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The role of tax system complexity on foreign direct investment allocation*

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ABSTRACT

We present new cross-country empirical evidence that tax system complexity affects international investments. The evidence comes from a database of foreign direct investment (FDI) bilateral flows for all OECD countries over the 2013-2016 period. We used the dataset from the Doing Business survey, which collects several measures of tax system complexity and effective tax rates. By means of a gravity model, we considered the impact of destination and parent country characteristics on firm investment decisions. An increase in the difference between tax complexity in the home country and the destination country is related with an increase in FDI outflows from home to destination. We also found that this effect is driven by small countries. We did not observe any impact of tax rate differentials on FDI outflows.

KEYWORDS: FDI flows; tax complexity; gravity model.

JEL Codes: H32; H29; H25.

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1. Introduction

In recent years, the removal of barriers to international trade has pushed governments to attract foreign direct investment (FDI). The aim is to capture positive spillover effects in the host economy, such as access to internationally available technologies and managerial knowledge[1] (OECD, 2008). At the same time, the pressure of public opinion has driven governments to guarantee that an appropriate share of tax revenues is collected from multinational firms (Zucman, 2015). There is still considerable difference between nations' tax levels and fiscal administrative systems (OECD, 2018). It is therefore important to understand the impact of tax rates and complexity on the level of FDI so that policies can be designed to minimize the impact of these distortions on the allocation of FDI flows.

Using Djankov *et al*.'s (2010) dataset, Esteller-Moré, Rizzo and Secomandi (2020) showed that taxes in the destination country had a considerable impact on determining FDI inflows in non-OECD countries but no impact in OECD countries. In this study, we empirically tested whether there are other determinants of FDI flows for OECD countries. In particular, we considered tax system complexity as a potentially important determinant of FDI flows. Fulfilling tax requirements is time-consuming, so it implies an additional burden for firms (Woodworth, 1969). The measurement of complexity is mainly associated with the numbers of tax rates, tax bases, tax payments and the number of exemptions or special provisions (Warskett *et al.*, 1998). According to de Mooij and Ederveen (2003), FDI decisions may depend on the socioeconomic characteristics of both origin and destination countries. In other words, the difference between socioeconomic characteristics in the two countries should determine the level of outflow from the origin country. To consider the impact of origin and destination country characteristics, we employed a gravity model (Isard, 1960).

Using this model, we found that FDI outflows were driven by tax complexity rather than tax rates in the 2013-2016 period. The evidence came from a database containing bilateral flows of FDI, measures of tax complexity, tax rates and other control variables for all OECD countries. This result held even when a range of country-specific controls were added, including the level of government expenditure and various measures of distance between countries.

In large markets/countries, firms have more opportunities for investment (Trandel, 1994), which implies that smaller countries expect larger gains from the development of attractive tax environments than larger countries. An attractive tax environment has lower tax rates and simpler administrative tax systems. Accordingly, we found that FDI outflows are more sensitive to tax complexity differentials in small countries.

The structure of the rest of the paper is as follows. Section 2 reviews the literature, Section 3 describes the data, Section 4 sets the empirical approach, Section 5 presents the results of the gravity model and heterogeneous effects and Section 6 contains the conclusions.

2. Literature review

Tax and non-tax factors might affect the decision to make investments abroad. The size of a foreign market, its regulatory and legal environment, and the distance from the home country are the most important non-tax factors. Regarding tax factors, previous studies show that investment decisions and

[1] See Alfaro *et al.* (2004), Barro (1991), Baumol *et al.* (2007), Du *et al.* (2014) and Javorcik (2004).

other activities of multinational corporations are sensitive to the corporate tax rate (for a review, see Devereux and Maffini, 2007).

A large body of literature indicates the existence of significant, quantitatively important tax effects on the magnitude and location of FDI (Desai and Hines, 2001; Devereux *et al*., 2002; Gordon and Hines, 2002; Slemrod, 1990). Literature on the impact of taxation on FDI has used panel data (Buettner and Wamser, 2013; Devereux and Freeman, 1995) and cross-country analyses (Djankov *et al*., 2010). More recently, some studies have used microdata on firm investments (Barrios *et al*., 2012; Becker and Riedel, 2012; Desai and Hines, 2001; Stowhase, 2002).

However, as shown in Devereux and Maffini (2007), a large number of studies on the effect of taxation on FDI allocation examine destination country taxation and do not consider parent country taxation. If the level of taxation in the country of origin of FDI flows is not considered, estimates could be biased. Our empirical approach takes into account both the origin and destination of the FDI flows.

To the best of our knowledge, only Lawless (2013) and Mueller and Voget (2012) have estimated the impact of tax complexity on FDI bilateral flows. They used as independent variables host tax complexity and host tax rate and found that both were negatively related to FDI outflows. Mueller and Voget (2012) examined the effect of complexity using German firm-level data from 2005 to 2009. Lawless (2013) used a Heckman selection model and found a negative effect of host tax complexity and tax rates on FDI outflows for OECD countries trading with OECD and non-OECD countries in the 2002-2009 period.

We also focused on tax complexity as a potential driver of FDI. In contrast with Lawless (2013) and Mueller and Voget (2012), we used a gravity model to investigate the impact on FDI from the origin to the host country, and vice-versa. We think it is reasonable to assume that when investors decide where to allocate their resources they look at the countries' tax complexity and tax rates relative to the tax complexity and tax rate in their home country. Hence, we fully exploit the FDI bilateral flow model. Serious bias due to omitted variables may occur if origin tax rates and complexity are not considered. Origin tax rates and complexity should affect the FDI outflow with an opposite sign with respect to destination tax rate and complexity (if the origin tax rate or complexity increases, the outflow from the origin country should increase).

3. Data

3.1 FDI

The main variable of interest is FDI classified according to the bilateral flow criterion, which distinguishes flows according to the origin and the destination country.[2] Following the definition of the International Monetary Fund (IMF, 2019), FDI is the category of international investment that reflects the objective of a resident entity in one economy to obtain lasting interest in an enterprise that is resident in another economy. Lasting interest implies the existence of a long-term relationship

[2] It is well-known that there are significant problems in the accounting procedure for FDI, and that even the statistics supplied by supranational bodies like Eurostat and the OECD suffer from differences in national reporting procedures. However, as stated by Hines (1997), to study the determinants of FDI it is sufficient to focus on the distribution of FDI flows across countries.

between the direct investor and the enterprise and a significant degree of influence by the investor on the management of the enterprise. Lasting interest is verified when the direct investor owns at least 10% of the voting power of the direct investment enterprise (OECD, 2008). Direct investment comprises not only the initial transaction that establishes the relationship between the investor and the enterprise, but also all subsequent transactions between them and among affiliated enterprises, both incorporated and unincorporated. Thus, FDI could be a financial flow consisting of equity, reinvestment of earnings and intercompany debt transaction (UNCTAD, 2009). As in Torslov *et al*. (2018) and Wei (2000), we used outward FDI instead of inward FDI because the statistical reporting of the former measure leads to a smaller number of missing values in the bilateral flows.[3] Data on FDI bilateral flows was taken from the bilateral Eurostat Balance of Payment and from the OECD International Direct Investment report.[4] All FDI flows were converted into current dollars.

