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The institutional determinants of outward foreign direct investment

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ABSTRACT

This study focuses on the influence of institution quality on foreign direct investment (FDI) outflows. For empirical estimation, we use a dataset covering 102 home and 67 host countries from 2001 to 2016. We use the gravity approach and apply the Poisson pseudo maximum likelihood method to derive unbiased estimates. A set of institutional variables in a country is integrated into a single institutional index using principal component analysis. Our main findings are the following. First, we only identify a positive influence of the level of institutional development on FDI outflows for the institutionally developed countries. Second, we have not found evidence for crowding out national investment in the countries with weak institutions. Third, increases in the level of institutions stimulate horizontal rather than vertical outward FDI in an economy. Finally, institutional distance negatively affects the level of outward FDI only when the institutional distance between the two countries is large. The policy implications of this research are strongly in favour of further developing institutions.

KEYWORDS

outward foreign direct investment (OFDI), institutional determinants, gravity model, Poisson pseudo maximum likelihood, principal component analysis, horizontal FDI, vertical FDI

JEL CLASSIFICATION INDICES

F21

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1. INTRODUCTION

Understanding the determinants of bilateral foreign direct investment (FDI) flows in the world economy implies studying the characteristics of both the host and home countries. While there are a considerable number of papers searching for the various characteristics of host economies that affect FDI inflows, attention to home economies is currently limited.

In this paper, we focus on the characteristics of institutional development in the source countries that affect bilateral FDI flows. There is only a handful of papers on the institutional determinants of outward foreign direct investment (OFDI), so the chosen topic leaves room for new findings.

Theory does not provide a solid basis concerning the relationship between the level of institutional development and OFDI. On the one hand, stronger institutions mean lower costs for national producers, and hence, a higher level of OFDI. Thus, one can expect a positive link between the level of institutional development and the level of OFDI. On the other hand, national companies are likely to escape from countries with weak institutions and in some cases may demonstrate increasing OFDI as institutions weaken.

Based on the literature estimating the influence of the level of institutional development on FDI in the home economy, we have taken some steps to further understand the phenomenon. Namely, we check how an increase in institutional development affects OFDI in the countries with developed and underdeveloped institutions. We also investigate whether institutions influence both horizontal and vertical FDI in the home country. Finally, we study the influence of institutional distance between the source and recipient economies on the OFDI level.

Our contributions to existing research are the following. First, using a dataset comprising 102 home and 67 host countries between 2001 and 2016 and applying the Poisson pseudo maximum likelihood method, we only observe a positive influence of institutional development on OFDI for the developed countries. Second, we find that institutional development has an insignificant effect on FDI outflows for the countries with weak institutions, and thus, do not find evidence for the crowding out of domestic investment. Third, we discover a positive influence of the institutional development on the horizontal OFDI and its insignificant influence on the vertical OFDI. Finally, we show that the institutional distance negatively affects OFDI only when institutional distance is large.

This paper is organised as follows. Section 2 presents the literature review. Section 3 describes the hypotheses and the empirical specifications of the model. Section 4 addresses the methodological issues and describes the data. The empirical results are presented and discussed in Section 5. Section 6 offers conclusions.

2. LITERATURE REVIEW

The topic of this study belongs to the large field of the determinants of bilateral FDI flows. The econometric modelling of FDI flows (both inward and outward) is often based on the gravity approach that was first applied by Brainard (1997). The gravity approach implies that the level of bilateral FDI flows is positively correlated with the size of the countries and negatively correlated with the distance between them. The theoretical justification of the applicability of the gravity approach to cross-country FDI flows can be found in the modern models of horizontal

FDI (Markusen 1984, 2002) and vertical FDI (Helpman 1984; Helpman – Krugman 1985), as well as in the newest models with heterogeneous firms (Helpman et al. 2004). Empirical evidence for the gravity approach has been found in many papers (e.g., Bénassy-Quéré et al. 2007; Daude – Stein 2007; Kleinert – Toubal 2010; Bloninger – Piger 2014; Cezar – Escobar 2015).

Focusing on OFDI, various other determinants are studied in the existing literature in addition to the gravity variables. We can divide these determinants into three groups. The first includes different economic indicators, such as factor endowments (Egger 2001), inward FDI (Stoian – Mohr 2016), inflation (Kayam 2009), trade openness (Mishra – Daly 2007; Das 2013), exchange rates (Kyrkilis – Pantelidis 2003; Amal et al. 2009), innovation activity (Das 2013), trade costs (Daude – Stein 2007; Cieślik – Tran 2019), population (Stoian 2013), etc. The second includes various proximity indicators, such as GDP similarity (Cezar – Escobar 2015), a common language (Cieślik – Tran 2019), a common border (Perea – Stephenson 2017) and the existence of colonial ties (Perea – Stephenson 2017).

