SUBSTITUTIONARY OR COMPLEMENTARY RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT AND EXPORTS. EVIDENCE FROM TRANSITION COUNTRIES

Bardhyl Dauti

University of Tetova, Faculty of Economics, Macedonia
Contact e-mail:bardhyl.dauti@unite.edu.mk

Abstract

The objective of this research is to provide an empirical assessment on the nature of FDI in selected transition countries, using bilateral country level data on FDI flows and export flows, between 5 South East European Countries (SEE-5), 10-New EU member states (EN-NMS-10) and 20 countries from the Organization of Economic Cooperation and Development (OECD-20 countries), at a yearly time period from 1994 to 2010. For estimation purpose, we use Random Effect Tobit estimates. The study finds country characteristics, like differences in GDP and GDP per capita, as well as differences in factor endowments between countries at labor and capital base and trade cost are significantly related to export flows between countries. With regard to the relationship between exports and FDI the findings of the study support vertical nature of FDI in the SEE-5 and EU-NMS-10 countries, whereas, based on country characteristics findings the study supports horizontal nature of FDI.

Keywords: transition countries, gravity model, exports, foreign direct investment
JEL classification F12, F14, F21, F23

INTRODUCTION

The relationship between FDI and exports has received extensive attention in the late empirical evidence. Theoretical predictions on the relationship between FDI and exports depend on the nature of FDI. Horizontal FDI are negatively related to trade, whereas vertical FDI are positively related to trade (Markunsen, 1984; Helpman, 1984). In this regard, horizontal (vertical) FDI are considered as substitute (complement) goods to trade (Shatza and Venables, 2000). With regard to trade cost, horizontal (vertical) FDI operates under the conditions of moderate to high (low) trade costs and trade and tariff barriers. With regard to country characteristics, horizontal (vertical) FDI operates under the conditions of large absolute market size and similar factor endowments (small absolute market size, different relative factor endowments). (Lipsey & Weiss, 1981; 1984; Ramstetter, 1991; Swenson, 1996; Dauti, 2016). The main purpose of this paper is to provide empirical evidence on the nature of FDI in the selected transition countries of South East European region and Central East European region, based on country characteristics and trade costs evidence. The developed model in this paper provides a unified theory considering both vertical and horizontal FDI. In this regard, the framework of the study will link the country characteristics

to the relationship between FDI and exports to generate the hypotheses: It is expected that FDI from source to host countries, will have an effect on increasing the exports of the exporting countries, suggesting the presence of export platform FDI.

The findings of the paper suggest a mixed nature of FDI in the host transition countries. On the grounds of country characteristic differences and trade cost, FDI and exports are substitutes and the nature of FDI is horizontal. On the other, on the grounds of the relationship between exports and FDI, the paper finds that bilateral FDI flow are positively related to exports, suggesting a complementary relationship between FDI and exports supporting vertical nature of FDI. The paper is organized as follow. The next section presents theoretical approach of the studies on horizontal and vertical FDI, based on theoretical framework of a gravity model. Section three describes the data, presents the hypothesis, methodology and the empirical model. Section four presents results obtained by estimating the empirical model framework. Last section summarizes the results and concludes.

1   LITERATURE RIVIEW OF GRAVITY MODEL APPLIED TO TRADE STUDIES

According to the core literature of empirical studies on the Gravity Model, the gravity equation specifies that a flow from origin i to destination j can be explained by economic forces at the flow's origin, economic forces at the flow's destination and economic forces either aiding or resisting the flow's movement from origin to destination. The most common specification of gravity model widely used in trade studies is Bergstrand (1989), specification which is given as follows:

$$x_{ij,t} = \beta_0 gdp_i^{\beta_1} gdp_j^{\beta_2} d_{ij}^{\beta_3} a_{ij}^{\beta_4} \varepsilon_{ij} \quad (1)$$

