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### Can tax incentives be detrimental to FDI? The role of institutions

### ¿Pueden ser los incentivos fiscales perjudiciales para la IED? El papel de las instituciones

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#### **ABSTRACT:**

The aim of this research is to identify the impact of tax incentives on FDI in the new Eastern European EU Member States. According to the results, while a country's general level of taxation conditions FDI, this is not the case with other partial dimensions of taxation commonly used in the literature. However, given that institutional quality affects FDI and tax revenues influence institutional quality, the overall effect of taxation on FDI is ambiguous. For low-institutional quality countries, a tax reduction can hinder FDI, while the opposite is true for high-institutional quality countries.

**Keywords:** Foreign direct investment, taxation, institutional quality, transition economies.

**JEL Classification Code:** F21; H11; H20; H25; P20.

#### **RESUMEN:**

El objetivo del trabajo es identificar el impacto de los incentivos fiscales sobre la IED en los nuevos Estados Miembros de la UE. Mientras el nivel general de imposición condiciona la IED, no ocurre así con otras dimensiones parciales de la fiscalidad. Por otro lado, dado que la calidad institucional también incide en la IED y los ingresos impositivos afectan a dicha calidad institucional, el efecto total de la imposición sobre la IED es ambiguo. Una disminución de los ingresos impositivos puede desincentivar la IED en países con una calidad institucional reducida, y lo contrario si es elevada.

**Palabras clave:** Inversión Extranjera Directa, imposición, calidad institucional, economías en transición.

**Clasificación JEL:** F21; H11; H20; H25; P20.

## 1. Introduction

Although there is a significant amount of literature on the determinants of foreign direct investment (FDI), the empirical analyses are not conclusive. Among the potential determinants is taxation. In regards to the effects of taxation on FDI there is considerable disagreement as noted by de Mooij and Ederveen (2003 and 2005) and others. Beginning with the seminal work of Hartman (1984) on FDI in the U.S., which pointed to its weak sensitivity with regard to differences in taxation, initial research focused on case studies. Over time, the literature on taxation as a determinant of FDI has adopted different approaches and widened its geographic scope by providing more conclusive results about the relevance of tax issues. Part of this work is focused on decisions regarding the choice of location, as in Devereux and Griffith (1998 and 2003), who examined the incidence of taxation on the location choices of U.S. multinationals in Europe. A different approach addresses the issue from the perspective of the intensity of FDI flows. For example, Benassy-Quéré et al. (2005) find a negative impact of tax burden on FDI in OECD countries, whereas Desai et al. (2004) reach this same conclusion for FDI in the U.S. Combining both approaches, the work of Razin et al. (2005) on FDI in OECD countries suggests that the home country's tax level is a relevant issue in deciding where to invest and the taxation of host countries affects the amount of investment. Opposite these findings, Wolff (2006) highlights the need to distinguish between the different financing components of FDI in his analysis of the European Union, which reveals that high taxes in the country of origin encourage FDI through reinvested earnings; however, no significant relationship with the investment financed through new equity is found. Apart from issues such as the different methods for measuring FDI, and the time period or country samples, the differences result largely from the variable that has been identified as the taxation level indicator. A common element in these works is that they often only take into account direct taxation on corporate income, either by taking the nominal rates (Wolff 2006) or by calculating the effective ones (Slemrod 1990; Devereux and Freeman 1995; Devereux and Griffith 2003). While various mechanisms to avoid double taxation have been incorporated into some models, including the calculation of bilateral effective tax rates on FDI flows (Devereux and Griffith 2003; Egger et al. 2009), few studies have considered other tax figures (Desai et al. 2004). From our point of view, it could be more appropriate to use a global indicator as companies can be affected not only by direct corporate taxes but by the entire fiscal system, including direct taxation on personal income, indirect taxation and social contributions.

