

## The Influence of Taxes on Inflows and Outflows of Foreign Direct Investment

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### ABSTRACT

The article discusses the effectiveness of tax incentives for regulation of the level of foreign direct investment inflows (FDI) and outflows in the economy. Theoretically, changes in tax levels should influence both the profitability of investment projects and companies' choice of locations for their production units. At the same time, transfer pricing opportunities in the world economy may neutralize the effects of tax changes on the level of countries' FDI inflows and outflows. The aim of the research is to study empirically the influence of tax levels in countries on bilateral FDI flows. Methodologically, this study relies on regression analysis. Two variables indicating the tax level of the economy are used: the share of total taxes on income, profits and capital gains and share of taxes and social contributions in total government revenues. The database includes observations over 71 recipients and 91 home countries in 2001–2016. The gravity approach is applied to construct the econometric model while the Poisson pseudo maximum likelihood method is used to derive unbiased estimates. The main results of the research are as follows. First, there is a negative relationship between the tax burden and level of FDI inflows to the country. Second, higher taxes lead to an increase in FDI outflows only in the countries with relatively low taxes, while in countries with relatively high taxes the opposite dependence is observed. Third, vertical (efficiency-seeking) FDI are much more sensitive to the level of taxes in the recipient country compared with horizontal (market-seeking) FDI. We have not found any evidence for the positive influence of tax differentials on bilateral FDI. The conclusion is made that tax regulation measures may be an efficient instrument for stimulating FDI inflows to the national economy.

### KEYWORDS

foreign direct investment, taxes, tax burden, gravity model, Poisson pseudo maximum likelihood, vertical FDI, horizontal FDI

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Оригинальная статья

## Влияние налогов на потоки прямых иностранных инвестиций

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### АННОТАЦИЯ

Эффективность налоговых мер, направленных на регулирование потоков прямых иностранных инвестиций в экономике является предметом дискуссии. С одной стороны, изменение уровня налогов влияет на рентабельность инвестиционных проектов, а, следовательно, на выбор компанией места для своего производства. С другой стороны, возможности трансфертного ценообразования в современной экономике могут нивелировать влияние налоговых

изменений на потоки прямых иностранных инвестиций в стране. В данном исследовании с помощью эконометрического инструментария дается оценка влиянию уровня налогов на объем межстрановых потоков прямых иностранных инвестиций. В исследовании используются два показателя, отражающих уровень налогов в стране: доля налога на доход, прибыль и прирост капитала в общем объеме государственных доходов, а также доля налогов и социальных взносов в общем объеме государственных доходов. База данных включает наблюдения над 71 страной-импортером и 91 страной-экспортером ПИИ за период 2001–2016 гг. В основе построения эконометрической модели лежит гравитационный подход. Для получения несмещенных оценок используется метод псевдомаксимального правдоподобия Пуассона. В рамках исследования получены следующие основные результаты. Во-первых, уровень налогов в стране-импортере ПИИ обратно пропорционален объему поступающих в страну прямых иностранных инвестиций. Во-вторых, рост уровня налоговой нагрузки ведет к росту объемов оттока ПИИ из страны только для группы стран с относительно низким уровнем налогообложения, для группы стран с высоким уровнем налогообложения наблюдается обратная зависимость. В-третьих, вертикальные (ориентированные на рост эффективности) ПИИ являются гораздо более чувствительными к уровню налогообложения в экономике-реципиенте по сравнению с горизонтальными (ориентированными на внутренний рынок страны) ПИИ. В-четвертых, гипотеза о положительном влиянии разницы в уровне налогообложения стран на потоки ПИИ между ними не получила эмпирического подтверждения. Сделан вывод о том, что меры налогового регулирования способны являться действенным инструментом, направленным на стимулирование притока прямых иностранных инвестиций в национальную экономику.

