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INSTITUTIONAL DETERMINANTS OF FOREIGN DIRECT INVESTMENT FLOWS IN TRANSITION ECONOMIES

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Abstract
This paper tests the institutional determinants of Foreign Direct Investment flows to 5 South East European Countries (SEEC-5) and the 10 New Member States of the European Union countries (EU-NMS-10) by using panel data set for a time span 1994-2018. The study employs an augmented Gravity Model with country specific institutional factors which determine foreign investors' decisions from 14 core European Union countries to invest into SEE-5 and EU-NMS-10 countries. From the results of the study we found that FDI flows are significantly influenced by both gravity factors (distance, GDP) and non-gravity, mainly efficiency seeking factors (bilateral exports, schooling), as well as institutional factors like: WTO membership, transition progress and governance indicators of rule of law, regulatory quality and political risk.
Key words: Foreign Direct Investment, Transition Countries, Institutions, Panel Econometrics, Gravity Model

1. Introduction

Foreign Direct Investment has been considered one of the main factors underlying the relative growth rates experienced by the South East European economies. The rising trend of FDI inflow made possible the deep liberalization and transformation of the economies of the region of SEE, thus increasing the degree of openness and integration of SEE economies into the world markets. In addition, the attitude of SEE countries towards European Union (EU) membership has involved a new boost in FDI that reflects the favorable prospects for the countries' economic future when faced with the challenges of the Single European Market. Despite the crucial role played by FDI in the SEE economies, the available empirical evidence is rather scant, being generally of a descriptive nature. The aim of this paper is to provide some more robust evidence on the tested hypothesis related allocation over time and locations of gross aggregate FDI inflows in the region of SEE-5 and EU-NMS-10. The paper will consider estimation of bilateral FDI flows between EU-14 countries[13] and EU-NMS-10[14] and SEE-5 countries[15] using an augmented Gravity Model, based on a panel data set for the period of 1994-2018. The paper by applying the standard methodology of the gravity model to the dataset of South East European countries and New European Member states contributes to the literature of institutional determinants of FDI in transitioning countries. The developed research questions supported by relevant hypothesis is related to exploring the crucial institutional factors that affect FDI positive decisions at bilateral flow levels for locating the investments in the SEE region. The study will include several political and institutional variables; such are governance related factors, corruption perception index and transition specific

[13] Source EU-15 countries of FDI: Austria, Belgium, Denmark, France, Finland, Germany, Greece, Ireland, Italy, Netherland, Portugal, Spain, Sweden and United Kingdom
[14] Host EU-NMS-10 countries of FDI: Bulgaria, Estonia, Czech Republic, Hungary, Romania, Slovak Republic, Slovenia, Poland, Latvia and Lithuania.
[15] Albania, Bosnia and Herzegovina, Croatia, North Macedonia and Serbia.

variables, like WTO membership of the host country, transition progress, and bilateral FDI agreements. Gorbunova et al. (2012), using Feasible GLS and Prais - Winston transformation on a sample of 26 former socialist countries, for the period 1994-2002, found that the employed variables proxying market stabilizing institutions play a more important role than those proxying market creating institutions. Generally speaking, institutional related factors of FDI have been considered by the European Commission as the most important detriment for EU accession. Therefore, considering the ambitions of SEE countries to become part of EU structure, it is expected that findings of the paper will provide useful analytical framework for policymakers to decide which major transition specific and institutional determinants of FDI should be considered for development strategies of the SEE countries. In general, the expected findings will shine light on relevant governmental bodies of the region with respect to promoting further increase of FDI as a crucial factor which provides employment, national welfare and economic growth for the selected countries.

Methodology, Empirical approach and Data

In line with theoretical framework of FDI determinants, we consider the role of geography in explaining FDI pattern among SEE and EU-NMS countries and other policy factors either resisting or promoting FDI by using the conceptual framework of the gravity model. The reduced form of the model including related selected variables is given below:

$$lnfdi_{ij,t} = a_{ij} + u_t + b_0 lngdp_{i,t-1} + b_1 lngdp_{j,t-1} + b_2 ln\left|gdpc_{i,t-1} - gdpc_{j,t-1}\right| + b_3 lnx_{jt} + b_4 lny_{jt} + b_5 lny_{jt} \times d + d + \varphi + \delta + \theta + \varepsilon_{ij,t} \qquad (1)$$

Where $fdi_{ij,t}$ is a bilateral FDI flow from source country i to host country j at time t, in millions of US dollars. $gdp_{ij,t-1}$ represents market size variables denoting the gross domestic product, in millions of US dollar in source and host country, respectively. Both variables are lagged by 1-time period, in order to control for the potential endogeneity between FDI and GDP. We use the absolute difference of GDP per capita variable between source country and host country at time t-1, $|gdpc_{it-1}-gdpc_{jt-1}|$ as a measure of factor endowment differentials between countries. The absolute difference of GDP per capita, between source and host country will allow us to control for serial correlation between GDP and GDP per capita variable. The country-pair specific effects, a_{ij} captures all the time invariant factors, such as distance, common land border, common language, etc, while u_t is a time dummy, φ is host country dummy, σ is source country dummy and θ is pair country dummy, x_{jt} represent a vector of host country explanatory variables and y_{jt} stands for host country institutional related variables and *d* is dummy variable denoting SEE-5 countries. The interaction terms, $y_{jt*}d$ is included in the model to estimate the institutional determinants of inward FDI flow in SEE-5 countries. The EU-NMS-10 country group is taken as control group. ε_{ijt} is the standard error term.

