

THE IMPACT OF CORPORATE INCOME TAX ON FDI INFLOW IN EMERGING EU ECONOMIES


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Abstract. *After global financial crisis, intensive tax policies adjustments were applied in emerging European Union (EU) economies, for the sake of tax competitiveness. In order to ensure that aim, emerging EU economies most often choose the policy of tax reduction and particularly lowering corporate income tax rate. This paper deals with the impact of corporate income taxes on foreign direct investment (FDI) inflow in selected emerging EU economies (Czech Republic, Hungary, Lithuania, Latvia, Poland, Slovakia, Slovenia) between two crises (global financial and pandemic), namely, over the period 2010-2019. Using classical panel data models (Fixed Effects and Random Effects model), the research shows that it is expected that corporate income taxes reduction provides FDI inflow. Observing the relationship between other factors (corruption index, competitiveness index and short-term interest rate) and FDI inflows, positive relations are confirmed. Panel-corrected standard errors (PCSE) estimator, implemented as robustness check, confirmed the results and conclusions based on FE model. However, negative relationship between corporate income taxes and FDI in the case of PCSE model is only verified in case of Hungary and Latvia, indicating tax competitiveness existence.*

Key words: *Corporate income tax, FDI, emerging EU economies, panel analysis, PCSE Method.*

JEL Classification: C33, H25, F21.

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1. INTRODUCTION

While some forms of global networks have existed for a long time, the recent technological advances transformed our world into a global village. Globalization is an omnipresent term and process, key for thinking about economic interdependencies and connections. Ergo, that means freer movement of people, goods, services and capital. Easier crossing of the border for factors of production, especially capital mobility, imposed a market competition of world proportions.

Capital mobility emphasized the term of ‘tax competitiveness’, since it manifests the multinational companies’ decisions of resources allocation (Devereux et al. 2002). Taxes influence companies’ decisions about the location, establishment, and expansion of their business (Desaia et al. 2004). Thus, the tax system can have a key role in the economic development of a country (Budryte, 2005). Many economic policy makers emphasized the importance of tax policies as a key factor for the smooth functioning of the economy (Blechová, 2016) and decisions on investment localization. Namely, one of the components of gross domestic product (GDP), and thus a generator of economic growth, are investments (Ercegovac & Beker Pucar, 2021a). Capital owners have been directing their investments towards economies with favourable business conditions.

Significant number of economic researchers pointed out that corporate income tax is one of the key determinants for choosing the location in which to invest. In the context of EU member states, economies have retained the right to fiscal sovereignty, which obviously gave them the opportunity to create unified tax policies. Although, to some extent, there is a tendency within the EU to harmonize tax policies, or at least bring them closer. Hence, tax policy-making has still been left on a national level. Therefore, without the influence of EU institutions, member state governments decide on tax rates and tax bases. EU economies retained the freedom to participate in the market struggle and to adjust tax policies for the sake of tax competitiveness. Specific interest in this paper is oriented towards different tax strategies chosen by emerging EU economies in the period between the two crises, the financial crisis and the crisis caused by the Covid-19, and their effects on the decision in relation to investments localization.

The aim of this paper is to examine the relationship between the statutory corporate tax rate and the inflow of foreign direct investment (FDI) in selected emerging EU economies (the Czech Republic, Hungary, Lithuania, Latvia, Poland, Slovakia, Slovenia) using available empirical data. Many authors dealt with this relationship in a theoretical context, but few have just demonstrated the impact of the corporate income tax rate on the decision to allocate investment in emerging EU economies. Furthermore, as the corporate income tax rate is not the only factor that determines investors, it was important to consider the impact of short-term interest rates on capital inflows. Moreover, this paper examines the impact of the competitiveness of emerging economies, and the presence of corruption in the public sector, which may be determining for the investment decision. Therefore, the main hypotheses of this paper are:

H₁: In selected emerging EU economies, there is a negative relationship between FDI and corporate income tax rate in the period 2010-2019.

H₂: The positive relations between corruption index, competitiveness index, short-term interest rate and FDI inflows exist in seven emerging EU economies in the period 2010-2019.

The paper is structured as follows: after the Introduction section, Section 2 reviews existing evidence in the empirical literature, Section 3 analyzes investments and factors that influence the decision on the location of investments in emerging EU economies. Section 4 presents used methods and data, while Section 5 discusses estimation results, and final section outlines concluding remarks.