In addition to taxation, institutional quality is another determinant of FDI that has been recently considered. Empirical studies have generally focused on the corruption dimension, which has been identified not only as a condition of the penetration strategies in other markets but also as a major obstacle to FDI<sup>1</sup>. The findings of Wei (1997a and 1997b) for OECD countries, and by Zhao et al. (2003), which highlight the harmful effects caused by the lack of transparency, support the relationship between institutional quality and FDI flows. Other authors have also examined the impact of institutional quality from a global perspective; the works of Benassy-Quéré

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<sup>1</sup> Some authors link high levels of corruption in recipient countries with the establishment of joint ventures projects instead of 100% foreign capital, given the advantages that flow from having local partners in these environments (Smarzynska and Wei 2000).

et al. (2007) and Stein and Daude (2007) find some correlation between institutional quality and FDI inflows in developing countries and economies in transition, respectively.

However, the current literature on FDI has not taken into account that institutional quality may depend on tax revenue, since the availability of public revenue positively affects the functioning of institutions<sup>2</sup>. In that case, taxation would affect FDI through two different mechanisms that generate opposite effects. The aim of this paper is to link these two issues in the case of Eastern European countries. This geographical framework was selected for several reasons: the availability of data, the use of tax incentives by these countries to attract foreign capital and the deep institutional change they have experienced.

The remainder of this paper is as follows. In section two we investigate the determinants of FDI inflows in the new EU partners, paying special attention to fiscal and institutional variables. Since our findings suggest that institutional quality conditions FDI, in section three we examine the determinants of institutional quality. According to our results, tax revenue affects institutional quality, and therefore, there is not only a direct effect of taxes on FDI but also an indirect effect via institutional quality. Because these two effects operate in opposite directions, the joint effect for each FDI recipient country is computed in Section four. The main conclusion is that for countries with low institutional quality, the use of tax incentives can be counterproductive with respect to FDI and can further erode the quality of their institutions.

## **2. FDI determinants. Taxation and institutions**

As noted, the empirical research on the tax-FDI nexus is not conclusive<sup>3</sup>. Since this is partially due to the use of different tax indicators, we have considered alternative tax variables to examine the effect of the tax framework on FDI in the new Central and Eastern Europe Member States. First, nominal tax rates on corporate income and effective bilateral tax rates on FDI flows, since they partially determine the tax burden of companies. Second, the use of exemptions as a mechanism to avoid double taxation may also be relevant because, since according to the literature (Yoo 2003), this instrument is more favourable to FDI than tax credits (imputation system) and deductions when the host country has a lower tax level than the country of origin, as is the case in the new Member States with respect to the EU-15. Finally, in our opinion, total tax pressure can also influence business decisions, since companies are directly or indirectly affected by the whole fiscal system, including direct taxation on personal income, indirect taxation and social contributions.

Apart from fiscal variables, there are other potential determinants of FDI identified in the literature that must be taken into account. Thus, we have also considered institutional quality, gravity factors, human capital endowment and labour costs, privatization methods and transport infrastructure as potential determinants. To avoid collinearity problems, we have pursued a strategy of sequential estimation by first examining the impact of tax and gravity factors and then the rest of variables. The

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<sup>2</sup> See Alonso and Garcimartín (2008 and 2010).

<sup>3</sup> With respect to Eastern Europe countries, see Carstesen and Toubal (2003), Javorcik (2004), Jakubiak and Markiewicz (2005), Bellak and Leibrecht (2005 and 2007), and Bellak et al. (2007).

dependent variable is defined as the share of the total FDI outflows from country *i* received by country *j*. Using relative rather than absolute flows allows us to eliminate the influence of those factors that are beyond the scope of the host countries, such as policies applied by third countries or the economic context of the home countries. The independent variables then are expressed in index numbers using the average value of the new EU partners as the base. The geographical scope of analysis extends over the EU-15 as home countries and those belonging to the 2004 incorporation of Central and Eastern Europe (Slovakia, Slovenia, Estonia, Hungary, Latvia, Lithuania, Poland and the Czech Republic) as well as Bulgaria, as host countries. The period of study covers the years 2000 through 2005.