The third group of OFDI determinants includes institutional factors. Some papers focus on the influence of particular components on the institutional environment. Rasiah et al. (2010) found that improving government regulation in a home country has a positive effect on OFDI, while liberalization reforms seem to be insignificant. Brada et al. (2012) reported a U-shaped dependence between the corruption level in the source economy and the level of OFDI. Stoian (2013) found that trade liberalization reforms in a home country do not have a positive impact on OFDI, while policy reforms and the general improvement of institutions increase this. Wang et al. (2012) showed that government participation in the economy exerting institutional pressure on domestic firms has a significant impact on the outflow of FDI. At the same time, Bénassy-Quéré et al. (2007) reported about the almost insignificant impact of institutional quality in a home country on OFDI.

Another group of studies use aggregate indicators of institutional development in empirical research. For example, Das (2013) analyzed the dependence of OFDI on political risk, which includes different institutional indicators with a significant negative impact, such as political stability, the rule of law, corruption, conflicts and others. Using a simple average of six institutional indicators, Faria – Mauro (2009) showed that OFDI is positively correlated with institutional quality. While contributing to the analytical framework of the topic, Dunning – Zhang (2008) also acquired results supporting the hypothesis of public and private institutions' positive influence on OFDI.

Some researchers treat OFDI as evidence of escaping national capital due to weak institutions in the home country. Witt – Lewin (2007) argued that the low level of institutional development in a country leads to a rise in OFDI as a form of capital flight. Klimek (2015) showed that governance quality and political stability as components of the overall institutional environment may reduce capital outflows. Stoian – Mohr (2016) argued that the underdeveloped institutions indicating the existence of regulative voids lead to resource misallocation and competitive disadvantages that companies try to counteract through OFDI. According to them extremely high protectionism and corruption in the home market led to resource constraints and enhance escapist OFDI.

Some studies assessed the level of difference in institutional development between two countries and its influence on bilateral FDI flows. Cezar – Escobar (2015) showed that an increase in institutional distance negatively affects OFDI, as it imposes additional costs on investors. Bénassy-Quéré et al. (2007) and Ali et al. (2010) confirmed the negative influence of this factor by indicating that an increase in institutional distance reduces bilateral FDI.

It is important to note that most of the aforementioned papers reach their results by focusing on a particular country group. Developing and transitional economies were examined by Rasiah et al. (2010), Brada et al. (2012), Wang et al. (2012), Stoian (2013), Stoian – Mohr (2016), Sass – Vlčková (2019). Developed countries were analyzed in Witt – Levin (2007) and Cezar – Escobar (2015). It is important that studying a particular group of countries does not allow to generalize the results to all countries in the world, thus restricting on the applicability of the results achieved. In this paper we examine the largest world's FDI origin and destination countries that allows to derive policy implications that fit to countries with different level of economic development.

3. HYPOTHESES AND THE ECONOMETRIC MODEL

We are going to test the following hypotheses.

Hypothesis 1. An increase in the level of institutional development leads to an increase in OFDI.

From a theoretical point of view, an increase in the quality of institutions decreases the costs of doing business in a country and makes national companies more competitive in the international markets. Besides this, strong institutions mean lower uncertainty for national companies, which decreases their discount rate and encourages them by engaging in new investment projects (including projects abroad). Buchanan et al. (2012) postulated that strong institutions lower the volatility of FDI. For example, Klimek (2015) argued that high quality institutions in a home economy should facilitate closing deals with a host country's administration.[1] Consequently, we can expect larger OFDI in the countries with more developed institutions.

Hypothesis 2. Weak institutions stimulate investment abroad.

Underdeveloped institutions are often treated as an additional tax for national businesses in an economy (Daude – Stein 2007). On the one hand, poor institutions may induce capital in a home country to look for better and safer conditions in a host country. Another possible reason to invest abroad is risk diversification: corporations headquartered in a risky location will consider opportunities to transfer some of their assets abroad. Thus, we expect to observe a statistically significant negative relationship between the quality of institutions and the level of OFDI in the countries with weak institutions, denoting a crowding-out effect for domestic investment.

Hypothesis 3. Stronger institutions lead to an increase in horizontal (market-seeking) OFDI and are insignificant in terms of the level of vertical (efficiency-seeking) OFDI.

We expect that an increase in institutional development in a home country leads to an increase in the productivity of national companies, which allows them to set lower prices for their goods. Therefore, a larger share of national companies will be able to bear the fixed costs of investing abroad and the country will see increases in OFDI.

Decreasing the costs of operating in a home economy seems to have no straightforward effect on the sourcing patterns of national companies. So, we anticipate institutional development to have an insignificant influence on FDI outflows.

[1]Klimek (2015) pointed out that two Chinese companies, Huawei and ZTE were unable to acquire the American companies as the issue of national security was raised by the host country's lawmakers.

Hypothesis 4. Increases in institutional distance negatively affect OFDI only when the institutional distance is large to begin with.

Institutional distance increases the costs of direct investment between two countries. However, when countries are at the same stage of institutional development, a certain level of institutional distance is unlikely to be an impediment to FDI flows between them. When countries have substantially different levels of institutional development, companies should bear additional costs when adapting to specific conditions in the other country; this could act as a restrictive factor for the bilateral FDI flows.

