

Determinants of the flows of foreign direct investments from Western to Eastern European countries

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ABSTRACT

I investigate which factors determine the flows of foreign direct investments from Western to Eastern European countries. The analysis is based upon the gravity model framework which argues that the choice of the foreign investment depends on the size of the donor and the recipient country; distance between the two countries as well as other control variables which determine bilateral flows of investments. I distinguish between general and transition-specific determinants of foreign investment flows. As general determinants of foreign investment flows I consider unit labor cost and corporate taxes. As transition-specific determinants that can explain different volumes of investment flows attracted by transition countries I consider: infrastructure, level of corruption, method of privatization; state of the competition policy, corporate governance and banking reforms of the recipient country. To perform the econometric analysis I am using random effects estimator and Hausman-Taylor estimator. The results of the analysis show that the privatization process and the state of banking reforms are determinants that have a statistically and economically significant effect on the capacity of transitional economies to attract investments from Western European countries.

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List of abbreviations

BIS - Bank of International Settlement

CEPII – Center for International Prospective Studies

CEE – Central and Eastern Europe

CIS – Commonwealth Independent States

EBRD - European Bank for Reconstruction and Development

EU - European Union

FDI - Foreign Direct Investment

GDP - Gross domestic product

HICP - Harmonized Index of Consumer Prices

OECD - Organization for Economic Co-operation and Development

M&A - Mergers & Acquisitions

WB – World Bank

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Introduction

Transition countries in Central Europe (Czech Republic, Hungary, Poland, Slovakia, and Ukraine); in Baltic (Estonia, Latvia, Lithuania) and Balkan region (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Montenegro, Romania, Serbia, Slovenia) are small open economies which heavily rely on foreign investments and on participation in international trade. To large extent, job creation in such countries depends on their capacity to address foreign investors and to attract flows of capital from abroad.

In previous studies, an economically significant, positive effect of inflows of foreign direct investments (FDIs) on growth of gross domestic product (GDP) in Central and Eastern European (CEE) countries was found (Kornecki, Raghavan, 2010). By introducing new technologies as well as increasing the capital level in the economy, inflows of FDIs induce economic growth (Benacek, Gronicki, Holland and Sass, 2000). New technologies which are introduced by foreign investors are consequently spread also to domestic industries (technological spillovers). Technological progress is essential for the country competitiveness.

Policy makers understand the importance of attracting FDIs and they act towards improving the economic and political environment in order to address foreign investors. According to the World Investment Report (2004) produced by the United Nations more than 90 % of all the changes over the period 1993 - 2003 by the national governments of transitional economies upon the FDI regulation have been undertaken to create more favorable environment to address foreign capital. These countries constitute an interesting sample as they were rather closed economies for a long period of time, they could not attract high volumes of investments. FDIs are therefore of particular importance in the transition process.

In this study I investigate which factors determine the volume of FDI that transitional economies can attract from Western European countries. In the empirical analysis I use a panel dataset containing bilateral flows of FDI from 14 donor (Western European) countries to 11 transition countries. The analysis is performed for the time period from 2001 to 2011.

The analysis is based upon the gravity model framework which argues that the choice of the foreign investment depends on the size of the donor and the recipient country; distance between the two countries as well as other control variables which determine bilateral flows of investments. I am primarily interested in determining and evaluating such determinants that can explain differences in the volume of FDI that transitional economies have attracted.

I distinguish between general and transition-specific determinants of foreign investment flows. As general determinants of foreign investment flows I consider unit labor cost and corporate taxes. As transition-specific determinants that can explain different volumes of investment flows attracted by transition countries I consider infrastructure, level of corruption, method of privatization; state of the competition policy, corporate governance and banking reforms of the recipient country.

To perform the econometric analysis I am using random effects and Hausman-Taylor estimator. The results of the analysis show that the privatization process and the state of banking reforms are determinants that have a statistically and economically significant effect on the capacity of transitional economies to attract investments from Western European countries.

The thesis is structured as follows: *Chapter 1* provides a literature review of the key determinants of foreign investment flows to the Eastern European countries; *Chapter 2* gives theoretical background to the quantitative analysis of the determinants of FDIs by discussing different approaches and models that authors use to perform their analysis and by describing in detail a gravity model framework upon which I build my econometric analysis; *Chapter 3* is devoted to data description. This *Chapter* also contains a detailed description of methodology that is applied to obtain data available for the analysis; *Chapter 4* provides analytical and econometric analysis. I also discuss the choice of the estimator for the econometric analysis. I evaluate results obtained from analytical and econometric analysis; In the *Conclusion* I assess the results from the analytical part and I draw some policy recommendations.

Chapter 1. Literature review on the key determinants of FDI flows

At the first stage of my analysis, I investigate which determinants are, according to the research and literature in this field, statistically and economically significant in explaining the capacity of countries to attract FDIs. It is important to note that in the following literature review I state only analyses that consider transition countries in their sample. Taking into consideration different economic and historical developments in transitional economies, determinants of foreign investments will differ for such countries.

Bevan and Estrin (2000) perform econometric analysis using a panel dataset on FDI flows from the Western European to transitional economies for the time period from 1994 to 1998. The authors are primarily interested in seeing whether European Union (EU) accession announcements can increase levels of foreign investments. They conclude that EU accession announcements, industrial development, corruption and private sector development have statistically and economically significant effects on the level of FDI flows.

Benacek, Gronicki, Holland and Sass (2000) use survey and econometric analysis with a strong focus on Hungary, Poland and the Czech Republic. The authors find that their econometric study supports the survey results which show that relative labor costs, privatization process and trade barriers of the recipient countries are important determinants for decision making of Western European investors. The analysis is performed for the period of the first 10 years of the transition process.

Johnson (2006) extends the previous research by including members of Commonwealth Independent States (CIS) to the sample and he compares CIS to CEE countries in regards to their capacity to attract foreign capital. The paper uses panel data on total FDI annual inflows for 25 transition economies for the time period from 1993 to 2003. Fixed effects and random effects

panel data model analyses present that the primary privatization method has a significant effect on inflows of foreign capital.