In the first specification of the sequential strategy, we have examined the impact of tax factors, controlling for market size and bilateral distance. The most commonly used indicator, the nominal tax rate on corporate income, shows a positive coefficient but without individual significance (Table 1, column 1). This lack of significance is not surprising, given that this indicator is a partial measure of the level of taxation levied on multinationals; the nominal tax rate on corporate income contains no information about fiscal incentives and tax bases. In contrast, the coefficient of the effective bilateral tax rate shows a negative impact on inward FDI and, although its t-ratio increases, it is not significant either (Table 1: column 2). In our view, this may be because although the effective rates offer a more complete picture than the nominal rates, they still do not include all tax issues affecting a company. In fact, when we use the tax-GDP ratio (Table 1: column 3) the coefficient becomes significant (99%) and shows the expected sign: a 1% reduction in this ratio in country *j* generates an increase in its FDI share of 0.4472 percentage points.

Table 1. FDI ESTIMATES I (LS)

	1	2	3	4	5
GDP	8.2571 (4.85) <sup>***</sup>	8.6304 (5.13) <sup>***</sup>	10.5580 (5.77) <sup>***</sup>	8.2656 (4.85) <sup>***</sup>	10.2317 (5.64) <sup>***</sup>
Bilateral distance	-9.2401 (-2.16) <sup>**</sup>	-9.7398 (-2.21) <sup>**</sup>	-10.5985 (-2.43) <sup>**</sup>	-9.2852 (-2.08) <sup>**</sup>	-11.0740 (-2.47) <sup>**</sup>
Nominal tax rate	4.2187 (0.64)			4.2114 (0.63)	
Effective bilateral tax rate		-3.3725 (-1.04)			
Tax revenue (% GDP)			-44.7269 (-4.14) <sup>***</sup>		-37.1883 (-3.54) <sup>***</sup>
Exemption				-0.5165 (-0.13)	
Direct selling					5.8716 (2.47) <sup>**</sup>
Number of obs.	135	135	135	135	135
R-squared	0.3428	0.3453	0.3916	0.3430	0.4149

Notes: t statistic between parentheses. \* / \*\* / \*\*\* denote significance at 90%, 95% and 99%, respectively. Robust estimates.

Dividend repatriation and double taxation are two additional factors whose effects on FDI have traditionally been considered. To calculate the effect of double taxation, we construct a dummy variable coded 1 for the home country applying the exemption system on repatriated earnings from the host country and 0 otherwise. According to

the literature, this instrument is expected to be more favourable to FDI than other instruments, especially if the host country has a lower taxation level than the home country. However, estimation results show that this variable is not relevant (Table 1: column 4). Regarding privatization programmes, a dummy for the direct sale method has been included. Its coefficient is positive and significant (Table 1, column 5), indicating that direct selling provides more opportunities for FDI than other instruments (as pointed out by Holland and Pain 1998). With respect to other variables, both GDP and bilateral distance are significant and show the expected sign.

A second group of variables that can affect FDI flows are related to the supply of factors of production and cost reduction strategies. In particular, we have incorporated labour costs, education (as a proxy for human capital), and infrastructures (proxied by transport infrastructure). The results for this second group of explanatory variables show that education, contrary to what one would expect, has a significant negative effect on the share of FDI (Table 2, column 1). In this regard, it must be noted that the number of years of schooling (the variable used) in the Eastern European countries is close to that of the more developed countries of the EU and there are no noteworthy differences among the new partners, with the exception of Slovenia, which is 25% below the average.

The coefficient of labour costs, although negative, is not significant, which causes further lack of significance in regards to tax revenue. This appears to be due to the high degree of correlation between the two variables (Table 2, column 2). Finally, transport infrastructure has a positive and significant effect on FDI share (Table 2, column 3).

Table 2. FDI ESTIMATES II (LS)

	1	2	3
GDP	12.4652 (5.66)***	10.5073 (6.23)***	7.4596 (4.01)***
Bilateral distance	-12.0955 (-2.78)***	-11.3956 (-2.37)**	-11.4327 (-2.75)***
Tax revenue (% GDP)	-75.8740 (-3.52)***	-29.6515 (-1.60)	-49.5424 (-4.47)***
Education	-47.4775 (-2.62)**		
Labour costs		-3.0342 (-0.58)	
Transport infrastructure			12.2203 (3.15)***
Direct selling	9.3087 (2.92)***	4.7545 (1.88)*	9.4978 (4.06)***
Number of obs.	135	135	135
R-squared	0.4410	0.4184	0.4407

Notes: t statistic between parentheses. \* / \*\* / \*\*\* denote significance at 90%, 95% and 99%, respectively. Robust estimates.