In the research we use an econometric model, where $OFDI_{ijt}$, the dependent variable in the model is the value of FDI outflows from a home country j to a host country i in the year t. In the absence of a gravity model of FDI, we use an *ad hoc* approach for constructing an econometric model, analyzing the previous empirical literature and including it in the most often used FDI determinants.

The gravity variables in the model are the level of GDP in the host and home economies (GDP_imp_{it} and GDP_exp_{jt}, respectively) and the distance between them ($Distcap_{ij}$). Due to the predictions of the gravity model, we expect the GDP level to have a positive influence on the level of FDI between countries and the distance to have a negative influence.

We include three control variables for the host country in the model.

The trade openness in year t ($Openness_{jt}$, calculated as the sum of export and import flows divided by GDP in year t), indicating the level of a country's involvement in the world economic relations, is an important determinant of FDI inflows for the following reasons. First, a high level of openness is associated with a liberal trade regime, an encouraging factor for foreign investors (Trevino et al. 2008). Second, foreign investors prefer "path dependence", i.e., to invest in countries with solid economic ties. Third, trade growth due to the implementation of bilateral trade agreements stimulates FDI flows between countries (Waldkirch 2010).

A country's macroeconomic indicators significantly decrease the level of uncertainty, and hence, the level of risk that foreign investors should take into account when considering foreign projects. Following Liebrecht – Riedl (2014), we use the inflation rate in the recipient economy in year t ($Infl_{jt}$) as a proxy for its macroeconomic stability.

The third control variable is the urban population share in the recipient country (Urb_pop_{jt}). First, different agglomeration effects in the urban environment are often associated with the growth of business and firm investment activity (Duranton – Puga 2004). Second, rural areas are mainly suitable for agricultural projects: this is not a general pattern for FDI projects.

We expect trade openness and urban population share to have a positive influence on OFDI flows and inflation rate to have a negative influence.

Following the research papers mentioned in the previous section, we include two contiguity indicators in the dataset: a common language ($Comlang_{ij}$) and a common religion ($Comrelig_{ij}$). Firms face lower costs when investing in similar countries, so we expect a positive correlation between contiguity variables and the level of FDI between countries.

To investigate the role of institutions on OFDI, we implement the vectors of the institutional characteristics of both the home and host economies ($Inst_{jt}$ and $Inst_{it}$ respectively). Each vector includes 6 institutional parameters: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, the rule of law and corruption.

Thus, the estimated regression equation takes the following form:

$$\ln OFDI_{ijt} = \beta_0 + \beta_1 \ln GDP\_imp_{it} + \beta_2 \ln GDP\_exp_{jt} + \beta_3 \ln Distcap_{ij} + + \beta_4 Openness_{jt} + \beta_5 Infl_{jt} + \beta_6 Urb\_pop_{jt} + \beta_7 \text{Comlang}_{ij} + \beta_8 \text{Comrelig}_{ij} + \beta_9 Inst_{it} + \beta_{10} Inst_{jt} + \varepsilon_{ijt}, \quad (1)$$

where β_0 is the constant, $\beta_1 - \beta_{10}$ are the estimated coefficients before the regressors and ε_{ijt} is the error.

4. METHODOLOGY AND DATA

Using a standard OLS approach when estimating the gravity equation for FDI usually leads to biased results. This is due to some features of the data used. Firstly, the data on bilateral FDI flows usually include up to 70% of zero values. Taking logs of the gravity variables leads to the loss of these observations, since the logarithmic function is not defined in the zone of zero values of the argument. Replacing the log of the dependent variable with a negligible small constant (say, with $(1 + FDI)$) also gives biased estimates when using OLS (Bénassy-Quéré et al. 2007). Secondly, as a rule, heteroscedasticity and serial autocorrelation are observed in the evaluated models. Thirdly, a definite approach should be developed in relation to the presence of negative observations of the dependent variable.

Nowadays, most researchers when working with FDI gravity models use different estimation procedures such as Tobit regression (Daude – Stein 2007; Hattari – Rajan 2009), the Heckman two-step model (Hattari – Rajan 2009; Martin – Pham 2015), the Hausman-Taylor model (Egger – Pfaffermayr 2004), the two-step system GMM approach (Egger 2001), etc. Despite the fact that the estimation of gravity models by the least square's method is often criticized, it can still be found in some works (e.g., Daude – Stein 2007; Klimek 2015), usually as a test of the stability of the estimated models.

One of the best methods for providing unbiased and consistent estimates under the conditions of a large number of zero values of the dependent variable and heteroskedasticity is the Poisson pseudo-maximum likelihood method (PPML), which was first applied by Silva – Tenreyro (2006) to assess cross-country trade flows. PPML is an interpretation of the generalized method of moments (GMM) from a variety of maximum likelihood methods. In turn, GMM is often used to correct for the bias caused by the endogenous nature of the explanatory variables. The main feature of PPML is the use of a constant-elasticity model instead of a model utilizing logarithms. As shown by Silva – Tenreyro (2006), the estimation of a log-linearized form changes the properties of the error term, which becomes correlated with the explanatory variables in the presence of heteroskedasticity. PPML has been used in different studies exploring the determinants of FDI flows (Bénassy-Quéré et al. 2007; Kleinert – Toubal 2010; Cezar – Escobar 2015; Mariev et al. 2016).