[INSERT FIGURE 1 AROUND HERE]

The variable FDI outflows over GDP in the dataset refers to all OECD countries, that is, 36 source countries versus 36 destination countries. These countries represent a large part of the world economy (63% of the world's GDP) and of international trade (68% of the value of exports in the world). The full list of source and destination countries is included in Table A1 of the Appendix. As suggested in recent works (*e.g*., Petkova *et al*., 2018), we only used data from 2013 to 2016, since substantial methodological changes in the classification of bilateral FDI flow series have been made since 2013[5] (Eurostat, 2020), and so data before and after 2013 are not comparable.

Figure 1 describes FDI over GDP outflows by means of a network graph using the Fruchterman-Reingold algorithm (Fruchterman and Reingold, 1991), where the nodes are represented by steel rings and more marked connections reflect more intense FDI outflows. For the countries we analyzed, the network reveals a very high degree of connectedness where most economies have FDI links vis-à-vis each other with different levels of intensity.

3.2 Tax complexity

We used the dataset[6] of the Doing Business survey to measure tax system complexity.[7] In particular, we focused on the *time to comply with tax obligations*. This variable, recorded in hours per year, measures how long a firm takes to prepare, compile and pay three main types of taxes and contributions: corporate income tax, value added or general sales tax and labor taxes, including

[3] Note that the variable net FDI outward can contain negative values because there can be reverse investments from the subsidiary in the destination country (UNCTAD, 2009).

[4] In principle, the data from Eurostat follows the OECD benchmark definition for FDI such that both datasets are fully comparable.

[5] The latest international standards for compiling FDI statistics lead to more meaningful measures of direct investment, but also to significant changes in the FDI statistics. One of the greatest changes was to include the global FDI statistics from the Balance of Payment and International Investment Position accounts (Eurostat, 2020).

[6] To ensure comparability across countries, the data were based on a case study of a hypothetical representative firm examined across countries. A range of assumptions were made about the structure of the business, and hypothetical financial accounts were presented to survey respondents to let them calculate the company's tax liabilities and costs of compliance.

[7] Recently, several authors have used this source of information for different purposes. For example, van Stel *et al*. (2007) used it to study the effect of business regulations on nascent and young businesses; Belitski *et al*. (2016) to analyze the connection between taxes, corruption and entry; and Jerbashian and Kochanova (2016) to explore the impact of business regulations on investments in information and communication technologies.

payroll taxes and social contributions. This information is available for the 2006-2017 period for more than 130 countries.

Figure 2 shows the length of time needed to pay taxes required for a standardized firm, as defined by the World Bank (2020). Countries differ significantly. During the 2013-2016 period, the average number of hours was 180, that is, about 23 working days. The values ranged from a minimum mean value of 56 hours in Luxembourg to a maximum mean value of 440 in Bulgaria.

[INSERT FIGURE 2 AROUND HERE]

3.3 Tax rates

The measurement of taxation is a non-trivial issue (Bénassy-Quére *et al*., 2005). Statutory rates are the most obvious and readily available measure, while ex post measures, such as effective tax rates, provide a more accurate measure of the tax burden as they account for any possible special tax treatment. Devereux and Maffini (2007) and Mooij and Ederveen (2006) found that both measures were important for the location of international investments. Hence, we decide to use both measures in each specification.

The effective tax rate on profits from the Doing Business survey measures the amount of taxes and mandatory contributions borne by the business in the second year of operation, expressed as a share of commercial profit. The taxes withheld (such as personal income tax) or collected by the company and remitted to the tax authorities (consumption taxes) but not borne by the company are excluded.[8]

The statutory tax rate is the top statutory corporate income rate, collected from the Eurostat and OECD dataset. The statutory tax rate is the rate a corporation has to pay on marginal income assuming that it is in the highest tax bracket, taking into account federal, state and local rates.

In addition to these two corporate tax rates, we use other four tax rates in the analysis as controls. The first two are derived from the Doing Business survey: effective tax rate on labor and effective tax rate on capital and property. The effective rate on labor is the ratio between the sum of all labor-related taxes payable (including payroll taxes, mandatory social security contributions, mandatory health insurance and mandatory unemployment insurance) and the pre-tax earnings. The effective rate on capital and property is the ratio between the sum of all property taxes, business license taxes, financial transactions, and asset and capital taxes and pre-tax earnings. In addition, indirect taxes and other direct taxes can have an impact on FDI (Desai and Hines, 2001), so we added the VAT statutory tax rate and personal income top tax rate from Eurostat and the KPMG report.

For the 2013-2016 period, in OECD countries the average of the effective corporate tax rate ranges from a minimum of 3.75% in Canada to a maximum of 29.6% in New Zealand. The mean rate for all countries over the entire period is 15.6% (**Figure** 3). For the statutory tax rate, the country with the highest value is the US (39%), the minimum is registered in Ireland (12.5%) and the mean is 28.3%

[INSERT FIGURE 3 AROUND HERE]

[INSERT FIGURE 4 AROUND HERE]

[8] If there are different corporate taxes (e.g. federal, state and local), the deductibility of one or more of those taxes is taken into account when the tax base is computed for corporate income.

3.4 Control variables

In its original definition, the gravity model directly incorporates trade costs through the distance between countries. In empirical applications, the distance is measured in various ways (Krugman, 1997). As suggested by van Bergeijk and Brakman (2010), in the main specification we used the ratio between bilateral exports and GDP to capture market size and trading costs between the origin and destination countries. Data on all exports and on GDP were taken from national accounts data compiled by the World Bank and OECD National Accounts data files. In line with a number of studies that used gravity equations, we also collected data on geographical distance. As in Mayer and Zignago (2011), we considered the distance between the most populated cities, and the distance between capitals of origin and destination countries. We also built a colonial dummy if the origin country colonized the destination country. This dummy was used to pick up cultural and institutional factors that might contribute to international trade and financial linkages between countries (Porta *et al*., 2008).

We controlled for a range of country characteristics relating to economy, trade and institutions, as is common in the literature. We collapsed these variables into three sets of control variables: institutional frameworks, economic and trade differences, and the supply of public services.

The institutional framework might be an important factor in international investments. In particular, we represented tax enforcement using an estimate of the magnitude of the shadow economy as a percentage of GDP, from Medina and Schneider (2018), for all OECD countries. From the Doing Business survey, we integrated the dataset with a variable counting all procedures that are officially required for an entrepreneur to start up and formally operate an industrial or commercial business in a country. Finally, we used the total number of taxes and contributions paid during a year, including general sales tax, VAT and labor taxes.