In the general form of the gravity model, exports from country i to country j are explained by the economic sizes (gdp) of country i and j's population, geographical distance and a set of dummies incorporating either institutional factor, trade preferences or factor endowment country characteristics. The basic model is specified as (Martinez - Zarzoso and Nowak - Lehm, 2003; 2004).

$$x_{ij,t} = \beta_0 gdp_i^{\beta_1} gdp_j^{\beta_2} pop_i^{\beta_3} pop_j^{\beta_4} d_{ij}^{\beta_5} a_{ij}^{\beta_6} \varepsilon_{ij} \quad (2)$$

Where x_{ij} is exports of goods from country i to country j. gdp_i and gdp_j are the gdp of the exporter and importer, $pop_{i\ and}\ pop_j$ are the populations of exporter and importer, d_{ij} is the distance between the two countries. A_{ij} represents any other factor impacting exports between countries and u_{ij} is the error term. For estimation purpose, the model in equation 2 is expressed in the log form.

$$lnx_{ij,t} = \beta_0 + \beta_1 lngdp_{i,t} + \beta_2 lngdp_{j,t} + \beta_3 lnpop_{i,t} + \beta_4 lnpop_{j,t} + \beta_5 lnd_{ij} + \beta_6 lna_{ij}$$
$$+ \varepsilon_{ij} \qquad\qquad (3)$$

Alternatively, equation (2) uses a GDP per capita variable instead of population, and is represented as follows:

$$x_{ij,t} = \eta_0 gdp_i^{\eta_1} gdp_j^{\eta_2} \left(\frac{gdp_i}{pop_i}\right)^{\eta_3} \left(\frac{gdp_j}{pop_j}\right)^{\eta_4} d_{ij}^{\eta_5} a_{ij}^{\eta_6} \varepsilon_{ij} \qquad (4)$$

Where gdp$_i$ /pop$_i$ are the exporter gdp per capita and gdp$_j$/pop$_j$ is the importer gdp per capita. Expressing equation (4) in log linear form yields.

$$lnx_{ij,t} = \eta_0 + \eta_1 lngdp_i + \eta_2 lngdp_j + \eta_3 ln\left(\frac{gdp_i}{pop_i}\right) + \eta_4 ln\left(\frac{gdp_j}{pop_j}\right) + \eta_5 lnd_{ij} + \eta_6 lna_{ij}$$
$$+ \varepsilon_{ij} \qquad\qquad (5)$$

Following Bergstrand (1989), the theoretical framework on the gravity equation explaining trade patterns among countries, equation (5) will be applied in this study, where *a* will include measures of factor endowment considerations at labor and capital base. The empirical evidence that test the relationship between FDI and exports, is mainly based on a two factor country model, considering two factors of production and two sectors (Maruknesn et al., 1998). In this paper, we extend this approach by including more than two countries, like SEE-5 and EU-NMS-10 countries as exporting (partner) countries and host countries of FDI and OECD-20 countries as reporting (importing) countries and source countries of FDI. The reduced form gravity equation of related choice variables is given below.

$$lnx_{ji,t} = \mu_t + \beta_0 lnfdi_{ij,t-1} + \beta_1 ln\left|gdp_{i,t-1} - gdp_{j,t-1}\right| + \beta_2 ln\left|gdpc_{i,t-1} - gdpc_{j,t-1}\right|$$
$$+ \beta_3 lnd_{ij} + \beta_4 contig + \beta_5 smctry + \beta_6 lnop_{j,t-1}$$
$$+ \beta_7 ln\left|skill_{i,t-1} - skill_{j,t-1}\right| + \beta_8 ln\left|cap_{i,t-1} - cap_{j,t-1}\right| + \beta_9 lnfdi_{ij,t-1}$$
$$\times see + see + \varepsilon_{ij,t} \quad (6)$$