More recent analysis of Leibrecht and Riedl (2012) uses a spatially augmented gravity model to explain flows of FDIs to CEE countries. In the analysis they use information on donor countries, recipient countries and they use a “third-country effect” meaning that the third country information can help to explain bilateral flows of direct investments. The authors evaluate a significant impact of infrastructure, wages and privatization on the capacity of transition countries to attract FDIs. The authors conclude that the core gravity variables are statistically significant with expected signs.

A paper by Bos and Laar (2004) uses a gravity model approach to study whether there is an “announcement effect” from the EU on the flows of direct investments. Their paper uses a sample of bilateral flows from the Netherlands to, at that time, EU candidacy countries and compares them with the flows of investments to Central Asian countries. The authors use data for the time period from 1987 to 2001 and conclude that there is no “announcement effect” from the EU for the countries in their sample.

Folfas (2011) uses the gravity model approach to investigate flows of capital between the EU member states. The paper confirms that flows of capital between the EU countries are determined by standard gravity model variables such as: the GDP of the donor and the recipient country and distance between the countries. He further concludes that a lower tax burden and a transparent tax structure have a significantly positive impact on addressing foreign capital. The author uses data on bilateral investment flows for the period 1990 – 2009 and the gravity model is estimated by the random effects and Hausman-Taylor estimator.

Chapter 2. Model specification

To investigate the factors that determine volumes of FDIs most authors use econometric analysis. They perform regression analyses in which they control for potential determinants of investments flows. Some authors also use survey analysis to support their results from quantitative analyses.

The literature provides many different models and theoretical background to the quantitative analysis of the determinants of FDIs. Many authors build their quantitative analyses on Dunning's (1973) OLI paradigm. It is a firm level framework which proposes that foreign investments can be explained mainly by three different categories of factors: ownership advantage (O) for firms to operate abroad, locational advantages (L) to operate abroad or the benefit of internationalization (I).

My aim is to develop a model which enables me to use data on bilateral foreign investment flows from Western to Eastern European countries controlling for various variables which act as possible determinants explaining different magnitudes of investment flows. I therefore follow the gravity model framework, which argues that the size of the donor and the recipient country as well as the distance between them is an important determinant in the choice of the foreign investment.

Specification of the model:

$$\ln(FDI_{ijt}) = \beta_0 + \beta_1 \ln(GDP_{jt}) + \beta_2 \ln(GDP_{it}) + \beta_3 \ln(DIST_{ij}) + \beta_4 X_{ijt} + \mu_{ij} + v_{ijt}$$

where,

FDI_{ijt} = flow of foreign investments from donor country i to the recipient country j at time t;

GDP_{jt} = size of the economy of the recipient country j at time t, usually approximated by GDP¹;

GDP_{it} = size of the economy of the donor country i at time t, usually approximated by GDP;

$DIST_{ij}$ = distance between economic centers of host and home economy;

X_{ijt} = vector of other control variables which determine bilateral FDI flows;

μ_{ij} = individual location-pair specific effect;

v_{ijt} = error term.

The gravity model is a conceptual framework widely used in empirical analyses in various fields of economics. This framework has become a quite popular and successful analytical tool to analyze flows of goods and services among countries, migration flows, number of phone calls and other due to its simple applicability and high explanatory power. Recently, many authors have applied the gravity model framework to the analysis of capital flows, especially flows of FDI between countries.

¹ Size of the economy is in the literature usually approximated by the GDP variable, discussion and detailed description of the variables will be provided in Chapter 3.

Chapter 3. Data description and methodology

3.1. *Sample countries*

In my empirical analysis I use panel data on bilateral flows from Western to Eastern European countries. As a sample of the recipient countries, I consider: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Poland, and Slovakia.

There are more transitional countries in Europe, however, in case of Belarus and Ukraine, their strong economic and political ties to Russia and also their own political involvements collide with the pattern of countries that I am observing in the sample.² I don't consider Serbia, Montenegro, and Bosnia and Herzegovina due to their recent division; data available on such countries don't constitute long enough time series to be included into my empirical analysis. There is no available public data on bilateral investment flows for Romania. Therefore I have a sample consisting of 11 recipient countries.

As donor countries I consider Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Spain, Sweden, Switzerland, and United Kingdom. I evaluate that investment flows from the donor countries cover nearly 85 % of the total FDI flows to recipient countries and the bilateral flows from other countries to recipient countries represent only a small fraction (less than 0.5%) of total FDI flows. Therefore including more donor countries would not have a significant impact on the total amount of investments analyzed. I consider a sample of the above listed 14 countries as a sample of the donor countries. In total, my sample combines 154 different pairs of donor-recipient countries.

² Primarily, the aim of the study is to determine and assess measures undertaken by countries that are **actively** conducting their policies towards deeper international involvements and attracting foreign capital. Belarus and Ukraine, as successor state of the former Soviet Union, have tight economic and political connections to Russia, which has a significantly negative influence on their capacity to participate in the international trade and to attract foreign capital.

3.2. *Dependant variable – FDI flows*

Data availability on bilateral flows of foreign investments allows me to study the time period from 2001 to 2011. Many of the recipient countries of my sample have declared independence or became sovereign states in the first half of the 1990's. In the first years of their existence their primary political and economic aim was to set up a functioning institutional framework rather than addressing foreign investors. I believe that the period from 2001 to 2011 is relevant for analyzing the capacity of transitional economies to attract foreign investors. In this period, all the countries had an established institution framework and were actively conducting their policies towards deeper international involvements and towards attracting foreign capital.

Many authors use in their analysis data on FDI stocks. However, since the model uses variables on GDP of the host and recipient countries which are flow variables, I argue that it is more appropriate to measure FDIs in flows, not in stocks, to retain the consistency in the methodology of the variables used in the model.

Many authors use aggregated data of FDIs to recipient countries; therefore such analyses don't consider data at the bilateral level, but only the total amount of flows of FDIs to recipient countries. I believe that data on bilateral flows contain more information and also enable me to control not only for the recipient-specific but also for donor-specific variables.

I use data on yearly bilateral flows of FDIs. Data come from the database of the Organization for Economic Co-operation and Development (OECD) and the national sources of the recipient countries. If the primary data from the source are measured in a local currency, such as Lithuanian Litas (LTL), I use average yearly exchange rate to convert them to million US dollars to obtain the same measurement units across countries. To obtain data in real terms, I

adjust for inflation by using the Harmonized Index of Consumer Prices (HICP)³ of the recipient country.