A country's ability to attract FDI also depends on economic, openness to trade and regulatory differences between countries. To control for income, we used the gross domestic product at purchasing power parities divided by the population (GDP per capita, PPP), from the OECD. We used the property right index (taken from the Index of Economic Freedom [IEF] of the Heritage Foundation), which is an estimate of the ability of individuals to accumulate private property, secured by clear laws that are fully enforced by the state. We considered the bargaining power of employees and employers on the wage level by using the employment rigidity index measured with a survey, from the World Economic Forum. We used a freedom to trade internationally index (from the Economic Freedom of the World [EFW] collection of indexes of the Heritage Foundation) that measures taxes on international trade, regulatory trade barriers and the size of the trade sector. Theory predicts that inflation might influence investment, partly through its impact on the cost of capital (Auerbach and Jorgenson, 1980), and partly because the government might use seignorage as a substitute for taxes (Djankov *et al.*, 2010). That is why we controlled for inflation and seignorage. Inflation was measured using the annual growth rate of the Gross Domestic Product (GDP) implicit deflator, from World Bank national accounts data and OECD national accounts data.[9] Seignorage was measured through the currency in circulation over GDP, collected from the US Federal Reserve and from the BCE.

[9] The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.

Bartik (1991) suggested that the role of tax incentives is underestimated if the potential impact of public expenditure is not considered. Public service provision, especially for material and non-physical infrastructures, tends to improve locations' attractiveness for investment, so corporate taxation may be compensated with spending (Bénassy-Quéré *et al*., 2007). To take this into account, we controlled for government expenditure (from OECD national accounts) over GDP.

4. Model specification

As stated above, we employed a gravity model. This framework was applied to the estimation of FDI flows (Bevan *et al*., 2004; Buettner, 2017; Frenkel *et al.* 2004), but without controlling for tax complexity difference between the home and destination country. To denote the bilateral outflows of FDI on GDP, measured at constant prices, from *i* to *j* with fdi_{ij}, the cross-section specification used in the main regression is the following:

$$fdi_{ij} = \beta_0 + \beta_1(c_i - c_j) + \beta_2(t_i - t_j) + \beta_3(x_i - x_j) + \beta_4 d_{ij} + a_i^H + \varepsilon_{ij} \quad (1)$$

where $c_i - c_j$ is the difference in tax complexity between country *i* and country *j*, measured by the log of the variable *time to comply with tax obligations*, and $t_i - t_j$ is the difference in the tax rate (*effective tax rate* or *statutory tax rate*) between country *i* and country *j*. Each variable refers to the average value for the period 2013-2016. Hence, the key parameters of interest are β_1 and β_2, which capture the impact of tax complexity and tax rate differential, respectively. We expect $\beta_1 > 0$ and $\beta_2 > 0$, that is, if the complexity/tax rate of the host country increases for a given level of complexity/tax rate of the origin country, the difference between origin and host complexity/tax rate decreases and the FDI outflows from origin to host country should decrease. Similarly, if origin complexity/tax rate increases for a given level of host complexity/tax rate, the difference between origin and host complexity/tax rate increases, and the FDI from origin to host country should increase.

To address the risk of results being distorted due to omitted variables, we controlled for a set of factors (x_i and x_j). In the main regression, we used the same control variables used by Djankov *et al*. (2010). We combined these variables in three sets: tax controls (labor, property and capital taxes, VAT and sales taxes, personal income tax); institutional framework (shadow economy on GDP, start-up procedures, number of tax payments); economic and trade differences (GDP per capita in PPP, IEF property right index, EFW freedom to trade internationally index, employment rigidity index, inflation, level of seignorage). We also controlled for public presence in the economy measured by the percentage of public expenditure on GDP. All variables that were not expressed in percentage terms were transformed with a logarithmic scale. The descriptive statistics of the main variables are shown in Table A2.

We considered spatial effects, not in the sense of spatial proximity, but of proximity to the markets,[10] controlling for the ratio between bilateral exports and GDP (Van Bergeijk and Brakman, 2010). In particular, we used as a control variable d_{ij}, which is equal to the ratio between the value of export (all products) from country *i* to country *j* and the sum of GDP of country *i* and country *j*:

[10] In the robustness check, we also controlled for geographical and cultural proximity instead of bilateral exports (Porta *et al*., 2008).

$$d_{ij} = \frac{export_{ij}}{GDP_i + GDP_J} \quad (2)$$

The additional inclusion of country-specific origin dummies (a_i^H) controlled for unobserved characteristics in each origin country (Devereux and Freeman, 1995). As in Wei (2000), we did not include destination country dummies, since they would saturate the model. Robust standard errors were used in all specifications. The error was clustered at the destination country level (*i*).

5. Results

5.1 Main results

The results in **Table 1** and in Table 2 were obtained using the gravity model with the tax rates and Djankov *et al.*'s (2010) controls as explanatory variables. In **Table 1**, the independent variable was the difference in effective corporate tax rates, and in Table 3 it was the difference in statutory corporate rates.

For each table, in column (1) we showed the estimate without the use of controls, in column (2) we added tax controls, in column (3) we added control variables to account for the institutional framework, in column (4) we added economic and trade differences, and finally in column (5) we used all control variables, as well as government expenditure over GDP.

In both tables, we observed that the difference in taxes does not have a statistically significant impact on FDI flows.[11] These results are consistent with Esteller-Moré, Rizzo and Secomandi (2020).

[INSERT TABLE 1 AROUND HERE]

[INSERT TABLE 2 AROUND HERE]

In Table 3 and Table 4, we replicated Tables 2 and 3, respectively, by adding as explanatory variables the difference in tax complexity, measured by the variable *time to comply with tax obligations*.

Table 3 shows the results using the difference in tax complexity and in effective tax rates. The effect of tax complexity differentials on FDI outflows was statistically significant and large in each specification, while the difference in the effective tax rates remained statistically non-significant. The estimates indicate that an increase in the difference in tax complexity by one percentage point (p.p) increases the FDI/GDP outflows by 0.04-0.06 p.p. For comparison purposes, Table 4 reports results obtained using the statutory tax rate. The effects of tax complexity differential on FDI outflows were statistically significant and of the same magnitude as the estimates shown in Table 4.

[INSERT TABLE 3 AROUND HERE]

[INSERT TABLE 4 AROUND HERE]

[11] The potential number of observations for bilateral FDI flows is 1,260 (36 investors × 36 destination countries – 36 same country pair). However, there are 172 missing values and also six missing values of the explanatory variables, so the final number of observations is 1,082.

5.2 Heterogeneity

It is common to find examples of smaller countries that set lower tax rates: Canada imposes lower income taxes than the US, Denmark has lower VAT than Germany, and Ireland has lower VAT than Great Britain. When countries compete to attract FDI, smaller countries always have to develop more attractive tax policies than larger ones. As they offer a larger market, bigger countries are a more attractive location for investment than smaller ones. Hence, smaller countries must make more effort to attract FDI (Haufler and Wooton, 2010). This result, also called the "bigger-country-higher-tax-rate" rule (Wang, 1999), can be extended to the tax obligations framework.