#### **КЛЮЧЕВЫЕ СЛОВА**

прямые иностранные инвестиции, налоги, налоговая нагрузка, гравитационная модель, Пуассоновский метод псевдомаксимального правдоподобия, вертикальные ПИИ, горизонтальные ПИИ

### **1. Introduction**

The role of foreign direct investment (FDI) in the development of countries is very difficult to overestimate. Together with international trade flows, FDI plays an integral part in the global value chains that are the key driver of the world development to date.

FDI affects both the host and home economies. In host economies, FDI increases budget revenues, creates jobs with high productivity, promotes advanced products to the market, brings new technologies, develops specific sectors of activity, changes the competitive environment, etc. In home countries, FDI outflows make national companies more competitive, trigger long-term positive changes in the market structure, and drive the economy to the efficiency frontier. Despite some negative effects of FDI (e. g. loss of the market shares by national companies in recipient economies and job losses in home economies), the increase in both FDI

inflows and outflows is considered to be a “win-win-win” game for governments, companies and employees.

The level of taxes in the economy is an important determinant for investment projects implemented within the country and investment of national companies abroad. Intuitively, it is clear that lower taxes in a separate country, leading to a higher rate of return of investment projects, all other things equal, should increase the level of FDI inflows and decrease the level of FDI outflows. At the same time, according to the existing literature, the influence of taxes on FDI inflows and outflows is more complicated than their simple effects on the profitability of investment projects. First, the mechanisms of transfer pricing that legally allow companies to move their taxable profit from high-tax to low-tax countries may neutralize the effects of raising (decreasing) taxes in a separate country. Second, higher taxes often mean a larger amount of public

goods available in the country, which can influence multinationals' decisions to invest in the country. Third, the level of tax burden may lose its significance if the level of the pre-tax profit of the project is higher compared with the alternative project in another country. Generally speaking, the set of demand and supply parameters of an investment project may be much more important than the level of taxes in a particular country. Moreover, theoretically, tax differentials may be just the equalizing outcome of the equilibrium states in the economies with imperfect competition and factor price differentials [1].

The aim of this research is twofold. First, by using the rich dataset on bilateral FDI flow in 71 host and 91 home countries in 2001–2016, we are going to reassess the effect of taxes on the level of FDI inflows and outflows. Second, to study the influence of taxes on FDI flows depending on a set of factors, namely the level of the tax burden in the country, the purpose of FDI and the level of tax differentials.

## 2. Hypotheses

The hypotheses we are going to test further are as follows.

H1. An increase in the tax burden leads to a decrease in FDI inflows in the economy.

Following the mainstream literature on tax determinants of FDI inflows, we assume that there is a negative relationship between the variables. This negative relationship can be explained by the fact that higher taxes decrease the profitability of investment projects and hence fewer foreign projects will be accepted.

H2. An increase in the tax burden leads to an increase in FDI outflows in the economy.

Two possible explanations support this hypothesis. If a multinational company (MNC) is choosing between exporting and investing into a foreign market, then the increase in the home country's taxes will make it less profitable to export and more profitable to invest. On the other hand, an increase in taxes will stimulate national companies to move their production offshore to the countries with lower

costs (including taxes) and supply the home market with the goods produced in another country. In both scenarios, an increase in taxes will lead to an increase in FDI outflows.

H3. Vertical (efficiency-seeking) FDI inflows are more sensitive to the tax level in the recipient economy compared with horizontal (market-seeking) FDI.

In a recipient economy, the motives of FDI are important when the role of taxation is considered. In the case of vertical FDI, multinationals are first of all interested in cutting costs. Therefore, the level of tax burden will play an important role when an MNC chooses the location for its plant. If market-oriented FDI is considered, the decreasing significance of taxes comparing to vertical FDI is expected for two reasons. First, higher taxes are usually imposed in countries with higher incomes of the population and thus, mean higher before-tax profits of the investment projects. Second, since the same statutory taxes are imposed on all companies within one industry in the country, an increase in taxes shouldn't influence the competitiveness of MNCs' investment projects.

H4. FDI inflows in countries with a low tax burden are more sensitive to the tax increase compared with the countries with a high tax burden.

