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THE IMPACT OF FISCAL DETERMINANTS ON INVESTMENTS IN EUROPEAN UNION COUNTRIES. A PANEL DATA ANALYSIS

Abstract

Taxation plays an important role in investment decisions and on net profit. In this view, this paper examines the fiscal determinants of investments realized by non-financial corporations in European Union (EU) countries. More exactly, the influences of profit tax and other important taxes like consumption and labor tax on the rate of investment are analysed. For this purpose, we use a panel analysis for 28 Member States from 2008 to 2018. In the presence of variables cointegration, we apply the fully modified ordinary least square (FMOLS) for investigating the long-run impact of taxation. Our results show a negative influence of the profit tax and a positive influence of consumption tax on the investment expansion. In addition, we find that the profit tax rate decreased after 2008 representing one of the most important fiscal measure adopted by the majority of EU Member States in order to stimulate the investment increase. The results are important for the governments, corporate governance of the companies and the investors, in order to understand the efficiency of their decisions to recover after a crisis.

Keywords: Corporate tax policy, Rate of investment, Panel data.

1. INTRODUCTION

The prosperity of a country determines the degree to provide individuals, society, companies and government with goods and services. Prosperity depends on various influencing factors, such as the political, social, but also the economic situation. In the context of the economic situation, domestic investment plays a major role. If companies invest their net profits in equipment and goods in their home country, prosperity increases and with it real wages, labor volumes, state budget and technological progress. The decision of a company to invest its profits domestically can

be influenced by different factors. One aspect is tax policy and its design. On the one hand, the level of tax burden and associated taxation may help companies to develop. On the other hand, the level of fiscal revenues are the most important source of financing the public expenditure (Mara et al. 2009).

From this chain of decisions and interrelationships, it becomes clear that tax determinants are directly related to domestic investment by firms. In addition to the constant pursuit of increasing wealth and thus domestic investment, opportunities to stimulate economic growth play an important role, especially in times of crisis. After the economic crisis, European Union (EU) countries have tried to stimulate economic growth and thus the investment rate by means of various fiscal measures.

Some authors in the past have addressed the relationship of investments with different taxation. However, these analyses have been considered in isolation. In this paper, the development of investment after the financial and economic crisis of 2008/2009 is analyzed on the one hand, in order to learn how the economy can react and be stimulated after the crisis period. In order to learn how the economy can react and be stimulated after the crisis period. Results of some authors such as Jorgenson (1963), Zidar (2015), Ohrn (2018), Djankov (2010) and Achim (2020) are the starting point for the work and are further developed by putting them in context with post-crisis behavior.

This article examines the impact of profit tax, corporate income tax, consumption tax and labor tax on investment rate registered by non-financial corporations.

For realizing this purpose, we will test the following hypotheses for EU28 group and separately for EU15 and EU13 to reveal the major differences between these two groups of countries. A division into EU15 and thus the founding states of the EU and EU13, which includes the accession states, makes sense because investment behavior, economic disparities, and also real wages still show strong differences from one another. In order to be able to examine the influence of fiscal policy determinants on domestic investment and to achieve the highest quality and transparency, a distinction is a necessity.

H1: Domestic investments are negatively affected by corporate taxation through the decrease of the net profit.

For testing this hypothesis, we will use profit tax and implicit corporate tax rate.

H2: The increase in consumption tax is not an obstacle to domestic investment.

It is important to see the impact of consumption tax for the investment environment because many countries after the beginning of the financial and economic crisis from 2008 chose to increase VAT rates.

H3: Labor tax burden has a significant impact on domestic investment ratio.

The labor taxation can have a negative impact on investments, especially when the level of salary is high, and the tax burden is very high. For this reason, we will expect to find a less impact of labor taxation in the EU13 because in these countries the labor force cost for the employer is lower comparative with EU15.

Using Eurostat data and panel analysis for 28 member states from 2008 to 2018, EU countries can be examined descriptively for trends and significances. In addition, based on our results, we investigate whether the fiscal measures adopted by EU member states after the economic and financial crisis from 2008 had a significant impact on investment. With the results obtained, the governments of the EU can stimulate the domestic investment rate through fiscal policies and recover better after periods of crisis. The findings also represent a crucial role for corporate management and investors with regard to investment decisions.