Empirical model

Following the work of Bevan and Estrin (2004), Johnson (2006) and Mateev (2008) applied to OLI framework; we employ the gravity model for explaining FDI patterns, among countries that have invested in the SEE-5 countries and EU-NMS-10. For estimation purposes, the

extended gravity equation for FDI flows in SEE and EU-NMS-10 countries is specified in the equation (2)

$$\begin{aligned} lnfdi_{ij,t} = a_{ij} + u_t + b_0 lngdp_{i,t-1} + b_1 lngdp_{j,t-1} + b_2 lnd_{ij} + b_3 ln\left|gdpc_{i,t-1} - gdpc_{j,t-1}\right| \\ + b_4 smctry_{ij} + b_5 wto_{jt} + b_6 bfdi_{jt} + b_7 lnbex_{ji,t} + b_8 lnsch_{jt} + b_9 lntp_{jt} \\ + b_{10} lncpi_{jt} + b_{11} lncc_{jt} + b_{12} lnrq + b_{13} lngov_{jt} + b_{14} lnrl_{jt} + b_{15} lnpr_{jt} \\ + b_{16} lnva_{jt} + b_{17} lncc_{jt} \times d + b_{18} lnrq_{jt} \times d + b_{19} lngov_{jt} \times d + b_{20} lnrl_{jt} \times d \\ + b_{21} lnpr_{jt} \times d + b_{22} lnva_{jt} \times d + d + \varphi + \delta + \theta + \varepsilon_{ij,t} \quad (2) \end{aligned}$$

Where i denote individual source countries, j denotes individual recipient countries, t denotes the years from 1994 to 2018. The empirical model assumes that bilateral FDI in SEE and EU-NMS countries is a function of the GDP in the host and source countries, absolute difference in GDP per capita, distance, language, cultural and border similarities, world trade organization membership of host economy, bilateral FDI agreement, bilateral exports from country j to country i, schooling, transition progress, corruption perception index and world governance indicators like control of corruption, regulatory quality, government effectiveness, rule of law, political risk and voice and accountability and the interaction terms between of the world governance indicators with a SEE dummy variable. With respect to the role of the interaction terms between institutional related factors and SEE dummy, the aim of the study is to differentiate the institutional related determinants of FDI across two group of countries SEE-5 and EU-NMS-10, where the second group of countries, EU-NMS-10 countries, is considered as a benchmark category of the sample countries.

Data description and hypothesis

Along the lines of previous research, the dependent variable $lnfdi_{ijt}$ is defined as the bilateral flow of FDI from source country i to host country j at time t. The source of this data is the OECD. The FDI flows are measured at current prices and current exchange rate in millions of US dollar.
Using gravity framework, the expected economic factors that determine the size of FDI bilateral are: the market size factors represented by GDP and absolute difference of GDP per capita between source and host countries and transaction cost factor representing the distance. Following the empirical literature, Bevan and Estrin (2004), Johnson (2004), Mateev (2008), apositive relationship between market size factors and the size of FDI is suggested. The explanation is that the bigger the host country GDP the larger the FDI, since larger economies become more attractive for foreign capital. In the empirical model we also include the variable of the absolute difference of GDP per capita between countries to capture the market size differentials between countries, as well as factor endowments differentials between countries. In line with the Frankel *et al.* (1995)[16] and Linder hypothesis (1961), it can also be taken to account for the differences in consumer tastes between countries. Based on the concept of comparative cost differences and combined tastes between countries, it is expected that high income EU-14 countries will focus their investments more towards relatively low income EU-NMS-10 and SEE-5 countries. Hence, it is expected positive impact of the absolute difference of GDP per capita variable on FDI. However, Bergstrand (1989), Globerman and Shapiro (2002), suggest both, positive and negative relationship between

[16]With aggregate data, at country level, there is more reason to focus on bilateral differences in comparative advantages and tastes (reflected by the absolute differences in GDP per capita) to explain aggregate bilateral FDI flows between different countries, with respect to income level. This is a reflection that all countries possess comparative advantages or preferences for something.

factor cost differentials and FDI. The positive (negative) sign of this variable may also be due to the fact that differences in wage levels are compensated (not compensated) by productivity.
The transaction cost variable in this study is represented by the distance between source and host country. The variable of distance lnd_{ijt} represents gravity factor. Distance between source and host country is expected to have a negative effect on the size of FDI, due to costly adoptions of goods to local preferences. This variable is used in the model to proxy for the transaction, transportation cost and physical cost of foreign investments. According to Johnson(2006), Resmini (2000) and Bevan and Estrin, (2000) greater distance presents weaker trade ties between the FDI source country and the host country, thus providing for lower FDI levels. However, a number of additional variables are also customarily used. In this regard, the model includes also additional gravity factors through dummy variables, like $smctry_{ij}$ which is a dummy variable that takes value one when two countries share a border, a language or were the same country in the past, correspondingly. In all the cases, the coefficient is expected to be positive.
The variable $lnbex_{jit-1}$ is considered in the model to account for bilateral exports from host country j to source country i. This variable is lagged by one-time period to allow the bilateral exports the grace period before it starts impacting host country's inflow of FDI. It is expected that host country bilateral exports to encourage more FDI. Hence, export oriented economies may be more successful in encouraging FDI. Therefore, it is expected positive relationship between lagged bilateral exports and FDI.
The variable $lnsch_{jt}$ accounting for years of schooling of the host country population is measured by tertiary school enrolment as a per cent of gross school enrolment. This variable will account for efficiency-seeking motives of FDI, capturing the human capital developments in the host country. According to the research literature from Borensztein, De Gregorio, and Lee (1998), there is a strong positive relationship between FDI and the level of educational attainment in the domestic economy. Hence, this variable is expected to present a positive relation to FDI.
Considering the empirical work of Holland and Pain (1988), Garibaldi et al. (2001), Kinoshita and Campos (2004), Bevan and Estrin (2004), Dauti (2015a) and Dauti (2015b), we augment the gravity model by considering additional institutional explanatory variables that are expected to be significant FDI determinants. We proxy for the quality of institutions in the host country through the World Bank's Worldwide Governance Indicators (WGI), which include six relevant measures, on percentile rank values, like: *control of corruption*[17], *regulatory quality*[18], *rule of law*[19], *government effectiveness*[20], *political risk*[21] *and voice and accountability*[22]. These measurements are used in the study in order to account for institutional quality and advancement issues (economic and political institutions). In general, it is expected that bilateral FDI from source to a host country will increase as the overall institutional conditions in that host countries improves.