The last variable included as an FDI driver is institutional quality, which also can influence investment decisions because a solid institutional framework is essential not only to the proper performance of business activity (Daude and Stein 2007) but also to economic growth and to the development of territories (Hall and Jones 1999; Acemoglu, Johnson and Robinson 2004). Although the incorporation of this factor into empirical research is problematic due to the lack of suitable indicators, we have considered that the World Bank's Aggregate Governance Indicators (AGI) provide the best available proxies for institutional quality<sup>4</sup>. The results (Table 3) indicate that institutional quality does indeed have a positive impact on FDI; an increase of 1% in the AGI average generates an increase in inward FDI share of 0.3163 percentage points. It must be remarked that we also found a positive dummy for Bulgaria, which means that this country receives a larger share of FDI than would be expected given its characteristics<sup>5</sup>.

Table 3. FDI ESTIMATES III (LS)

	1
GDP	13.5474 (4.79)***
Bilateral distance	-13.2369 (-2.97)***
Tax revenue (% GDP)	-97.2382 (-4.94)***
Transport infrastructure	5.5817 (1.06)
Direct selling	6.0978 (3.20)***
AGI	31.6346 (2.75)***
Bulgaria	51.2830 (3.20)***
Number of obs.	135
R-squared	0.4916

Notes: t statistic between parentheses. \* / \*\* / \*\*\* denote significance at 90%, 95% and 99%, respectively. Robust estimates.

In sum, this analysis shows that the variables that appear to have influenced FDI inflows in Eastern European countries are tax revenues, market size, geographical distance, privatization through direct sales, infrastructure, and institutional quality. However, some of these variables may have problems of endogeneity. This is certainly the case with GDP and institutional quality. Regarding GDP, it is argued that FDI generates technology and management diffusion effects that contribute positively to the productivity and efficiency of local companies. And with respect to institutional quality, foreign capital makes the institutional system more open to external influences, fuelling a larger demand for good institutions and facilitating learning processes and good practices imitation from other countries experience. To avoid potential problems of endogeneity, instrumental variables were used. As instruments, we have used population for GDP, and GDP (PPP) per capita in 1995 and the AGI

<sup>4</sup> Regarding the weaknesses of Governance Indicators, see Alonso and Garcimartín (2008 and 2010).

<sup>5</sup> We also tried to include the dummy of Bulgaria in the previous specifications, but it did not turn out to be significant. This suggests that this country receives a greater share of FDI than it should given its institutional features, but not fiscal, geographic, country size or infrastructure provision.

average for the period 1996 through 1999 for institutional quality. As shown in Table 4<sup>6</sup>, all variables remain significant and show the expected sign. Moreover, as in the initial estimates, tax revenue is the variable with the greatest impact on FDI.

Table 4. FDI ESTIMATES (IV)

	1	2
GDP	18.4348 (7.55) <sup>***</sup>	17.6794 (7.48) <sup>***</sup>
Bilateral distance	-13.8511 (-3.23) <sup>***</sup>	-8.6031 (-4.94) <sup>***</sup>
Tax revenue (% GDP)	-140.7538 (-5.79) <sup>***</sup>	-124.9615 (-5.83) <sup>***</sup>
AGI	64.3884 (5.66) <sup>***</sup>	56.2846 (6.14) <sup>***</sup>
Direct selling	5.0542 (2.38) <sup>***</sup>	5.3303 (3.07) <sup>***</sup>
Bulgaria	92.6042 (5.44) <sup>***</sup>	75.5280 (6.39) <sup>***</sup>
Greece-Bulgaria		84.4294 (30.09) <sup>***</sup>
Sweden-Estonia		32.7417 (12.70) <sup>***</sup>
Spain-Czech Republic		44.4205 (26.21) <sup>***</sup>
Number of obs.	135	135
Centered R <sup>2</sup>	0.4741	0.7002
Underidentification test Kleibergen-P rk LM st. <sup>2</sup> (2)P-v	31.639 0.0000	28.782 0.0000
Overident. T. Hansen J statistic <sup>2</sup> (1)P-v	0.195 0.6587	0.011 0.9177
Endogeneity test: GDP <sup>2</sup> (1) P-val	8.373 0.0038	
Endogeneity test: AGI <sup>2</sup> (1) P-val	8.494 0.0036	

Notes: z statistic between parentheses. \* / \*\*/ \*\*\* denote significance at 90%, 95% and 99%, respectively. Robusts estimates.