2   RESEARCH METHODOLOGY AND ECONOMETRIC ASSESSMENT

Due to the presence of zero export flows in the export data matrix, we also present the results from Poisson Pseudo Maximum Likelihood (PPML) estimation technique (Sivla and Tenreyro, 2006; 2008), Random Effect Tobit (RET) estimation technique (Peracchi, 2004) and the standard Heckman correction for selection bias (Heckman, 1979). These estimation methodologies are presented in the study in order to deal with the problem of large numbers of zero observations in the bilateral export flow matrix. In this regard, to solve the problem of negative observations in the dependent variable, we transform the dependent variable by treating the negative observations of the export data as zero values. By this transformation we take care of negative observations, and the coefficients from an OLS regression can still be interpreted as elasticity (Guerin, 2006). The advantages of using PPML and RET is that they deal with the problem of zero export flows, provide unbiased and consistent estimates in the presence of heteroscedasticity as all observations are weighted equally and the mean is always positive (Henderson and Millimet, 2008; Westerlund und Wilhelmsson, 2009; Silva and Tenreyro, 2008).

3.1 Data description and hypothesis

The dependent variable, $x_{ji,t}$ in the model is the bilateral exports in goods from exporting country j (SEE-5[1] and EU-NMS-10[2]) to importing country i (OECD-20[3]), in year t, calculated in millions of US dollars.

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[1]Albania, Bosnia and Herzegovina, Croatia, Macedonia and Serbia
[2]Bulgaria, Romania, Slovenia, the Slovak Republic, the Czech Republic, Hungary, Poland, Latvia, Lithuania and Estonia

Foreign Direct Investment, $fdi_{ij,t-1,}$ denotes the inward stock of bilateral FDI into SEE-5 and EU-NMS-10, originated from OECD-20[4]. It is expected that the stock of FDI will have a significant and positive effect on trade, suggesting that export-platform FDI may be important for the SEE and EU-NMS countries. The source of this data is OECD. FDI stock is measured at current prices and current exchange rate in millions of US dollars. If all countries were identical and trade costs were zero, there would be no motivation for FDI. Positively (negatively) estimated coefficient denotes for the presence of vertical (horizontal FDI). The source of bilateral FDI stock data is OECD.

Absolute difference of gdp and gdp per capita, $\left| gdp_{i,t-1} - gdp_{j,t-1} \right|$ and $\left| gdpc_{i,t-1} - gdpc_{j,t-1} \right|$, between partner countries represent differences in economic mass and income level of trading partners. Both variables are used in absolute difference terms, in order to avoid the problem of negative values[5]. Absolute differences of gdp also reflect the absolute differences between export supply and import demand between trading partners. Absolute difference of gdp per capita, on the other hand, denotes the comparative cost differences and combined similarities in tastes between trading countries. According to standard trade theory, we would expect that an increase in the difference in GDP between partner countries will reduce the trade volume between countries, since trade is expected to maximize when countries are of equal size (Helpman and Krugman, 1985). However, according to standard gravity model applied in trade studies, we expect positive impact of the absolute difference of GDP between trading partners on the size of bilateral trade (export and import) flow. Also, it is expected that high income OECS-20 countries will trade more with relatively low income EU-NMS-10 and SEE-5 countries.

Factor endowment variables, $\left| skill_{i,t-1} - skill_{j,t-1} \right|$ and $\left| cap_{i,t-1} - cap_{j,t-1} \right|$. To capture the effect of the difference in relative factor endowments on export flow between source and host countries, we have included in the model the absolute difference in the relative skill endowments between country i and j, measured by difference of employment in service sector (as a per cent of total employment), between country i and country j and the absolute difference in the relative capital endowments between country i and j, measured by gross fixed investments relative to total employment, in terms of the absolute difference of the

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[3]Austria, Belgium, Denmark, France, Finland, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden, the United Kingdom, the United States, Canada, Israel, Norway, Turkey and Switzerland.

