cases were described below.

1. Changes in the value of the preferences accruing from the income exempted from CIT have negative impact (model VAR2) after one year and two years (signs of correlation coefficients and coefficients in the model negative) on the net turnover profitability rate in medium-sized companies. Interpretation of this relationship is quite difficult. On the one hand, exempt revenue consists of a number of different items (e.g. income from running lottery tickets, income obtained from business activity conducted in the special economic zone) which are tax neutral on the revenue side, but not all are cost neutral (in the sense: expenses financed from them may be tax deductible costs). In addition, the above revenues and the expenditure financed with them are not accounting neutral. Thus, obtaining such revenues may entail greater involvement of other financial sources of medium-sized enterprises, which in turn may cause that the net financial result decreases in a short period of time, and thus the net turnover profitability index decreases. Moreover, assuming that revenues exempt from CIT are according to of the Accounting Act as other operating or financial revenues, their increase has a negative impact on the net turnover profitability ratio (the value of total revenues is in the denominator of the formula).
2. Changes in the value of the losses from previous years deducted in a given year have a positive impact (VAR2 model) after one and two years (signs of correlation coefficients and coefficients in the positive model) on:
 - changes in total net financial result in small companies,
 - changes in gross turnover profitability rate in small enterprises,
 - changes in net turnover profitability rate in small companies.

According to tax law, a company is allowed to deduct losses from the same source of income for 5 consecutive years and no more than 50% loss from each year. Therefore, taking into account the obtained results, the impact on the above mentioned independent variables may even have a loss of seven years ago. The deducted tax loss reduces income tax in a given year, thus increasing the net financial result and net turnover profitability ratio. The loss itself may be the result of for instance previous investments. This may explain the impact of the deductible loss on the gross turnover profitability rate. Perhaps the gross turnover profitability index is rising not because of loss deduction itself, but due to investments from a few years ago.

3. Changes in the value of the tax deductions made in a given year have a positive impact (VAR1 model) after a year (signs of correlation coefficients and coefficients in the positive model) on:

- changes in net financial result per one company and in medium-sized companies,
- changes in net financial result per one person employed in all companies and in medium-sized enterprises,
- changes in gross financial result all companies and in medium-sized enterprises,
- changes in net financial result all companies and in medium-sized enterprises,
- changes in the gross turnover profitability rate in all companies and in medium-sized enterprises,
- changes in the net turnover profitability ratio in all companies and in medium-sized enterprises.

Tax deductions includes mainly deductions of tax paid abroad (in the absence of a double taxation agreement) and deductions of tax paid on dividends received from foreign subsidiaries (not less than 75% of shares). As one may assume from the above list and calculations, the positive impact applies primarily to medium-sized companies and through their strong impact also all companies (except microenterprises). This can be demonstrated by the fact that the correlation coefficient for 5 out of 6 above mentioned relationships is higher when the dependent variable applies not to all companies but only to medium-sized enterprises. Interpretation of inflows is similar to the case of losses from previous years. Tax deduction affect its reduction and therefore an increase in net profit and the rate of profitability net turnover. A more accurate interpretation does not seem important since tax deduction from CIT is used by a small number of taxpayers. For example, in the 2017 only 354 entities took advantage of this preference.

4. Changes in the value of GDP in a given year have a negative impact (VAR1 model) after one year (signs of correlation coefficients and coefficients in the negative model) on:

- changes in net financial result per one medium-sized company,
- changes in net financial result per one medium-sized company
- changes in gross financial result in medium-sized companies,
- changes in net financial result in medium-sized companies,
- changes in gross turnover profitability rate in medium-sized companies,
- changes in net turnover profitability rate in medium-sized companies.

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5. Changes in the value added in a given year have a negative impact (VAR1 model) after one year (signs of correlation coefficients and coefficients in the negative model) on:
 - changes in net financial result per one medium-sized company,
 - changes in net financial result per one medium-sized company,
 - changes in gross financial result in medium-sized companies,
 - changes in net financial result in medium-sized companies.
 6. Changes in the value of GDP per capita in a given year have a negative impact (VAR1 model) after a year (signs of correlation coefficients and coefficients in the negative model) on:
 - changes in net financial result per one medium-sized company,
 - changes in net financial result per one medium-sized company
 - changes in gross financial result in medium-sized companies,
 - changes in net financial result in medium-sized companies,
 - changes in gross turnover profitability rate in medium-sized companies,
 - changes in net turnover profitability rate in medium-sized companies.
 7. Changes in the value of public consumption in a given year have a negative impact (VAR2 model) after one and two years (signs of correlation coefficients and negative coefficients in the model) on changes in gross financial result in medium-sized companies.