Endogenous: GDP and AGI. Instruments: Population (2000-2005), AGI (1996-1998) and GDP pc (1995).

However, significant specificities were detected in bilateral investment flows, which are not explained by the common determinants. This is the case of flows between Greece and Bulgaria, Sweden and Estonia, and Spain and the Czech Republic. As regards to the intensity of the flows between Greece and Bulgaria, the strong economic ties that exist between the two countries are certainly worth noting. The intense trade and significant penetration of Greek capital indicate that Bulgaria has taken advantage of low labour costs and geographical proximity. Moreover, the privatization of the Bulgarian telecommunications sector has also gained the attention of FDI from Greece. Regarding the second outlier, not only have the tight links between Sweden and Estonia been decisive, but Estonia has also played an important role for Nordic FDI flows, opening the door into the Baltics, particularly in the banking sector. In the third case, the operation conducted by Telefónica in the

<sup>6</sup> Due to problems of data availability, it has not been possible to use panel data.

Czech telecommunications sector, through which Spain became the eighth investor in this country, seems to explain this anomaly. The inclusion of these outliers in the estimate (Greece - Bulgaria, Sweden - Estonia, and Spain - Czech Republic) improves significantly the explanatory power of the model: the  $R^2$  increases from 47% to 70%. Finally, it should be noted that the under and over-identification tests along with the endogeneity test indicate that the instruments used are appropriate.

### **3. Taxation and institutional quality**

As noted in the previous section, both taxation and institutional quality affect FDI in Eastern European countries. It appears that a lower tax pressure and a higher institutional quality facilitate inward investment. However, if these two variables are related, then the effect of the tax measures aimed at attracting foreign investments would not be limited to the above direct results.

In this sense, the literature on institutional quality traditionally distinguishes between two types of explanatory factors. On the one hand, variables of a historical and geographical nature, such as the colonial origin of a country, its geographic location, the origin of its legal system, ethnic fragmentation and religion; on the other hand, we have those determinants related to development, such as income per head, income distribution, education and tax revenue. Although empirical research has provided some favourable evidence concerning the structural characteristics as identified above, several authors have noted that much of its significance disappears when controlling for per capita income. This does not happen with those determinants related to development, which indicates greater robustness (Alonso and Garcimartín 2010; Alesina et al. 2003; or Islam and Montenegro 2002). Therefore, and given also the enormous similarities that Eastern European countries show in the first group of factors, we have focused on the second group of explanatory variables. Among them, one of the most important factors identified in the literature is the level of development itself. Its impact on institutional quality occurs as a result of mechanisms that operate from both the supply and the demand side. The impact of the level of development determines the availability of resources to generate quality institutions and generates more demanding societies. This positive relationship between the two variables has been confirmed by several studies (Alonso and Garcimartín 2010; Chong and Zanforlin 2000; Islam and Montenegro 2002; or Rigobon and Rodrik 2004, among others).

Another determinant to be considered is income distribution. As can be expected, a strong inequality generates divergent interests among various social groups, which, in turn, leads to conflict, political instability and insecurity. In addition, inequality makes it easier for institutions to remain in the hands of groups who attempt to achieve and protect their own interests rather than the interests of the common good. Finally, inequality undermines a disposition towards cooperative action and instead favours corruption and rent-seeking activities. This relationship has been supported by previous studies (Alonso and Garcimartín 2010; Alesina and Rodrik 1993; Alesina and Perotti 1996; and Easterly 2001).

Education is the fourth factor considered as a determinant in institutional quality. A more educated population demands more transparent and dynamic institutions, and makes possible their building. The empirical analyses show favourable evidence



supporting a relationship between education and institutional quality; the higher the level of education of a society, the higher the quality of its institutions (Alonso and Garcimartín 2010; Alesina and Perotti 1996; Glaeser and Saks 2006; Rauch and Evans 2000).