2. LITERATURE REVIEW

Vast literature deals with papers that examine tax role in economic policy of the emerging EU economies. Aničić et al. (2015) in their research pointed out that tax systems should provide international competitiveness of the country. Budryte (2005) noted that in contemporary world, surviving market struggle is truly challenging. Wulfgramm et al. (2016) emphasized that in majority of countries tax policy is one of the central issues, therefore tax systems are subject of constant theoretical and political examinations (Aničić et al. 2012). Moreover, tax policy is one of the main determinants of FDI inflow (Janeba, 1993). Namely, tax competitiveness ensures smooth functioning of the economy (Blechová, 2016). Furthermore, in case of Ireland, by lowering corporate income tax rates significant amount of FDI was attracted, and thus achieved an economic boom (Stewart, 2011). That is in line with Desaia et al. (2004) who indicated that taxes determine owners' decisions on the localization of their capital and business. Hence, economies with lower rates attract more investments than the economies with higher rates due to the capital mobility (Devereux et al. 2002). Spill-over effect and tax avoidance schemes (Hong & Smart 2007) are inevitable since the tax system burdens taxpayers too much. Consequently, investors' profits are reduced by higher taxes (Bellak & Leibrecht, 2005). However, as Keightley & Sherlock (2014) explained, tax competitiveness could be achieved without compromising public revenues by simultaneously lowering corporate income tax rates while expanding the tax base (de Mooij & Nicodème, 2008).

The tax system is based on the trade-off between efficiency and equality (Aničić et al. 2015), depending on the country's preferences. The tax system may be more inclined to increase economic growth, i.e. reduce inequality. In fact, the structure of the tax system reflects the importance of taxes in an economy. The structure of taxes is influenced by the following factors: economic development, level of market development, education of the population, structure of the working age population, size of government, pension system, as well as social policy. Tax policy must be carefully designed; otherwise, it could have negative effects on the economy. If the tax system burdens taxpayers too much, tax evasion is inevitable (Hong & Smart, 2007).

In addition to the above, the tax system of open economies certainly affects the competitiveness of the economy. The tax system, i.e. tax rates, could be a generator or a negative factor for the FDI inflow, and consequently the level of employment (Janeba, 1993). Investor profits are reduced by increasing tax rates (Bellak & Leibrecht, 2005), since it increases the cost of labor and reduces disposable profit after tax (Aničić et al. 2012).

This paper also draws on the literature that analyzes tax systems of the EU economies. Within the EU, toward elimination of harmful competition between members, there are tendencies for tax harmonization (Gropp & Kostial, 2001). Glavaški & Beker Pucar (2020) pointed out that strengthening the fiscal framework is necessary due to the shortcomings of unfinished EU project that were visible after global financial crisis.

However, tax harmonization is not favourable for all economies equally, since in core EU countries elasticity of investment movements in relation to tax changes is lower than in peripheral EU countries (Gropp & Kostial, 2000). According to Baldwin & Krugman (2002), that could be explained as tax harmonization failure. Thus, Sørensen (2004) in his paper discussed whether more conventional corporate tax harmonization should still be a long-term policy goal for the EU.

The large number of studies also researched the impact of FDI inflows, since it is often seen as one of the factors that increases the economic growth of the country (Hunady & Orviska, 2014). FDI had essential role for the emerging EU economies (Andrašić et al. 2018). The emerging EU economies went through successful transitions thanks to capital inflow in multinational companies (Bevan & Estrin, 2004; Walkenhorst, 2004). Thus, presence of foreign capital has several beneficial impacts on economy, including: (i) competitiveness and technology improvements, (ii) unemployment reduction, (iii) better position on the international market, (iv) rise in exports, and (v) foreign currency inflow (OECD, 2008; Denisia, 2010; Ercegovac & Beker Pucar, 2021b). Although, the global economic environment has significantly changed after the financial crisis (Zubair et al. 2020), some business factors such as: the Corruption Index, Competitiveness Index (Dunning & Zhang, 2008), and the Short-Term Interest Rate (Talpos & Vancu, 2009) still notably affect investment localization decisions (Dunning, 1992). The idea of this paper is to fill the gap that exists in the literature regarding corporate income tax impact on FDI localization decision in emerging EU economies using Fixed vs. Random-effects model estimator and Panel-corrected standard errors (PCSE) estimator, given the obvious scarcity of scientific papers dealing with this topic after the global crisis.

3. SOVEREIGNTY OF TAX POLICY BACKGROUND AND FDI

Tax policy is one of the central issues of every state (Wulfgramm et al. 2016), because taxes represent the most significant public revenue. By creating tax policies, the state is able to collect money from taxpayers, on various bases. In addition, taxes are a significant determinant of economic growth. However, state's tax system depends on the goals which have to be achieved, such as: reducing the fiscal deficit, increasing investment or achieving certain social goals.