Based on the OECD Benchmark Definition of FDI (3rd edition, 1996) and IMF Balance of Payments Manual (5th edition, 1993), I define that FDIs involve a 10 per cent threshold value of ownership and FDIs consist of both initial transactions to create and invest and subsequent transactions between the investor and the recipient enterprise to maintain, expand or reduce the existing investment. In more detail, FDIs can be divided into three broad categories:

- a new foreign investment flow which is the foreign investors' purchase of an enterprise in a host country. This can be undertaken in a form of mergers & acquisitions (M&A) of an existing enterprise or in a form of greenfield investments
- intra-company transaction that can be in the form of short term or long term borrowing and lending of funds between the parent company and its affiliates
- reinvested earnings which are enterprise earnings that are not distributed in form of dividends nor reinvested back to the mother company or home country.

As a consequence of large disinvestments, observations on bilateral flows of FDIs can also have negative values. Our model presumes taking the log form of the variable. In this case, there are different approaches in the literature. One approach suggests dropping such observations on negative values. Another approach suggests replacing negative values by small positive values that would enable the authors to use log forms. Differently, some authors suggest

³ HICP data are obtained from Eurostat and national sources (according to the methodology of Eurostat: all items HICP, 2005=100).

adding a constant to all of the observations in the manner that all of the observations would become positive.

In the analysis of FDIs, dropping negative values constitutes a broad consensus in the literature. Negative values of FDI flows are rare occasions which happen only in case of huge disinvestments. The primary question of the analysis is concerning the factors that determine the capacity of transition countries to address foreign investors, meaning that the primary question aims to answer the determinants of the origin of the investments, not the disinvestments. There is no available public data on inflows of FDIs to recipient countries; however, dropping values on significant disinvestments enables me to better capture the capacity of transition economies to attract investments (as the investments are originated).

Moreover, regression results are very sensitive to different values of the constant that would be added to the observations. This way one observation (a negative outlier) can significantly change regression results. By dropping the negative values, I lose approximately 13 % of all the observations on the flows of FDIs.

3.3. *Determinants of FDI flows*

I provide a detailed description of the determinants of FDI flows that I consider in the model. The model presumes distance, the size of the market of the donor and the recipient country as core determinants of the flows of direct investments.

3.3.1. Core determinants of FDI flows

Distance

We live in a highly globalized world where relative distance always becomes shorter and shorter; however, distance still plays an important role for investors in deciding where to place an investment. At this place, I do not consider only geographic distance but also cultural distance. Neighboring countries often share cultural, historical and linguistic characteristics that make investing and understanding the customers' behavior easier. The further we go, the more distant customer behavior and traditions become. To approximate for the physical and also cultural differences between countries, I use the distance between capital cities of the donor and recipient countries. To get data on the distance between the capital cities, I use a database of Centre d'Etudes Prospectives et d'Information Internationale (CEPII)⁴. The variable is measured in km. The gravity model framework presumes that the higher the distance between donor and recipient countries the lower is the attractiveness of such an investment. This hypothesis is confirmed by many research papers in the field.

Market size of the economy

The gravity model uses the size of the economy or of the market of the recipient and the host country as a core explanatory variable. The authors approximate the size of the economy by different variables such as GDP, GDP per capita, population, etc.

In my further analysis, I approximate the market size of the donor and recipient economy by the GDP measure. A measure on GDP is most widely used as an approximation of the market size in the literature of FDI analyses.

⁴ Center for International Prospective Studies

Naturally, the bigger the country measured by GDP, the higher the flow of FDIs should be. Higher country outputs enable them to take and to attract more investments. Such a hypothesis is also supported by the research of Bevan and Estrin (2000).

Data on GDP come from the World Bank (WB) database, measured in current US dollars. To observe data in real terms I adjust for inflation by using the HICP index of the given country.

Broadly building on the literature and research in this area, I construct a set of control variables that will be used in my model. As mentioned above, the recipient countries of the sample are specific in the sense that they have gone through the transition process, therefore the set of controls will be adjusted to this fact. I distinguish between general variables and transition-specific variables as determinants of FDIs.

3.3.2 General determinants of FDI flows

Unit labor cost

Unit labor cost is an important determinant for investors when they evaluate decisions about the location of an investment. Broadly said, the lower the unit labor cost, the higher the profits may be for an investor. Countries of my sample do not publish data on unit labor cost but I believe that the factor of price of labor is a strong point of decision making of investors and therefore I have decided to include a proxy variable for unit labor cost – difference in average yearly wages between the donor and the recipient country. I have decided to use the difference in wages between the donor and the recipient country, instead of the average yearly wages in the recipient country since a German investor would consider wages in Hungary or in another part of Eastern Europe to be relatively different than for a Spanish investor.

I conclude that I would expect a negative sign on the ULC variable, meaning that the bigger the difference is in wages between the donor and the recipient country, the higher the incentive for the investor to allocated money in such a country, holding all the other variables constant. Bevan and Estrin (2000) and Benacek, Gronicki, Holland and Sass (2000) in their research papers find economically positive and statistically significant effect of unit labor cost on FDIs.

To obtain data on yearly average gross wages for donor and recipient countries, I use the database of the United Nations Economic Commission for Europe. I compute the difference in wages between the donor and the recipient country. Variables are given in US dollars (at current exchange rates). To obtain data in real terms, I adjust the differences in the wages for inflation by deflating the nominal variables using the HICP index of the donor country. Such an adjustment is done because a potential investor values differently a nominal value across time. The variable is measured in US dollars.

Tax:

One of the strategic objectives for an investor to place an investment abroad is profit maximization. A tax structure and its transparency therefore play in this regard an important role. I use data on corporate income tax, which I believe is the most relevant variable of the whole tax structure to be considered by the potential investor. Data are measured in percentage points and come from the KPMG database on corporate income tax.

3.3.3. Transition-specific determinants of FDI flows

Transition-specific determinants measure how promptly and successfully countries have adjusted to market economy. As countries in our sample were rather closed economies for a long period of time, they did not attract high volumes of investments at that time. Therefore, measures

undertaken by certain countries during the transition process toward more open market economy had a significant effect on the success of attracting FDIs.