[17]Examines the extent to which public power is exercised for private gain, as well as state capture (World Bank, 2015)
[18]Examines the ability of the government to formulate and implement efficient policies and regulations that permit and promote private sector development (World Bank, 2015)
[19]Examines the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence (World Bank, 2015)
[20]Examines the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies (World Bank, 2015)
[21] Examines the likelihood that the government will be destabilized or overthrown (World Bank, 2015)
[22]Examines the extent to which a citizen participation in elections, freedom of expression, freedom of association, and a free media (World Bank, 2015).

The variable $lntp_{jt}$ is included in the model to capture the transition progress of host country institutions. Following Mrak and Rojec (2013), this variable is constructed by the sum of seven EBRD transition specific indexes, i.e. the indexes denoting large scale privatization, enterprise restructuring, competition policy, banking reforms and interest rates liberalization, securities markets and non-bank financial institutions, and infrastructure reform. Transition progress is included in the model as policy determinants of FDI to reflect the main transition characteristics of SEE-5 and EU-NMS-10 countries. It is expected that the transition progress will be positively associated to bilateral FDI flows.
Additionally, Transparency International Corruption Perception Index, (CPI) is included in the study to address the level of perceived corruption and to capture the investment climate in the host countries. The variable $lncpi_{jt}$ is measured by perceived corruption on a continuous scale from 1 to 10. In the model, we account for the effects of corruption as an institutionally related determinant. The variable is expected to have a positive relationship with the FDI flows, since a higher value of the corruption index indicates a less corrupt business environment in the host country. However, in the study there are also other institutional dummy variables included.

The dummy variables, such as wto_{jt}, $bfdia_{ijt}$ are included in the model in line with the business network theory of FDI flows, to denote institutional factors affecting FDI flows into SEE countries. In this regard, wto_{jt} is included in the model to denote the membership of the receipt country of FDI into the World Trade Organization (WTO). The variable $bfdia_{ijt}$ is included in the model to denote bilateral investment treaties between country i and j at time t.

Finally, to address the question of whether the main institutional determinants of FDI are different across the two group of countries (SEE countries versus EU NMS), in the estimated model, we introduce the interaction variables between host country institutional variables and SEE dummy variable *d*. These variables are included in order to differentiate between the overall potential for FDI between the SEE-5 and EU-NMS-10 countries. It is expected that inflows of FDI may, to a certain extent, be independent of the above country-specific determinants and will be related to the geographic region of SEE that has been plagued by political instability and war for the important part of the time period under consideration. Therefore, the SEE-5 countries may be considered as less attractive locations for FDI in comparison to EU-NMS-10 countries.

Methods: Econometric Assessment

The usual problem with estimating FDI flows, using gravity equation, is the multilateral resistance terms (MRTs). To proxy MRTs, following Rose and van Wincop, (2001); Feenstra, (2004); Baldwin and Taglioni, (2006) we use country fixed effects for host countries and source countries, time fixed effects and country-pair fixed effects. We start with estimation of the robust Least Square Dummy Variable (LSDV) estimates accounting for time fixed effects, source countries fixed effects and host countries fixed effects and country-pair (index) fixed effects. An advantage of LSDV estimates is that by adding the dummy for each country we estimate the pure effect of each individual explanatory variable, accounting also for unobserved heterogeneity. This methodology also identifies individual-country specific and time effects. To check for the robustness of our LSDV results obtained using the static panel data techniques, following Arrellano and Bover (1995) and Blundell and Bond (1998), we run dynamic panel data regression using Arrellano-Bover/Blundell/Bond estimation procedure. To account for the potential endogeneity of explanatory variables, we employ system Generalized Method of Moments

(GMM) estimation techniques. One of the advantages of system GMM is that it utilizes a bigger subset of instruments. However, the drawback of GMM estimation technique is over fitting the endogenous variables, by increasing the number of instruments, thus leading to biased and inconsistent estimates (Roodman, 2009a).

Firstly, we perform several tests to choose the appropriate specification among static specifications. For the purpose of testing we have also considered the baseline regressions of FE and RE estimates. First we check for the relevance of panel effect among observations. Using Breusch - Pagan Lagrange Multiplier test (BPLM)[23] we reject the null that variances across entities are zero, and we find significant presence of panel effect and conclude that random effect is more appropriate in relation to OLS estimates. However, the output from the Hausman test suggests choosing fixed effect estimates for interpreting the results.[24]To see if time effects are needed when running fixed effects we test for joint significance of the dummies for all years equally 0[25]. The parameter test indicates that there is time specific effect on bilateral FDI. Therefore, time specific effects are needed.