Finally, Alonso and Garcimartín (2008 and 2010) have proposed another determinant of institutional quality: the tax revenue available to government. They argue that the availability of resources is crucial for governments to develop a high-quality institutional framework and that the existence of a sound fiscal system generates a more demanding relationship between the state and its citizens, favouring transparency and accountability (Tilly 1992; Moore 1998). It is important to indicate that this relationship is not triggered by public revenue from other sources, such as state-owned companies or natural resources.

Some of these determinants are potentially endogenous. This is clearly the case of GDP per capita, since better institutions contribute to increase income levels. Education is also potentially endogenous, since better institutions can generate a better education system. Finally, tax revenue can also be endogenous, since more efficient institutions help to reduce fraud and implement more efficient tax systems. Therefore, we have estimated the institutional quality equation by using instrumental variables, employing as instruments the lagged value of GDP per capita in 1995, the lagged value of education in 1990, tax revenue in 1995 and the urban population ratio (for tax revenue, since it positively affects tax revenue; Tanzi 1992)<sup>7</sup>.

Table 5. INSTITUTIONAL QUALITY ESTIMATES

	2SLS IV
Tax revenue (% GDP)	123.1686 (2.22)**
GDP pc	98.1330 (6.19)***
Education	167.4981 (2.69)***
Gini Index	14.0053 (0.34)
Portugal	134.3936 (3.44)***
Number of obs.	25
Centered R <sup>2</sup>	0.8659
Under-identification test. LM Kleibergen-Paap rk st. <sup>2</sup> (2)P-value	9.389 0.0091
Over-identification test Hansen J statistic <sup>2</sup> (1)P-value	0.349 0.5546

Notes: z statistic between parentheses. \* / \*\* / \*\*\* denote significance at 90%, 95% and 99%, respectively. Robust estimates.

Endogenous: Tax revenue, GDP pc and education (2000). Instruments: Tax revenue (1995), urban population (%), GDP pc (1995) education (1990). Outlier: Portugal.

<sup>7</sup> Educational attainment for the year 1995 is not used due to the lack of data, employing instead the values for 1990. Gini index is considered exogenous; the results are similar if it is included as endogenous.

To make compatible our results with the previous estimates of FDI, the relative values of the variables have been used and thus defined as index numbers. The sample covers both Eastern and Western European countries (FDI host and home countries), since otherwise the sample size would be too short for a proper estimation of the parameters. According to our results (Table 5), GDP per capita, tax revenue and education are significant and have a positive effect on institutional quality. On the contrary, the Gini index is not significant, which can be due to the fact that most of the former centrally-planned economies included in our sample have a more egalitarian income distribution than that associated with their levels of development and institutional quality. Finally, note that the over and under-identification tests suggest that the instruments are appropriate.

To check the robustness of these results, we have performed the same estimation using panel data. Since the Governance Indicators are available only from 1996, and changes in the institutional framework occur very slowly, the time period is insufficient to apply a dynamic technique. The results of both estimations by means of random effects (G2SLS estimator of Balestra and Varadharajan-Krishnakumar, and EC2SLS estimator of Baltagi) confirm that the explanatory variables (tax revenue, GDP per capita and education) have a positive impact on institutional quality (Table 6)<sup>8</sup>. The values of the coefficients are similar, but there exist small variations in the individual significance for both tax revenue and education.

Table 6. INSTITUTIONAL QUALITY ESTIMATES. DATA PANEL

	EA G2SLS	EA EC2SLS
Tax revenue (% GDP)	87.3303 (2.00)**	79.9593 (1.88)*
GDP pc	97.0015 (7.53)***	97.2396 (7.7)***
Secondary education	114.364 (1.77)*	124.7569 (1.97)**
Italy	-87.619 (-3.94)***	-86.2095 (-3.87)***
Number of obs.	50	50
N <sup>o</sup> of groups	25	25
Prob > $\chi^2$	221.28 0.0000	219.44 0.0000
R-squared within	0.3181	0.3131
R-squared between	0.8502	0.8499
R-squared overall	0.8357	0.8343

Notes: z statistic between parentheses. \* / \*\* / \*\*\* denote significance at 90%, 95% and 99%, respectively. Robust estimates.

