INSTITUTIONAL DETERMINANTS OF FOREIGN DIRECT INVESTMENT IN MACEDONIA: EVIDENCE FROM PANEL DATA

Ismet Voka
University, Aleksander Moisiu
Durres, **ALBANIA**

Bardhyl Dauti
State University of Tetovo
Tetovo, **MACEDONIA**

ABSTRACT

The paper uses gravity model, augmented with institutional related FDI determinants to estimate the stock of bilateral FDI potentials between Macedonia and 24 European Union countries. We use panel data on Macedonia's bilateral FDI activity across EU - 24 countries, for the period 1997 - 2010. The paper employees augmented gravity model of FDI, considering for host country institutional factors that determine the entrance of foreign capital in Macedonia. The findings of the paper suggest that FDI into Macedonia from EU - 24 countries is determined by market size and institutional related determinants.

Keywords: Foreign Direct Investment, Macedonia, Panel Data.

INTRODUCTION

Gravity model has been extensively applied in bilateral trade studies to estimate trade potentials (Baldwin, 1994). Eaton and Kortum (2002) and Anderson and Wincop (2003), provided further contribution on a theoretical and empirical grounds, on the scientific progress of trade related studies using gravity model framework for estimation of bilateral trade potentials between countries. The gravity model was estimated using multi – country general equilibrium model (Anderson and Wincoop, 2003). In the general equilibrium model, bilateral trade activity depends from the same exogenous variables as bilateral FDI activity (Bergstrand and Egger, 2007) and may be described by gravity model as well. (Brenton, Di Mauro and Lücke, 1999). Considering the importance of bilateral FDI activity for speeding up the transition process, one might be interested for estimating the ‘’potential’’ levels of FDI versus ‘’actual’’ levels of FDI. This paper will investigate the potential level of foreign direct investments in Macedonia. In this regard, the paper will consider estimation of bilateral FDI stocks between EU – 24 countries and Macedonia, using an augmented gravity model, based on a panel data – set for a time span: 1997 – 2010. Macedonia is chosen as a target of special focus, in order to test how the model of the determinants of FDI applies to a semi – developed country. Moreover Macedonian government has taken important steps with regard to promotion of the country to foreign investors, like significant institutional reforms. Also, foreign direct FDI in Macedonia are considered as crucial source of GDP growth, increase of employment and exports and a main driving force for enhancement of the transition process in the country. Therefore, considering the importance of FDI for Macedonia's economy, the paper outlines the actual and potential determinants of FDI in Macedonia from source EU - 24 countries. The paper is organized as follows. The next section presents stylized facts for Macedonia. Section three presents methodology and empirical model and describes data used. Section four presents the results obtained by estimating the augmented gravity model framework. Section five presents the calculation of FDI potentials in Macedonia at stock levels from individual EU – 24 source countries. Last section concludes.

Stylized facts about Macedonia

Table 1 reports the dynamics of FDI inflow in Macedonia by source countries. The sample of source countries of FDI in Macedonia consist of EU - 14 countries and EU - NMS - 10 countries. The bilateral FDI inflow data in Macedonia, at stock level, originated from the EU - 24 countries, is considered in two categories of countries; EU - 14 and EU - NMS - 10, for the purpose of the sample design in the empirical part of the study. Among the EU - 14 countries Greece, Netherlands and Austria are recorded as a main source countries of FDI, during the observed period 1994 - 2010, whereas among new European member states Hungary, Slovenia followed by Bulgaria are leading countries in terms of their investment stock in Macedonia.