Competition policy

I use an index of the European Bank for Reconstruction and Development (EBRD) for competition policy. As defined by the methodology of the EBRD, the competition policy index measures effective enforcement of competition policy, possibility of agents to freely enter the market and competition; and the legislation concerning M&A and joint ventures.

Privatization

Privatization is a signal of commitment to private ownership. Privatization itself creates opportunities to attract FDIs. As a measure of privatization, I use the EBRD index of large-scale privatization. As given in the methodology of the EBRD, the index on privatization measures a fraction of private ownership of all the enterprise assets and progress in corporate governance.

Banking reform

I measure the state of the banking system by the EBRD statistics on banking reform and interest rate liberalization. The methodology of the EBRD describes that this index measures the state of convergence of banking laws and regulations to standards proposed by the Bank of International Settlement (BIS) and also a provision of the full set of competitive banking services in the recipient countries.

Infrastructure

Investors often consider an insufficient infrastructure network to be an obstacle for the location of their investment. Countries largely invest to improve the highway infrastructure, water and electricity supplies that can significantly decrease transportation and operating costs of potential investors. As an indicator of infrastructure level, I use the EBRD index of infrastructure.

Enterprise restructuring

To measure enterprise restructuring, I use the EBRD statistics on governance and enterprise restructuring. As given by the methodology of the EBRD, this indicator assesses the legislation that governs and controls the corporate environment, such as bankruptcy legislation, legislation on credit and subsidies etc.

The EBRD published every year a Transition Report. The transition report assesses developments in various areas of the transition process.

The measurement scale for the EBRD indicators ranges from 1 to 4+. The EBRD defines that 1 represents little or no change from a rigid centrally planned economy and 4+ represents the standards of an industrialized market economy. EBRD indexes are scaled by 0.33 points; therefore they take 11 different values from 1.00 to 4.33.

EU membership

As supported by the literature, many authors conclude that the EU accession announcements and the accession itself had a statistically significant and quantitatively important effect on FDIs. Such results are provided by Clausing, Dorobantu (2005), Baldwin, Francois, and Portes (1997) and others. EU membership is a dummy variable that equals 1 if a country is a member country of the European Union and 0 if it is not.

Corruption

There have been many studies on the effect of corruption in transition economies on foreign investments. Smarzynska and Wei (2000) argue that a higher level of corruption increases operating costs of potential investors, therefore a higher level of “small or big corruption” decreases the profitability of investments.

As a measure of corruption, I use a yearly statistic of Transparency International. As of 2012, the Corruption Perception Index by Transparency International ranks 176 countries on a scale from 0 to 100, where 0 is a very corrupt country and 100 is a transparent country. In prior years, the scale measure was from 0 to 10.

Chapter 4. Empirical analysis

4.1. Descriptive statistics

I start the empirical analysis with descriptive statistics on the flows of FDIs which could provide a general idea about the main variable of interest. *Table 1*⁵ shows a ratio of net inflows of FDIs to GDP flowing to recipient countries in the time period from 2001 to 2011.

Data on the ratio of the net inflows of FDIs to GDP come from the WB database. From the ratio of net inflows of FDIs to GDP, it is visible that there is a sudden drop in the statistics in the year 2008/2009 for almost all the recipient countries. It seems from data that the general worldwide economic situation had impact on the investment flows to the Eastern European counties.

EU accession announcements and the accession itself have been evaluated by many authors as a significant determinant of increased levels of foreign investment flows. In total 9 out of 11 recipient countries have become members of the EU during the period of data observation. Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia became members of the EU in May 2004 and Bulgaria joined the EU as a member state in January 2007. When I observe data, I don't see any significant increase in the net flows of foreign investments either at the time of their accession or before their accession, in years 2001-2003 (as a result of positive EU accession announcements).

For some countries, such as Estonia, Hungary, Latvia and Poland I observe an increase in the statistics in the period from 2005 to 2007. However, such an increase is also visible for

⁵ See appendix. All the referred tables are presented in Appendix.

Croatia, Macedonia, which have not yet entered the EU and also for Bulgaria, which was at that time only advancing in the admission process. Therefore according to *Table 1* I conclude that there is no visible increase in the flows of FDI to be attributed to EU accession or positive EU accession announcements.

It can be observed from the statistics that there is a slightly different magnitude of net investment flows to GDP across countries. For countries such as Bulgaria, Estonia and Hungary I observe couple of big shocks meaning that there is economically a significant increase in the statistics measuring the ratio of net investment flows to GDP.

Not considering such observations (such observations are not numerous) I evaluate that the net flows are broadly between 4 to 8 per cent of GDP which supports the presumption of the gravity model framework that the investment flows are proportionate to the size of the recipient country (as measured by GDP).

However, without controlling for any other variables, I cannot draw any deeper conclusion. In order to gain a better understanding of the determinants of FDI flows I proceed with an econometric analysis.

4.2. Regression analysis

I firstly estimate my model without any controls. To estimate such a model, I use a pooled OLS estimator as a benchmark regression. *Table 2* provides estimates and standard errors of the regression analysis. *Column 1* of the referred table presents estimates of the initial regression which includes only core variables of the gravity model framework. I assess that all of the variables are statistically significant (at 1% significance level) and they have expected signs.

I evaluate, that according to this baseline regression, 1% higher GDP of a donor

(recipient) country means on average a 0.33 (1.09) % higher investment flow between countries, holding all the other variables constant.

At this point, I start including sets of control variables into the model. Firstly, I look at the cross-correlation of my explanatory variables. I evaluate that there is no strong positive or negative correlation either between the core and general explanatory variables or between the core and transition-specific independent variables; it is worth noting that only transition-specific variables display higher cross-correlations between themselves. I will have to consider this fact when choosing the set of control variables among the transition-specific variables.

Firstly, I include into my regression only general control variables. I have previously defined that I consider ULC and tax as general (not transition-specific) determinants of FDI flows. Regression results can be seen in *column 2, table 2*.

All of the variables are statistically significant (at 1% significance level); estimates on the core gravity variables are a bit higher in comparison to the estimates from the first estimation, however, all the estimates have expected signs. I proceed with the estimation of the model that will include core gravity variables and transition-specific determinants.