Endogenous: Tax revenue, GDP pc and Secondary education. Instruments: one-lag tax revenue, two-lags GDP pc and one-lag Secondary education.

<sup>8</sup> The method of random effects is applied considering the result of the Hausman test and the data structure, as the number of observation periods is relatively small and the use of fixed effects would generate problems in the number of parameters to be estimated because of the relationship between the number of individuals and periods.

#### 4. Overall impact of taxation on FDI share

In view of the previous results, tax revenue exerts two effects on FDI. In the direct and negative effect, a lower level of taxes positively influences investment, while in the indirect and positive effect, reducing tax revenue decreases the quality of institutions, which in turn negatively affects the ability to attract investment. Therefore, the overall effect is ambiguous, and it depends on the value of the coefficients and the levels of the variables in each country. Specifically, the total effect is defined by:

$$dFDI_{ij} = [(\beta_3/\text{Tax revenue}_i) + [(\beta_4/AGI_j) * (\alpha_2/\text{Tax revenue}_i)]] * d\text{Tax revenue}_i \quad (1)$$

where  $\beta_3$  and  $\beta_4$  denote the tax revenue institutional quality coefficients, respectively, in the FDI equation and  $\alpha_2$  stands for the tax revenue parameter in the institutional quality equation.

Using the values obtained above ( $\beta_3 = -124.9615$ ,  $\beta_4 = 56.2846$ , and  $\alpha_2 = 123.1686$ ), the total impact of tax revenue on FDI is shown in Table 7. A reduction of the tax revenue by 1 % generates a different variation of the share of FDI in every country, depending on its level of tax revenue and institutional quality. The total effect is positive in all the countries of Eastern Europe, with the exception of Bulgaria. Thus, whereas a cut in the tax revenue by 1% results in an increase in the share of FDI of 0.7923, 0.6387 and 0.6253 percentage points in Estonia, Lithuania and Slovenia, respectively, Bulgaria's share is reduced by 1.0292 points. A detailed analysis reveals that these differences are more intense in terms of the negative impact via institutional quality than in terms of the direct effect. That is why the total value is negative in the case of Bulgaria. Institutional quality in this country is so low that when reducing tax revenue, the result is a loss of FDI. In fact, Bulgaria is by far the country with the lowest institutional quality of our sample. Although the impact of reducing tax revenue is reversed only in Bulgaria, the benefits in terms of FDI share decrease as institutional quality worsens (Estonia versus Poland).

The results allow us to draw several conclusions. Those countries that do not have a solid institutional system, lack the opportunity to use tax incentives to attract investment. Furthermore, only those who enjoy a stable institutional framework, at least when compared to their competitors for FDI, may benefit from tax cuts. This is an important conclusion that can be extended to other areas. Although it is a simple exercise that must be taken cautiously, we have used the estimated coefficients to calculate the direct and indirect effects for Romania and some Latin American countries. Thus, in the case of Romania, it would experience a reduction of 3.8747 percentage points in its share of FDI when the tax burden is decreased by 1%. The shortcomings of its institutional system, with values well below even those of Bulgaria, are the root cause of the indirect effect (-5.3688) that, in turn, overcomes the direct impact (1.4941). With respect to Latin American countries, we observe big differences across countries: Costa Rica (0.7716) versus Dominican Republic (-7.9841), or Chile (1.4578) versus Argentina (-4.5292). It must be remarked that these differences are not the result of the direct effect (tax revenue) but are rather the result of the indirect effect (institutional quality) which varies widely across countries. In sum, countries with weak institutional systems should rethink tax incentives. Tax

policies aimed at promoting foreign investment must not penalise institutional quality. Otherwise, the effect can be counterproductive.