Table 1. Performed tests of the static panel models

Testing		
Hausman Test:	χ^2 (19) [p> χ^2]	188.39 [0.00]
Breusch - Pagan LM test:	χ^2(1) [p> χ^2]	589.84 [0.00]
Parameter Test:	F(16, 1400) [p>F]	4.36 [0.00]
Robust FE vs Robust RE: Sargan – Hansen statistic,	SH - statistics [p - value]	152.226 [0,00]
Wooldridge test: Robust RE vs Robust FE:	F(16, 195); [p>F]	5664.16 [0.00]
Wald Test for heteroscedasticity:	χ^2 (175) [p> χ^2]	5393.36 [0.00]
Wooldridge test for autocorrelation	F(1, 139)[p>F]	23.619 [0.00]

Notes: Dependent variable is log bilateral FDI flow. T-statistics in brackets, ***, ** and * indicate significance of coefficients at 1, 5 and 10 per cent, respectively.

To verify the robustness of the baseline results we also control for time effects for particular years in our sample. The F - test justifies the use of time dummies for particular years of our sample. However, the suggested baseline FE and RE estimates suffer from autocorrelation and heteroscedasticity[26]. Therefore, to control for no autocorrelation and homoscedasticity, we have employed robust estimates of fixed effects and random effects. The associated p - values of the Sargan – Hansen statistic suggest that robust fixed effect provides consistent and unbiased estimates[27]. However, the problem with estimating FDI flows, using gravity equation, is the multilateral resistance terms (MRTs). To proxy MRTs, we use country fixed effects for host

[23]Using Breusch and Pagan Lagrangian Multiplier (LM) test we decide to choose between random effect estimates and a simple OLS regression, The null hypothesis in the LM test is that variances across entities are zero, The p - value of 0,00, suggest for the relevance of panel effect in relation to simple OLS estimates.

[24] The p value of Hausman test of 0,000 suggest that we have sufficient evidence to reject the null hypothesis that random effect estimates provide consistent estimates, Therefore we consider fixed effect estimates for interpreting the results.

[25] The F test of 4.36 and the associated p - value, obtained from the parameter test of0,00, indicate that we reject the null hypothesis that all years coefficients are jointly equal to zero, therefore time fixed effects are needed,

[26]Group wise heteroscedasticity Wald test and Wooldridge test for autocorrelation are performed to check whether the data suffer from heteroscedasticity and autocorrelation, The χ^2 value of the Wald Test of 5393.36 with the associated p - value obtained after using Wald test for heteroscedasticity in the FE regression model suggest the presence of heteroscedasticity in the data. Also the F test value of 23.619, associated with the p - value of 0,000 obtained from the Wooldridge test for auto-correlation, suggest the presence of autocorrelation in the data, making the estimated coefficients biased.

[27]The p - value of 0,000 obtained from Sargan - Hansen statistics (xtoverid), suggest that we have sufficient evidence to reject the null that robust random effect estimates are consistent, suggesting to choose robust fixed effect estimates for interpreting the estimated coefficients.

countries and source countries, time fixed effects and country-pair fixed effects. (Columns 3-7). Moreover, the LSDV models with time, country and pair dummies are employed to control for common external shocks and unobserved country-fixed effects.

Discussion of results from static models

In this section we present the estimated coefficients of the augmented gravity model (table 2), using robust Fixed Effect (FE) estimates (column 1) and robust LSDV estimate (column 2-6). Column (2) show the results with time fixed effects. Column (3) and (4) show results for time invariant host country and source country fixed effects and for time varying host country and source country fixed effects, respectively.

Table 2. Results from static panel models: Robust FE and Robust LSDV estimates

VARIABLES	(1) RobustFE	(2) LSDV	(3) LSDV	(4) LSDV	(5) LSDV	(6) LSDV
$lngdp_{i,t-1}$	0.220**	0.506***	0.083	0.020	0.191*	0.191*
	[2.27]	[10.74]	[0.84]	[0.20]	[1.82]	[1.82]
$lngdp_{j,t-1}$	0.341**	0.856***	0.214*	0.311	0.488**	0.488**
	[2.31]	[14.87]	[1.76]	[1.13]	[1.96]	[1.96]
$ln\lvert gdpc_{i,t-1} - gdpc_{j,t-1}\rvert$	0.712**	1.268***	0.996***	0.883***	0.488*	0.488*
	[2.49]	[10.87]	[5.71]	[4.60]	[1.76]	[1.76]
lnd_{ij}		-1.028***	-1.527***	-1.56***	-2.061***	-6.53***
		[-11.99]	[-15.13]	[-15.40]	[-17.24]	[-4.24]
$smctry_{ij}$		0.212	-0.912***	-0.93***	19.841***	-0.090
		[1.18]	[-3.84]	[-4.02]	[3.82]	[-0.05]
wto_{jt}	0.799***	0.566***	0.878***	0.606***	0.539***	0.539***
	[4.02]	[3.20]	[5.05]	[3.08]	[2.97]	[2.97]
$bfdi_{jt}$	0.052	0.515***	0.016	-0.028	-0.028	-0.028
	[0.28]	[5.46]	[0.15]	[-0.26]	[-0.18]	[-0.18]
$lnbex_{ji,t}$	0.037	0.275***	0.185***	0.174***	0.005	0.005
	[1.49]	[8.31]	[5.99]	[5.40]	[0.17]	[0.17]
$lnsch_{jt}$	1.178***	-0.293	1.001***	0.397	0.460	0.460
	[4.50]	[-1.60]	[5.44]	[1.27]	[1.56]	[1.56]
$lntp_{jt}$	3.684***	-1.117	2.673***	1.125	1.717*	1.717*
	[3.86]	[-1.03]	[3.27]	[1.08]	[1.90]	[1.90]
$lncpi_{jt}$	0.159	0.555	0.121	-0.523	-0.389	-0.389
	[0.37]	[1.42]	[0.31]	[-1.22]	[-1.01]	[-1.01]
$lncc_{jt}$	-0.323	0.255	-0.352	-0.030	-0.219	-0.219
	[-0.61]	[0.58]	[-0.81]	[-0.06]	[-0.48]	[-0.48]
$lnrq$	1.093	0.212	1.271*	0.697	0.928	0.928
	[1.38]	[0.36]	[1.88]	[0.98]	[1.40]	[1.40]
$lngov_{jt}$	0.823	-0.371	0.841	1.506**	1.643***	1.643***
	[1.10]	[-0.81]	[1.36]	[2.31]	[2.65]	[2.65]
$lnpr_{jt}$	-1.064***	-1.121***	-1.050***	-0.807**	-0.697**	-0.697**
	[-3.01]	[-3.29]	[-3.31]	[-2.12]	[-2.12]	[-2.12]
$lnva_{jt}$	0.925	2.110**	0.097	0.846	1.322	1.322
	[0.67]	[2.25]	[0.08]	[0.70]	[1.25]	[1.25]
$lnrl_{jt}$	1.044*	-0.826**	0.445	0.437	1.055**	1.055**
	[1.95]	[-2.21]	[0.94]	[0.90]	[2.20]	[2.20]
$lncc_{jt} \times d$	1.116	-0.303	0.663	0.662	1.143*	1.143*
	[1.55]	[-0.47]	[0.96]	[0.98]	[1.82]	[1.82]
$lnrq_{jt} \times d$		-3.402***	-3.012***	-2.408**	-1.771*	-1.771*
		[-4.27]	[-3.05]	[-2.53]	[-1.72]	[-1.72]
$lngov_{jt} \times d$	-0.501	1.307**	-0.446	-0.826	-1.002	-1.002
	[-0.56]	[2.32]	[-0.58]	[-1.04]	[-1.30]	[-1.30]