In order to show the stability of the signs and the significance of the explanatory variables in the econometric model, we present the estimation results obtained by different methods. However, for the interpretation of the results we use the coefficients derived from the PPML method.

For the empirical analysis, we use bilateral FDI data for 102 home and 67 host countries.[2] The countries were chosen on the basis of data availability; the data covers the period from 2001

[2]The countries are listed in Appendix (Table A1).

to 2016. We have approximately 67% zero and 8% negative observations in the database. As negative FDI is associated with returning capital to a home country (divestment), and these flows do not represent FDI outflows, we treat such flows as zeroes. Offshore countries were not included in our dataset and a few outliers were removed before estimation. The total number of observations in the database is 100,909. The dataset represents an unbalanced panel because some observations are missing.

The FDI flows mainly represent UNCTAD data (*unctadstat.unctad.org*) and data from the websites of national central banks. The authors must mention two important limitations of the bilateral FDI data available. First, they include round tripping, when the same cash flow is calculated as FDI at least twice (Aykut et al. 2017). Second, some laundered illicit money flows can be considered as FDI. Although this may influence the results discussed below, the authors are unaware of any FDI bilateral data that are free of these drawbacks.

Data on GDP, inflation, trade and the share of urban population are derived from the World Bank (*data.worldbank.org*). Bilateral distance is sourced from Silva – Tenreyro's (2006) database,[3] which was computed using the great circle algorithm calculating the shortest distance between two points (countries' capitals in our case) on the globe.[4] Contiguity variables were obtained from the CEPII gravity database (www.cepii.fr).

The institutional variables are derived from the open-source data of the Worldwide Governance Indicators (WGI) project, providing data for six dimensions of governance: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and corruption (http://info.worldbank.org/governance/wgi/#reports).

In order to decrease the number of regressions in the analysis, we construct a single index responsible for the level of the institutional development of each country. In the absence of a rigorous mathematical model for calculating the institutional development index, we use principal component analysis (PCA) to generate a single indicator for the level of institutional development in both the home and host FDI countries.[5] One of the advantages of PCA is minimal loss of information while reducing the dimensionality of the data (Choi et al. 2016).

Before running regressions, the explanatory variables in Equation (1) were tested for multicollinearity using the VIF test and pairwise correlation. No multicollinearity problems were identified.

5. RESULTS AND DISCUSSION

In the first step of the estimation procedure, we check the variables included in our econometric model for their statistical significance. We estimate Equation (1) using different estimation

[3]Available at: https://personal.lse.ac.uk/tenreyro/LGW.html.

[4]The distance variable in the FDI gravity model implies that the costs of investing abroad rise with distance. There exist different approaches to capture the costs of investing abroad, including economic distance (Le, 2017), flow distance (Wu et al. 2020), remoteness (Dorakh 2020), *etc*. Contiguity dummies are also often included as a proxy for the adaptation costs in a foreign country (Neumayer 2011). Without the model losing validity, in this paper we follow the mainstream literature by using geographical (physical) distance, a common language and a common religion as the contiguity variables.

[5]The PCA approach is often used to calculate the index of institutional development: see, for example (Cezar - Escobar 2015; Sabir et al. 2019; Choi et al. 2016, Francois - Manchin 2013).

Table 1. Estimating the determinants of OFDI using different econometric methods

Method Dependent variable	OLS ln(*FDI*)	OLS ln(1+*FDI*)	LSDV ln(1+*FDI*)	Tobit ln(1+*FDI*)	PPML *FDI*
GDP of the host country (ln)	0.584*** (0.009)	0.262*** (0.003)	0.309*** (0.009)	0.310*** (0.007)	0.574*** (0.025)
GDP of the home country (ln)	0.651*** (0.012)	0.382*** (0.004)	0.009*** (0.012)	0.286*** (0.007)	0.709*** (0.034)
Distance (ln)	–0.890*** (0.017)	–0.553*** (0.008)	–0.644*** (0.025)	–0.645*** (0.020)	–0.548*** (0.037)
Inflation (home)	–0.036*** (0.004)	–0.005*** (0.000)	0.000 (0.000)	0.000 (0.000)	–0.050*** (0.012)
Urban population (home)	0.024*** (0.001)	0.007*** (0.000)	0.015*** (0.000)	0.016*** (0.001)	0.032*** (0.004)
Trade openness (home)	0.472*** (0.023)	0.358*** (0.009)	0.195*** (0.017)	0.194*** (0.010)	0.335*** (0.035)
Common language	1.060*** (0.055)	0.374*** (0.028)	0.366*** (0.086)	0.365*** (0.073)	0.259* (0.134)
Common religion	0.929*** (0.063)	0.700*** (0.028)	0.870*** (0.085)	0.870*** (0.077)	0.939*** (0.137)
No. of obs.	24,761	91,461	91,461	91,461	100,828
R-sq.	0.33	0.29	0.06	–	0.14