Table 1: Foreign Direct Investment stock in Macedonia, by country of origin for the period: 1997 - 2010, in millions of US dollar

Host country of FDI: Macedonia					
Source EU – 15 countries	Bilateral FDI flows. In mill of US dollar	%	Source EU - NMS – 10 countries	Bilateral FDI flows. In mill of US dollar	%
Austria	1,884.02	19.15	Bulgaria	507.01	8.49
Belgium	10.73	0.11	Romania	4.81	0.08
Denmark	6.80	0.07	Slovenia	1,901.31	31.87
Finland	0.31	0.00	Slovak Rep	0.63	0.01
France	241.35	2.45	Czech Rep	12.70	0.21
Germany	738.13	7.50	Hungary	3,536.28	59.27
Greece	3,271.51	33.25	Poland	2.70	0.04
Ireland	1.56	0.02	Latvia	0.00	0.00
Italy	419.64	4.26	Lithuania	0.02	0.00
Netherland	2,646.78	26.90	Estonia	0.02	0.00
Portugal	7.64	0.08			
Spain	-1.05	-0.01			
Sweden	29.56	0.30			
United Kingdom	582.48	5.92			
Total	9,839.47	100.00	Total	5,965.48	100.00

Source: NBRM, 2014

Observing the inward FDI, by economic activity (table 2), we notice that foreign capital in the form of FDI at stock level, in Macedonia, during the observed period: 1997 - 2010, mostly was concentrated in tradable sector (manufacturing), (75%), followed by non - tradable sectors like, electricity, gas and water construction (8,6%), service sector (7,8%), mining and querying (5,9%) and agriculture (1,8%).

Table 2:FDI stock in Macedonia, by economic activity, during 1997 - 2010, in millions of US dollar

	Agriculture, hunting and fishing	Mining and Querying	Manufacturing	Electricity, gas and water construction	Total services
1997	1.04	0.27	66.51	0	0.57
1998	0.58	0.40	159.97	0	0.80
1999	0.90	0.68	223.10	0	5.65
2000	0.72	9.21	274.34	0	30.65
2001	2.36	11.99	349.18	0	41.45
2002	3.89	17.65	477.02	0	58.43
2003	12.26	19.41	612.76	0	82.36
2004	31.41	30.44	904.56	0	87.73
2005	27.11	46.33	914.64	0	72.06
2006	30.44	59.67	1056.05	206.88	92.82
2007	39.67	74.55	1333.07	237.57	127.90
2008	43.51	237.58	1249.47	231.67	165.29
2009	23.44	128.06	1366.98	204.77	138.06
2010	38.73	176.58	1398.46	303.25	177.69

Source: NBRM, 2014

Methodology, empirical approach and data

For estimation purposes, the extended gravity equation for FDI inflow in Macedonia applied to equation (1) in log – linear form is expressed as follows.

$$lnfdi_{ijt} = \beta_0 + \beta_1 \ln gdp_{it-1} + \beta_2 \ln gdp_{jt-1} + \beta_3 lnd_{ij} + \beta_4 \ln\left|gdpc_{it-1} - gdpc_{jt-1}\right| + \beta_5 \ln smctry_{ij}$$
$$+ \beta_6 \ln fdi_{ijt-1} \times \ln cc_{jt} + \beta_7 \ln fdi_{ijt-1} \times \ln gov_{jt} + \beta_8 \ln fdi_{ijt-1} \times \ln rq_{jt} + \beta_9 \ln fdi_{ijt-1} \times \ln rl_{jt} \quad (1)$$
$$+ \beta_{10} \ln fdi_{ijt-1} \times \ln va_{jt} + \varepsilon_{ijt} + \mu_{ijt}$$

where *i* denotes individual EU - 24 source countries[1], *j* denotes Macedonia as a host country. *t* denotes the years from 1997 to 2010. The dependant variable fdi_{ijt} is defined as the bilateral stock of Foreign Direct Investment (FDI) from source country *i* to host country *j* at time. The source of this data is National Bank of Republic of Macedonia (NBRM). The dependent variable FDI_{ijt} measures FDI inflow at stock level from individual source countries into Macedonia, in millions of US dollar.

GDP per capita: The empirical literature suggests positive relationship between market size factors and the size of FDI flows. (Bevan and Estrin, 2004; Johnson, 2006; Mateev, 2008). The explanation is that the bigger the host country GDP per capita the larger the inflow of FDI, since larger economies becomes more attractive for foreign capital. The source of the data for this variable is UNCTAD.