The rest of the paper is organized as follow. The second section addresses the state of the art of research on investment in relation to factors influencing tax policy, thus providing the

theoretical reference. The third section presents the methodology and data used. The empirical strategy, the data used and their sources are thus described in more detail. The core idea of this section is the descriptive presentation of the data on the one hand and the results of the panel unit root test, the panel co-integration test and the fully modified least square method on the other hand. Finally, in the last section, a summary is formulated and concluding considerations are presented.

2. LITERATURE REVIEW

The aim of this section is to provide an overview of the most relevant studies related to domestic investment in conjunction with tax influencing factors.

Jorgenson (1963) was one of the first authors to study the relationship between investment and tax policy and found a negative correlation. With the estimation model he studied companies in the U.S. in between 1948 and 1960. Summers (1981) was interested in investment in relation to effective taxation of corporations and the result was the fact that investment increases when corporate taxation decreases. Through an estimation model, he studied the U.S. over the period from 1948 to 1979. Mihir et al. (2004) focus on interest rate and country tax rate and found that firms respond to higher interest rates by borrowing less capital from external sources. No relationship with tax aspects was found. The model of ordinary least squares (OLS) technique was used to study the U.S. in 1982, 1989, and 1994. Zidar (2015) analyzed income tax changes in relation to investment and found that economic activity increases when income tax cuts are forthcoming. Research method represented the estimation procedure and considers the U.S. in 1992 and 1993. Ohrn (2018) focused on the relationship between investment and effective corporate tax rate. He found that a 1 percentage point reduction in tax rates results in a 4.7 percent increase in installed capital investment. Using the estimation procedure, he dealt with the U.S. over the period from 2005 to 2012. Bustos et al. (2004) found that changes in corporate tax rate have no effect on long-run demand for capital. He uses panel data and applies the OLS method for chilean firms between 1985 and 1995. Edame (2014) analyzed the correlation between investment and corporate income tax and figured out that there is a negative correlation. He used the OLS technique and covers the year 1980 and 2010 in Nigeria. Muzurura et al. (2018) studied taxation, and economic growth and found that tax revenues stimulate the productivity of domestic fixed investment. With the model OLS, Zimbabwe was studied between 1998 and 2015. Bakari et al. (2019) examined investment for correlation with income tax and tax revenue. The results show that both corporate and domestic investment taxation positively affect economic growth. The country of Germany from 1972 to 2016 was studied.

So far, we have presented authors who have focused exclusively on one country. In the following section, we list authors who studied multiple countries. King et al. (1984) studied private savings in real business investment in conjunction with effective tax rates and found a negative correlation. With the estimation model they focused on 1980 for U.S., U.K., Sweden, and Germany. Cummins et al. (1996) examine the relationship between fixed investment and tax reforms and find that there are statistically negative significances between investment responses and tax changes in 12 of 14 OECD countries. With the OLS and the generalized method of moments (GMM) they focus on 1981 to 1992. Devereux et al. (2002) focus on investment in the context of marginal effective tax rate, statutory tax rate, and corporate income tax and find that tax cuts and reforms tend to stimulate investment when effective tax rates fall. They analyze the period 1980 to 1990, focusing on EU and G7 countries. Devereux (2003) examines the effective tax rate in context of statutory corporate tax rate and explores possible attractive country benefits with lower tax rates. A positive correlation was found between low taxation and country attractiveness and thus investment. Also a negative correlation between corporate taxation and investments where examined. With the estimates of the distribution they focused on the U.S., France, Germany, and U.K. in 1999. Djankov et al. (2010) chose to study the correlation between investment and effective corporate tax rate.

Their results are based on econometric regression for 85 countries and show that effective corporate tax rate has a strong negative impact on investments. In the same view Achim and Borlea (2020) examine the comparisons of effective tax rate and cash effective tax rate, on the one hand with the applicable tax rate or statutory tax rate, on the other hand, as an important red flegs of existing a tax avoidance within the company. Further, a higher tax avoidance hampers the proper development of the company, along with many other negative side effects for the whole economy.