Notes: The robust standard errors are in parentheses; ***$P < 0.01$; **$P < 0.05$; *$P < 0.1$; Constant term not reported; OLS and LSDV standard errors are reported after correction for heteroscedasticity.
Source: Authors' calculations using the Stata program.

techniques. In Table 1, the results for the OLS, LSDV, Tobit and PPML methods[6] are presented. When estimating with OLS, we use both $\ln(FDI)_{ijt}$ and $\ln(1+FDI)_{ijt}$ as dependent variables. We do not include institutional variables at this stage. The results from Table 1 indicate that both the gravity variables and the contiguity variables are significant and have the expected signs independently of the estimation technique. Analyzing the control variables for the FDI home economy, we see that trade openness and the share of the urban population are positively associated with OFDI growth: the inflation variable is significant in three out of five estimation results.

To test Hypothesis 1, we include institutional variables in the model. Each institutional variable of the home economy is included separately in the model to avoid multicollinearity problems. All further estimation outcomes in this section are derived using the PPML technique.

[6]When applying the Poisson pseudo-maximum likelihood method instead of the log-linearized form, Equation (1) is expressed in an exponential form: $OFDI_{ijt} = \exp(\beta_0 + \beta_1 \ln GDP\_imp_{it} + \beta_2 \ln GDP\_exp_{jt} + \beta_3 \ln Distcap_{ij} + \beta_4 Openness_{jt} + \beta_5 Infl_{jt} + \beta_6 Urb\_po\ p_{jt} + \beta_7 \text{Comlang}_{ij} + \beta_8 \text{comrelig}_{ij} + \beta_9 Inst_{it} + \beta_{10} Inst_{jt})\ \varepsilon_{ijt}$.

As presented in Table 2 (Models 1–6), all institutional variables are significant and have positive signs, so we can conclude that the increase of the institutional quality in a home country leads to an increase in the OFDI flows. The other regressors in the econometric equation (gravity variables, home country controls and contiguity variables) are significant and have the expected signs. The inflation variable in the home economy is now significant in all specifications and has a negative impact on FDI outflows. The index of institutional development in the recipient economy is also positively correlated with OFDI in the home country.

The results of including the institutional index of the home economy in the regression analysis are presented in the right column (Model 7) of Table 2. The influence of this index is positive and statistically significant, confirming Hypothesis 1 that stronger institutions stimulate OFDI in the economy.

Next, we study the impact of institutions on OFDI in the groups of more and less institutionally developed countries. We divide all home countries into more and less institutionally developed according to their institutional index (columns 2 and 3 of Table 3).[7] The estimation results show that a higher level of institutional development only stimulates OFDI in the countries with more developed institutions: it is insignificant for the countries with less developed institutions.

As high-income countries are in general more institutionally developed (e.g., Kaufmann et al. 2005), we also test Hypothesis 2 by dividing the home countries according to GDP per capita. Using the World Bank's classification, we divide countries into 4 groups: high-income, upper middle-income, lower middle-income and low-income (columns 4–7 of Table 3). The estimation results are similar: in the group of high-income countries, higher institutional quality promotes OFDI; in the other groups, it does not produce a significant effect. So, we can conclude that we are unable to find a proof for Hypothesis 2 regarding the crowding out of national investment in the countries with weak institutions. Our estimations show that if institutions are weak, they are insignificant for OFDI.

To test Hypothesis 3 (the impact of institutional development on outward horizontal and vertical FDI), we divide the recipient economies according to the level of GDP per capita. We consider FDI to low-income economies to be vertical and FDI to high and upper middle-income countries to be horizontal. We do not interpret the influence of institutional development on OFDI for lower middle-income countries because, in our opinion, these FDI could be either vertical or horizontal. The estimation results show that, in accordance with Hypothesis 3, stronger institutions stimulate horizontal FDI and do not significantly affect the level of vertical FDI in the home economy (see Table 4).

In the final step of the estimation procedure, we focus on the institutional distance (ID) as an OFDI determinant. Following previous research papers (e.g., Cezar – Escobar 2015), we calculate institutional distance as the absolute value of the difference in the institutional indices of the home and host economies. We include the ID variable instead of indices for the institutional development of the home and host economies in Equation (1). In order to save space, in

[7]As presented in Table A1 in Appendix, the range of the values of the institutional quality index lies between –4.86 and 3.87 for the home country and between –5.46 and 4.20 for the host country. Based on the analysis of the distribution plots, we treat countries with an institutional index below zero as less institutionally developed and those with an institutional index greater than or equal to zero as more institutionally developed.