$lnpr_{jt} \times d$	0.455	1.779***	0.792	0.696	0.325	0.325
	[0.74]	[4.22]	[1.39]	[1.19]	[0.58]	[0.58]
$lnva_{jt} \times d$	-1.747	-1.858	-0.075	-1.125	-2.502*	-2.502*
	[-1.17]	[-1.36]	[-0.05]	[-0.77]	[-1.91]	[-1.91]
$lnrl_{jt} \times d$	-2.391*					
	[-1.71]					
d		9.864***				
		[2.69]				
Constant	-33.538***	-20.347***	-17.288***	-15.10**	-22.77***	32.169**
	[-5.77]	[-5.81]	[-3.18]	[-2.44]	[-3.61]	[2.37]
Observations	1,611	1,611	1,611	1,611	1,611	1,611
R-squared	0.427	0.627	0.687	0.697	0.794	0.794
Year dummy	No	Yes	No	Yes	Yes	Yes
Host country dummy	No	No	Yes	Yes	No	Yes
Source country dummy	No	No	Yes	Yes	No	Yes
Index (country-pair dummy)	No	No	No	No	Yes	Yes
Number of groups	175	175	175	175	175	175

Notes: Dependent variable is log bilateral FDI flow. t-statistics in brackets, ***, ** and * indicate significance of coefficients at 1, 5 and 10 per cent, respectively.

Finally, column (5) and (6) presents a specification where pair effects are also added. Among LSDV estimates, to interpret the results we consider robust LSDV estimates, counting for time and pair dummies (column 6).Moreover, the LSDV estimates with time and country-pair dummies fit the data much better than does the robust FE estimates. R-square for the LSDV estimates is 79.4 per cent, compared with 42 per cent for fixed effects. In all cases the gravity coefficients appear to show the same effect on the flow of FDI from EU-14 source countries to SEE-5 and EU-NMS-10 countries. Considering these estimates, as Bevan and Estrin (2004) find, the positive and significant coefficients of host and source country GDP and the negative and significant coefficient for distance indicates that FDI is determined by gravity factors, as expected. Also the significant coefficients of gravity related factors support Bloningen (2014), Bayesian study for consistently high inclusion probability of gravity related variables in FDI studies. This suggests that the income level and the size of host country market is an important determinant for foreign investors. A negative and significant coefficient of distance indicates that FDI flows are determined by gravity factors as expected. On the other hand, the positive coefficient of host country GDP and negative coefficient of distance support the market-seeking hypothesis of FDI. Focusing on estimates from columns (6) the estimated gravity coefficients can be interpreted as follows. An increase in source and host country GDP by 10 per cent, increases bilateral FDI flow from source to host country, on average by 1.9 and 4.8 per cent, respectively, ceteris paribus. An increase in the road distance between capital cities of source and host country by 1 per cent will decrease bilateral FDI flows from source to host countries, on average, by 6.5 per cent, ceteris paribus.

The findings from the robust LSDV models (columns 2 and 6) are confirming a positive effect of absolute difference of GDP per capita between countries on the size of bilateral FDI flow. The positive sign of this variable may be attributed to the fact that high income EU-14 countries will focus their investments more in relatively low income EU-NMS-10 and SEE-5 countries. Based on the concept of factor cost differentials the results confirm that differences in wage levels between countries are compensated by productivity. An increase in GDP per capita differences between countries by 1 per cent, increase bilateral FDI flow from source to host countries, on average, 0.4 per cent, ceteris paribus (column 6).

The findings of the study suggest also that other transition and institutional related factors became more important as it is confirmed in recent empirical literature. The same estimates indicate that host country WTO membership is associated with an increase of FDI. The robust LSDV model predicts that bilateral FDI flow between two WTO member countries is 71.42 per cent higher than bilateral FDI flow between countries that are not WTO members[28]. Focusing on LSDV estimates (column 7), the estimated impact of transition progress on FDI is 1.717, indicating that advancements of host country transition reforms by 1 per cent, is associated with average increase of bilateral FDI flow into host countries by 1.71 per cent, ceteris paribus.