Estimation results of the transition-specific variables are provided in *column 3 of table 2*. It can be seen that many of the transition-specific explanatory variables are significant; however, not all of them have expected signs. All the core gravity model variables are statistically significant (at 1% significance level) with expected signs. Estimates on the core variables are comparable to the measures obtained in the estimation with general control variables. According to the estimation 3, better state of the enterprise structure, lower levels of corruption and the EU accession announcements have negative effects on the flows of FDIs. All of the above-mentioned explanatory variables are statistically significant (at 1% significance level).

I proceed by estimating a regression that will include all the variables that I have determined as potential factors having an impact on the flows of FDIs to the Eastern European countries.

By estimating a regression with all the control variables (*column 4 of table 2*) I observe that the core gravity model variables are statistically significant (at 1% significance level) with expected signs, estimates are comparable to the ones obtained in the previous regressions. General control variables are observed to be also statistically significant (at 1% significance level) with estimates economically comparable to the previous estimations. Estimates on the core explanatory variables are statistically significant and they have expected signs.

However, as far as it concerns the transition-specific control variables, many of the estimates have unexpected signs. Especially, it is to my interest that the dummy variable EU, which denotes EU membership, is statistically significant in both regression estimations (*column 3 and 4*), having a negative estimate which would mean that an EU accession or EU accession announcement would have a negative impact on the flows of FDIs, holding all the other variables constant.

As I examine the regression outputs I presume that such an unexpected sign is caused by high correlation of the EU dummy variable with the other transition-specific control variables. EU accession is associated with achieving accession goals which are closely related and can be measured or approximated by many of the variables that I include in the regression as transition-specific control variables. Therefore I estimate a regression in which an EU dummy variable serves as an approximation of the general developments in the transition process (*column 5, table 2*). Once the transition-specific variables are excluded from the regression, an estimate on the EU dummy variable is positive and statistically significant. Therefore, by including the

transition-specific explanatory variables into the regression estimation, the EU dummy variable loses its economic significance and explanatory power and becomes redundant.

As far as it concerns other transition-specific control variables, *table 3* provides the cross-correlation between such variables. I observe that the correlation between the transition-specific variables is high. High correlation between two or more independent variables means that variables may contribute redundant information to the regression model and can lead to unstable coefficients.⁶ All of the transition-specific variables (except for the EU membership) measure a development of the transition countries from the centrally planned structure of their economies towards the open market economies, therefore conceptually they are closely related and cross-correlation among such variables is high.

Tables 4a) - e) provide a statistics on the minimum, median and maximum value of the transition-specific control variables across countries over time. I provide such statistics to point out the variation in the variables. The EBRD indexes take 11 different values ranging from 1 to 4.33. I observe that there is not much variation in the given transition-specific variables over time. Especially, the observations on infrastructure and enterprise restructuring do not show much variation what certainly limits their explanatory power.

By considering statistical significance of the variables (as given in *column 3 and 4, table 2*), variation of the variables over time (as given by *Tables 4a) - e)*); and the cross-correlation among the variables (as given by *Table 3*) I conclude to drop determinants of competition policy, enterprise restructuring and infrastructure out of the regression analysis in order to avoid redundant information in the model.

At this point I would like to note that putting lagged variables of transition-specific

⁶ Large standard errors and low t-statistics.

control variables does not change the estimates significantly (neither economically nor statistically) and does not improve the model.

I proceed with the estimation that includes further considered variables: as general control variables I consider the difference in wages between the donor and the recipient country and the corporate income tax in the recipient country. As transition-specific control variables I further consider the state of the banking reforms, corruption and the method of privatization. Such control variables are also most frequently evaluated in the literature as transition-specific determinants of the flows of foreign investments. *Column 7 in table 2* provides an estimation of this regression. I assess that all the estimates have expected signs and all of them are statistically significant (at 1% significance level) except of the estimate on the privatization.

By performing the analytical and econometric analyses I have determined the set of control variables that are used in the model. I proceed with the discussion of the estimators.

So far I have been using the pooled OLS estimator, which only pooled all the observation on my variables together and didn't account for the structure of the data. However, I am following the same 154 country pairs or cross sections, which enables me to use panel data estimation methods. The fixed effects estimator uses a transformation to remove the unobserved, time-constant effect (characteristics which are specific of country pairs) prior to estimation. Along with the transformation, all time-constant explanatory variables are also removed. The gravity model framework considers distance as one of the core explanatory variables, distance between two countries is a time-invariant variable, and therefore using a fixed effects estimator I would not be able to estimate time-invariant variables such as distance.

I estimate my model with the random effects estimator. Naturally, I assume that the idiosyncratic, time-varying error is uncorrelated with each explanatory variable across all time

periods (the same assumption holds for fixed effects estimation), however, by estimating the random effects estimation, I am imposing an additional assumption that the unobserved, country-pair specific effect is uncorrelated with each explanatory variable in all time periods. This additional assumption does not need to reflect the reality and it will be further discussed.

In *table 5* I provide estimates of the final set of my explanatory variables. Therefore *column 1* in *table 5* provides the same estimation as I have already described in *column 7* of *table 3*. I want to make the comparison between different estimators evident therefore I am using a separate table for the estimations that include the final set of the explanatory variables.

Random effects estimates can be seen in *column 2* of *table 5*. I evaluate that most of the variables are economically and statistically similar to the estimates of the pooled OLS estimation. According to the random effects estimation, estimates on taxes and corruption are not statistically significant. Except of corruption, all the variables have expected signs.

As mentioned before, by estimating the random effects model, I have imposed an additional assumption that the unobserved, country-pair specific effect is uncorrelated with each explanatory variable in all time periods.

The Hausman-Taylor estimator⁷, which is typically suggested in the literature, enables me to distinguish between exogenous (in the sense that they are uncorrelated with the country-pair specific effect) and endogenous variables as well as time-variant and time-invariant variables in the regression model.

All the variables in the model are time-variant, except of distance. I set transition-specific explanatory variables as endogenous variables (therefore I allow for their correlation with the

⁷ Walsh (2006) argues that the Hausman-Taylor estimator is the most appropriate estimator for the gravity model framework of trade in goods, as well as services.

country-pair specific, time-invariant effects) as all of the transition-specific variables measure the development of the transition countries from the centrally planned structure of their economies towards the open market economies, therefore they are conceptually closely related. Hausman-Taylor estimator requires imposing an assumption that the idiosyncratic, time-varying error is uncorrelated with each explanatory variable across all time periods.