Gross Domestic Product: The GDP related gravity variables $lngdp_{it}$ and $lngdp_{jt}$ capture market size effects of source and host country on FDI flow: the larger the origin country of FDI the more FDI should emerge from this country; the larger the market size of a host country the more FDI it should receive. Thus, for both variables we expect positively signed

[1]*Austria, Belgium, Denmark, France, Finland, Germany, Greece, Ireland, Italy, Netherland, Portugal, Spain, Sweden and United Kingdom, Bulgaria, Romania, Slovenia, Slovakia, Czech Republic, Poland, Hungary, Estonia, Latvia and Lithuania*

significant coefficients. The source of this data is UNCTAD. The Gross Domestic Product is measured in US dollar, at current prices and current exchange rates, in millions.

Distance: This variable represents gravity factor. Distance between source and host country is expected to have negative effect on the size of FDI flows, due to costly adoptions of goods to local preferences (Johnson, 2006) and high transportation cost (Bevan and Estrin, 2000; Resmini, 2000). The variable distance (lnd_{jt}) is measured by the actual route distance from the economic centres (generally, capital cities) between source and host countries, in kilometres.

Gravity dummy variable. However, a number of additional variables are also customarily used. In this regard, the model includes also additional gravity factors through dummy variables, like (*smctryij)* which are dummy variables that take 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. This variable is used to capture information costs. Firms in adjacent countries, countries with common relevant cultural features are likely to know more about each other and to understand each other's business practices better than firms operating in less – similar environments. The source of the data for smctry is CEPII.
Control of corruption: The index of control of corruption, ($lncc_{jt}$) captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as ''capture'' of the state by elites and private interests. It is expected that control of corruption to be negatively associated with bilateral FDI.

Regulatory quality: The index of regulatory quality ($lnrq_{jt}$) measures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. It is expected that regulatory quality index to be positively related to bilateral FDI.

Rule of Law: The index of rule of law (*lnrljt)* measures the perceptions of the extent to which economic agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence. It is expected that economic agent's confidence in host country institutional system, represented by quality of contract enforcement and property rights, to be positively related to bilateral FDI.

Voice and accountability: This index captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. It is expected that quality of host country free election processes and host country institutional processes, represented by good governance, will have positive impact on bilateral FDI in Macedonia.

Government effectiveness: This index captures perceptions of 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. It is expected that Macedonia's government effectiveness will be positively related to the inward FDI in the country, at stock level. In general, it is expected that bilateral FDI flow from source to host country will increase as the overall institutional conditions in Macedonia improve. Therefore, it is expected positive relationship between FDI and host country governance indicators. The source of these data is the database on world governance indicators from the World Bank.

Lagged dependent variable: In the empirical model we will also consider the lagged value of the dependent variable (FDI_{ijt-1}) as an explanatory variable. The inclusion of one year lagged FDI flows allows us to control for any possible agglomeration effects of FDI, which in many empirical studies is found to be significantly related to further FDI flow (Campos & Kinoshita, 2003; Agiomirgianakis et al, 2004). This variable is included as the interaction term. $FDI_{ij,t-1}*a_c$ denoting interaction terms of FDI determinants with country indicators, where a_c denote country dummy variables like world governance indicators. Methodologically the lagged dependent variable is introduced in the model to correct for serial correlation problems. (Greene, 2012)

RESULTS

In this section we present the empirical results from baseline and robust fixed effects (FE). We discuss the economic interpretation of models summarized in table 3. We check the robustness of the model to changes in specification and we check for the coefficient sizes and significance by including lag variables. The dependent variable is in logarithm in all cases.