Table 2. Estimation of the impact of different institutional variables on OFDI with the PPML method

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
GDP of the host country (ln)	0.567*** (0.025)	0.585*** (0.026)	0.574*** (0.025)	0.580*** (0.026)	0.573*** (0.026)	0.570*** (0.025)	0.574*** (0.025)
GDP of the home country (ln)	0.667*** (0.034)	0.717*** (0.033)	0.701*** (0.035)	0.692*** (0.032)	0.725*** (0.034)	0.698*** (0.034)	0.709*** (0.034)
Distance (ln)	−0.529*** (0.040)	−0.618*** (0.036)	−0.568*** (0.037)	−0.612*** (0.037)	−0.540*** (0.038)	−0.551*** (0.037)	−0.548*** (0.037)
Inflation (home)	−0.071*** (0.012)	−0.084*** (0.010)	−0.069*** (0.012)	−0.088*** (0.011)	−0.043*** (0.012)	−0.061*** (0.012)	−0.050*** (0.012)
Urban population (home)	0.040*** (0.004)	0.037*** (0.003)	0.033*** (0.004)	0.039*** (0.003)	0.031*** (0.003)	0.031*** (0.004)	0.032*** (0.004)
Trade openness (home)	0.363*** (0.042)	0.326*** (0.030)	0.342*** (0.033)	0.341*** (0.031)	0.348*** (0.037)	0.331*** (0.033)	0.335*** (0.035)
Common language	0.327** (0.136)	0.236 (0.148)	0.269** (0.132)	0.254* (0.145)	0.267* (0.139)	0.268** (0.133)	0.259* (0.134)
Common religion	0.806*** (0.133)	0.928*** (0.137)	0.992*** (0.138)	0.949*** (0.137)	0.994*** (0.138)	0.899*** (0.137)	0.939*** (0.137)
Institutions in the host country	0.085*** (0.022)	0.086*** (0.021)	0.095*** (0.021)	0.088*** (0.021)	0.088*** (0.022)	0.093*** (0.022)	0.090*** (0.022)
Vote index	2.021*** (0.316)						
Political stability and no violence index		2.168*** (0.382)					
Government performance index			1.155*** (0.267)				

(continued)

Table 2. Continued

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Regulatory quality index				0.446* (0.265)			
Rule of law index					2.438*** (0.307)		
Corruption control index						1.574*** (0.249)	
Institutions in the home country							0.217*** (0.034)
No. of obs.	100,828	100,828	100,828	100,828	100,828	100,828	100,828
R-sq.	0.130	0.134	0.139	0.130	0.135	0.139	0.140

Source: Authors' calculations using the Stata program.

Table 3. The impact of institutions on OFDI in countries with different levels of institutional development and GDP per capita

	Institutional development		GDP per capita			
(1)	More developed (2)	Less developed (3)	High (4)	Upper middle (5)	Lower middle (6)	Low (7)
GDP of the host country (ln)	0.594*** (0.028)	0.449*** (0.048)	0.573*** (0.031)	0.433*** (0.055)	0.463*** (0.073)	0.576*** (0.059)
GDP of the home country (ln)	0.632*** (0.038)	0.965*** (0.051)	0.721*** (0.033)	1.039*** (0.069)	1.127*** (0.122)	0.578*** (0.112)
Distance (ln)	−0.560*** (0.040)	−0.316** (0.133)	−0.545*** (0.044)	−0.653*** (0.126)	−0.368** (0.175)	−0.354*** (0.097)
Inflation (home)	−0.065*** (0.017)	−0.019** (0.008)	−0.064*** (0.016)	−0.012 (0.015)	0.007 (0.011)	-0.053 (0.033)
Urban population (home)	0.034*** (0.005)	0.028*** (0.007)	0.035*** (0.005)	0.024** (0.010)	0.020** (0.009)	0.042*** (0.011)
Trade openness (home)	0.304*** (0.036)	0.850*** (0.093)	0.334*** (0.036)	1.059*** (0.304)	1.708*** (0.396)	0.280** (0.115)
Institutions in the home country	0.302*** (0.042)	−0.087 (0.088)	0.286*** (0.037)	−0.040 (0.095)	−0.219 (0.247)	−0.008 (0.100)
Institutions in the host country	0.076*** (0.023)	0.089* (0.048)	0.079*** (0.024)	0.097 (0.068)	−0.110 (0.096)	0.079 (0.066)
Common language	0.161 (0.141)	0.716** (0.311)	0.257* (0.137)	0.781** (0.279)	1.981*** (0.442)	0.142 (0.657)
Common religion	1.006*** (0.154)	0.307 (0.463)	1.289*** (0.172)	1.242*** (0.396)	1.611*** (0.606)	3.564*** (0.741)
No. of obs.	49,511	51,317	45,119	28,861	16,542	10,306
R-sq.	0.140	0.111	0.131	0.043	0.069	0.214

Source: Authors' calculations using the Stata program.

Table 5 we report only the coefficients before the institutional distance variable: all other regressors in the model are in general significant and have the expected signs. Analyzing the coefficients in Table 5 for the full sample of observations in the database, we can see that ID affects OFDI negatively only in the case of a large institutional distance between countries; otherwise, it is insignificant.[8]

[8]The value of the institutional distance variable lies in the interval from 0 to 9.33. Analyzing the distribution plots, we treat a value of ID greater than or equal to 4.0 as large, greater than or equal to 1.0 and less than 4.0 as medium, and less than 1.0 as small.