3. METHODOLOGY AND DATA

This section discusses the methodological issues of the study. Topics covered include the scope of the study, origin and explanation of data sources, model specification, estimation techniques, and data description.

3.1. Data and descriptive statistics

In this research we will use annual data starting from 2008 until 2018 for 28 EU countries for testing the impact of taxation on domestic investments realized by non-financial corporations. The data are divided into EU15 (founding states) and EU13. The EU15 includes all Member States of the EU before the so-called eastward enlargement in 2004, i.e. Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, Luxembourg, Netherlands, Portugal, Spain, Sweden and the United Kingdom. The EU13 includes all remaining EU Member States that joined the EU after 2004. After the onset of financial and economic crisis from 2008 the fiscal policy was used as an important instrument for stimulating economic recovery.

In this context this study tries to reveal the main fiscal determinants of investments (Table 1) in EU countries based on panel methodology. The dependent variable used in the regression equation is the investment rate of non-financial corporations and computed as a ratio between gross fixed capital formation and gross value added. This indicator reflects the contribution of investments in fixed assets to the value added realized by each company. We are focusing only on non-financial corporations because in this case it is pursued the production process for providing goods or non-financial services to the market.

The independent variable PROFITAB is defined as gross operating surplus divided by gross value added. This ratio is used to define the share of value added that is created in the production process. The variable PT represents the tax revenue paid by companies on profits. ITRCI focus on the effective tax rate in terms of corporate profits which is seen as taxable profit. The variable ITL is used to refer to the sum of all direct and indirect taxes and social contributions paid by employees and employers, divided by the total compensation of employees working in the economic territory. The ITC is defined as all consumption taxes divided by the final consumption expenditure of households. The variable OITC includes capital and business income taxes and taxes on stocks of capital. The last independent variable is INTERESTR or Interest rate according to EMU convergence criteria bond yields. The indicator refers to long-term interest rates, which are to be used in the convergence criteria for European Monetary Union (EMU).

Table 1 Description of variables

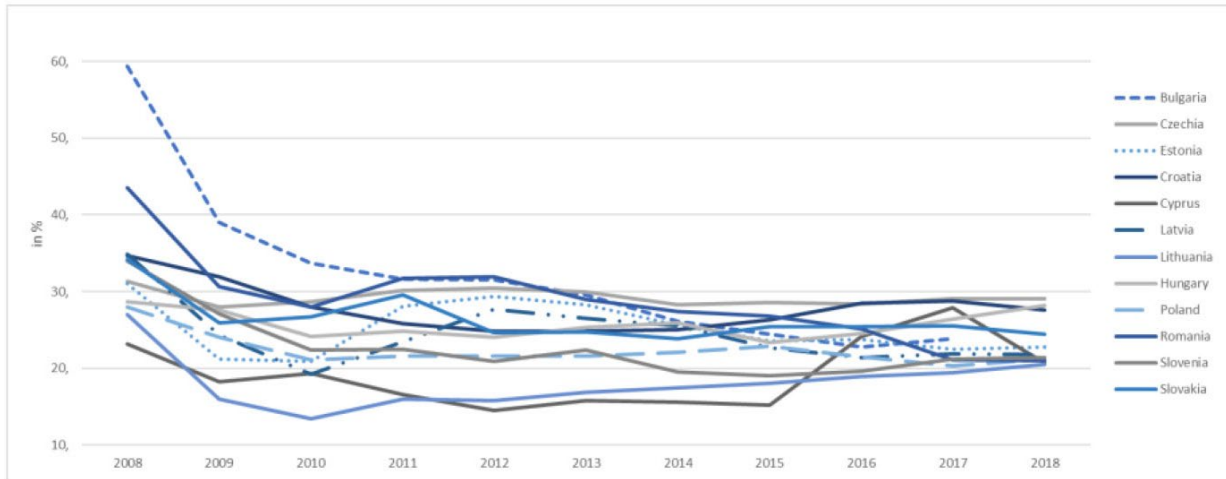| Variable	Specification	Source	Expected sign
IR	Investment rate of non-financial corporations (%)	Eurostat Database (2021)	
PROFITAB	Profit share of non-financial corporations (%)	Eurostat Database (2021)	+
PT	Profit tax (% of commercial profits)	World Bank Indicators (2021)	_
ITRCI	Implicit tax rate on corporate income (%)	Eurostat Database (2021)	_
ITL	Implicit tax rate on labor (%)	Eurostat Database (2021)	+
ITC	Implicit tax rate on consumption (%)	Eurostat Database (2021)	+
OITC	Overall implicit tax rate on capital (%)	Eurostat Database (2021)	_
INTERESTR	Interest rate according to EMU convergence criterion bond yields (%)	Eurostat Database (2021)	_