The arguments for this hypothesis are similar to the previous ones. FDI to countries with low taxes is usually efficiency-seeking and more sensitive to an increase in costs. Otherwise, FDI to countries with high taxes is market-seeking and should be less sensitive to the tax increase.

H5. An increase in the tax differentials between the home and host country positively influences the level of FDI inflows.

It is assumed that not only the taxes in FDI home and recipient countries themselves influence FDI inflows but the tax differentials also matter. In other words, a particular recipient economy will attract more FDI from countries with higher taxes and a particular home economy will face larger FDI outflows to the countries with lower taxes, all other things being equal.

### 3. Literature review

The research lies in the large field of foreign direct investment determinants. The most popular basis for modeling FDI determinants is the gravity approach because it has both theoretical justification and empirical evidence. For detailed discussion, see, e.g. [2]. The empirical studies of Bevan and Estrin [3], Hejazi [4], Kleinert and Toubal [5], Blonigen and Piger [6] and many others confirm the positive influence of the market size of both home and host countries together with the negative influence of the distance between them on the level of bilateral FDI inflows.

Various determinants of FDI inflows are studied both at national and regional levels. Noorbakhsh et al. focusing on FDI inflows to developing countries show that human capital is one of the key factors that attract foreign direct investment [7]. Based on FDI stock data from eight new EU member states for the period 1998–2004, Riedl argues that the degree of industrial concentration within a country appears to be a significant location factor as well [8]. Botrić and Škuflić, studying the determinants of FDI in south-eastern European countries in 1996–2002, show that FDI depends on the size and growth potential of a national economy, natural resources and quality of workforce, openness to international trade and access to international markets, and the quality of physical, financial, and technological infrastructure [9]. Daude and Stein study the effects of institutions on FDI inflows for 20 OECD home countries. They state that better institutions in the recipient countries have overall a positive and significant effect on FDI [10]. Asiamah et al. estimate determinants of FDI inflows in Ghana and find that a low inflation rate as an indicator of the macroeconomic stability in the recipient country attract higher levels of FDI, all other things being equal [11]. Du et al in their study of FDI inflows in Chinese regions find that regions with higher wages attract larger amounts of FDI [12]. Pearson et al. consider FDI inflows in the USA and observe higher FDI inflows in states with a higher growth rate [13].

There are fewer studies that deal with the factors that influence FDI outflows. Egger discusses the relationship between different types of economic activities in EU member states in 1986–1996 and shows that exporting and FDI outflows substitute each other thus presenting different ways of companies' expansion abroad [14]. Stoian and Mohr show that weak institutions in emerging economies stimulate FDI outflows because national companies are escaping from home country regulative voids [15]. Kayam examines the home country factors that determine the outward foreign investments from 65 developing and transition countries in the 2000–2006. The main findings are that the small market size, trade conditions, costs of production and local business conditions are the main drivers of outward FDI. Proxies for the institutional environment such as bureaucracy, corruption, investment risk are also significant push factors of FDI [16]. Das studies the role of home country determinants for a large sample of developing economies for 1996–2010. The results indicate that a source country's level of economic development, globalisation, political risk and science and technology investments contribute significantly to outward FDI from developing countries [17]. Ciešlik and Tran distinguish between horizontal and vertical reasons for FDI. Their estimation results indicate that total market size, skilled-labour abundance, investment cost, trade cost as well as geographical distance between two countries are significant determinants of FDI outflows [18].