The Hausman-Taylor estimator (*column 3 of table 6*.) produces quantitatively similar results to the previous regression outputs.

I evaluate that the estimates on general control variables are not statistically significant. Core gravity model variables are statistically significant (at 1% significance level) with estimates economically comparable to the previous estimations. Estimates on the banking reforms and method of privatization are statistically significant, with expected signs. An estimate on corruption has an unexpected negative sign.

I observe that most of the estimations predict a negative sign on the index measuring corruption, which is against my primary hypothesis. To explain this, I included a difference in the corruption index (over the two consecutive years) into the regression instead of the level variable, therefore I do not control for the overall state of corruption but for progress towards transparency and non-corruptive behavior. Such an adjustment produces a positive coefficient on the estimate of corruption, without any significant changes on the other estimates. Intuition behind the negative coefficient on corruption can be that a corruptive environment may mean that investors are able to overcome administrative and legislative barriers related to their investment faster, and this can facilitate the process of the investment.

Hausman-Taylor estimation provides that 1 point increase in the statistics (as measured by the EBRD index) of banking reform increases the bilateral flow of investments between the

countries on average by 71%, holding all the other variables constant. Further, 1 point increase in the index of privatization increases the bilateral flow of investments between the countries on average by 95%, holding all the other variables constant.

5. Conclusion

I conclude that bilateral flows on foreign direct investments from Western European to transitional economies confirm the gravity model framework, which argues that the size of the donor and the recipient country as well as the distance between them are important determinants of investment flows. I can observe that the size of the recipient economy has economically a higher influence on the bilateral investment flows.

More importantly, the goal of the study was to determine and evaluate factors that could explain different volumes of FDI across transition countries. I evaluate that general control variables, such as relative wages and corporate income tax don't provide consistently statistically significant estimates that could explain such differences.

I have justified that by including transition-specific control variables; the EU membership dummy variable becomes redundant in the model.

The Hausman-Taylor estimator supported by the random effects estimator and by analytical analysis shows that the privatization process and the state of banking reforms are determinants that have a statistically significant effect on the capacity of transitional economies to attract investments from Western European countries. Interestingly, I find that corruption has a negative effect on the flows of investments, holding all other variables constant, however, progress (measured by the change of the corruption index over time) towards transparency and non-corruptive behavior has economically a positive effect on bilateral investment flows, holding all the other variables constant.

As defined by the EBRD, the state of the banking reforms measures convergence of banking laws and regulations to standards proposed by the BIS and also evaluates provision of

the full set of competitive banking services in the recipient countries. Regulation and functioning of the domestic banking sector and domestic credit flows is an important determinant for addressing foreign investors.

Therefore policy makers should act towards creating a competitive banking sector and towards facilitating credit flows to domestic-based enterprises. Importantly, standards proposed by the BIS provide a framework that national authorities should consider and consult when implementing national laws regarding banking and regulation in order to address foreign capital.

The EBRD index on privatization measures a fraction of private ownership of all the enterprise assets and progress in corporate governance. As evaluated by the empirical analysis, a system of law that enables effective corporate governance creates an environment attractive for foreign investors. The higher is the fraction of private ownership of enterprise assets the higher is an incentive for investors to allocate money in such an environment.

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7. Appendix

Table 1 – Net Inflows of FDIs to GDP⁸

	Bulgaria	Croatia	Czech Rep	Estonia	Hungary	Latvia	Lithuania	Macedonia	Poland	Slovakia	Slovenia
2001	5.9	6.9	8.8	8.7	7.5	1.6	3.7	13	3	N/A	2.5
2002	5.7	4.1	10.8	3.9	4.5	2.7	5	2.8	2.1	11.8	7.2
2003	10.1	6	2.1	9.3	2.6	2.7	1	2.5	2.1	1.2	1
2004	10.5	2.6	4.4	8	4.2	4.6	3.4	5.9	5	5.4	2.5
2005	14.2	4	8.9	22.5	7.7	5.1	4.6	2.4	3.6	4.9	2.7
2006	23.7	6.9	3.7	13.2	16.6	8.5	6.8	6.5	6.3	5.9	1.8
2007	32.9	8.5	5.9	15.6	51.9	9.4	5.9	9	6	4.6	4
2008	19.9	8.7	2.9	7.9	48.6	4.3	4	6.2	2.8	4.2	3.3
2009	8	5.5	1.5	9.8	-2.3	-0.2	0.2	2.8	3.3	1.8	-0.7
2010	3.9	1.4	3.1	10.9	-16.1	1.8	1.9	3.2	3.6	0.8	1.4
2011	4.8	2	2.5	2	6.9	5.3	3.4	4.7	3	3.8	1.7

⁸ All the tables were created by the Author.

Table 2 - Regression Analysis⁹

LFDIA	1	2	3	4	5	6	7
C	-3.64*** (0.96)	-13.63*** (1.99)	-4.90*** (1.22)	-15.48*** (2.35)	-13.35*** (2.00)	-14.89*** (2.34)	-15.38*** (2.20)
LGDPD	0.33*** (.04)	0.47*** (0.053)	0.33*** (0.044)	0.47*** (0.05)	0.47*** (0.05)	0.47*** (0.05)	0.47*** (0.05)
LG DPR	1.09*** (0.046)	1.30*** (0.063)	0.78*** (0.09)	1.00*** (0.12)	1.28*** (0.064)	0.98*** (0.12)	1.28*** (0.08)
LDIST	-1.25*** (0.084)	-1.34*** (0.087)	-1.34*** (0.088)	-1.38*** (0.091)	-1.33*** (0.087)	-1.37*** (0.09)	-1.32*** (0.009)
LULC		1.017*** (0.185)		1.01*** (0.203)	1.015*** (0.18)	1.02*** (0.203)	1.10*** (0.20)
TAX		-0.048*** (0.0129)		-0.03* (0.017)	-0.05*** (0.013)	-0.037*** (0.0017)	-0.056*** (0.016)
EU			-0.44*** (0.20)	-0.46*** (0.21)	0.24* (0.144)		
COMPPOL			0.89*** (0.30)	0.66* (0.34)		0.317 (0.30)	
CORR			-0.25*** (0.09)	0.02 (0.11)		-0.25*** (0.113)	0.19*** (0.08)
ENT			-0.83*** (0.27)	-0.73*** (0.299)		-0.63*** (0.29)	
PRIV			0.34* (0.201)	0.053 (0.22)		0.57*** (0.22)	0.051 (0.18)
BANK			1.75*** (0.314)	1.696*** (0.36)		1.63*** (0.368)	0.637*** (0.21)
INFRA			0.1393 (0.224)	0.109 (0.24)		0.21 (0.23)	
TIME DUMMY	Y	Y	Y	Y	Y	Y	Y