Source: Author's own composition

The most important instrument used in corporate taxation is staturoy corporate tax rate. One form of tax policy is the development of the statutory corporate tax rate in order to stimulate the investments based on lower rates. In the next figure is presented the corporate tax rate evolution between 2008 and 2018 (see Figure 1).
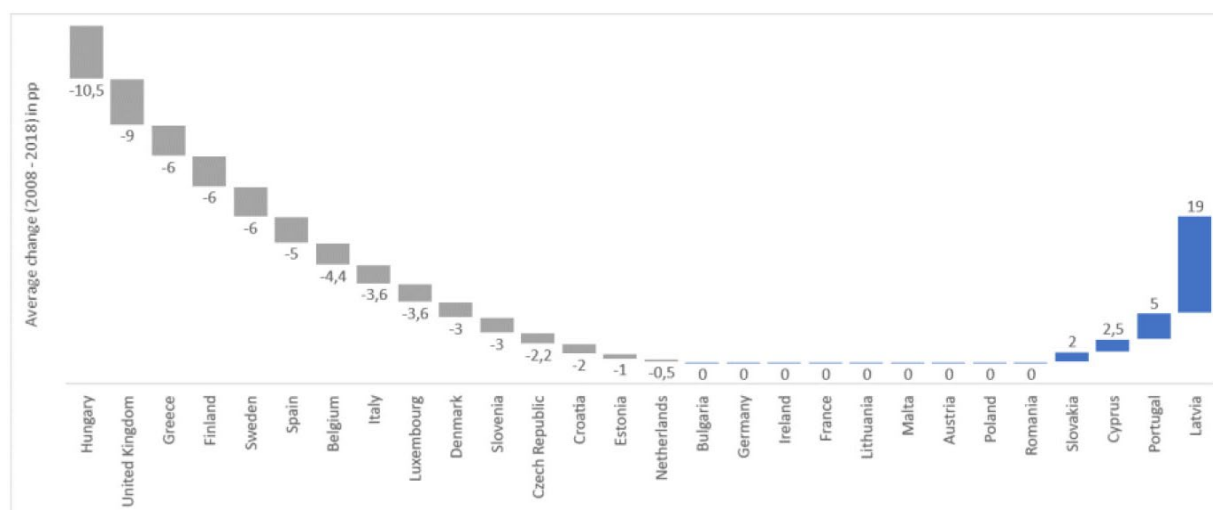
Source: Author's own composition based on Eurostat database, 2021

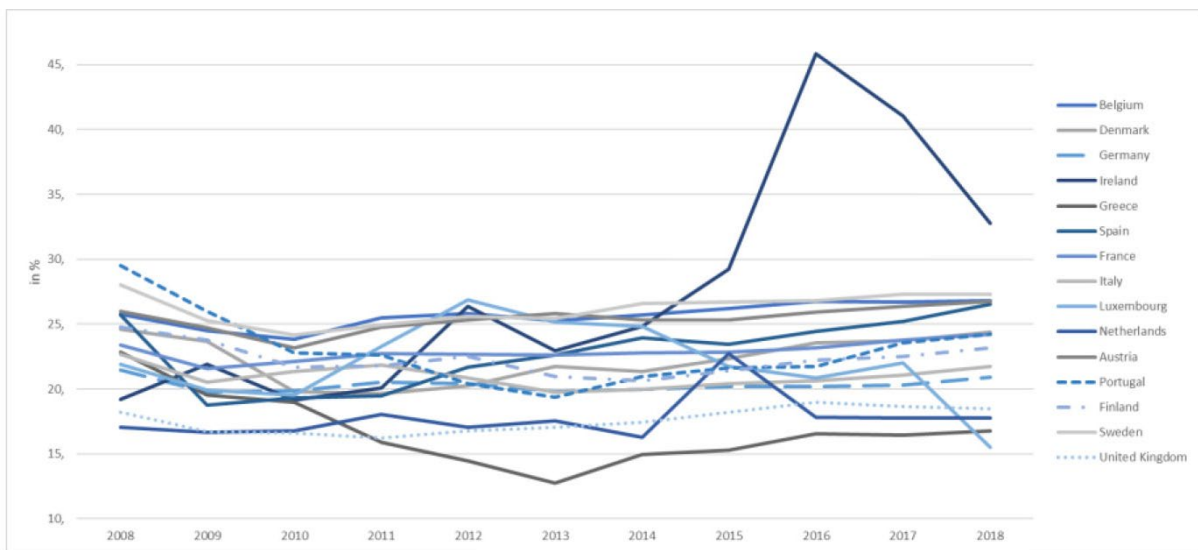Figure 1 Statutory corporate tax rate change between 2008 and 2018 in EU countries (in pp)