To distinguish varying effects depending on country size, we built a variable dummy (big) equal to one if the country of origin has a population greater than the sample population average. Thus, in Table 5 and Table 6, we added the dummy variable big to the gravity model and the interactions between big and all explanatory variables.

Table 5 shows the results of the gravity model with the difference in tax complexity and the difference in corporate effective tax rate as explanatory variables. The coefficient of big has the expected positive sign and is significant at the 1 per cent level, while the variable difference in time to comply with tax obligations keeps the positive sign. The interaction term of difference in time to comply with tax obligations*big is always negative and significant at the 5 per cent level. In all specifications, the impact of tax complexity on FDI for bigger countries is not statistically different from zero.12 We obtained the same results when the variable difference in effective tax rate was replaced with difference in statutory tax rate (Table 6). This was consistent with our expectations.

[INSERT TABLE 5 AROUND HERE]

[INSERT TABLE 6 AROUND HERE]

5.3 Robustness check

The most important contribution of the gravity equation is that it can be used to control for the relevance of trade costs. Our results are robust to different definitions of the trade costs. We replaced in the gravity model the bilateral exports with other three measures: distance between the most populated cities in the origin and destination in kilometers, distance between the capitals in the origin and destination in kilometers, and the dummy "colony" that is equal to one if the home country had a colonial experience in the past in the destination country.

Table 7 shows the results of the gravity model with all control variables, difference in tax complexity and effective tax rate and different distance measures: in column (1) we take the bilateral export; in column (2) the distance between the most populated cities; in column (3) the distance between capitals; and in column (4) the dummy colony.

Table 8 replicates Table 7 with statutory tax rates instead of effective tax rates. Looking at these two tables, the signs and sizes of the estimated coefficients of the main variables are comparable with the

[12] For example, in the case where we use all controls (Col. 5, Table 5), the linear combination of the coefficients of *diff. in time to comply with tax obligations + diff. in time to comply with tax obligations *big* leads to an estimation equals to 0.693 – 0.596 = 0.097, which is not statistically different from zero (p-value = 0.325).

previous results. In particular, the difference in complexity remains positive and statistically significant.

[INSERT TABLE 7 AROUND HERE]

[INSERT TABLE 8 AROUND HERE]

6. Conclusions

Esteller-Moré, Rizzo and Secomandi (2020) showed that FDI outflows are not affected by tax rates in OECD countries. Interestingly, using a gravity model, we confirm that FDI in OECD countries are not driven by tax rates but strongly determined by the level of tax complexity, measured by the length of time required to comply with tax codes. A complex tax system generates uncertainty (Edmiston *et al*., 2005), directly imposes transaction costs on a firm, reduces the return on any given investment (Warskett *et al*., 1998), and in general creates a hostile environment (Friedman *et al.*, 2000). Therefore, investors seem to search for certainty and timeliness in the application of tax rules, and these concerns seem to be more important than the effective tax rate paid (OECD, 2008). One argument supporting these results is that multinationals often channel foreign investment in a given nation through financial corporations in offshore financial centers (Damgaard and Elkjaer, 2018). In these cases, the immediate investing country (the offshore) differs from the final destination country of the FDI and therefore a reduction in tax rate in the final destination country has no direct effect on FDI (Beer and Loeprick, 2018; Petkova *et al*., 2018).

We also found that this effect is driven by countries with a smaller demographic size. This is consistent with the idea that when countries compete to attract FDI, bigger countries that offer a larger market are a more attractive location for investment than smaller ones. Therefore, smaller countries must make more effort to attract FDI than larger countries (Haufler and Wooton, 2010), through more attractive tax policies and less complex tax systems.

These results have two immediate policy implications. First, if tax differentials do not matter so much for FDI flows, countries could increase their location attractiveness by decreasing their tax system complexity. Second, the impact of complexity on FDI should matter the most to small countries. These finding are particularly relevant with respect to BEPS recommendations (OECD, 2018), which indicate that attention should also be given to harmonization of rules governing tax administrative systems.

A strand of the literature shows that the quality of institutions matters for attracting FDI (McCloud and Kumbhakar, 2012; Dort *et al*., 2014). The interaction between tax system complexity and institutional context could play a key role in explaining FDI flows in a better way. We leave this interesting issue for further research.

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TABLES

Table 1. Impact of corporate effective tax rate on FDI outflows

	(1)	(2)	(3)	(4)	(5)
Diff. in effective tax rate on profit	0.008	0.014	0.004	0.003	0.005
	(0.014)	(0.018)	(0.010)	(0.010)	(0.008)
Diff. in capital and property tax rates		0.047			0.049
		(0.042)			(0.034)
Diff. in standard VAT rates		0.014			-0.016*
		(0.016)			(0.009)
Diff. in personal income top tax rate		-0.004			0.002
		(0.004)			(0.005)
Diff. in number of tax payments			-0.237		-0.079
			(0.258)		(0.128)
Diff. in GDP per capita - PPP				-0.787*	-1.074**
				(0.439)	(0.430)
Diff. in IEF property right index				0.010	0.026*
				(0.010)	(0.015)
Diff. in start-up procedures			0.021		0.021
			(0.023)		(0.021)
Diff. in employment rigidity index				-0.106	-0.114
				(0.068)	(0.078)
Diff. in IEF trade freedom index				0.004	0.025
				(0.018)	(0.026)
Diff. in seignorage					0.006
					(0.011)
Diff. in inflation					-0.085*
					(0.049)
Diff. in shadow economy			0.016*		0.016
			(0.009)		(0.012)
Diff. in government expenditure					0.043*
					(0.022)
Bilateral export	0.024	0.026	0.024	0.025	0.027
	(0.018)	(0.019)	(0.018)	(0.019)	(0.020)
Constant	-0.053	0.119	0.146*	-0.058	-0.212
	(0.135)	(0.092)	(0.075)	(0.147)	(0.194)
Observations	1,082	1,082	1,082	1,082	1,082
R-squared	0.04	0.04	0.04	0.04	0.05
Origin country FE	YES	YES	YES	YES	YES

*Note: Period 2013–2016. Dependent variable: FDI outflows on GDP. The dependent variables have been rescaled by dividing by 1,000. Robust standard errors, clustered at destination country level, are reported in brackets. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ****