⁹ * Indicates statistical significance at 10% level, ** indicates statistical significance at 5% level, *** indicates statistical significance at 1% level;

LGDPD – log of the GDP of the donor country, LG DPR – log of the GDP of the recipient country, LDIST – log of the distance between the recipient and donor country, LULC – log of the unit labor cost, TAX – tax, EU – EU membership, COMPPOL – competition policy, CORR – corruption, ENT – enterprise reform, PRIV – privatization, , BANK – banking reform, INFRA – infrastructure

Table 3 - Cross Correlation of Transition-Specific Variables

	BANK	COMPPOL	CORR	ENT	PRIV	INFRA
BANK	1	0.6	0.33	0.58	0.52	0.69
COMPPOL	0.6	1	0.53	0.81	0.58	0.61
CORR	0.33	0.53	1	0.45	0.1	0.44
ENT	0.58	0.81	0.45	1	0.41	0.72
PRIV	0.52	0.58	0.1	0.41	1	0.37
INFRA	0.69	0.61	0.44	0.72	0.37	1

Minimum, Median and Maximum Analysis

Table 4a) Privatization method

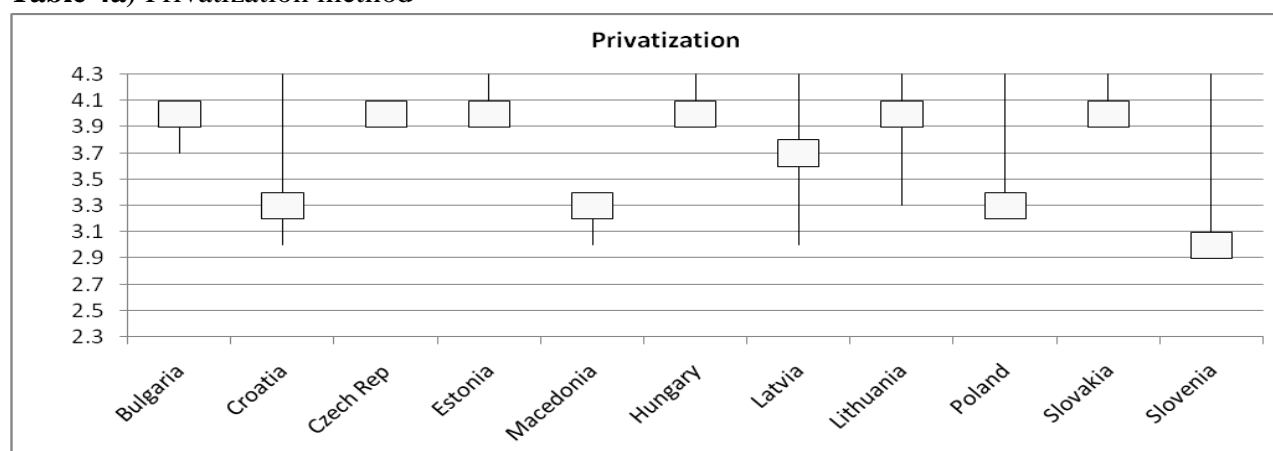


Table 4b) Enterprise restructuring

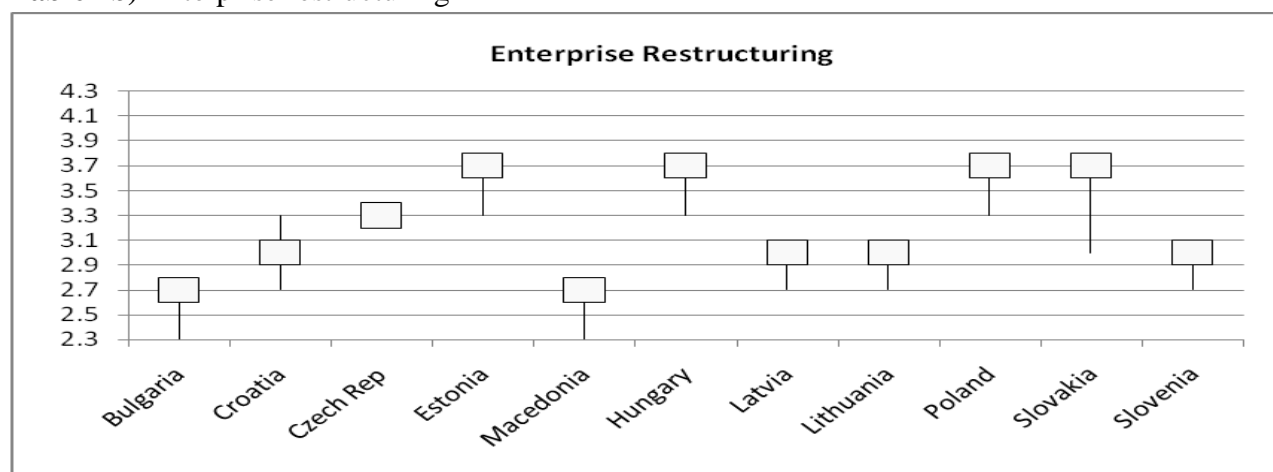


Table 4c) Competition Policy

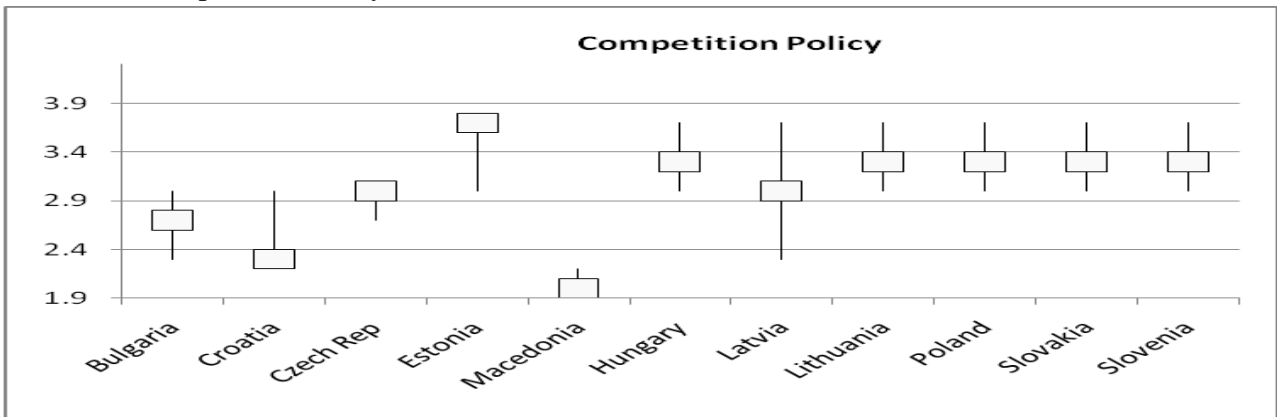


Table 4d) to be added Banking

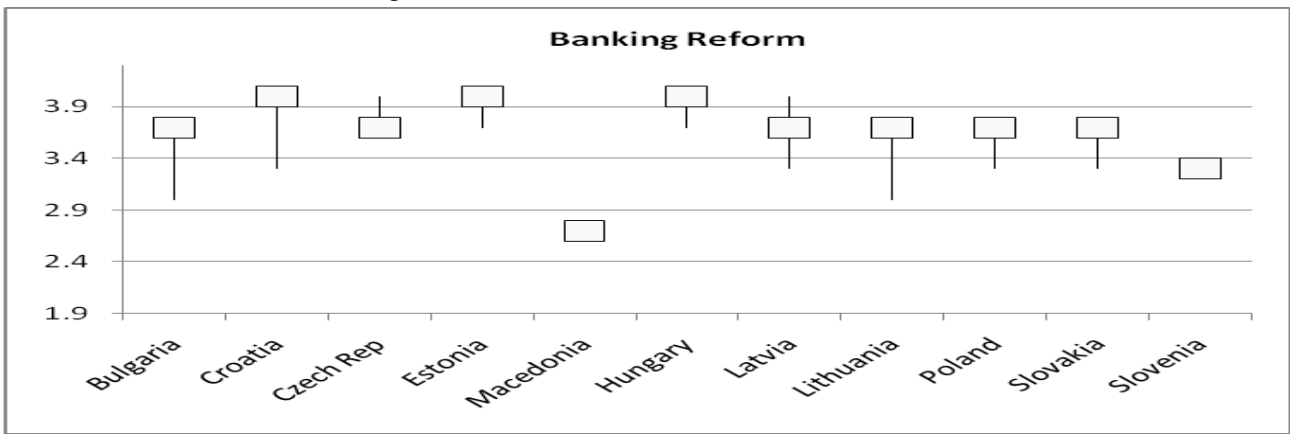


Table 4e) Infrastructure

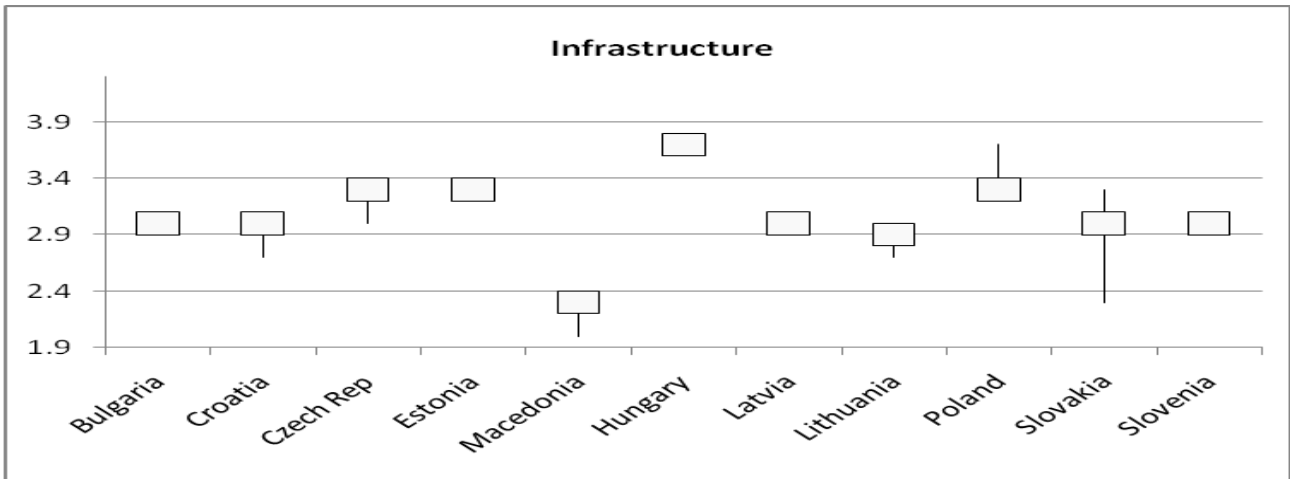


Table 5 - Regression Analysis (Final Set of Controls)

FDI	Pooled OLS	Random Effect	Hausman-Taylor
C	-15.38*** (2.20)	-15.74*** (3.58)	
LGDPD	0.47*** (0.05)	0.47*** (0.09)	0.49*** (0.254)
LG DPR	1.28*** (0.08)	1.03*** (0.11)	0.858*** (0.275)
LDIST	-1.32**** (0.009)	-1.41*** (0.17)	-1.55*** (0.535)
LULC	1.10*** (0.20)	1.011*** (0.319)	0.52 (0.58)
TAX	-0.056*** (0.016)	-0.063 (0.15)	-0.07 (0.16)
CORR	0.19*** (0.08)	-0.105 (0.09)	-0.36*** (0.12)
PRIV	0.051 (0.18)	0.50* (0.28)	0.95*** (0.43)
BANK	0.637*** (0.21)	0.92*** (0.30)	0.71* (0.40)
TIME DUMMY	Y	N	N
R-squared	0.52		