A closer look at statutory corporate taxation requires a clustering into three groups. Hungary, United Kingdom, Greece, Finland, Sweden, Spain, Belgium, Italy, Luxembourg, Denmark, Slovenia, Czech Republic, Croatia, Estonia and Netherlands record a reduction in corporate taxation. Hungary records the highest reduction with 10.5 percentage points (pp) between the year 2018 and 2008. The second group represents a constant corporate taxation in the period from 2008 to 2018. These are Bulgaria, Germany, Ireland, France, Lithuania, Malta, Austria, Poland and Romania, which have been at the same level on average for ten years. The last category includes the countries that recorded an increase in corporate taxation. These are Slovakia, Cyprus, Portugal and Latvia. The highest increase is recorded in Latvia, with 19 percentage points.

Figure 2 Invesment rate of non-financial corporation for EU13

Figure 2 shows the development of investment by non-financial corporations in the new member states (EU13). The EU13 show a homogeneous development. A general downward trend is evident. Bulgaria recorded the highest level of domestic investment in 2008, at 60%.

Figure 3 Invesment rate of non-financial corporation for EU15

After a brief increase in investment rate, in Figure 3 it can be seen that the EU15 show a constant and stable development. The exception is Ireland, which recorded a constant increase from 2013 to 2016.

In addition to economic changes, tax policy reforms have also played a role in investment policies. To better explain the links between the investment rate and fiscal policy, three examples are examined in more detail.

Bulgaria had a constant corporate tax rate with 10% over the past decade. And in the same course Bulgaria represents the EU country with the lowest tax rate. The fact that Bulgaria is a fiscally attractive country explains the growth in the investment rate.

In Croatia, the corporate tax rate was reduced by 2 pp over a period of 10 years. Looking at the investment rate, a steady upward trend is evident. Measures have been developed to stimulate the investment rate. For example, in recent years, special free trade zones have been established, which are subsidized by government and offer special location advantages and tax benefits to domestic and foreign companies and investors.

Ireland has shown consistent corporate taxation over the last decade and is one of the tax havens in the EU with a corporate tax rate of 12.5%. The peak in investment in 2016 can probably be attributed to the European Investment Bank's provision of €825 million for long-term public and private sector investment projects. In addition, Ireland has granted unlawful tax breaks of up to €13 billion to the Apple company, which was deemed unlawful by the European court in 2016 and ordered to be repaid. Another reason is likely to be the relocation of the headquarters of multinational corporations such as Adient or Medtronic.

Spain and Portugal reduced their tax rates, while in the United Kingdom an already announced reduction came into effect. Member states narrowed their tax bases to encourage investment and promote competitiveness, while at the same time often broaden the tax base to limit the scope for tax avoidance or to reduce ineffective tax eliminate ineffective tax incentives. Five member states (Spain, France, Croatia, Portugal and Romania) introduced 2013 tax incentives to encourage investment in plant and machinery. These included granting bonus depreciation or tax incentives for reinvesting profits.