Table 2. Impact of corporate statutory tax rate on FDI outflows

	(1)	(2)	(3)	(4)	(5)
Diff. in statutory tax rate	0.000	0.003	0.001	0.012	-0.010
	(0.012)	(0.019)	(0.011)	(0.010)	(0.013)
Diff. in capital and property tax rates		0.033			0.049
		(0.041)			(0.034)
Diff. in standard VAT rates		0.010			-0.024
		(0.008)			(0.015)
Diff. in personal income top tax rate		-0.003			0.004
		(0.006)			(0.006)
Diff. in number of tax payments			-0.256		-0.126
			(0.298)		(0.152)
Diff. in GDP per capita - PPP				-0.887*	-1.068**
				(0.509)	(0.439)
Diff. in IEF property right index				0.015	0.026*
				(0.013)	(0.014)
Diff. in start-up procedures			0.024		0.035
			(0.027)		(0.029)
Diff. in employment rigidity index				-0.111	-0.125
				(0.075)	(0.079)
Diff. in IEF trade freedom index				0.009	0.022
				(0.019)	(0.024)
Diff. in seignorage					0.006
					(0.011)
Diff. in inflation					-0.085*
					(0.046)
Diff. in shadow economy			0.016*		0.017
			(0.008)		(0.012)
Diff. in government expenditure					0.047*
					(0.024)
Bilateral export	0.025	0.027	0.025	0.026	0.029
	(0.018)	(0.019)	(0.018)	(0.018)	(0.020)
Constant	0.017	0.175	0.192	-0.109	-0.176
	(0.066)	(0.174)	(0.131)	(0.153)	(0.180)
Observations	1,082	1,082	1,082	1,082	1,082
R-squared	0.04	0.04	0.04	0.05	0.05
Origin country FE	YES	YES	YES	YES	YES

*Note: Period 2013–2016. Dependent variable: FDI outflows on GDP. The dependent variables have been rescaled by dividing by 1,000. Robust standard errors, clustered at destination country level, are reported in brackets. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ****

Table 3. Impact of tax complexity and corporate effective tax rate on FDI outflows

	(1)	(2)	(3)	(4)	(5)
Diff. in effective tax rate on profit	0.009	0.009	0.008	0.006	0.004
	(0.013)	(0.014)	(0.010)	(0.012)	(0.009)
Diff. in time to comply with tax obligations	0.452**	0.455**	0.599*	0.417**	0.448**
	(0.219)	(0.210)	(0.301)	(0.201)	(0.217)
Diff. in effective tax rate on labor	0.010	0.010*	0.011*	0.012*	0.007
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Diff. in capital and property tax rates		0.025			0.045
		(0.031)			(0.027)
Diff. in standard VAT rates		0.000			-0.010
		(0.013)			(0.011)
Diff. in personal income top tax rate		0.001			0.004
		(0.004)			(0.006)
Diff. in number of tax payments			-0.162		-0.105
			(0.175)		(0.139)
Diff. in GDP per capita - PPP				-0.406	-0.626*
				(0.319)	(0.370)
Diff. in IEF property right index				0.027*	0.041**
				(0.015)	(0.017)
Diff. in start-up procedures			-0.052		-0.003
			(0.035)		(0.023)
Diff. in employment rigidity index				-0.077	-0.079
				(0.053)	(0.058)
Diff. in IEF trade freedom index				0.001	0.029
				(0.016)	(0.023)
Diff. in seignorage					0.006
					(0.009)
Diff. in inflation					-0.073
					(0.053)
Diff. in shadow economy			-0.007		0.022**
			(0.009)		(0.011)
Diff. in government expenditure					0.034
					(0.021)
Bilateral export	0.030	0.030	0.030	0.031	0.031
	(0.019)	(0.019)	(0.019)	(0.019)	(0.020)
Constant	0.155	0.197	0.095	-0.076	-0.095
	(0.103)	(0.148)	(0.102)	(0.170)	(0.196)
Observations	1,082	1,082	1,082	1,082	1,082
R-squared	0.05	0.05	0.05	0.05	0.05
Origin country FE	YES	YES	YES	YES	YES

*Note: Period 2013–2016. Dependent variable: FDI outflows on GDP. The dependent variables have been rescaled by dividing by 1,000. Robust standard errors, clustered at destination country level, are reported in brackets. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ****

Table 4. Impact of tax complexity and corporate statutory tax rate on FDI outflows

	(1)	(2)	(3)	(4)	(5)
Diff. in statutory tax rate	-0.004	-0.019	-0.003	0.002	-0.020
	(0.009)	(0.022)	(0.009)	(0.009)	(0.015)
Diff. in time to comply with tax obligations	0.498*	0.556*	0.633*	0.440*	0.567**
	(0.276)	(0.294)	(0.336)	(0.238)	(0.225)
Diff. in effective tax rate on labor	0.008**	0.010*	0.009**	0.010**	0.008
	(0.004)	(0.006)	(0.004)	(0.005)	(0.005)
Diff. in capital and property tax rates		0.029			0.052*
		(0.032)			(0.027)
Diff. in standard VAT rates		-0.010			-0.023
		(0.013)			(0.019)
Diff. in personal income top tax rate		0.007			0.007
		(0.008)			(0.007)
Diff. in number of tax payments			-0.201		-0.177
			(0.206)		(0.165)
Diff. in GDP per capita - PPP				-0.436	-0.469
				(0.369)	(0.307)
Diff. in IEF property right index				0.028	0.041**
				(0.017)	(0.016)
Diff. in start-up procedures			-0.044		0.012
			(0.030)		(0.029)
Diff. in employment rigidity index				-0.091	-0.089
				(0.065)	(0.054)
Diff. in IEF trade freedom index				0.000	0.027
				(0.015)	(0.021)
Diff. in seignorage					0.004
					(0.010)
Diff. in inflation					-0.073
					(0.047)
Diff. in shadow economy			-0.008		0.026**
			(0.010)		(0.011)
Diff. in government expenditure					0.041*
					(0.023)
Bilateral export	0.030	0.029	0.030	0.031	0.031
	(0.018)	(0.019)	(0.019)	(0.019)	(0.020)
Constant	0.274*	0.307	0.213*	-0.050	0.009
	(0.157)	(0.210)	(0.118)	(0.133)	(0.157)
Observations	1,082	1,082	1,082	1,082	1,082
R-squared	0.04	0.05	0.05	0.05	0.05
Origin country FE	YES	YES	YES	YES	YES

Note: Period 2013–2016. Dependent variable: FDI outflows on GDP. The dependent variable has been rescaled by dividing by 1,000. Robust standard errors, clustered at destination country level, are reported in brackets. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***

Table 5. Impact of tax complexity and corporate effective tax rate on FDI outflows, for big and small countries

	(1)	(2)	(3)	(4)	(5)
Diff. in effective tax rate on profit	0.014	0.015	0.013	0.011	0.010
	(0.017)	(0.019)	(0.013)	(0.016)	(0.012)
Diff. in effective tax rate on profit *big	-0.019	-0.020	-0.017	-0.018	-0.018
	(0.015)	(0.016)	(0.012)	(0.014)	(0.011)
Diff. in time to comply with tax obligations	0.639**	0.639**	0.840*	0.568**	0.629**
	(0.309)	(0.296)	(0.422)	(0.268)	(0.294)
Diff. in time to comply with tax obligations *big	-0.585**	-0.573**	-0.750*	-0.463*	-0.557**
	(0.285)	(0.268)	(0.382)	(0.231)	(0.260)
Bilateral export	0.029	0.029	0.030	0.031	0.031
	(0.018)	(0.019)	(0.019)	(0.019)	(0.020)
Big	1.371***	1.319***	1.410***	1.618***	1.487***
	(0.325)	(0.417)	(0.339)	(0.346)	(0.411)
Constant	0.193	0.244	0.116	-0.144	-0.168
	(0.138)	(0.212)	(0.140)	(0.232)	(0.266)
Observations	1,082	1,082	1,082	1,082	1,082
Other controls	No	Taxes	Institutional frameworks	Economic and trade diff.	All
R-squared	0.05	0.05	0.05	0.05	0.06
Origin country FE	YES	YES	YES	YES	YES