The influence of taxes on FDI inflows is studied in different papers. Nielsen et al. in their literature review report 12 papers showing a positive correlation between taxes and FDI inflows; 12 papers, a negative correlation; and 3 papers, no correlation [19]. Klemm and van Parys, using the data on 40 low-income countries for 1985–2004, demonstrate that tax reduction is an important factor for attracting FDI to the country [20]. Biggs, focusing on twenty-one developing countries, shows that tax incentives help increase FDI inflows [21]. Djankov et al., using data on 85 countries, demon-

strate that lower taxes attract investment to manufacturing but not to the service sector [22]. Zee et al. in their research on developing economies show that lower taxes do not encourage FDI inflows [23]. Chai and Goyal report that tax incentives have a limited influence on FDI inflows in the East Caribbean Currency Union [24]. Van Parys and James have found no robust positive effect between tax holidays and FDI attraction in Western and Central African countries [25]. Kinda, using the firm-level data on 30 Sub-Saharan Africa countries, shows that the role of taxes in attracting FDI is not very important [26].

The influence of taxes on FDI outflows is mainly considered in the context of how tax differentials influence bilateral FDI flows. Devereux and Griffith [27], Gorter and Parikh [28], Egger et al. [29] make similar conclusions, namely, that the larger tax differential increases FDI flows between countries. Benassy-Quere et al. report that larger tax differentials lead to higher FDI outflows [1]. There are just a few studies of the effects of tax levels on FDI outflows. Beck and Chaves show that FDI outflows increased together with an increase in the corporate income tax and decreased together with an increase in the labor income tax in 25 OECD countries in 1975–2006 [30]. Fan et al. show that an increase in domestic taxes in China stimulates FDI outflows [31].

To sum up, our literature review has brought to light two important points. First, the tax level in the country is one of the various determinants of FDI inflows and outflows discussed in research literature. In the econometric model of FDI flows, taxes should be considered together with other factors influencing MNCs' choice of location. Second, there is mixed evidence of how taxes influence FDI. Different factors that determine the specific features of this influence should be considered.

#### 4. Econometric model, data and methods

The dependent variable  $FDI_{ijt}$  in the econometric model is the volume of FDI inflows to country  $i$  from country  $j$  in year  $t$ .

According to the gravity approach, the size and the distance variables should be included in the econometric model. But when the host and recipient countries' GDP is included as size variables, strong positive correlation between GDP and the tax level in the economies is observed (the largest and developed countries usually set highest taxes). To avoid a multicollinearity problem in the model instead of GDP, GDP per capita of the host ( $GDPcap\_imp_{jt}$ ) and recipient countries ( $GDPcap\_exp_{it}$ ) are used as size variables. The distance variable ( $DIST_{ij}$ ) is calculated as the distance between the capitals of the countries. We expect to observe a positive influence of GDP per capita of both home and recipient economies and a negative influence of the distance on the level of FDI between the countries.

Following the approaches described in existing literature [32; 33], a set of control variables that influence the FDI bilateral flows is included in the model: the inflation rate in year  $t$  in the recipient economy ( $Infl_{it}$ ), the dummy variable for the common official language in countries  $i$  and  $j$  ( $Comlang_{ij}$ ) and the contiguity variable ( $Contig_{ij}$ ). The negative influence of the inflation level and the positive influence of the common official language and the contiguity variable on the FDI inflow level to the recipient country are expected.

The choice of the main explanatory variable is an important issue. The indicators to estimate the tax burden are divided into backward-looking and forward-looking. Backward-looking indicators, e.g. the statutory tax rates or the average tax rates, are based on the observed tax payments. The disadvantage of the backward-looking indicators is the possible endogeneity that arises when future payments are influenced by the previous investment.

Forward-looking indicators can be calculated for a typical investment project on the basis of the rules of the tax base and tax rate. The standard forward-looking indicators used in empirical research are the average effective tax rate and the average marginal tax rate. Since tax systems are not linear, the former indicator may sub-

stantially differ from the latter one. Since these indicators are calculated for a specific way of financing, their drawback is the difficulties in aggregating investment across many projects.

Although in theory, preference should be given to forward-looking indicators, in practice backward-looking indicators may give us more information on the tax system in a particular country [34].

To estimate the influence of tax burdens on the level of FDI flows, two indicators are used: the share of total taxes on income, profits and capital gains in total government revenues in year  $t$  ( $TaxI_{it}$  and  $TaxI_{jt}$ ) and the share of taxes and social contributions in total government revenues in year  $t$  ( $TaxSC_{it}$  and  $TaxSC_{jt}$ ). Both indicators are backward-looking and the author doesn't have an opportunity to implement forward-looking indicators in the analysis due to the lack of necessary data.