Although taxes are only one of the key factors influencing the FDI inflow, the growing impact of globalization has conditioned the national governments of almost all member states of EU to reform tax systems (Budryte, 2005). In order to survive the market struggle, emerging EU economies have been particularly active in reversing their tax systems. Corporate income tax distinguishes as the most important tax form that determines the FDI inflow. Namely, the corporate tax rate level determines the country's tax competitiveness level, thus lower rates make the country more attractive for investment. Keightley & Sherlock (2014) explained that tax competitiveness could be achieved without compromising public revenues, according to de Mooij & Nicodème (2008) the solution is lowering corporate income tax rates while expanding the tax base.

The race for tax competitiveness was causing problems within the EU. Especially as Glavaški & Beker Pucar (2020) pointed out the global recession has highlighted all the shortcomings of the unfinished EU project. Namely, lowering tax rates generates various problems within the EU single market with regard to the free movement of people, goods, services and capital, of which the movement of capital is crucial. Different tax rates

within the single market lead to the “migration” of capital from Member States with higher tax rates to Member States with lower rates, significantly affecting economic growth and unemployment rate. For that reason, the EU has insisted for the last two decades on establishing tax harmonization (Gropp & Kostial, 2001; Devereux et al. 2002), in order to discourage the transfer of multinational company’s capital from one country to another. However, the harmonization success is questionable. Since national governments have disagreed on the corporate income tax rate, the room for capital movement was left. This is explained in the paper by Baldwin & Krugman (2002), who pointed out that tax harmonization cannot suit all economies equally. There is a well-founded fear that if it occurs, tax harmonization will harm at least one economy. The reason for this is in the different elasticities of investment between core countries and peripheral countries (Gropp & Kostial, 2000). Therefore, Sørensen (2004) in his paper implied that the EU should not insist on harmonization, but to remain at the level of reducing the cost of tax liabilities, which would result in more efficient redistribution. That could be confirmed by empirical data analysis based on corporate income tax rates in selected EU economies, and potential effects on investments localization decisions.

In this paper the selected economies are seven emerging EU economies, including Czech Republic, Hungary, Lithuania, Latvia, Poland, Slovakia, and Slovenia. Estonia as a part of Baltic countries is omitted due to data gap. Empirical data related to emerging EU economies show that corporate income tax rates are lower than the Eurozone average in the period from 2010 to 2019 and ranged between 24.4% and 23% (Figure 1). Furthermore, most of the observed emerging EU economies had followed the corporate income tax rates reduction which occurred in Ireland and was followed by economic boom. Namely, one of the most important reasons for Ireland’s success has been recorded by lowering the corporate income tax rate to 12.5%. Tax competitiveness has been achieved, which attracted FDI and led to an economic boom. However, despite the fact that Ireland recorded a significant inflow of FDI, only Hungary lowered the corporate income tax rate to 9% in 2017, positioning itself as the country with the lowest corporate income tax rate in the EU. Poland and the Czech Republic recorded an unchanged tax rate of 19% in the observed period, while Slovenia had changes in tax rates in the observed period from the initial 20% in 2010, to 19% as recorded in 2019 (Figure 1). When it comes to the Baltic countries, Lithuania and Latvia had the same rate of 15% until 2018, afterwards, Latvia adjusted the rate upwards (to 20%). The economy with the highest rate in 2019 is Slovakia, which recorded an increase in the corporate income tax rate in 2012 from 19% to 23%, and then decreased in 2016 to 21% that remained unchanged until the end of the observed period (Figure 1).

On the other hand, FDI movements recorded more fluctuations in comparison to tax rate changes in the emerging EU economies. Since FDI was recognized as a generator of the economy (Hunady & Orviska, 2014), FDI was targeted as a crucial factor for the emerging EU economies in the 1990s (Andrašić et al. 2018). If historical aspect was taken into account, most of the selected emerging economies of the EU were former countries of the Soviet Union and Yugoslavia. Thus, economic organization of those countries was based on planned economy and state or public ownership. Namely, new socio-political circumstances in the context of disintegration of ex countries, forced former socialist countries to turn to the liberal capitalism (EU accession in 2004), where *laissez faire* rules apply and capital is privately owned. The foreign capital inflow and the presence of multinational companies have played a crucial role in the successful transition and adaptation to new frameworks (Bevan & Estrin,

2004; Gerschewski, 2013). The foreign capital inflow is generally recognized as the most important component of FDI, since, FDI brings with it new technologies (Stanišić, 2008) and knowledge (Ercegovac & Beker Pucar, 2021a). Furthermore, FDI enable productivity growth, thus boosting the overall economy of the inflowing economy (OECD, 2008; Ercegovac & Beker Pucar, 2022).