*Note: Period 2013–2016. Dependent variable: FDI outflows on GDP. Big is a dummy variable equal to 1 if the home country has a population below average. Other controls: tax controls (labor, capital and property effective tax rates, VAT and sales ordinary tax rate, personal income top tax rate); institutional frameworks (shadow economy on GDP, start-up procedures); economic and trade differences (GDP per capita in PPP, IEF property right index, EFW freedom to trade internationally index, employment rigidity index); all controls (labor, capital and property effective tax rates, VAT and sales ordinary tax rate, personal income top tax rate, shadow economy on GDP, start-up procedures, GDP per capita in PPP, IEF property right index, EFW freedom to trade internationally index, employment rigidity index, inflation, level of seignorage, government expenditure on GDP). The dependent variables have been rescaled by dividing by 1,000. Robust standard errors, clustered at destination country level, are reported in brackets. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ****

Table 6. Impact of tax complexity and corporate statutory tax rate on FDI outflows, for big and small countries

	(1)	(2)	(3)	(4)	(5)
Diff. in statutory tax rate	-0.006	-0.025	-0.005	0.004	-0.025
	(0.013)	(0.030)	(0.013)	(0.013)	(0.021)
Diff. in statutory tax rate *big	0.005	0.020	0.004	-0.006	0.015
	(0.013)	(0.028)	(0.013)	(0.013)	(0.020)
Diff. in time to comply with tax obligations	0.717*	0.794*	0.898*	0.617*	0.801**
	(0.392)	(0.420)	(0.475)	(0.328)	(0.317)
Diff. time to comply with tax obligations *big	-0.683*	0.742*	-0.821*	-0.544*	0.721**
	(0.362)	(0.392)	(0.433)	(0.291)	(0.303)
Bilateral export	0.030	0.029	0.031	0.031	0.032
	(0.019)	(0.019)	(0.020)	(0.019)	(0.020)
Big	1.257***	1.184**	1.283***	1.711***	1.382***
	(0.421)	(0.524)	(0.411)	(0.331)	(0.427)
Constant	0.385*	0.419	0.309*	-0.090	-0.006
	(0.223)	(0.302)	(0.167)	(0.180)	(0.211)
	-0.006	-0.025	-0.005	0.004	-0.025
Observations	1,082	1,082	1,082	1,082	1,082
Other controls	No	Taxes	Institutional frameworks	Economic and trade diff.	All
R-squared	0.05	0.05	0.05	0.05	0.06
Origin country FE	YES	YES	YES	YES	YES

*Note: Period 2013–2016. Dependent variable: FDI outflows on GDP. Big is a dummy variable equal to 1 if the home country has a population below the average. Other controls: tax controls (labor, capital and property effective tax rates, VAT and sales ordinary tax rate, personal income top tax rate); institutional frameworks (shadow economy on GDP, start-up procedures); economic and trade differences (GDP per capita in PPP, IEF property right index, EFW freedom to trade internationally index, employment rigidity index); all controls (labor, capital and property effective tax rates, VAT and sales ordinary tax rate, personal income top tax rate, shadow economy on GDP, start-up procedures, GDP per capita in PPP, IEF property right index, EFW freedom to trade internationally index, employment rigidity index, inflation, level of seignorage, government expenditure on GDP). All estimates include destination country fixed effects. The dependent variables have been rescaled by dividing by 1,000. Robust standard errors, clustered at destination country level, are reported in brackets. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***.*

Table 7. Impact of tax complexity and effective tax rate on FDI outflows, with different distance measures

	(1)	(2)	(3)	(4)
Diff. in effective tax rate on profit	0.004	0.002	0.001	0.003
	(0.009)	(0.010)	(0.010)	(0.009)
Diff. in time to comply with tax obligations	0.448**	0.415*	0.415*	0.445*
	(0.217)	(0.212)	(0.212)	(0.226)
Bilateral export	0.007	0.004	0.004	0.005
	(0.005)	(0.005)	(0.005)	(0.005)
Distance between the most populated cities	0.031			
	(0.020)			
Distance between capitals		-0.000		
		(0.000)		
Colony			-0.000	
			(0.000)	
Constant				-0.605
				(0.649)
	-0.095	0.144	0.162	-0.049
Observations	1,082	1,088	1,088	1,088
R-squared	0.05	0.05	0.05	0.05
Origin country FE	YES	YES	YES	YES
Other controls	All	All	All	All

*Note: Period 2013–2016. Dependent variable: FDI outflows on GDP. Other controls: labor, capital and property effective tax rates, VAT, personal income tax rate, shadow economy on GDP, start-up procedures, GDP per capita in PPP, IEF property right index, EFW freedom to trade internationally index, employment rigidity index, inflation, level of seignorage, government expenditure on GDP. The dependent variables have been rescaled by dividing by 1,000. Robust standard errors, clustered at destination country level, are reported in brackets. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***.*

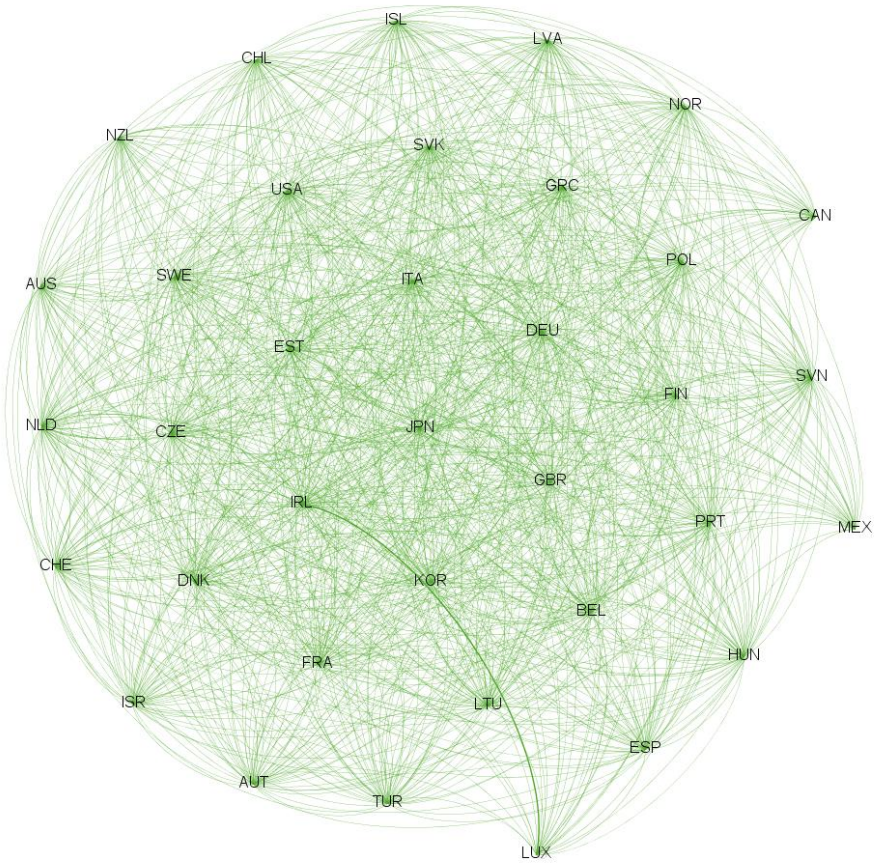
Table 8. Impact of tax complexity and statutory tax rate on FDI outflows, with different distance measures