The database is collected from the open source data: bilateral FDI data, from the OECD official website (<https://data.oecd.org>); inflation rates and GDP per capita levels, from the World Bank database (<https://data.worldbank.org>); the distance, common language and contiguity indicators, from CEPII gravity database (<https://www.cepii.fr>); and the tax level variables, from ICTD/UNU-WIDER Government Revenue Dataset (<https://www.wider.unu.edu>).

Thus, the estimated regression equation looks the following way:

$$FDI_{ijt} = \exp(\beta_0 + \beta_1 \ln GDPcap\_imp_{it} + \beta_2 \ln GDPcap\_exp_{jt} + \beta_3 \ln Distcap_{ij} + \beta_4 \ln Infl_{it} + \beta_5 \ln Comlang_{ij} + \beta_6 \ln Contig_{ij} + \beta_7 Tax_{it} + \beta_8 Tax_{jt}) \epsilon_{ijt}, \quad (1)$$

where  $\beta_0$  is the constant term,  $\beta_1 - \beta_8$  are the estimated coefficients before the regressors,  $Tax_{it}$  and  $Tax_{jt}$  are the levels of tax burdens in year  $t$  in countries  $i$  and  $j$  respectively,  $\epsilon_{ijt}$  is the error term. When applying the Poisson pseudo-maximum likelihood method (discussed below), equation (1) is estimated in an exponential form.

There is a well-known discussion on the choice of the appropriate estimation

technique for the data on bilateral FDI flows [32]. First, the data on bilateral FDI flows have a lot of (up to 65%) zero observations. Taking logs of the dependent variable leads to dropping these observations, resulting in a sample selection bias. Second, the heteroscedasticity in the error term is usually observed in the data. Third, some of the regressors may be endogenous in the model.

For the above-described reasons, application of the standard OLS approach to gravity-type data leads to biased estimation results. Although some researchers still include OLS estimates in their analysis for comparison [13; 35], for interpretation of the results most of them use different sophisticated estimation techniques: the dynamic panel generalized method of moments [36], tobit model [37], Hausman-Taylor approach [35], Heckmen two-step procedure [38], etc.

One of the best methods to estimate gravity models of FDI to date is the Poisson pseudo maximum likelihood method (PPML). It was first developed by Silva and Teneyro [32] to estimate the gravity model of trade, and then applied to FDI flows by Head and Ries [39]. PPML is an interpretation of the generalized method of moments (GMM) from a variety of maximum likelihood methods. In turn, the GMM is often used to correct for bias caused by the endogenous nature of the explanatory variables. Poisson estimator includes observations for which the FDI level is zero. Moreover, PPML is consistent in the presence of fixed effects that are required by the gravity model. For detailed comparison of different estimation techniques of the gravity model see, for example, [2]. Technical details of using PPML methods are described in [40].

## 5. Estimation results

In this section, we are going to apply the PPML method. The estimates are derived by using clustering standard errors, thus allowing for correlation of the standard errors within the cluster.

The estimation results of equation 1 are presented in Table 1. The signs of the coefficients before the gravity variables

are as expected: we found a positive and statistically significant influence of the economic sizes of the recipient and home economies and a negative influence of the distance between these countries on the level of bilateral FDI inflows. As expected, we found that inflation in the recipient economy negatively influences the FDI inflows. The more similar the countries are, the larger are the FDI flows between them: the coefficients before the contiguity and the common language variables are positive and significant.

Due to the high correlation of *TaxI* and *TaxSC* variables, they are not included simultaneously in the model. The interaction term *TaxI\*TaxSC* is added to capture both tax variables in the model (see Model 3 in Table 1). Further, for the sake of brevity, only the interaction term as the tax variable of both home and recipient economies is used. The interaction term *TaxI\*TaxSC* is additionally multiplied by 20 to keep the dimension of the coefficients before tax variables. This operation doesn't affect the sign and significance of the explanatory variables.