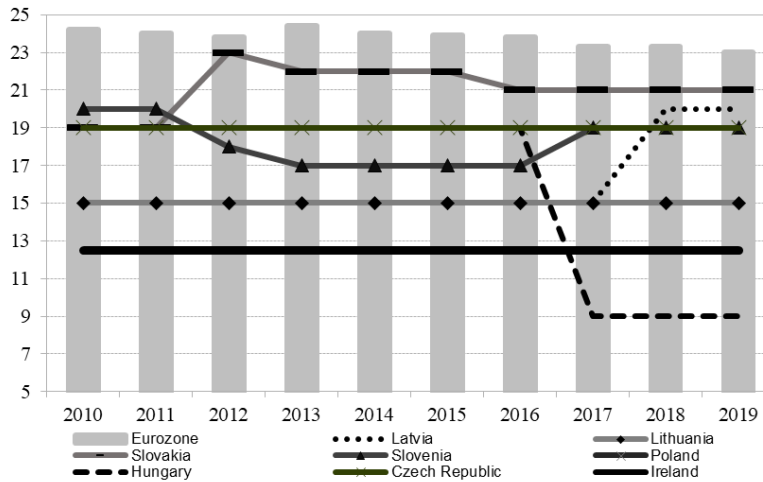


Fig. 1 Corporate income tax rates in selected emerging economies of the EU, Ireland and the Eurozone, in the period 2010-2019

Source: Authors' presentation based on data from Trading economics.

The 2008 world financial crisis fundamentally changed the investment priorities (Zaubir et al. 2020). Therefore, it is important to identify the most important determinants that influence the decision to localize investments. Corporate income tax was recognized as a crucial factor for the inflow of FDI, often inducing economic policy makers to lower tax rates. However, in addition to the corporate income tax rate, there are some other factors that play a significant role when it comes to FDI. Hence, the business environment significantly determines the attractiveness of host country as an investment location (Dunning, 1992; Dunning & Zhang, 2008).

As can be seen in Figure 2, almost all selected emerging EU economies in the observed period recorded a tendency to increase the FDI inflow. Poland has the absolute largest investments inflow, followed by the Czech Republic, while Slovenia, Lithuania and Latvia are at the back of the selected emerging EU economies, observing the absolute amounts. However, in those economies the FDI did not record significant oscillations. Hungary is an economy that has recorded more drastic changes in the FDI inflow in the observed period. The first decline was recorded in 2013, followed by growth in 2014. However, another sharp decline in the FDI inflow was recorded, and even the withdrawal of existing FDI (in 2015 and 2016). The slowdown in FDI that was noticed in 2013 may be linked to a number of measures with potential detrimental impacts on the business environment (European Commission, 2015). From 2017 to 2019, there was a constant increase in the inflow of FDI in Hungary, which is, among other things, a consequence of lower income tax rates (correction in 2017 to 9%).

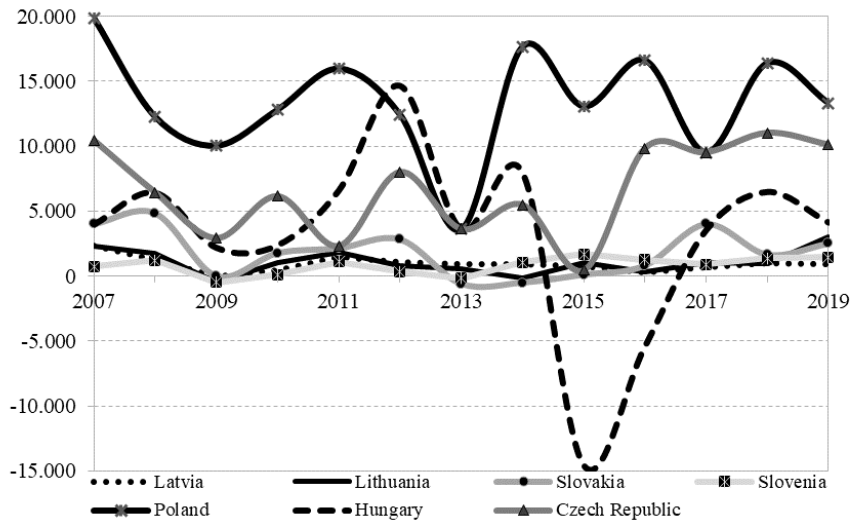


Fig. 2 Inflow of FDI in selected emerging EU economies in the period 2010-2019

Source: Authors' presentation on OECD database.