[4]The FDI stock variable contains a large number of zero observations and negative values. To avoid this problem, we transform the FDI stock variable. Therefore, to account for negative observations in the matrix of bilateral FDI stock variable, we transform this variable by treating the negative values the same as zero values. By this transformation we take care of negative observations, and the coefficients from an OLS regression can still be interpreted as elasticity's. The use of FDI stock variable instead of its alternative of FDI flow has two key advantages: First, the stock variable avoids the problem of multicolinearity between trade and investment flows, given that such flows are simultaneously affected by the same economic variables. Second, the use of FDI stock is a more correct approach, since the lagged FDI flows do not have impact on trade. Hence, the use of FDI stock variable is moreover able to capture the time lag effects which are not the case with FDI flows. The FDI variable is lagged by one period (n=1) in order to allow the FDI the grace period before is starts at impacting host country's exports (imports).

[5] Moreover, some of the developed OECD countries; i.e. Portugal, have lower GDP and GDP per capita levels recorded during the observed period, 1994-2010, in comparison to EU-NMS-10 countries, i.e. Poland. The same logic applies with SEE-5 countries. Turkey, for example as a part of the sample of OECD countries has lower GDP per capita level than Croatia. Hence, by considering the absolute difference of GDP and GDP per capita between developed OECD countries and EU-NMS-10 and SEE-5 countries, we take care of negative observations in the matrix of the respective variables of absolute differences of GDP and GDP per capita. Both variables are lagged by one period in order to avoid the problem of endogeneity between gross domestic product and exports as the dependent variable.

OECD-20 ratio less the ratio for country j (SEE-5 and EU-NMS-10). According to standard trade theory, it is expected that an increase in differences in relative endowments will increase trade flow, since trade increases with differences in relative factor endowments (Helpman and Krugman, 1985). Hence it is expected that the coefficient of skill and capital endowment to be positively related to bilateral trade. The source of the data is the World Bank database.

Trade cost and gravity related variables, $(d_{ij}, contig, smctry)$. The trade cost variable in this study is represented by the distance between source and host country. The variable of distance lnd_{ijt} represents the gravity factor. Distance between source and host country is expected to have a negative effect on the size of export flows, due to costly adoptions of goods to local preferences and high transportation costs. The variable distance lnd_{jt} is measured by the actual route distance from the economic canters (generally, capital cities) between source and host countries, in kilometers. This variable is used in the model to proxy the transaction, transportation cost and physical cost of trade. The source of this variable is: CEPPI. According to Resmini (2000) greater distance presents weaker trade ties between the source country and host country, thus providing for lower trade flow levels. Typically, empirical studies proxy trade costs with bilateral distance. Hence, it is expected that an increase in trade costs reduces trade volumes. Additionally, to capture information costs, the study considers other standard gravity variables like *conting* and *smctry*, indicating whether two countries are contiguous or the 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 source of the data for *conting* and *smctry* is CEPII.

Openness, $op_{j,t-1}$: The variable of openness denoted by $lnop_{jt}$ will be included in the model to account for the openness level of the SEE and EU-NMS countries. This variable is measured by the sum of exports and imports in goods and services over GDP. This variable is used to capture the de jure liberalization of trade and foreign exchange transactions. The fewer restrictions an importing country imposes on trade the higher will be trade flow from an exporting country. Therefore, a positive relationship between trade openness and trade flow is expected. The source of the data consisting of openness variable, like exports, imports and GDP, is UNCTAD.

Interaction term between FDI and SEE dummy variable, $fdi_{ij,t-1} \times see$. To distinguish the effect of FDI stock on exports between SEE-5 and EU-NMS-10 countries, we have included the interaction terms between SEE dummy and FDI stock. By this interaction[6] we test the hypothesis that the effect of the inward stock of FDI on the bilateral exports, in exporting countries, is different between SEE-5 countries and EU-NMS-10 countries.