As Table 1 illustrates, we found a statistically significant negative influence of the tax level in the recipient economy on the level of FDI inflows. This result supports Hypothesis 1.

At the same time, we found no support for Hypothesis 2 concerning the crowding out effects of national investment when taxes increase in the home country. The results of the estimations show the negative influence of the tax level on FDI outflows in home economies.

To make additional analysis of the influence of taxes on FDI outflows, equation 1 is considered separately for high-, medium- and low-tax home countries. Countries are divided into high-, medium- and low-tax based on the analysis of the distribution plots of the tax variables. The estimation results are presented in Table 2. It is observed that an increase in taxes leads to an increase in FDI outflows in the group of countries with low taxes and a decrease in FDI outflows in countries with high taxes. The latter result can be explained by the effect of decreasing competitiveness of the national business in the economies with high taxes. High taxes suppress business activity in the economy and make national business less effective and less competitive in the international markets. This, in turn, causes a decrease in FDI outflows. At the same time, there is the expected crowding out effect of the national investment in the economies with relatively low taxes. Thus, we can say that Hypothesis 2 is partially confirmed.

Table 1

**Influence of tax levels in home and host countries on FDI inflows**

Variable	Model 1	Model 2	Model 3
GDP per capita host	0.555*** (0.070)	0.550*** (0.056)	0.601*** (0.067)
GDP per capita home	1.314*** (0.058)	1.155*** (0.049)	1.287*** (0.055)
Distance	-0.119*** (0.040)	-0.148*** (0.042)	-0.132*** (0.040)
Inflation host	-0.062*** (0.011)	-0.049*** (0.009)	-0.047*** (0.010)
Common language	0.737*** (0.129)	0.669*** (0.130)	0.621*** (0.132)
Contiguity	0.604*** (0.156)	0.666*** (0.148)	0.642*** (0.151)
Tax on income host	-3.271*** (0.873)		
Tax on income home	-5.533*** (0.811)		
Tax on SC host		-2.004*** (0.532)	
Tax on SC home		-0.716 (0.432)	
<i>TaxI*TaxSC</i> host			-0.783*** (0.185)
<i>TaxI*TaxSC</i> home			-1.092*** (0.166)
No. obs.	83635	84488	75735

Notation. Hereinafter the standard errors are reported in parentheses; \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$ ; constant term not reported.

Source: Authors' own calculations by using Stata.

Table 2

**Influence of tax levels in home countries on FDI outflows depending on the tax level**

Variable	High taxes home	Medium taxes home	Low taxes me
GDP per capita host	0.605*** (0.097)	0.721*** (0.057)	0.515*** (0.063)
GDP per capita home	0.751*** (0.158)	1.112*** (0.049)	1.223*** (0.075)
Distance	-0.243*** (0.067)	- 0.078 (0.034)	0.002 (0.037)
Inflation host	-0.055*** (0.017)	-0.042*** (0.013)	-0.061*** (0.014)
Common language	0.545*** (0.174)	0.218*** (0.118)	1.075*** (0.118)
Contiguity	0.677*** (0.211)	0.531*** (0.144)	1.024*** (0.177)
TaxI*TaxSC host	-0.451 (0.280)	-0.963*** (0.167)	-1.028*** (0.262)
TaxI*TaxSC home	-1.421*** (1.873)	0.398 (0.787)	1.792*** (0.596)
No. obs.	11638	12423	51674

Source: Authors' own calculations by using Stata.

To test Hypothesis 3 about the different sensitivity of taxes in case of vertical and horizontal FDI, recipient economies are divided into groups with high, medium and low GDP per capita levels. The World Bank thresholds are used to divide countries into different groups according to their income level. The considerable difference in the value of the coefficient before the tax variable in high (-0.954) and low (-11.382) income countries is observed. Our results support the idea that efficiency seeking FDI is very sensitive to the tax rate in the recipient economy. At the same time, taxes for market-seeking FDI are comparatively less important because all companies supplying a particular market face the same tax burden, and higher taxes are compensated by the higher pre-tax profit for the company. Thus, Hypothesis 3 is confirmed.