Table 4. Influence of institutions on OFDI depending on GDP per capita of the host economy

	GDP per capita			
	High	**Upper middle**	**Lower middle**	**Low**
GDP of the host country (ln)	0.558*** (0.037)	0.646*** (0.049)	0.887*** (0.077)	0.640*** (0.057)
GDP of the home country (ln)	0.702*** (0.043)	0.675*** (0.059)	0.748*** (0.119)	0.792*** (0.074)
Distance (ln)	−0.513*** (0.046)	−0.642*** (0.090)	−0.813*** (0.207)	−0.425*** (0.096)
Inflation (home)	−0.039*** (0.015)	−0.045** (0.020)	−0.073*** (0.025)	−0.079* (0.042)
Urban population (home)	0.035*** (0.004)	0.016** (0.008)	0.016* (0.008)	0.042*** (0.013)
Trade openness (home)	0.316*** (0.042)	0.387*** (0.061)	0.310*** (0.089)	0.444*** (0.089)
Institutions in the home Country	0.255*** (0.034)	0.332*** (0.060)	0.192** (0.082)	0.008 (0.078)
Institutions in the host country	0.132*** (0.036)	0.096 (0.074)	-0.151 (0.114)	0.098 (0.061)
Common language	0.357** (0.139)	0.431* (0.235)	0.166 (0.302)	−0.132 (0.491)
Common religion	1.342*** (0.163)	1.097*** (0.302)	0.720** (0.360)	3.575*** (0.884)
No. of obs.	49,418	24,779	17,566	9,065
R-sq.	0.142	0.092	0.128	0.196

Source: Authors' calculations using the Stata program.

Then we analyze the importance of ID variable separately for the countries with strong and weak institutions. As presented in Table 5, the result remains stable only for the countries with developed institutions. The influence of ID for the countries with weak institutions does not support Hypothesis 4: it is positive for the full sample of countries and for the subsample with a medium institutional distance between the home and host economies. In our opinion, the explanation of this result is twofold. First, it is simply the result of prevailing "south-north" to "south-south" FDI in the world economy. Second, companies from the institutionally less developed countries are more immune to the low quality of institutions in the recipient economies compared to companies from the more developed countries.

Remember that the result of testing Hypotheses 1 and 2 was that stronger institutions lead to an OFDI increase in the countries with developed institutions and are insignificant for the countries with less developed institutions. Further, we want to test whether this result is stable considering different levels of institutional distance between countries.

Table 5. The influence of institutional distance on OFDI

	All sample	Large distance	Medium distance	Small distance
All countries				
Institutional distance	–0.028 (0.027)	–0.245* (0.130)	0.077 (0.059)	–0.162 (0.158)
No. of obs.	100,828	16,668	57,012	27,184
Home countries with strong institutions				
Institutional distance	–0.032 (0.027)	–0.385** (0.156)	0.053 (0.060)	–0.142 (0.164)
No. of obs.	49,511	8,260	28,973	12,278
Home countries with weak institutions				
Institutional distance	0.139*** (0.051)	–0.081 (0.225)	0.428*** (0.097)	–0.303 (0.405)
No. of obs.	51,317	8,408	28,039	14,870

Source: Authors' calculations using the Stata program.

When we consider all the countries in the dataset, we observe that an increase in institutional development leads to an OFDI increase regardless the level of institutional distance between countries (see Table 6, where we again only report the coefficients before the institutional variable). Doing the same exercise for the countries with developed institutions, we find that an increase in the institutional quality in a home country leads to a significant increase in OFDI to

Table 6. The influence of institutional quality on OFDI depending on level of institutional distance

	All sample	Large distance	Medium distance	Small distance
All countries				
Institutions in the home country	0.216*** (0.034)	0.456*** (0.098)	0.184*** (0.047)	0.182*** (0.096)
No. of obs.	100,828	16,668	57,012	27,184
Home countries with strong institutions				
Institutions in the home country	0.302*** (0.027)	0.174 (0.193)	0.222*** (0.053)	0.215** (0.107)
No. of obs.	49,511	8,260	28,973	12,278
Home countries with weak institutions				
Institutions in the home country	–0.087 (0.088)	0.158 (0.210)	–0.095 (0.146)	–0.106 (0.284)
No. of obs.	51,317	8,408	28,039	14,870

Source: Authors' calculations using the Stata program.

the countries with a small or medium institutional distance and does not influence OFDI to the countries with a large institutional distance.

Note that OFDI from the countries with strong institutions to the countries with a small institutional distance is equivalent to horizontal FDI, while OFDI to the countries with a large institutional distance is equivalent to vertical FDI. Thus, the estimation outcomes presented in Table 6 also indirectly support Hypothesis 3 that stronger institutions support horizontal FDI and do not significantly affect the level of vertical FDI in a home economy.

An increase in the level of institutions does not lead to a statistically significant increase in OFDI in any of the samples (small, medium or large institutional distance between countries). This presents additional proof that Hypothesis 2 is inconsistent.