SEE dummy, see.The coefficient of SEE dummy, on its own, measures the export differentials between SEE-5 and EU-NMS-10 countries. It is expected negative coefficient of SEE dummy variable, since the level of SEE-5 exports to OECD-20 is expected to be lower

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[6]The presence of a significant interaction indicates that the effect of one predictor variable on the response variable is different at different values of the other predictor variable. It is tested by adding a term to the model in which the two predictor variables are multiplied. Adding an interaction term to a model drastically changes the interpretation of all of the coefficients. If there were no interaction term B_1 would be interpreted as the unique effect of inward FDI stock on bilateral exports. Since the interaction indicates that the effect of inward FDI stock on bilateral exports is different for different values of SEE dummy, the unique effect of inward FDI stock is not limited to B_1, but also depends on the values of SEE dummy variable. (SEE=1 if countries are part of SEE sample, 0=otherwise; capturing the benchmark category of countries of EU-NMS-10 countries).

in comparison to the level of EU-NMS-10 exports to OECD-20. The ε_{ijt} is the usual standard error.

The main relationship we are interested in is between FDI and exports. Whether exports and FDI are complements or substitutes depends on whether FDI is horizontal or vertical. A negative relationship between FDI and exports suggests the domination of horizontal FDI; hence, FDI and exports are substitutes. In this regard, in case of the horizontal FDI, we expect a negative coefficient of the FDI stock variable, since horizontal FDI should decrease bilateral exports. Alternatively, a positive relationship between FDI and exports, favours the domination of vertical FDI, hence FDI and exports are complements. Vertical FDI should increase imports of intermediates and exports of final goods.

Considering country characteristics, based on Markunsen *et al* model (1989), FDI is horizontal (vertical) when countries are similar (dissimilar) in terms of size and relative endowments. Hence, we expect FDI and trade to be substitutes (complements) when the country characteristics coefficients of $\left|gdp_{i,t-1} - gdp_{j,t-1}\right|$, $\left|gdpc_{i,t-1} - gdpc_{j,t-1}\right|$, $\left|skill_{i,t-1} - skill_{j,t-1}\right|$ and $\left|cap_{i,t-1} - cap_{j,t-1}\right|$ are small (large), provided that trade costs are moderate to high (low). Therefore, if the coefficients of country characteristicsare close to zero, which means that countries are identical, and trade costs are large, then FDI is horizontal, hence exports and FDI are substitutes. If countries are different in size and relative endowments, and trade costs are moderate to low, it is expected vertical FDI to dominate, and therefore FDI and exports are complements. However, in a model with multi-stages of production and multi – countries we do not have a clear prediction on the interactive skill and capital variables.

3   **EMPIRICAL ANALYSIS: DISCUSSION OF THE RESULTS**

In table 1 we report the alternative estimation techniques from PPML, RET and stage two of Heckman's selection model (column 1, 2 and 3, respectively). These estimates are considered in the study due to the robustness to heteroscedasticity (Santos and Silva, 2006). Stage two of Heckman's selection model must be considered to check for the problem of zero export flows. First we estimate a probit regression where the export flows determinants are regressed on the dependent variable, bilateral exports$_{jit}$ equal to 1 when country j (SEE-5 and EU-NMS-10) exports to country i (OECD-20) and 0, otherwise (when country j does not export to country i). In the second stage we calculate the inverse mills ratio as a bias correction term and then run an OLS regression considering the specified regressors in the selection equation of the heckman model and the calculated inverse mills ratio as an additional regressor. From the table below we see that RET and PPML estimates provide significant results[7]. As expected, all the reported results that deal with the issue of zero export flows provide different coefficients size and significance level. For example, the inward FDI stock elasticity is considerably larger under Heckman model, (0.427 per cent), compared to PPML and RET estimates with estimated respective values of (0.067per cent) and (0.197 per cent). These differences with respect to estimated economic impact of the explanatory variables on the dependent variable are driven either by the large number of zero export flows in the sample or by the heterogeneity of the data.

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[7]The likelihood-ratio test (χ^2) reported in the last row of both RET and PPML estimates is a test of the significance of the random-effect estimates and Poisson estimates.