According to the fact that the descriptive analysis points to the causality in the movement of foreign direct investment towards corporate taxes differentials, the subject of the econometric analysis in the continuation of the paper will be the assessment of this connection using the panel model.

4. METHODS OF ESTIMATION AND DATA

The analysis is based on panel data econometric framework, which allows the research on corporate income taxes and FDI across emerging EU countries and over the time. Namely, the intention is to analyze the negative relationship between corporate income taxes and FDI inflow (Hypothesis 1), as well as influence of other factors that affect FDI (Hypothesis 2). The sample contains the data on 7 emerging EU economies observed in the period between two global crises, 2010-2019. This period is selected in order to avoid structural breaks in the sample, as well as to analyze intensive adjustment of tax policies in emerging EU economies after global financial crisis. Initially, classical panel data models are used in this paper, allowing for some (restricted) heterogeneity in slope coefficients by inclusion of dummy variables. Namely, we implemented Fixed Effects and Random Effects specifications with time and/or individual effects. However, classical panel models could be limited if the model contains cross-section dependence, autocorrelation or heteroscedasticity. Therefore, Panel-corrected standard errors estimator recommended by Beck and Katz (1995) is used in order to encompasses heteroscedastic, autocorrelated and/or contemporaneously correlated disturbances. The general form of the empirical panel data equation can be written as follows:

$$y_{it} = b_0 + b_1X_{it} + b_2D_i + \mu_i + \lambda_t + u_{it} \quad (1)$$

where y_{it} is foreign direct investments of country i in the year t . X_{it} contains determinants of foreign direct investments which vary over i and t , while D_i is dummy variable for groups of economies i , or it is used to encompass outliers in the empirical data. Individual effects are represented by μ_i , along with time effects λ_t , and stochastic disturbance term u_{it} .

Dependent variable, y_{it} , foreign direct investment inflow (fdi_in_{it}) is measured in absolute amount in millions of dollars with inward perspective. FDI statistics cover all cross-border transactions and positions between enterprises which are in a FDI relationship: (a) direct investment positions (stock), (b) direct investment income flows, and (c) direct investment financial flows. Following the main results in the empirical studies, a set of potential explanatory determinants, X_{it} , are employed: corporate income taxes, macroeconomic stabilization variables, business environment variables, and dummy variables representing outliers. The most important independent variable is corporate income taxes variables, cit_{it} , showing the effects of tax competition between economies on investments localization decisions. It is expected that reduction of corporate income taxes provides FDI inflow, and *vice versa*. The effects of macroeconomic stabilization are represented by economic variables: GDP growth ($grow_{it}$) and short-term (ST_ir_{it}) or long-term interest rates (LT_ir_{it}). GDP growth should have positive influence on FDI, as well as influence of interest rate on FDI. Mentioned variables are defined using data from OECD statistics.

Business environment is encompassed in the model by introduction of competition indexes ($comp$) and corruption indexes ($corr$). The competitiveness of the economy is measured by a competitiveness index consisting of 98 variables. The variables are organized into twelve pillars: (1) institutions, (2) infrastructure, (3) adoption of ICT, (4) macroeconomic stability, (5) health, (6) workforce skills, (7) product market, (8) labor market, (9) financial system, (10) market size, (11) business dynamics and (12) ability to innovate. Positive relationship in the model between competitiveness index and FDI is expected, since that improving of business environment could attract investments. Another factor in the business environment that influences the decision of investments localization is the existence of corruption in the public sector. The decision is made by looking at the corruption index, which according to the degree of corruption shows that 0 means corruption at the highest level and 100 means economy without corruption. Thus, company owners gravitate towards countries that are more competitive compared to the rest of the world and where the presence of corruption is reduced to a minimum. Mentioned variables are defined using data from Trading Economics.