Table 7. TOTAL EFFECT OF A TAX REVENUE CUT ON INWARD FDI SHARE

NEMS9	1% Decrease			1 Percentage point decrease		
	Direct e. FDI share 1	Indirect e. FDI share 2	Total e. FDI share 3 = 1 + 2	Direct e. FDI share 4	Indirect e. FDI share 5	Total e. FDI share 6 = 4 + 5
Bulgaria	1.2743	-2.3035	-1.0292	3.9289	-7.1021	-3.1732
Slovakia	1.2693	-0.7812	0.4881	3.8984	-2.3992	1.4992
Slovenia	1.0698	-0.4445	0.6253	2.7690	-1.1505	1.6185
Estonia	1.3382	-0.5459	0.7923	4.3332	-1.7677	2.5654
Hungary	1.0910	-0.4705	0.6205	2.8798	-1.2419	1.6378
Latvia	1.4400	-0.9067	0.5333	5.0175	-3.1593	1.8582
Lithuania	1.4367	-0.7980	0.6387	4.9943	-2.7740	2.2203
Poland	1.2782	-0.8408	0.4374	3.9532	-2.6005	1.3527
Czech R.	1.1653	-0.5948	0.5705	3.2856	-1.6770	1.6086

Note: Own calculations from estimation results and the European Commission and the World Bank data.

## 5. Conclusions

Throughout this paper we have examined if tax incentives hinder or foster FDI. The results obtained by analyzing foreign direct investment between the EU-15 and the new Eastern Europe Member States allow us to draw some conclusions. First, in countries with similar characteristics, taxation can be detrimental to FDI. Second, foreign investment is positively related to a country's institutional quality. Third, institutional quality is conditioned by tax revenue. Given the negative direct effect and the positive indirect effect of taxes on FDI, the overall impact of tax incentives on FDI is ambiguous. In the case of the Central and Eastern European new EU Member States, this impact is positive with the exception of Bulgaria. Given the low institutional quality of this country, a tax reduction would be counterproductive in terms of FDI attraction. This result is important for low-institutional quality countries implementing tax cuts to attract FDI.

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## Appendix: variable definition and data source

All the variables are expressed in relative terms, except dummies. The dependent variable is in levels, while the explanatory variables are in logs.

**FDI:** Share of the total flows of FDI originating in country *i* and received by country *j*. 2000-2005. Source: WIIW, Database on FDI.

**GDP:** Gross Domestic Product, 2000-2005. Source: Eurostat.

**Bilateral distance:** Distance between home country *i* and host country *j*. Source: CEPII.

**Tax revenue:** Direct taxes, indirect taxes and social contributions to GDP, 2000-2005. Source: European Commission (2008).

**Nominal tax rate:** Nominal tax rate on business income, 2000-2005. Source: European Commission, Taxation Trends in the EU (2008).

**Effective bilateral tax rate:** Averaged bilateral effective tax rate on FDI considering investment undertaken in country *j* (host country) by a subsidiary of a parent company resident in country *i* (home country). As well as taking account of the domestic tax system, it therefore also incorporates taxes charged on the payment of dividends and interest between the subsidiary and the parent, and any further taxes levied by the country of residence of the parent company. 2000-2005. Source: Devereux et al. (2008).

**Exemption:** Dummy that assigns value 1 to the country *j* when home country *i* use exemption system to avoid double taxation on the income coming from the host country *j*. Source: Huizinga et al. (2008).

**Labour cost:** Labour costs per worked hour (Euros). 2000-2005. Source: Eurostat.

**Education:** Average years of school for the population aged over 25 years Source: Barro and Lee (1993 and 2000).

**Direct selling:** Dummy that assigns value 1 to the host country *j* that uses the direct selling as main privatization method. Source: Holland and Pain (1998), World Bank (2002) and BERD (2003).

**Transport infrastructure:** Ground transport infrastructure in terms of paved road kilometres and electrified railway lines per every 1000km<sup>2</sup>. Source: Eurostat.

**AGI:** Host country *j* score in the Aggregate Governance Indicators. 2000-2005. Source: Kauffman et al. (2009), World Bank.

**Population:** Average population for the period 2000-2005. Source: Eurostat.

**GDP pc:** GDP per capita at purchasing power parity in 1995 constant dollars. 2000-2005. Source: World Development Indicators, World Bank.

**Secondary education:** School enrollment, secondary (% gross) defined as the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to secondary education. 2000-2005. Source: World Development Indicators, World Bank.

**Gini Index:** Latest year available, 2001/2002. Source: World Development Indicators, World Bank.

**Urban population:** Percentage of urban population. 2000-2005. Source: World Development Indicators, World Bank.