To confirm Hypothesis 4 that vertical FDI is more sensitive to the tax level

in the recipient economy, the database is divided into groups with high, medium and low taxes in recipient countries (see Table 4). As we expected, the level of taxes in low-tax countries influences FDI inflows more, compared with high-tax countries (the value of the coefficient - 1.056 against the value - 1.670). It should be noted that the difference is quite moderate compared with the difference observed for countries with different income levels.

At the last stage of the estimation procedure, the importance of tax differentials (*TaxDiff*) on bilateral FDI inflows is estimated. In columns 3 and 4 of Table 5 the estimates for the positive (*TDpos*, taxes in the home country are higher than taxes in the host country) and the negative tax (*TDneg*) differentials are reported. Contrary to our expectations, the positive influence of tax differentials on the level of FDI inflows is not observed.

Table 3

**Influence of tax levels in host countries on FDI inflows depending on their GDP per capita**

Variable	High GDPpc host	Medium GDPpc host	Low GDPpc host
GDP per capita host	0.920*** (0.085)	0.289* (0.171)	1.633*** (0.294)
GDP per capita home	1.250*** (0.063)	1.528*** (0.118)	1.048*** (0.275)
Distance	-0.135*** (0.045)	- 0.129 (0.100)	0.127 (0.193)
Inflation host	-0.064*** (0.015)	-0.086*** (0.014)	-0.107*** (0.036)
Common language	0.516*** (0.144)	1.055*** (0.377)	1.731*** (0.446)
Contiguity	0.651*** (0.162)	1.143*** (0.348)	2.112** (0.910)
TaxI*TaxSC host	-0.954*** (0.200)	2.272** (0.964)	-11.382*** (3.103)
TaxI*TaxSC home	-0.855*** (0.177)	-2.177*** (0.420)	-2.377*** (0.734)
No. obs.	46911	17814	11010

Source: Authors' own calculations by using Stata.



Column 1 of Table 5 shows the influence of the tax differentials (TD) for the full sample. Hypothesis 5 about the positive influence of tax differentials on bilateral FDI flows is not confirmed. Then the database is divided into two parts with the positive and negative of the tax differential (columns 3 and 4 of Table 5). Although a significant positive influence of TD is observed for the sample of negative TD we can assume that Hypothesis 5 will be true for the case of the positive tax differential, i.e. the case when taxes in the FDI home country exceed taxes in the FDI recipient country. As Column 3 of Table 5 shows, the sign of the coefficient before

TD is negative, which means that Hypothesis 5 is not confirmed.

The negative relationship between TD and FDI inflows may be explained by the following. TD in the case of positive differentials reflects the degree of dissimilarity of the countries. When the difference between the countries increases (an equivalent to increase in TD), investors face additional costs of adapting to a foreign country, which leads to a decrease in bilateral FDI flows.

For additional examination of how tax differentials influence FDI inflows, equation 1 is estimated for the subsamples when taxes in the home economy are high

Table 4

**Influence of tax levels in recipient countries on FDI inflows depending on their tax level**

Variable	High taxes imp	Med taxes imp	Low taxes imp
GDP per capita host	0.809*** (0.187)	0.517*** (0.110)	0.459*** (0.073)
GDP per capita home	1.083*** (0.125)	1.359*** (0.078)	1.427*** (0.084)
Distance	-0.180*** (0.070)	-0.098 (0.646)	-0.079 (0.053)
Inflation host	-0.140*** (0.040)	-0.015 (0.019)	-0.062*** (0.013)
Common language	0.942*** (0.196)	0.205 (0.206)	0.974*** (0.173)
Contiguity	0.469** (0.230)	0.632*** (0.224)	1.179*** (0.220)
TaxI*TaxSC host	-1.056*** (0.369)	-1.790* (0.936)	-1.613* (0.860)
TaxI*TaxSC home	-0.563*** (0.323)	-0.979*** (0.226)	-1.670*** (0.258)
No. obs.	11655	17292	46788

Source: Authors' own calculations by using Stata.