Finally, dummy variable is defined for Latvia ($dummyL$), since Latvia is the economy with the lowest corporate income taxes in the group of emerging EU economies, which means that expected sign in the regression is minus. Dummy variable is defined to take value 1 for Latvia, and 0 otherwise. Another dummy variable is defined to capture outliers identified in the case of Hungary ($dummyH$) in the years 2015 and 2016, due to negative values of FDI inflows. Namely, negative FDI positions are the result of situation in which loans from the affiliate to its parent exceed equity capital and the loans given by the parent to the affiliate. Therefore, dummy variable is defined to take value 1 for the years 2015 and 2016 in Hungary, and 0 otherwise. Consequently, the baseline model, derived from theoretical framework to test Hypothesis 1 and 2 and used variables, could be specified as:

$$fdi_in_{it} = b_0 + b_1cit_{it} + b_2ST_ir_{it} + b_3grow_{it} + b_4comp_{it} + b_5corr_{it} + b_6dummyH_i + b_7dummyL_i + \mu_i + \lambda_t + u_{it} \quad (2)$$

5. TESTING THE IMPACT OF CORPORATE INCOME TAXES AND OTHER DETERMINANTS ON FDI LOCALIZATION

The procedure performed in order to estimate the impact of corporate income taxes on FDI inflow (Hypothesis 1), as well as other significant factors, consists from the following empirical steps. Since that sample included period between two global crises 2010-2019 for 7 emerging EU economies, we firstly tested cross-sectional dependence (CSD) in the panel. Results of Pesaran CD test are presented in Table 1, and imply null hypothesis, H_0 : cross-sectional independence, against the alternative hypothesis, H_1 : cross-sectional dependence between panels. Pesaran CD test showed that null hypothesis of cross-section independency has to be rejected for all analyzed variables. Detected dependence is expected due to the fact that all economies in the sample are members of EU, which links strong institutional framework. Analyzed emerging EU economies became EU members in 2004, and cross-section dependence is therefore expected due to specific institutional design of EU. Namely, those economies share the common market, common agricultural policy, customs union, tax harmonization, and finally, some of them are part of the monetary union (Lithuania, Latvia, Slovakia, and Slovenia). Those common policies inevitably lead to connections, spill-over effects and dependencies between emerging EU countries (Josifidis et al. 2018).

Table 1 Pesaran CD test

Pesaran CD test	CD-test	p-value	Corr.	Aps. (corr.)
<i>fdi_in</i>	2.43	0.015	0.168	0.241
<i>cit</i>	2.73	0.006	0.189	0.508
<i>comp</i>	14.49	0.000	1.000	1.000
<i>corr</i>	5.06	0.000	0.349	0.533
<i>ST_ir</i>	9.85	0.000	0.680	0.680
<i>LT_ir</i>	12.68	0.000	0.875	0.875
<i>grow</i>	3.89	0.000	0.268	0.429

Source: Authors' calculations.

Due to test results of cross-section dependence, second generation panel unit root test is used – Pesaran CIPS test (2007) which allows for cross-section dependence in the form of a single unobserved common factor. Pesaran CIPS is based on null hypothesis, H_0 : non-stationarity of variable, against alternative hypothesis H_1 : stationarity of variables. The results of the Pesaran CIPS for variables in the level and at the first differences in the model with constant are shown in Table 2. Panel unit root tests fail to reject null hypothesis at 5% significance level, meaning that variables *fdi_in*, *cit*, *comp*, *corr*, are non-stationary in the levels. Therefore, in the next step the stationarity of first differences is tested, and results showed that those variables are stationary in first differences. On the other hand, variables *grow* and *ST_ir* are stationary in the levels. Detected problem of nonstationarity is solved using transformation of non-stationary variables, in terms of first differences.

Table 2 Pesaran CIPS test

Pesaran CIPS test H ₀ : I(1) H ₁ : I(0)	Lags	Level of variables		First difference		Variabl es	Level of variables		First difference	
		Z(t)-stat.	p- values	Z(t)- stat.	p- values		Z(t)- stat.	p- values	Z(t)- stat.	p- values
<i>fdi_in</i>	0	-0.907	0.182	-3.627	0.000	<i>corr</i>	-0.838	0.201	-5.120	0.000
	1	1.026	0.848	-1.513	0.000		-0.127	0.450	-7.220	0.000
	2	8.427	1.000	8.427	0.000		8.427	1.000	-	-
<i>cit</i>	0	2.716	0.997	-4.227	0.000	<i>comp</i>	-1.808	0.035	-6.695	0.000
	1	1.765	0.961	4.950	0.000		0.670	0.749	-10.490	0.000
	2	7.247	1.000	8.427	0.000		8.427	1.000	-	-
<i>grow</i>	0	-3.057	0.001			<i>ST_ir</i>	-2.571	0.005		
	1	-1.717	0.043				-1.822	0.034		
	2	-1.622	0.056				-1.700	0.039		

Source: Authors' calculation.