The robust fixed effect estimates show that the estimated elasticity of rule of law index in the EU-NMS-10 countries is 1.044 per cent. For SEE-5 countries it is -1.347 per cent (1.044-2.391). The difference of 2.3 per cent or 2.3 percentage points less for SEE-5 countries is statistically significant at 1 per cent level of significance. We conclude that the size of inflow of FDI vary with respect to the index of rule of law between SEE-5 and EU-NMS-10 countries.. On the other hand, the same result indicates that 1 per cent increase in the rule of law index, decreases bilateral FDI flow from EU-14 to SEE-5 countries, on average, by 1.34 per cent, ceteris paribus. The coefficients size in absolute value above one of rule of law index, for both group of countries, indicate that foreign investors are sensitive to changes in the rule of law index for both group of countries.

The robust LSDV estimates accounting for time invariant host country and source country fixed effects (column 4) show that the estimated elasticity of regulatory quality for the base group of EU-NMS-10 countries is 1.271 per cent(1.271-3.012*0). For SEE-5 countries it is -1.741 per cent (1.271-3.012*1). The difference of 3.012 per cent less for SEE-5 countries is statistically significant at 1 per cent level of significance. Thus, we conclude that the size of inward FDI flow vary with respect to perceptions of SEE-5 and EU-NMS-10 countries governments to promote private sector developments. The results indicate that a 1 per cent increase in regulatory quality index is associated with 1.2 per cent increase of FDI flow in EU-NMS-10 countries and 1.74 per cent decrease of FDI flow in SEE-5 countries, ceteris paribus. Hence, sound regulation policies that promote private sector developments in SEE-5 countries are not contributing to inflow of FDI. The explanation that may lay behind the scope of this interpretation can be attributed to biasness and inconsistency of private sector-regulation policies, for SEE-5 countries, thus confirming the regional predispositions toward this inconsistency, concerning regulation policies being applied for FDI attraction motives. On the other hand, the regulation policies that promote private sector development in EU-NMS-10 countries contribute to inflow of FDI in the base group of EU-NMS-10 countries.

The estimated elasticities of bilateral exports is positive and statistically significant at 1 per cent level, in LSDV estimates with host and source country dummies. This result suggests that the increase of bilateral exports of host SEE-5 and EU-NMS-10 countries serves as a channel through which FDI activity in the exporting countries expand. The positive relationship between bilateral exports and bilateral FDI flow, on the other hand, confirms the complementarities between bilateral exports and bilateral FDI flows. With regard to the significant and positive coefficient of schooling, the results of the study support efficiency seeking considerations, that foreign investors

[28]The formula to compute this effect is $\left(e^{b_i}-1\right)\times 100$, where b_i is the estimated coefficient.

are likely to locate their investments in countries with high potentials of efficient human resources and a well-educated labor force.

Discussion of results from dynamic panel models

In this section following Rodman (2006), we use system GMM estimation technique. In all cases the dependent variable, gross domestic product for host and source country and bilateral exports are endogenous and other explanatory variables are treated as exogenous. We use the institutional related variables as instrumental variables for the endogenous variables, in order to overcome the endogeneity problem. The dummy variables like: same country, bilateral FDI agreement, WTO membership and distance are excluded from the model, since using all the explanatory variables used in LSDV estimates increases the number of instruments, thus overfitting the endogenous variable. Particularly, we use system GMM estimates and report robust two - step GMM estimates which provides standard errors that are robust to heteroscedasticity and serial correlation. We address the downward bias of standard errors in two-step GMM by using the proposed correction term by Windmeijer (2005), which is implemented by the *xtabond2* Stata command. We use internal instruments for the lagged dependent variable to avoid the difficulty of finding valid external instruments. To deal with the instruments explosion, following Roodman (2009b) we consider lag limit of the dependent variable and other endogenous regressors and collapse the instruments.

Table 3. Results from the robust system GMM estimates

VARIABLES	(7) Robust Two step- System GMM
$lnfdi_{ij,t-1}$	0.317***
	[5.00]
$lngdp_{i,t-1}$	1.492*
	[1.85]
$lngdp_{j,t-1}$	0.894*
	[1.68]
$ln\lvert gdpc_{i,t-1} - gdpc_{j,t-1}\rvert$	1.304***
	[3.18]
$lnbex_{ji,t}$	-0.317
	[-0.60]
$lnsch_{jt}$	-0.668
	[-1.14]
$lntp_{jt}$	0.295
	[0.08]
$lncpi_{jt}$	0.055
	[0.04]
$lncc_{jt}$	0.487
	[0.47]
$lnrq$	-0.786
	[-0.35]
$lngov_{jt}$	-0.052
	[-0.05]
$lnpr_{jt}$	-0.085
	[-0.13]
$lnva_{jt}$	3.228
	[1.42]
$lnrl_{jt}$	-0.300
	[-0.32]

$lncc_{jt} \times d$	-2.215*
	[-1.75]
$lnrq_{jt} \times d$	-1.453
	[-0.90]
$lngov_{jt} \times d$	2.233
	[1.36]
$lnpr_{jt} \times d$	0.894
	[0.89]
$lnva_{jt} \times d$	0.327
	[0.15]
Constant	-47.504**
	[-2.37]
Observations	1,173
Number of groups	155
Arellano-Bond test for AR(1)	0.000
Arellano-Bond test for AR(2)	0.982
Number of instruments	46
Wald statistics, p value	0.000
Sargan test of overid. restrict, p value	0.506
Hansen test of overid. restrict, p-value	0.787
Hansen test excluding group p-value	0.481
Differ-in-Hans, test of exog. of instr. p-value	0.961

Notes: Dependent variable is log bilateral FDI flow. Z-statistics in brackets, ***, ** and * indicate significance of coefficients at 1, 5 and 10 per cent, respectively. Internal instruments are used for endogenous variables (lagged dependent variable, GDP in host country, GDP in source country and bilateral exports). Lag limits are 2/3 for the lagged dependent variable and 2/4 for endogenous regressors. The collapse option is always used. Year dummies are included but not shown.