	(1)	(2)	(3)	(4)
Diff. in statutory tax rate	-0.020	-0.030*	-0.030*	-0.018
	(0.015)	(0.015)	(0.015)	(0.014)
Diff. in time to comply with tax obligations	0.567**	0.517**	0.517**	0.549**
	(0.225)	(0.216)	(0.215)	(0.229)
Diff. in effective tax rate on labor	0.008	0.008	0.008	0.006
	(0.005)	(0.005)	(0.005)	(0.005)
Bilateral export	0.031			
	(0.020)			
Distance between the most populated cities		-0.000**		
		(0.000)		
Distance between capitals			-0.000**	
			(0.000)	
Colony				-0.603
				(0.651)
Constant	0.009	0.673**	0.701**	0.040
	(0.157)	(0.266)	(0.272)	(0.148)
Observations	1,082	1,088	1,088	1,088
R-squared	0.05	0.05	0.05	0.05
Origin country FE	YES	YES	YES	YES
Other controls	All	All	All	All

*Note: Period 2013–2016. Dependent variable: FDI outflows on GDP. Other controls: labor, capital and property effective tax rates, VAT, personal income tax rate, shadow economy on GDP, start-up procedures, GDP per capita in PPP, IEF property right index, EFW freedom to trade internationally index, employment rigidity index, inflation, level of seigniorage, government expenditure on GDP. The dependent variables have been rescaled by dividing by 1,000. Robust standard errors, clustered at destination country level, are reported in brackets. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ****

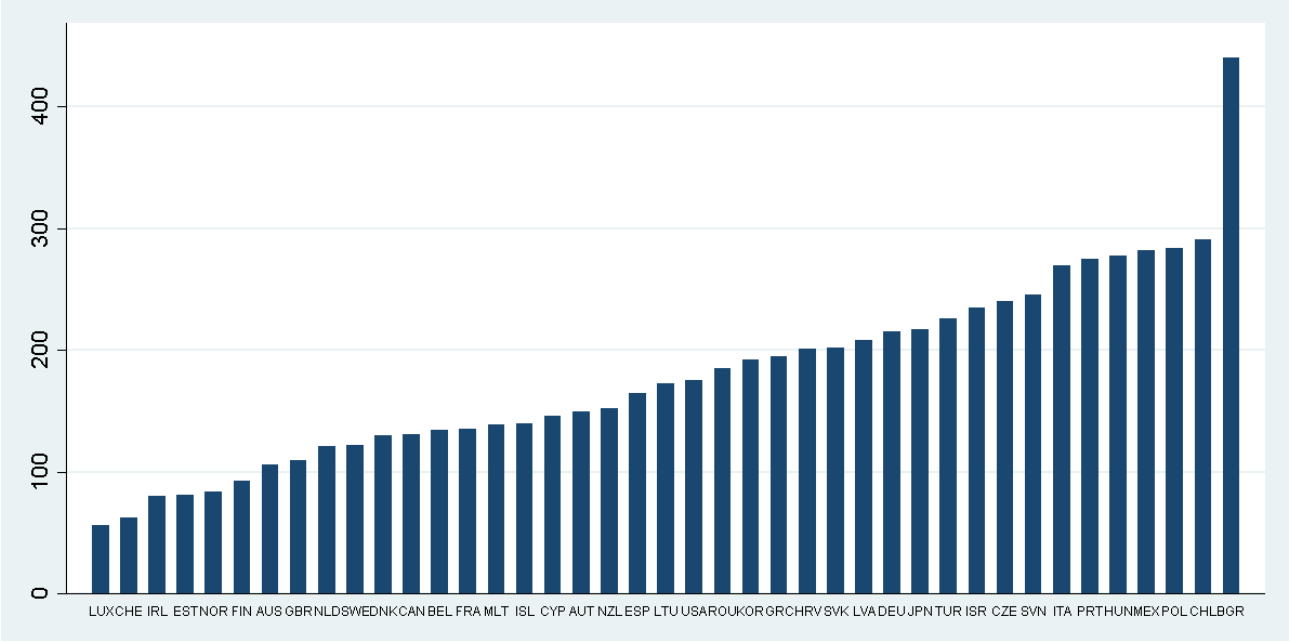
FIGURES

Figure 1. Bilateral flows of Foreign Direct Investment on GDP, network graph (2013-2016)



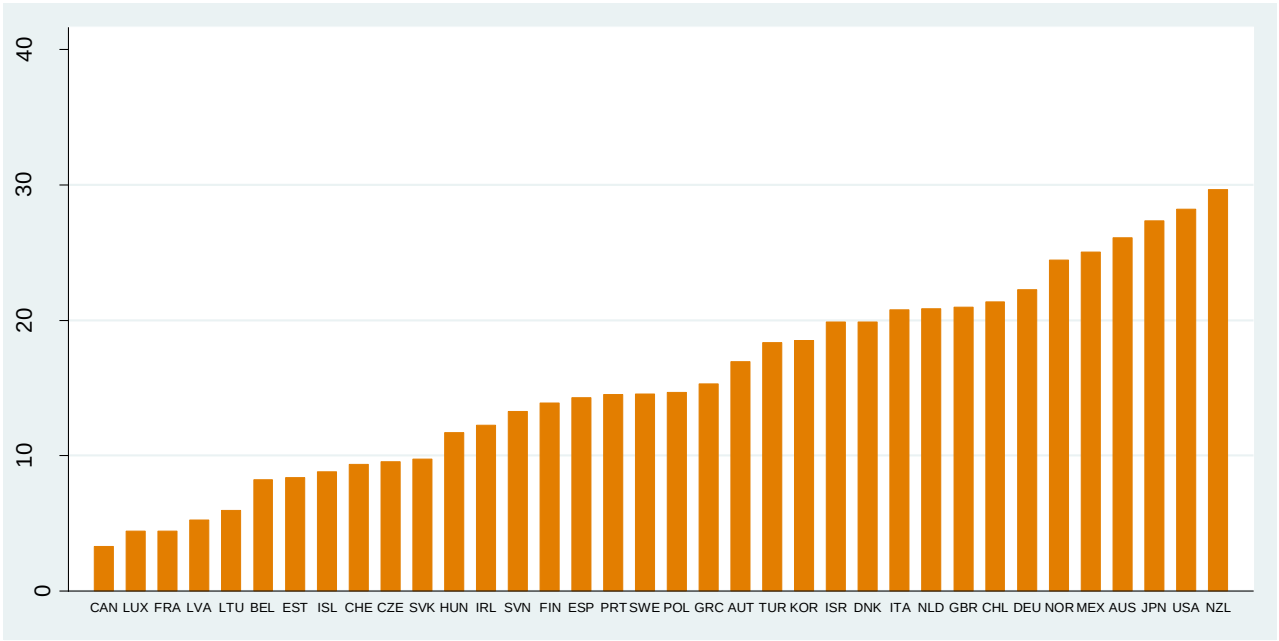
Source: elaboration from Eurostat and OECD data.