Initially, all potential explanatory variables were included in the classic panel model, and econometric procedure 'from general to specific' is used to eliminate insignificant regressors. Table 3 represents only significant variables in the model: corporate income taxes, macroeconomic stabilization variables, business environment variables and dummy variables representing outliers. Those variables are significant in explaining FDI inflow in Fixed-effects model, while corporate income taxes were not significant in the Random-effects model. Results of the Hausman test indicated that efficient model is the one estimated using Fixed-effects specification.

It is expected that the reduction of corporate income taxes provides FDI inflow, which is confirmed in Fixed-effects model by negative sign of *cit* variable. Short-term interest rate (*sir*) affects FDI positively, promoting investments inflow, which is in line with analyses of Dupor (2000) who showed that rising interest rates stimulate foreign investors to invest in an economy. Business environmental variables showed that higher level of corruption index (*corr*) and higher competition index (*comp*) are important parameters for decision-making on investment. Outliers in data are captured by dummy variables for Latvia (*dummyL*), since Latvia is the economy with the lowest corporate income taxes in the group of emerging EU economies. Dummy variable (*dummyH*) is defined to capture outliers identified in the case of Hungary in the years 2015 and 2016 in context of negative values of FDI inflow; namely, values indicated that investment outflows exceeded inflows. Variable *dummyH* is significant in the model, showing that reduction of taxes influenced inversely on FDI, namely FDI increased in Hungary.

Results represented in Table 3 are related to the research hypothesis 1. This finding might be interpreted as acceptance of the hypothesis that negative link between corporate income tax rates and FDI inflows exists. Positive link between other factors (corruption index, competitiveness index and short-term interest rate) and FDI inflows is confirmed in seven emerging EU economies in the period 2010-2019; therefore, hypothesis 2 is accepted.

Table 3 Fixed vs. Random-effects model estimator for emerging EU economies in the period 2010-2019

Dependent variable:	Fixed-effect model			Random-effects model		
	Coef.	Std. Error	P>(t)	Coef.	Std. error	P>(t)
<i>fdi_in</i>						
<i>cit</i>	-844.65	242.28	0.001	13.384	192.321	0.945
<i>ST_ir</i>	1805.56	359.75	0.000	1579.951	293.683	0.000
<i>comp</i>	38.982	14.73	0.010	38.022	18.447	0.039
<i>corr</i>	260.001	111.37	0.023	194.3103	86.487	0.025
<i>cons</i>	1894.91	5314.93	0.723	-8772.661	5221.214	0.093
<i>dummyL</i>	-	-	-	-3006.191	1633.365	0.066
<i>dummyH</i>	-13482.19	2769.959	0.000	-13186.46	2966.424	0.000
R ²	0.34			0.46		
Wald chi ²	7.62	0.0001		65.88		0.000
Breusch-Pagan test				48.13	0.000	
Mean VIF	1.18					
Number of observations		70			70	

Source: Authors' calculations.

5.1 Robustness Check: PCSE Method

Due to detected problem of cross-section dependence and nonstationarity of variables, classical panel methods are limited. However, Beck and Katz (1995) recommended use of Panel-corrected standard errors (PCSE) estimator, which allows for heteroscedasticity, autocorrelation and contemporaneously correlation across panels. Due to detected problem of autocorrelation (Wooldridge test), heteroscedasticity (Wald test), cross-section dependence (Pesaran CD test), PCSE estimator is implemented (Table 4). Problem of nonstationarity is solved using transformation of non-stationary variables, in terms of first differences.

PCSE estimator confirmed the results and conclusions based on FE model. FDI is positively affected by short-term interest rate, corruption and competition index, while negatively by dummy variables. In Latvia, lowest corporate income tax rates in the sample indicated FDI inflow. In Hungary negative FDI inflow is detected in 2015 and 2016, and further, Hungary policymakers reacted with corporate income tax reduction in 2017 from 19% to 9%. Although the PCSE model confirmed that lower corporate tax rates in Latvia and Hungary imply higher FDI, variable *cit* is not significant, meaning that the same could not be generalized for the other 5 emerging EU economies in the sample.

Robust results represented in Table 4 could be interpreted as partial acceptance of the hypothesis 1 that negative link between corporate income tax rates and FDI inflows exists in Hungary and Latvia. However, this result could not be generalized for all analyzed emerging EU economies. Positive relation between other factors (corruption index, competitiveness index and short-term interest rate) and FDI inflows is confirmed using PCSE method in seven emerging EU economies in the period 2010-2019; therefore, hypothesis 2 is fully accepted.