3.2. Empirical analysis

The core idea of this study is to analyze the impact of fiscal policy on domestic investments after the start of economic crisis from 2008. One important way for economic recovery is to stimulate or at least protect the investments because it contributes to creating new jobs and finally to economic growth. In this study we will test the impact of profit tax, consumption, capital, and labor taxes on domestic investments. The information on descriptive statistics is presented in Appendix 1. In the case of corporate taxation, we will use in our model the profit tax computed as a percent in commercial profits and not statutory corporate tax rate. Because this indicator reflects the effective tax rate considering different fiscal facilities applied in computing the corporate profit tax base. The same methodology will be applied for the other fiscal variables. In this regard we will consider the implicit tax rate the most relevant indicator for each category of taxes.

For testing the impact of fiscal variables, we will formulate the general model specification:

Investment Rate = f (Economic factors, taxation factors)

Based on this general equation we will conduct our model using different fiscal variables as is reflected in equation (1).

$$IR_{i,t} = \alpha + \beta_1 PROFITAB_{i,t} + \beta_2 FISCALVARIABLES_{i,t} + \beta_7 INTERESTR_{i,t} + \varepsilon_{i,t} \qquad (1)$$

where:

• i and t represent country i at year t, respectively; β is the coefficient of the independent variables; $\varepsilon_{i,t}$ is an error term.

Before estimating our model, it is necessary to test for cross-sectional dependence and to examine the unit root properties for the variables included in the model. The first step of our econometric analysis is to see if there is a correlation across the countries included in our panel analysis.

We assume the existence of cointegration variables and for testing this we will proceed to analyze panel unit root properties. The following tests developed by Levin, Lin and Chu (2002), Breitung (2000), Im, Pesaran and Shin (2003) will be conducted in Eviews. In the last two columns of Table 2 we will use ADF-Fisher Chi-square (Maddala and Wu, 1999) and PP-Fisher Chi-square (Choi, 2001).

Table 2 Panel unit root test results

Variable	LLC	Breitung	IPS	ADF	PP
IR	-21.63***	1.94	-9.43***	156.29***	212.012***
PROFITAB	-8.309***	1.58	-2.015**	82.57**	102.588***
PT	-10.53***	-1.64**	-3.18***	93.67***	132.18
ITRCI	-16.93***	2.96	-5.79***	125.53***	199.30***
ITL	-10.15***	-0.96	-2.27**	82.87**	154.18***
ITC	-11.60***	-0.19	-4.49***	109.39***	158.57***
OITC	-11.34***	1.80	-3.81***	108.91***	153.69***
INTERESTR	-5.03***	1.21	0.21	58.42	64.03

Source: Author's own composition

Table 3 Panel unit root test results (first differences)

	LLC	Breitung	IPS	ADF	PP
ΔIR	-17.08***	-1.47*	-3.67***	129.50***	209.107***
ΔPROFITAB	-21.87***	-2.68***	-5.48***	169.54***	243.07***
ΔPT	-20.41***	-6.18***	-5.07***	161.67***	254.80***
ΔITRCI	-13.38***	-0.97	-3.37***	121.64***	218.49***
ΔITL	-12.24***	-2.702***	-2.17**	97.59***	169.63***
ΔITC	-23.34***	-3.92***	-6.73***	197.44***	319.55***
ΔOITC	-14.95***	-2.20**	-3.714***	127.93***	209.79***
ΔINTERESTR	-21.93***	-4.81***	-4.56***	137.46***	196.96***

Notes: Newey-West automatic bandwidth selection and Bartlett Kernel, individual intercept and trend. Exogenous variables: Individual effects, individual linear trends ***, ** and * indicate the significance at 1%, 5%, and 10% levels, respectively.

Source: Author's own composition

The test presented in Table 2 and 3 were run with individual intercept and trend at level and for the first difference. The results indicate the fact that our variables contain long-run information because are stationary at first difference. In this case we have to see if there is a possible cointegration for variables included in our models. The results are reported in Table 4 and denote the panel cointegration for both models.