Interpretation of the relationships described in points 4-7 is quite difficult. First of all, these relationships apply only to medium-sized companies. It seems that the increase in the value of selected macroeconomic indicators may be caused for example by an increase in aggregate demand which in turn leads to a growth in prices. The increase in prices will affect not only consumer but also producer goods, what is the reason of higher production costs. It seems, therefore, that after a year or two, this may cause a decrease in the value of the financial result and turnover profitability rate. Moreover, it could be connected with the investment overhang which can lead to negative consequences for profitability of enterprises. The reason is that investments affect economic growth of GDP as one of the main components of aggregate demand.

Then, we focused on comparing the impact of tax preferences and selected selected macroeconomic indicators on the profitability of enterprises. Take into consideration the absolute values of significant and causal correlations, we estimated that there was a little stronger impact

in the case of tax preferences ($|r| = 0.64$ to 0.71) than selected macroeconomic variables ($|r| = 0.61$ to 0.67).

In the last part of statistical analysis, we made an attempt to build single-equation econometric models. We constructed 6 models - cases where the dependent variable is affected by at least two dependent variables that are not correlated significantly with each other. The variables regarding tax preferences and one representative of selected macroeconomic indicators were applied as independent variables. We selected the representative one based on the absolute value of the correlation coefficient of the independent variable and the dependent variable. Each time the variable *d_PKB_brutto_1* was selected. Five of the six models were not appropriate because of high estimation errors, statistically insignificant regression coefficients *B* in the equation, $p > 0.05$ or low determination coefficient R^2 . The sixth model, however, had good results. The multiple regression for this case was presented in table 2.

Table 2. Summary of multiple regression

N=13	Summary of dependent variable regression: <i>d_wfn_1f_50_249</i> (regression) $R = 0.82693357$ $R^2 = 0.68381914$ adjusted $R^2 = 0.62058296$ $F(2,10) = 10.814$, $p < 0.00316$, Standard error of estimation = 182.66					
	<i>b*</i>	Standard error with <i>b*</i>	<i>B</i>	Standard error with <i>B</i>	<i>t</i> (10)	<i>p</i>
Intercept term			495.6415	183.7549	2,69730	0.022417
<i>d_oop_wn_1</i>	0.525969	0.194720	0.0005	0.0002	2.70116	0.022269
<i>d_PKB_brutto_1</i>	-0.458787	0.94720	-0.0053	0.0023	-2.35614	0.040217

Source: own study

As it results from Table 2, two variables (*d_oop_wn_1* and *d_PKB_brutto_1*) explain 68.4% of the variability of the variable *d_wfn_1f_50_249*. The coincidence condition is also met:

$$\text{sgn}(r_i) = \text{sgn}(b_i)$$

sgn (r_i) - signs at Pearson's linear correlation coefficients between independent variables and the dependent variable,

sgn (b_i) - signs with non-standardized regression coefficients occurring in the model with independent variables.

4. Conclusions

In the paper, based on the literature review, we decided to set and verify three hypotheses:

- H1: There is a positive effects of the chosen fiscal preferences on the profitability of enterprises in Poland.

The hypotheses was confirmed only in some part. There is a positive effect of the losses from previous years on the following measures: total net financial result, gross turnover profitability rate and net turnover profitability rate but only in small companies. On the other hand, there is a positive influence of tax deductions on net financial result, net financial result, gross financial result, net financial result, gross turnover profitability and net turnover profitability for all companies and in medium-sized enterprises. Moreover, we found that there is an effect of the preferences accruing from the income exempted from CIT on the net turnover profitability rate in medium-sized companies but it is negative.

- H2: There is a positive effects of GDP on the profitability of enterprises in Poland.

The hypothesis should be rejected. We found only that there is an effect of some of the chosen macroeconomic indicators: GDP, value added, GDP per capita and public consumption on the profitability in medium-sized enterprises but it is negative.

- H3: The positive effects of the chosen fiscal preferences and GDP on the profitability of enterprises in Poland is different.

The hypotheses was confirmed only in some part. There was a little stronger impact in the case of the chosen fiscal preferences than for selected macroeconomic variables connected with GDP. However, one must take into consideration that the influence of the fiscal instruments on profitability is positive although only for some kinds of enterprises. The impact of GDP or some of its components is negative and regards medium-sized companies.

The findings of the paper contributes to widening the existing international knowledge about fiscal policy and public economics. Moreover, it add new knowledge to the theory of corporate finance. The results may be important for decision-makers, indicating the need to modify the current methods of fiscal policy. It regards not only Poland but also abroad, particularly in the countries of the EU.

However, one must take into consideration that the time series in the study were relatively short. The analysis of data before 2003 is be difficult. First reason is the lack of all necessary data. The second problem was connecting

with the changes in tax law what makes that some data are incomparable. Therefore, the tests had low power and the results should not be treated as decisive. This also indicates the need to repeat the research in the future. Longer time series will increase the power of testing by providing more reliable results. This will allow for better evaluation of the implemented fiscal preferences and their possible modification.

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