The significant coefficient of the Mills ratio confirms that correcting for sample selection bias is not justified, and hence sample selection bias is not a concern. However, because heterogeneity is likely to be present in the data, once considering the fact that in the selected sample we have included SEE-5, EU-NMS-10 and OECD-20 countries that normally vary significantly with respect to macroeconomic level of development, we check for the best specified model. To check for this, following Santos Silva and Tenreyro (2006), we applied heteroscedasticity - robust Ramsey RESET test, which is performed by checking the significance of an auxiliary regressor constructed as $(x'b)^2$, where b denotes the vector of estimated parameters[8].The p-value of the Ramsey-rest test is larger in RET estimates, suggesting that the RET model seems to pass this test. Therefore, based on Ramsey-reset test we chose RET model as a valid model for interpreting the results.

Focusing on the results of RET estimates (column 1), the estimated coefficient of bilateral FDI stock for EU-NMS-10 countries is 0.212 (0.212-0.098*0), per cent. For SEE-5 countries it is 0.114 per cent (0.212-0.098*1). We find that there is sufficient evidence against the hypothesis that the size of bilateral exports does not vary with respect to the level of inward FDI stock, between SEE-5 and EU-NMS-10 countries. These results indicate that 10 per cent increase in the bilateral FDI stock from OECD-20 countries to SEE-5 countries, on average, increases bilateral exports from SEE-5 to OECD-20 countries by 1.1 per cent, ceteris paribus. The positive coefficient of bilateral inward FDI stock in the benchmark category of EU-NMS-10 countries indicate that 10 per cent increase in bilateral inward FDI stock from OECD-20 to EU-NMS-10 countries, result on increase of bilateral exports from exporting EU-NMS-10 countries to importing OECD-20 countries, by 2.2 per cent, ceteris paribus. The coefficients size, above 1 in absolute value, of inward FDI stock for both group of countries, indicate that export potentials of exporting SEE-5 and EU-NMS-10 countries to OECD-20 countries are sensitive to changes in the inward FDI stock in host SEE-5 and EU-NMS-10 countries originated from OECD-20 countries.

Table 1: Different estimates

VARIABLES	(1) Random Effect Tobit	(2) Random Effect PPML	(3) Heckman Two stage	(4) Selection variables	(5) Probit Equation First stage	(6) OLS Second stage
Log of bilateral FDI stock (-1)	0.212***	0.066***	0.427***	0.057**		
	[13.03]	[10.57]	[25.36]	[2.13]		
Log of abs difference in GDP (-1)	0.088***	0.059***	0.383***	0.052	0.181***	0.364***
	[3.15]	[6.02]	[15.78]	[1.46]	[3.39]	[9.84]
Log of abs difference in GDPc (-1)	-0.086*	-0.080***	-0.561***	-0.100	0.525***	1.302***
	[-1.73]	[-4.17]	[-11.04]	[-1.24]	[8.08]	[10.38]
Log of distance	-0.710***	-0.124***	-0.665***			
	[-4.45]	[-5.54]	[-13.47]			
Contingency	0.851	0.015	0.242	-0.110		
	[1.52]	[0.23]	[1.63]	[-0.49]		
Same country	-0.515	-0.058	-0.298	0.502*		
	[-0.69]	[-0.71]	[-1.58]	[1.81]		
Log of openness	0.816***	-0.069	-0.878***	-1.628***	-0.284	-1.084***
	[6.53]	[-1.56]	[-4.54]	[-8.50]	[-1.13]	[-5.97]
Log of abs. diff. in skill endowment	-0.212***	0.011	-0.039	-0.430***	0.216**	0.195**
	[-3.45]	[0.57]	[-0.68]	[-4.40]	[2.46]	[2.35]
Log of abs diff. in capital endowment	0.191***	0.011*	0.082***	0.167***	0.136***	0.236***
	[7.90]	[1.72]	[3.62]	[5.88]	[3.74]	[8.70]
Interaction: FDI (-1)*SEE-5 dummy	-0.098***	0.027*	-0.053	-0.193***		

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[8]The *p-values* of this test close to zero indicate serious misspecification problem.