DISCUSSION OF RESULTS FROM FIXED EFFECTS

In this section we present the estimated coefficients of the augmented gravity model using standard fixed effect and the robustness check from fixed effect estimates. The robust FE - LSDV estimates (column 1) are showing significant negative coefficient of host country GDP. The reason, why host country GDP is negative, may be due to the fact that the growth rate of Macedonia's GDP was lower than the growth rate of FDI stock. Another explanation can be attributed to the fact that Macedonia, during the period 1997 to 2010, was in the process of installing parliamentary democracy, and this result, has been attributed to deficit financing of the democratic process (Dauti, 2008), meaning that the growth of GDP is mainly reflecting government sector deficit financing rather than the growth of real sector. Focusing on the coefficient of *same country*, indicating cultural, border and language similarities between source and host country at the same time, we find that border and cultural similarities are positively associated to bilateral FDI, as expected. However, other transition and institutional related factor became more important as it is confirmed in latest empirical literature. Among institutional related determinants the same estimates are showing that bilateral FDI stock interacted with rule of law and voice and accountability variable are significant and positively related to agglomeration patterns. This interaction tests whether the relationship between past and current FDI differ according to quality of rule of law and government accountability. The result is showing that as the economic agent's confidence on host country institutions increases by 10 percent, FDI activity in host countries is reduced by 6 percent. These results means that the early presence of foreign investors in the host countries has shown positive spillover effect on the increase of economic agent's confidence on the host country institutional system, especially contract enforcement policies, property rights and the court policies, in the host country.

Table 3: Results from OLS, FE, RE and robust OLS, FE, RE estimates and de - meaning regressions with source country fixed effects, host country fixed effects and time effects

VARIABLES	(1) FE	(2) FE Robust
Log of GDP in source country	-0.126	-0.126
	[-0.56]	[-0.44]
Log of GDP in host country	-1.423***	-1.423*
	[-2.87]	[-1.91]
Log of difference in GDP per capita	0.010	0.010
	[0.17]	[0.22]
Log of distance		
Cultural and language similarities		
Log of corruption perception index	2.914***	2.914***
	[3.77]	[4.26]
Log of control of corruption *FDI(-1)	-0.331*	-0.331
	[-1.87]	[-1.47]
Log of government effectiveness *FDI(-1)	-0.441**	-0.441***
	[-1.98]	[-3.16]
Log of regulatory quality * FDI (-1)	-1.612***	-1.612**
	[-2.73]	[-2.17]
Log of rule of law * FDI(-1)	0.687**	0.687*
	[2.02]	[1.93]
Log of voice and accountability * FDI (-1)	1.836***	1.836**
	[3.14]	[2.69]
Constant	-51.35***	-51.35***
	[-5.44]	[-5.01]
Host country dummy	NO	NO
Source country dummy	NO	NO
Year dummy	NO	NO
Observations	228	228
R-squared	0.584	0.584
R2-overall	0.637	0.637
Number of I	22	22

t-statistics in brackets:
*** p<0.01, ** p<0.05, * p<0

Also, bilateral FDI stock interacted with voice and accountability variable is significant and positive, meaning that the early presence of foreign investments in Macedonia, has been associated with positive spillover effect on the increase of the quality of free government election processes. On the other hand the institutional related coefficients of control of corruption, government effectiveness and regulatory quality, interacted with lagged value of bilateral FDI stock, are significant but negatively related to agglomeration patterns, once confirming that the earlier presence of foreign investments in Macedonia, could not improve quality of host country institutional related factors associated with corruption by state elite and private interest, good governance of public services and government abilities to apply economic policies and regulation that promote boost in private sector developments. This is

an indication that FDI decisions rely on past information's on host country perceptions toward state elite's corrupt practices, good governance and regulation policies on private sector developments. This means that the relationship between past and current FDI differ according to control of corruption, good governance and regulation policies.