Table 5

**Influence of tax levels in recipient countries on FDI inflows depending on the tax level in home countries**

Variable	All sample	TDpos	TDneg	Timp < Texp	Timp > Texp
(1)	(2)	(3)	(4)	(5)	(6)
GDP per capita host	0.467*** (0.058)	0.479*** (0.074)	0.570*** (0.102)	0.639*** (0.078)	0.608*** (0.108)
GDP per capita home	1.154*** (0.048)	1.086*** (0.070)	1.227*** (0.068)	0.966*** (0.125)	1.348*** (0.077)
Distance	-0.101** (0.040)	-0.162*** (0.056)	-0.202*** (0.068)	-0.233*** (0.055)	-0.245*** (0.070)
Inflation host	-0.053*** (0.010)	-0.060*** (0.012)	-0.030** (0.015)	-0.052*** (0.011)	-0.028* (0.015)
Common language	0.740*** (0.126)	0.497*** (0.157)	0.711*** (0.183)	0.605*** (0.147)	0.674*** (0.190)
Contiguity	0.583*** (0.152)	0.450** (0.188)	0.105 (0.241)	0.584*** (0.194)	0.146 (0.245)
Tax differential	-0.169* (0.092)	-2.169*** (0.289)	1.614*** (0.301)		
TaxI*TaxSC home				-1.291*** (0.307)	-1.355*** (0.277)
No. obs.	75735	33350	41515	45383	41515

Source: Authors' own calculations by using Stata.

her/lower than taxes in the host economy (Columns 5 and 6 of Table 5). As expected, the coefficients before tax variables have a negative sign but no significant difference in their levels is found.

To sum up, our analysis does not confirm Hypothesis 5 concerning the positive influence of tax differentials on bilateral FDI flows.

## 6. Conclusions

This paper analyzes the influence of taxes on FDI inflows and outflows. The theory doesn't provide us with an unambiguous answer on how changes in tax burdens in a country influence FDI inflows and outflows. The research literature on the topic provides mixed results.

For the purpose of our research, we used a large dataset of bilateral FDI flows in 91 home and 71 recipient countries in 2001–2016. The resulting econometric model based on the gravity approach and the Poisson pseudo likelihood method is applied to derive unbiased estimates. Two indicators are used as the main explanatory variables in the research: the share of total taxes on income, profits and capital gains in total government revenue and the share of taxes and social contributions in total government revenue.

The main contributions to the existing research are the following. First, we reviewed the previous research results and showed that an increase in the tax burden decreases the level of FDI inflows in the

country. Second, we found that higher taxes increase FDI outflows in low-income countries and decrease FDI outflows in high-income countries. The former result is associated with the crowding out effect of the national investment, the latter, with the decline in competitiveness of national companies due to high taxes. Third, it is demonstrated that horizontal (market-seeking FDI) are less sensitive to tax changes than vertical (efficiency-seeking FDI). We haven't found any evidence supporting the hypothesis that an increase in tax differentials leads to an increase in bilateral FDI flows.

The results show that tax policy can be an effective instrument for influencing both FDI inflows and outflows. However, the signs and significance of the effects of tax changes on FDI depend on the country's characteristics: the income level, level of taxes and motives of foreign investors in the country.

The data availability imposes some limitations on the results of the research. The use of firm and/or industry level data may bring some new results to the topic. The forward-looking indicators of measuring tax levels in the country may help obtain more precise estimates. If another country's characteristics that influence FDI inflows and outflows are added to the picture, the quality of the econometric model may be improved. Furthermore, the effects of taxes on FDI flows may be not linear. Future research may take these points into consideration.

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