Table 4 Results for Kao panel cointegration test

Model	t-statistics	probability	R-squared
Model EU28	-9.72***	0.0000	0.43
Model EU15	-5.95***	0.0000	0.45
Model EU13	-7.173***	0.0000	0.45

Notes: Probability value for the rejection of null-hypothesis. Null-Hypothesis = No cointegration, automatic lag length selection based on SIC with a max lag of 2, Newey-West automatic bandwidth selection, and Bartlett Kernel

Source: Author's own composition

A relevant analysis regarding the power of different panel cointegration test statistics is realized by Gutierrez (2003). He proves that in homogeneous panels with a reduced number of time periods, Kao's tests tend to prove higher power than Pedroni's tests, whereas in panels with large T the latter tests perform best.

Based on the study realized by Breitung and Pesaran (2005), when the cointegration relationship is proved, the long-run coefficients can be estimated efficiently based on fully modified least square (FMOLS) procedures. As the cointegration is confirmed in our models and for obtaining the long-run coefficients, we will use FMOLS. Phillips and Hansen (1990) developed the FMOLS for attaining an optimal co-integrating regression estimation. In agreement with Hamit-Haggar (2012), we consider FMOLS the most proper technique for our panel methodology including heterogeneous cointegration.

Using the FMOLS technique for our panel methodology, four estimating equations were established, each relating to different independent variables (Appendix 2, 3 and 4). The countries under study are categorized into three groups: EU28, EU15 and EU13. For all three approaches is a high coefficient of determination (R^2) between 64.3% and 77.9%. For all countries, there is a positive and significant correlation between domestic investment rate and profit share. If the profit share of non-financial corporations increases the investment rate of non-financial corporations also increases.

For EU28 and EU15, there is no significance between domestic investment and profit tax. However, a strong negative significance is shown for EU13. There is also a strong positive significance for the implicit tax rate on corporate income for EU28 and EU13. Domestic investment even increases when corporate taxes rise. No significance can be found for implicit tax rate on labor in EU28. However, a negative significance is found for EU15 and a positive significance for EU13. This means if labour tax rises in EU15, less is invested in the country. If labour tax rises in EU13, investment continues to increase. If we look at the results for consumption taxes, we find a strong positive significance for all countries, which means that domestic investment continues despite rising consumption taxes. For interest rates, a negative significance was found for EU28 and EU15. For EU13 there is a positive significance. The result is not particularly surprising, since there is usually an indirect correlation. If the interest rate is higher, investors will turn to alternative investments or reduce their investments.

Our results are in line with those of Cummins et al. (1996) which found that tax changes have a negative effect on investment. Devereux et al. (2002) which also found a negative correlation between investment and corporate taxes. Djankov (2010) has also elaborated a negative relationship between investment and effective corporate taxation. Edame (2014) found also a negative influence of investment on corporate income tax and Zidar (2015) also underlines the negative impact of income tax changes and investments.

4. CONCLUSION

The objectives of the study were formulated in three different hypotheses. For the first hypothesis, the relationship between corporate taxation and domestic investment is examined. As it has been shown that for the EU28, as well as for the EU13, there is a positive relationship between domestic investment and corporate taxation. In this context, the results of the profit tax are also worth mentioning since a distinction of the corporate income tax is to be mentioned. The profit tax is a conglomerate of income tax, corporate income tax and trade tax. No significance was found for profit tax except for EU13. The EU13, in turn, show a negative significance. Thus, it can be said that for both the EU28 and the EU13 is a positive influence of domestic investment to implicit corporate taxation, thus confirming the first hypothesis.
Looking at the second hypothesis, which focuses on the significance between consumption taxes and domestic investment, it is clear that there is a strong positive significance for all countries. Consumption tax is directly correlated with domestic investment. After the economic crisis, some countries took the fiscal measure to increase the consumption tax.

When considering the last hypothesis and thus examining an influence of labor taxes to domestic investment, it was found that there is no strong correlation for the EU28. For the EU15 there is a strong negative correlation and for the EU13 a strong positive correlation. Thus,

investment within the EU15 and the EU13 run in opposite directions once there is a uniform increase or decrease in labor taxes. In the EU13, the level of labor taxes is lower and thus tax revenues are also lower compared to the EU15. As a result, there is no significant correlation for the EU28, as the labor tax level differs significantly.

In summary, we find a negative influence between profit tax and investment and a positive impact of consumption tax on investment expansion. Moreover, based on our results, it could be found that fiscal measures adopted by EU Member States after the economic and financial crisis from 2008 to 2010 had a significant impact on investment.