Estimating potential inward FDI stock in Macedonia

To estimate the actual and potential bilateral FDI stock in Macedonia, we have considered only the main gravity variables, like source country GDP, host country GDP and distance, assuming that the size of bilateral FDI stock in Macedonia, originated from EU - 24 countries depends only from the market size variables of the respective EU - 24 countries and Macedonia and the transaction cost associated with location of capital stock of FDI, captured by distance variable in actual routes between the capital city of Macedonia (Skopje) and the capital cities of the respective EU - 24 countries. For estimation purpose, we have used standard baseline OLS, FE and RE regressions. The main gravity coefficients are used in the model, in order to estimate the potential FDI stock in Macedonia, originated from EU - 24 countries. The hausman test[2] suggest to choose random effect estimates (column 5) for calculating the potential FDI stock in Macedonia, originated from EU - 24 countries.

Table 4: Baseline results from gravity determinants of bilateral FDI stock in Macedonia

	(3)	(4)	(5)
VARIABLES	OLS	Fixed Effect	Random Effect
Log of GDP in source country	1.372***	1.154	1.408***
	[9.22]	[1.63]	[4.09]
Log of GDP in host country	1.581***	1.863***	1.625***
	[3.48]	[2.71]	[4.19]
Log of distance	-3.078***		-3.281***
	[-9.37]		[-3.76]
Constant	-7.989*	-29.069***	-7.686
	[-1.91]	[-7.46]	[-1.25]
Observations	253	253	253
R-squared	0.352	0.382	
R2-overall	.	0.116	0.352
Number of I		23	23
Hausman Test			
chi2(2)			0.22
Prob>chi2			0.8973

t-statistics in brackets *** p<0.01, ** p<0.05, * p<0.1

The random effect estimates, (column 5), have been used to calculate potential Macedonian inward FDI stock[3]. Based on the actual macroeconomic data, the potential FDI inward stock in Macedonia, are calculated for the period 2007 - 2010, by individual countries of origin.

[2] *The p - value from hausman test of 0,897, suggest that we have insufficient evidence to reject the null hypothesis that the unique errors (ui) are not correlated with the regressors. Therefore we choose random effect estimates for calculating potential FDI stock in Macedonia*

[3] *To calculate FDI potentials in Macedonia., we have used only the estimated significant gravity coefficients of bilateral FDI stock, like GDP in source and host country and distance. This calculation is based on the assumption that the size of potential bilateral FDI activity between Macedonia and EU - 24 countries will be achieved only by the distance between economic sizes of host and source countries and not by other institutional related factor either assisting or resisting bilateral FDI activity.*

This analysis includes 24 countries, both EU - 14 source countries[4] and EU - NMS - 10 countries[5].

Table 5: FDI actual and potentials in Macedonia, by country of origin

FDI - country of origin	2007		2008		2009		2010	
	Realized	Potential	Realized	Potential	Realized	Potential	Realized	Potential
Austria	273.36	10.779	465.63	11.222	522.32	11.019	496.66	10.978
Belgium	1.47	8.717	1.63	9.160	1.72	8.973	1.56	8.141
Denmark	1.42	8.14	1.76	8.57	2.08	8.34	2.42	8.31
Finland	0.00	7.12	0.00	7.57	0.21	7.31	0.21	7.26
France	12.05	11.08	18.14	11.51	37.67	11.31	173.04	11.25
Germany	98.55	11,74	92.17	12.16	89.29	11.94	95.45	11.90
Greece	444.12	12.124	627.23	12.586	547.87	12.415	576.10	12.290
Ireland	0.03	6.64	0.01	6.96	0.58	6.64	0.57	6.50
Italy	53.35	13.45	77.30	13.87	80.45	13.67	78.23	13.59
Netherland	494.80	12.05	606.18	12.51	754.23	12.29	735.48	12.23
Portugal	2.56	6.22	3.17	6.64	2.27	6.45	2.05	6.38
Spain	-0.23	9.49	-0.18	9.93	-1.23	9.72	0.23	9.64
Sweden	3.09	8.15	-2.44	8.53	5.13	8.18	6.88	8.83
UK	92.46	10.692	159.81	10.90	110.53	10.54	137.00	10.56
Bulgaria	71.69	12.82	120.38	13.41	132.94	13.23	156.76	13.17
Romania	0.52	11.46	-0.35	12.01	1.25	11.62	2.49	11.56
Slovenia	190.25	8.217	365.70	8.72	563.57	8.48	532.74	8.39
Slovakia	0.07	8.65	0.05	9.28	0.00	9.08	-0.02	9.05
Czech R.	8.61	8.85	0.68	9.46	0.73	9.18	3.36	9.16
Poland	0.54	9.48	0.69	10.08	0.59	10.31	0.53	9.98
Hungary	483.26	10.07	571.37	10.55	560.02	10.18	463.46	10.17
Latvia	0.00	4.73	0.00	5.25	0.00	4.80	0.00	4.66
Lithuania	0.00	5.63	0.00	6.24	0.00	5.80	0.02	5.75
Estonia	0.00	3.85	0.01	4.27	0.00	3.88	0.01	3.83