The estimates from these specifications confirm the theoretically expected results. According to the results from Table 3, column 7 the estimated coefficient of the lagged dependent variable is positive and significant, suggesting that bilateral FDI flow is subject to persistence effects. The Wald test suggests that independent variables are jointly different from zero. As expected, the coefficient size of lagged value of FDI is greater than one, indicating an explosive growth of FDI. This result confirm that the increase in agglomeration effect of FDI by 10 per cent, results in an increase of current FDI flow into host SEE-5 and EU-NMS-10 countries, by 3.1 per cent, ceteris paribus. However, in line with the findings of Zulfiu (2008) the dynamic model does not provide significant institutional variables, with exception to market size and income development factors. This fact suggests that some of the explanatory power of the lagged dependent variable is being falsely attributed to the other variables in the static specification.

Host and source country GDP are positive and significant as expected and confirmed in the LSDV and FE estimates. Absolute difference of GDP per capita is also positive and significant, indicating that 1 per cent increase in the absolute difference of GDP per capita between countries, increases bilateral FDI flow from source to host countries, on average, by 1.3 per cent, ceteris paribus. This result means that in dynamics differences in wage levels between countries can be compensated by productivity. The positive impact of absolute difference in GDP per capita between countries on bilateral FDI flow also confirm the hypothesis related to comparative cost differences and combined tastes between countries, that high income EU-14 countries will focus their investments more to relatively low income EU-NMS-10 and SEE-5 countries. Since we are left with insufficient variation in the data after accounting for the lagged FDI, we are prohibited to entice strong conclusion with respect to the impact of the explanatory variables on the dependent variable. Hence, the results of the dynamic model do not indicate the right specification, but rather, there are omitted dynamics on the static model. Moreover, having regard that the sample of the countries included in the model is significantly heterogeneous in nature with respect to country specific factors, i.e level of development, institutional performance, size of FDI and other macroeconomic

related factors, it should be kept in mind that the results of the determinants of FDI in panel of heterogeneous transition economies shall be recognized with carefulness.

Conclusion and Policy Implications

In this paper, using an augmented gravity model, we focused the research mainly on the importance of institutional and transition-related factors as crucial determinants that largely explain the size of FDI in transition economies. As expected, in the static model, all of these determinants play an important role in determining firms' foreign market entry decision. Moreover, SEE-5 and EU-NMS-10 host country institutional-related factors appeared to significantly determine bilateral FDI flow from the EU-14 countries. Guided by economic theory and empirical investigation, we specify static, static and dynamic models. From all the estimates we found that gravity factors, like market size of the host and source country, are important determinant for foreign investors. Negative and significant coefficient of distance indicates that FDI is determined by gravity factors, as expected. Based on a panel data analysis we have found that FDI flows are significantly influenced by both gravity factors (distance, GDP) and non-gravity factors (bilateral exports, schooling, WTO, transition progress and governance indicators of rule of law, regulatory quality and political risk). The positive and significant coefficients of market size factors (GDP) for both source and host country indicates that FDI is determined by host and source country market seeking considerations. Also, the positive and significant coefficient of schooling is a signal that foreign investors consider efficiency - seeking considerations for positive FDI decisions. On the other hand, the positive and significant coefficient of bilateral exports supports the complementarity relationship between FDI and exports in the host countries of FDI. The significant coefficients of host country WTO membership, transition progress, rule of law and regulatory quality confirm the importance of institutions for FDI flows in SEE-5 and EU-NMS-10 countries. The economic importance of the findings of this paper is on providing an analytical foundation for the evaluation of country policies and institutions aimed at making South East European Countries and New EU member states more attractive to foreign investors. In line with this finding, the paper provides guidance on which major macroeconomic and institutional determinants of FDI a strong emphasis should be placed by policymakers in these countries. In terms of contribution to the empirical evidence, the study contributes to the literature in the field of determinants of FDI in transitioning countries, in particular by introducing the institutional determinants of FDI in transition countries when applying the standard methodology of the gravity model to the dataset of SEE and NMS countries. In this study we have augmented the gravity model to accounts for many host country transition and institutional related factors that consider investment climate in SEE-5 and EU-NMS-10 countries.

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Appendix

Table 1. Description of variables used in the model and data sources

Variable name	Description	Source
$lnfdi_{ijt}$	FDI outflows of Source Country: FDI flow from source country to host country at current year	OECD
$lngdp_{i,t-1}$	GDP in source country	UNCTAD
$lngdp_{j,t-1}$	GDP in host country	UNCTAD
$ln\lvert gdpc_{i,t-1} - gdpc_{j,t-1}\rvert$	Difference in GDP per capita between source country and host country, in PPP (constant 2005 international$), in logarithm	World Bank
lnd_{ij}	Distance in kilometers between capital cities of host and source countries, in logarithm	www.geobytes.com
$smctry_{ij}$	Dummy variables that take value one when two countries share a border, a language or were the same country in the past, correspondingly and zero, otherwise	CEPII
$lnbex_{ji,t}$	Bilateral exports from country j to country inin millions of US dollar	OECD
wto_{jt}	World Trade Organization membership of host country. Dummy variable = 1 at the time of host country accession into WTO at year t, 0 otherwise	UNCTAD
$bfdi_{jt}$	Bilateral Investment agreement. Dummy variable = 1, denoting the year of entry into force of bilateral investment agreement, at the time afterward, 0 otherwise	UNCTAD
$lnsch_{jt}$	School enrollment, tertiary (% gross), in logarithm	World Bank
$lntp_{jt}$	Log of transition progress. The sum of the indexes of overall infrastructure reforms, banking reforms, trade and foreign exchange rate reforms and the index of the securities and non – bank financial institutions	EBRD
$lncpi_{jt}$	Log of corruption perception index, range 0 - 10	Transparency International