Table 4 PCSE Estimator for emerging EU economies in the period 2010-2019

Dependent variable:	Panel-corrected standard errors (PCSE)		
	Coef.	Std. Error	P>(t)
<i>fdi_in</i>			
<i>cit</i>	13.3847	159.258	0.993
<i>ST_ir</i>	157.951	370.611	0.000
<i>comp</i>	38.0224	14.429	0.008
<i>corr</i>	194.310	61.426	0.002
<i>cons</i>	-8772.661	4600.807	0.057
<i>dummyL</i>	-3006.191	750.678	0.000
<i>dummyH</i>	-13186.46	3532.147	0.000
R ²		0.51	
Number of observations		70	

Source: Authors' calculations.

Conclusions related to the robustness check using different methods of estimations are as follows: (1) PCSE method is the most reliable method compared with FE and RE methods; (2) negative relationship between corporate income taxes and FDI is confirmed in FE and PCSE model, although in the case of PCSE model only in case of Hungary and Latvia; (3) the magnitude of influence of explanatory variables on FDI inflow is slightly lower in PCSE model compared with FE; (4) residuals are stationary and cross-section independent in PCSE model. Hence, it is concluded that PCSE model is the most favourable one.

6. CONCLUSIONS

This paper analyzes the impact of changes in the corporate income tax rate on the investments localization decision in emerging EU economies. The results of classical panel models (Fixed-effects and Random-effects models) based on selected emerging EU economies (Czech Republic, Hungary, Lithuania, Latvia, Poland, Slovakia, and Slovenia) for the period between two crises, indicated negative link between corporate income tax rates and FDI inflows which is in line with economic investment theory (Talpos & Vancu, 2009). Results of the Hausman test showed that the model with Fixed-effect (FE) is more efficient in comparison to the one with Random-effect specification. Therefore, this paper confirms that reduction of corporate income taxes, i.e. achieving tax competitiveness, provides FDI inflow. Observing other factors, it is shown that short-term interest rate effects FDI positively (Dupor, 2000) and business environmental variables indicated that higher level of corruption index and higher competition index are significant factors for decision-making on investment. Furthermore, Panel corrected standard errors (PCSE) method is implemented, as robustness check, due to limitation of classical panel methods: problem of cross-section dependence and nonstationarity of variables. PCSE confirmed conclusions based on FE model; however, negative relationship between corporate income tax and FDI inflow was only detected in case of Hungary and Latvia. Between analysed emerging EU economies, Latvia and Hungary are at the same time economies with the highest score of tax competitiveness indexes, confirming that tax competitiveness exists in EU economies and that causes positive macroeconomic effects by foreign direct investment attraction.

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UTICAJ POREZA NA DOBITAK PREDUZEĆA NA PRILIV SDI U EKONOMIJAMA EU U RAZVOJU

Nakon globalne finansijske krize intenzivna prilagođavanja poreske politike primenjena su u ekonomijama Evropske unije (EU) u razvoju, zarad poreske konkurentnosti. Da bi ostvarile taj cilj, ekonomije EU u razvoju najčešće biraju politiku smanjenja poreza, a posebno snižavanja stope poreza na dobit preduzeća. Ovaj rad se bavi uticajem poreza na dobit preduzeća na priliv stranih direktnih investicija (SDI) u odabranim ekonomijama EU u razvoju (Češka, Mađarska, Litvanija, Letonija, Poljska, Slovačka, Slovenija) između dve krize (globalne finansijske i pandemijske), tj. , u periodu 2010-2019. Koristeći klasične modele panel podataka (model Fixed Effects i Random Effects), istraživanje pokazuje da se očekuje da smanjenje poreza na dobit preduzeća obezbedi priliv SDI. Posmatrajući odnos između ostalih faktora (indeks korupcije, indeks konkurentnosti i kratkoročne kamatne stope) i priliva SDI, pozitivni odnosi su potvrđeni. Panel-korigovan estimator standardnih grešaka (PCSE), implementiran kao provera robusnosti, potvrdio je rezultate i zaključke zasnovane na FE modelu. Međutim, negativna veza između poreza na dobit preduzeća i SDI u slučaju PCSE modela je verifikovana samo u slučaju Mađarske i Letonije, što ukazuje na postojanje poreske konkurentnosti.

Ključne reči: porez na dobit preduzeća, SDI, ekonomije EU u razvoju, panel analiza, PCSE metoda.