Prosperity depends on various influencing factors, such as the political, social, but also the economic situation. In connection with the economic situation, domestic investment plays a major role. If companies invest their net profits in assets and goods domestically, prosperity increases and with it real wages, the volume of labor, the national budget and technical progress. A company's decision to invest its profits domestically can be influenced by various factors. One aspect is tax policy and its design. Here, the government and its decisions play a major role. Especially after times of crisis, an economy is depressed and incentives must be created to encourage companies to invest. Not all measures of the government lead to stimulate the economy. On a fiscal basis, a few factors could be identified.

Limitations of the work are certainly that we have always included profitability and interest rate as a constant in the calculation. Many other influencing factors play a major role. The observation period from 2008 to 2018 with an economic and financial crisis can also be extended. Further research in this area is necessary to be prepared for post-crisis periods.

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Appendix 1 Summary statistics for EU28

Variable	Obs.	Mean	Std. Dev.	Min	Max
INVRATE	290	23.45	5.231	12.74	59.36
PROFITAB	290	44.08	7.770	29.74	73.33
PT	290	12.25	6.194	-0.20	28.40
ITRCI	290	15.87	7.261	2.67	38.17
ITL	290	34.44	5.674	22.20	44.19
ITC	290	18.41	3.504	9.27	30.80
OITC	290	22.01	9.958	5.66	55.06
INTERESTR	290	3.41	2.809	0.00	22.50

Source: Author's own composition

Appendix 2 Empirical results based on FMOLS for EU28

Dependent variable Investment Rate	(1)	(2)	(3)	(4)
PROFITAB	0.333*** (0.056)	0.309*** (0.055)	0.494*** (0.030)	0.278*** (0.057)
PT	-0.011 (0.046)			-0.031 (0.047)
OITC		-0.050 (0.056)		
ITRCI			0.201*** (0.031)	
ITL			0.105* (0.055)	0.066* (0.040)
ITC			0.416*** (0.073)	0.201*** (0.035)
INTERESTR	-0.159*** (0.027)	-0.214*** (0.031)	-0.127*** (0.040)	-0.074*** (0.022)
R-squared	0.714	0.717	0.739	0.716
Observations	249	249	249	249

Notes: () parenthesis value indicates the Std. Error. Probability significance: ***$p<0.01$, **$p<0.05$, *$p<0.1$. Weighted estimation; Additional regressor deterministics: @TREND; Long-run covariance estimates (Bartlett kernel, Newey-West fixed bandwidth)

Source: Author's own composition

Appendix 3 Empirical results based on FMOLS for EU15

Dependent variable Investment Rate	(1)	(2)	(3)	(4)
PROFITAB	0.359***	0.358***	0.324***	0.330***
	(0.071)	(0.071)	(0.074)	(0.072)
PT	0.019			0.049**
	(0.054)			(0.056)
OITC		-0.128*		
		(0.075)		
ITRCI			0.114	
			(0.075)	
ITL			-0.087	-0.195***
			(0.056)	(0.055)
ITC			0.597	0.588***
			(0.052)	(0.047)
INTERESTR	-0.441***	-0.515***	-0.328***	-0.389***
	(0.036)	(0.042)	(0.028)	(0.025)
R-squared	0.748	0.753	0.779	0.775
Observations	150	150	150	150

Source: Author's own composition

Appendix 4 Empirical results based on FMOLS for EU13

Dependent variable Investment Rate	(1)	(2)	(3)	(4)
PROFITAB	-0.008	0.215**	0.719***	0.068
	(0.097)	(0.091)	(0.096)	(0.112)
PT	-0.976***			-0.633***
	(0.093)			0.097
OITC		-0.074		
		(0.090)		
ITRCI			0.341***	
			(0.112)	
ITL			0.177***	0.276***
			(0.067)	(0.065)
ITC			0.336***	0.336***
			(0.068)	(0.068)
INTERESTR	0.398***	0.335***	0.199***	0.4823***
	(0.045)	(0.051)	(0.043)	(0.054)
R-squared	0.674	0.672	0.643	0.685
Observations	99	99	99	99

Source: Author's own composition