6. CONCLUSION

In this paper, we studied the impact of institutional development on FDI flows in home economies. Compared to the number of papers devoted to the institutional determinants in host countries, there are few papers focused on home economies.

Our methodological contribution is the application of the Poisson pseudo maximum likelihood method to derive unbiased estimates on how institutional development affects OFDI. Principal component analysis was used to generate a single institutional index of a country: this helps us to consider different aspects of institutional development with minimum information loss.

Estimating the influence of institutions on OFDI for all countries in the dataset, our results correspond to the existing strand in the literature and show that the countries with more developed institutions generate larger FDI outflows. We then took some further steps to understand the issue by studying countries with different development levels, by considering horizontal and vertical FDI separately and by examining the role of institutional distance between countries. The results showed that the influence of institutions on OFDI was very uneven within the dataset. First, we observed that institutions had an insignificant effect on OFDI in the countries with weak institutions. Second, we found that an increase in institutional development stimulated horizontal OFDI and was insignificant for vertical OFDI. Third, institutional distance seems to be a limiting factor in OFDI only when the institutional distance is large. If it is small, we can observe that companies do not face significant adaptation costs when investing abroad.

Although this paper does not aim to contribute to the theory of the influence of institutions on FDI, it clearly identifies a deficit in such knowledge.

Important policy recommendations follow from the results. First, improving institutions makes national companies more competitive in international markets, as is expressed in the increase of OFDI. Second, improving institutional environment is a long-term game; the countries with weak institutions should not expect their actions to have an immediate effect on local business investment activity abroad. Third, upgrading institutions leads to an increase in horizontal OFDI and has no impact on vertical OFDI, so the national government should not be concerned about shifting the demand off the country with an OFDI increase. Fourth, increasing the level of institutional development decreases the institutional distance between the most developed countries, and thus, stimulates both FDI outflows and inflows.

Unfortunately, using data on bilateral FDI flows imposed some limitations on our analysis. Thus, we cannot investigate the influence of institutional changes in the home economy on OFDI depending on the characteristics of particular firms, industries and regions. Using disaggregated data on firms, industries and/or regions in future research will provide a basis for new important empirical findings and policy issues.

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Appendix

Table A1. List of countries

Home countries	Host countries
Austria, Albania, Argentina, Armenia, Australia, Azerbaijan, Bahrain, Bangladesh, Belarus, Belgium, Bolivia, Botswana, Brazil, Bulgaria, Canada, Chile, China, Costa Rica, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Ghana, Greece, Guatemala, Hungary, Honduras, Iceland, India, Indonesia, Ireland, Italy, Israel, Japan, Kazakhstan, Kuwait, Latvia, Lithuania, Mexico, Moldova, Mongolia, New Zealand, Nigeria, Norway, Pakistan, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, South Korea, Serbia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, Uganda, United States, Zambia	Algeria, Angola, Argentina, Armenia, Austria, Azerbaijan, Australia, Bahrain, Bangladesh, Belarus, Belize, Belgium, Bosnia, Brazil, Bulgaria, Cameroon, Canada, Chile, China, Colombia, Congo, Costa Rica, Cote d'Ivoire, Croatia, Cuba, Czech Republic, Gibraltar, Guatemala, Denmark, Egypt, Estonia, Finland, France, Gabon, Georgia, Germany, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Iran, Iraq, Italy, Japan, Kazakhstan, Kuwait, Latvia, Lebanon, Liberia, Libya, Liechtenstein, Lithuania, Luxembourg, Malaysia, Malta, Mexico, Mongolia, Morocco, Myanmar, Nepal, Netherlands, New Zealand, Nigeria, Norway, Oman, Pakistan, Paraguay, Philippines, Peru, Poland, Portugal, Qatar, Romania, Russia, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Korea, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Yemen, Zambia

Table A2. Descriptive statistics of institutional quality indicators

Institutional indicator	Observations	Mean value	Standard deviation	Min.	Max.
Home country of FDI					
Voice and accountability	100,909	0.780	0.208	0.00	1.00
Political stability and absence of violence	100,909	0.725	0.096	0.38	0.98
Government effectiveness	100,909	0.663	0.247	0.25	1.00
Regulatory quality	100,909	0.744	0.187	0.00	1.00
Rule of law	100,909	0.686	0.208	0.17	1.00
Corruption control	100,909	0.500	0.212	0.17	1.00
Institutional index (PCA)	100,909	1.240	1.955	–4.86	3.87
Host country of FDI					
Voice and accountability	100,909	0.702	0.246	0.00	1.00
Political stability and absence of violence	100,909	0.727	0.103	0.35	0.98
Government effectiveness	100,909	0.608	0.268	0.00	1.00

(continued)

Table A2. Continued

Institutional indicator	Observations	Mean value	Standard deviation	Min.	Max.
Regulatory quality	100,909	0.722	0.202	0.09	1.00
Rule of law	100,909	0.663	0.218	0.17	1.00
Corruption control	100,909	0.474	0.209	0.17	1.00
Institutional index (PCA)	100,909	2.530	1.973	–5.46	4.20

Source: Authors' calculations using the Stata program.