$lncc_{jt}$	Control of corruption in host country, in per centile rank, in logarithm	World Bank. WGI
$lnrq$	Regulatory Quality in host country, in per centile rank, in logarithm	World Bank. WGI
$lngov_{jt}$	Government effectiveness, in per centile rank, in logarithm	World Bank. WGI
$lnrl_{jt}$	Rule of law in host country, in per centile rank, in logarithm	World Bank. WGI
$lnpr_{jt}$	Political risk, in per centile rank, in logarithm	World Bank. WGI
$lnva_{jt}$	Voice and accountability in host country, in per centile rank, in logarithm	World Bank. WGI
d	d denoting dummy variable is equal 1 for SEE-5 countries; 0 - otherwise, capturing the benchmark category of EU-NMS-10 countries	Own knowledge

Table 2. Correlation matrix between variables employed in the model

	LFDI	LGDP_S	1LGDP_H	1LDIFGDPC	LD	SMCTRY	WTO	BFDIA	LBEXX	LSCH	LTP1	LCPI	LCC
LFDI	1.0												
LGDP_S	1.0	1.0											
LGDP_H	0.2	0.2	1.0										
LDIFGD	0.5	0.5	0.0	1.0									
LD	0.3	0.3	0.2	0.0	1.0								
SMCTRY	-0.3	-0.3	0.1	0.0	-0.2	1.0							
WTO	0.2	0.2	-0.2	0.0	0.0	-0.6	1.0						
BFDIA	0.2	0.2	-0.1	0.3	-0.1	0.0	0.0	1.0					
LBEXX	0.2	0.2	-0.1	0.1	0.0	0.0	0.0	0.2	1.0				
LSCH	0.6	0.6	0.3	0.6	0.1	-0.2	0.1	0.3	0.1	1.0			
LTP1	0.2	0.2	0.0	0.3	0.0	0.1	-0.1	0.4	0.2	0.3	1.0		
LCPI	0.2	0.2	-0.1	0.3	-0.1	-0.1	0.1	0.6	0.3	0.5	0.3	1.0	
LCC_pr	0.2	0.2	-0.1	0.3	-0.2	-0.1	0.1	0.4	0.1	0.3	0.5	0.5	1.0
LRQ_pr	0.2	0.2	-0.1	0.4	-0.2	-0.1	0.1	0.4	0.1	0.4	0.4	0.5	0.5
LGOV_pr	0.2	0.2	-0.1	0.3	-0.1	-0.1	0.1	0.5	0.2	0.5	0.4	0.5	0.5
LPS_pr	0.2	0.2	-0.1	0.4	-0.2	-0.2	0.1	0.5	0.2	0.4	0.4	0.5	0.5
LVA_pr	0.2	0.2	-0.1	0.4	-0.2	-0.1	0.1	0.5	0.1	0.4	0.3	0.5	0.5
LRL_pr	0.3	0.3	-0.1	0.4	-0.2	-0.1	0.1	0.5	0.1	0.5	0.4	0.5	0.5
LCC_prs	0.2	0.2	-0.1	0.4	-0.2	-0.1	0.1	0.5	0.1	0.5	0.4	0.5	0.5
LRQ_prs	-0.2	-0.2	0.1	-0.3	0.1	-0.1	0.0	-0.5	-0.1	-0.3	-0.3	-0.4	-0.5
LGOV_prs	-0.2	-0.2	0.1	-0.3	0.1	-0.1	0.0	-0.5	-0.1	-0.3	-0.3	-0.3	-0.5
LPS_prs	-0.2	-0.2	0.1	-0.3	0.1	-0.1	0.0	-0.5	-0.1	-0.3	-0.3	-0.3	-0.5
LVA_prs	-0.2	-0.2	0.1	-0.3	0.1	-0.1	0.0	-0.5	-0.1	-0.3	-0.3	-0.3	-0.5
LRL_prs	-0.2	-0.2	0.1	-0.3	0.1	-0.1	0.0	-0.5	-0.1	-0.4	-0.3	-0.4	-0.5
SEE dummy	-0.2	-0.2	0.1	-0.3	0.1	-0.1	0.0	-0.5	-0.1	-0.3	-0.3	-0.3	-0.5

	LRQ_pr	LGOV_pr	LPS_pr	LVA_pr	LRL_pr	LCC_prs	LRQ_prs	LGOV_prs	LPS_prs	LVA_prs
LRQ_pr	1.0									
LGOV_pr	0.5	1.0								
LPS_pr	0.8	0.5	1.0							
LVA_pr	0.9	0.5	0.8	1.0						
LRL_pr	0.9	0.5	0.8	0.9	1.0					
LCC_prs	-0.7	-0.5	-0.6	-0.7	-0.6	1.0				
LRQ_prs	-0.7	-0.5	-0.7	-0.7	-0.6	1.0	1.0			
LGOV_prs	-0.6	-0.4	-0.6	-0.7	-0.6	1.0	1.0	1.0		
LPS_prs	-0.7	-0.5	-0.6	-0.7	-0.6	1.0	1.0	1.0	1.0	
LVA_prs	-0.7	-0.5	-0.7	-0.7	-0.6	1.0	1.0	1.0	1.0	1.0
SEE-D	-0.7	-0.5	-0.7	-0.7	-0.6	1.0	1.0	1.0	1.0	1.0