Figure 2. Time to comply with tax obligations, in hours, 2013-2016 average values



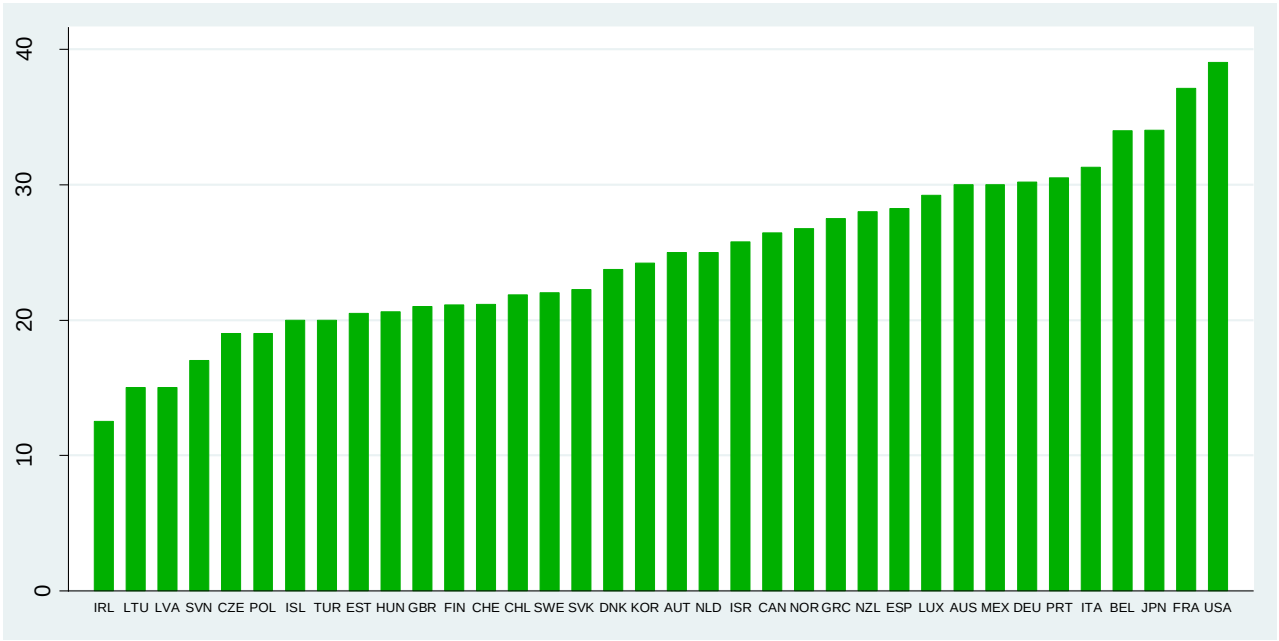
Source: Doing Business survey, World Bank.

Figure 3. Effective corporate tax rates (%), 2013-2016 average values



Source: Doing Business survey, World Bank.

Figure 4. Statutory corporate tax rates (%), 2013-2016 average values



Source: OECD

Appendix

Table A1. List of home and host countries

Country	***Code***
Austria	AUT
Belgium	BEL
Czech Republic	CZE
Germany	DEU
Denmark	DNK
Spain	ESP
Estonia	EST
Finland	FIN
France	FRA
United Kingdom	GBR
Greece	GRC
Hungary	HUN
Ireland	IRL
Italy	ITA
Lithuania	LTU
Luxembourg	LUX
Latvia	LVA
Netherlands	NLD
Poland	POL
Portugal	PRT
Slovak Republic	SVK
Slovenia	SVN
Sweden	SWE
Switzerland	CHE
Iceland	ISL
Norway	NOR
Australia	AUS
Canada	CAN
Chile	CHL
Israel	ISR
Japan	JPN
Korea, Rep.	KOR
New Zealand	NZL
United States	USA
Mexico	MEX
Turkey	TUR

Table A2. Summary statistics

	(1) N	(2) mean	(3) sd	(4) min	(5) max
Bilateral export	1,082	2.308	4.725	0.002	55.46
Diff. in effective tax rate on profit	1,082	-0.068	9.983	-25.25	26.38
Diff. in capital and property taxes	1,082	0.038	3.164	-10.90	10.90
Diff. in effective tax rate on labor	1,082	1.075	18.49	-49.60	49.60
Diff. in standard VAT rates	1,082	0.897	7.772	-20	22
Diff. in statutory tax rate	1,082	-0.659	9.009	-26.51	26.51
Diff. in personal top income tax rate	1,082	-0.164	17.85	-41.92	41.92
Diff. in inflation	1,082	-0.001	2.147	-8.945	8.945
Diff. in shadow economy	1,082	0.180	9.339	-24.07	24.07
Diff. in IEF property right index	1,082	-0.594	8.545	-27	26.45
Diff. in IEF trade freedom index	1,082	0.025	4.267	-16.90	16.90
Diff. in seignorage	1,082	0.092	5.400	-21.68	21.68
Diff. in start-up procedures	1,082	0.088	2.728	-8	8
Diff. in employment rigidity index	1,082	-0.040	1.444	-3.775	3.775
FDI /GDP	1,082	0.206	2.908	-19.74	84.30
Diff. in GDP per capita - PPP	1,082	-0.022	0.485	-1.656	1.402
Diff. in number of tax payments	1,082	0.014	0.561	-1.749	1.705
Diff. in time to comply with tax obligations	1,082	0.032	0.616	-1.530	1.648
Colony	1,082	0.035	0.184	0	1
Distance between most populated cities	1,082	4,677	5,010	59.62	19,335
Distance between capitals	1,082	4,695	5,002	59.62	19,335
Diff. in gov. expenditure on GDP	1,082	0.358	5.27	-14.182	14.182