Results from table 5, are confirming that according to the gravity model (model 5), the realized level of FDI stock is over the potential during the years from 2007 to 2010, for countries like: Austria, Greece, Netherlands, Italy, Germany, United Kingdom, Hungary, Bulgaria and Slovenia. Referring to the country level data, in the year of 2010, the highest record of actual FDI stock in Macedonia was coming from Netherlands, reaching its level about 69 times higher than potentially expected. followed by Slovenia with recorded actual FDI stock 65 times higher than its potential level, Greece and Austria, with a recorded actual

[4] *The EU - 14 source countries consist of: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherland, Portugal, Spain, Sweden and United Kingdom.*

[5] *The EU - NMS - 10 source countries of FDI in Macedonia include: Bulgaria, Romania, Slovenia, Slovak Republic, Czech Republic, Hungary, Poland, Latvia, Lithuania and Estonia.*

FDI stock 49 times higher than potentially expected and Hungary with recorded actual FDI stock in Macedonia, 42 times higher than theoretically expected.

Other countries that have recorded significantly higher amounts of actual FDI stock in Macedonia than potentially expected are: France (15 times), United Kingdom (12,97 times higher), Bulgaria (11,90 times higher), Germany (8,63 times higher), Italy (5,75 times higher). However, for countries like: Belgium, Denmark, Finland, Ireland, Portugal, Spain, Sweden, Romania, Slovakia, Latvia, Lithuania and Estonia, the potential level of inward FDI in Macedonia from these countries is significantly higher than the respective actual levels. The ratio of potential-to-realized FDI below one shows that the country received less FDI than predicted by the model and there exist more scope for receiving new FDI, while values above one show that Macedonia have received more FDI than potentially expected.

CONCLUSION

This paper has identified significant determinants of FDI flows at stock level into Macedonia, and highlighted the implications of different institutional factors for FDI flows. Using augmented gravity model with both traditional and transition specific variables, we focused the research mainly on the importance of gravity and institutional factors as primary determinants of FDI in Macedonia. As expected, all of these determinants play an important role in determining firm's foreign market entry decision. Moreover, Macedonia's host country institutional related factors appeared to significantly determine bilateral FDI flow from the EU – 14 countries and EU – NMS – 10 countries. From the estimates we found that gravity factors like income level of the host country is an important determinant for foreign investors. Negative and significant coefficient of distance indicates that FDI is determined by gravity factors, as expected. The findings of the study can provide an analytical foundation for the evaluation of country policies and institutions aimed at making Macedonia more attractive country to foreign investors. The findings also suggest that strong emphasis should be placed by host country policy makers in improving the efficiency of government institutions, controlling corruption and bureaucracy and improving the general economic conditions. Hence, policy implications of the paper are on understanding that factors behind FDI - flows should help policy makers in designing strategies for attracting potential FDI. The estimated values of potential FDI in Macedonia reveal that a further increase in inward FDI can be achieved only upon realization of further economic growth and better improvement of transition and institutional specific factors. Therefore, Macedonia's institutions should be focused on creating conditions for sustainable economic growth, thus reducing the gap between actual level of FDI in Macedonia and its potential level, originated from source EU - 24 countries.

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