	(1)	(2)	(3)	(4)	(5)	(6)
	[-2.88]	[1.86]	[-1.26]	[-4.43]		
SEE-dummy	-1.206***	-0.473***	-1.698***	-0.211		
	[-4.55]	[-6.19]	[-9.78]	[-0.87]		
Mills ratio			1.187*			
			[1.94]			
Invmills ratio						0.779
						[1.03]
Sigma_u	1.517***					
	[19.13]					
Sigma_e	0.713***					
	[60.90]					
_cons		2.511***				
		[8.76]				
_cons		-4.266***				
		[-14.35]				
Constant	4.171***		12.34***	8.96***	-5.727***	-10.51***
	[3.12]		[12.96]	[7.79]	[-4.59]	[-6.35]
Ramsey-Reset test (p-value)	4.08	3.83	1.48	1.48	1.40	
Observations	2,141	2,142	2,287	2,287	1,755	1,755
Censored observations			146			
Uncensored observations			2,141			
Number of groups	241	241				
Log likelihood	-2730.23	-4135.22			-179.27	
Wald χ²	714.98	448.32	2454.72			
Prob > χ²	0.0000	0.0000	0.0000			

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

The coefficient of SEE dummy in first case (column 1) is economically large and statistically significant. Negative coefficient for SEE dummy shows that the level of SEE-5 exports to OECD-20 is lower in comparison to the level of EU-NMS-10 exports to OECD-20. As expected, the estimate predicts that bilateral export flow from SEE-5 to OECD-20 countries is 70.06 per cent lower than bilateral export flow from EU-NMS-10 to OECD-20 countries.[9] The positive relationship between exports and FDI stock between SEE-5 and OECD-20 countries, in one hand and EU-NMS-10 and OECD-20 countries, on the other hand, confirms of the complementarities between stock of FDI and exports in both group of countries (SEE-5 and EU-NMS-10). The stock of inward of FDI into exporting countries seems to be trade inducing. This result suggests that increasing the stock of inward FDI from the origin countries, in the exporting countries, works as a channel through which exports expand in exporting countries. The estimated positive coefficient of FDI stock for SEE-5 and EU-NMS-10, indicates that FDI in these countries are vertically oriented, targeting mainly geographically fragmented production process by stages.

Considering country characteristics, we find that bilateral exports increase with the differences in GDP and decrease with the differences in GDP per capita. The positive and significant coefficient of difference in GDP indicate that differences between import demand of importing OECD-20 countries and export supply of exporting SEE-5 and EU-NMS-10 countries is positively related to trade potentials. Interpreting these results, 10 per cent increase in terms of absolute GDP (GDP per capita) difference between the trading partners, increases (decreases) the exports flows by 0.8 per cent, respectively, ceteris paribus. These

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[9] The formula to compute this effect is $\left(e^{b_i} - 1\right) \times 100$, where b_i is the estimated coefficient of -1.206 of SEE dummy variable.

findings indicate that high developed OECD-20 countries have high propensity for trade with SEE-5 and EU-NMS-10 relatively low developed countries. However, the size of the estimated coefficients of GDP and GDP per capita differences are very small, (below one in absolute value), indicating that export flows are not sensitive to changes on export supply and import demand conditions as well as comparative cost differences and combined similarities in tastes between trading partners. This is evidence that export flows are not concerned with the movements in absolute differences of GDP and GDP per capita between trading partners, since the impact of both variables on export flows is economically very small.

The estimates show positive and significant effect of openness on exports. The positive and significant coefficient of openness indicate that, as de jure trade becomes more liberalized, the export flows from SEE-5 and EU-NMS-10 to OECD-20 countries increase. Hence, 10 per cent increase in openness degree of exporting countries, is associated, on average with 8 per cent increase of export flows, ceteris paribus. Trade costs substituted by distance variable are negatively related to bilateral exports, in the RET estimates, as expected. The results are confirming that a 10 per cent increase in distance between exporting and importing countries reduces bilateral exports activity between countries, on average, by 7 per cent, ceteris paribus.

The factor endowment coefficients at labor and capital base are both significant at 1 per cent level of significance. The estimated elasticity of skill endowment difference is very low, (in absolute value below 1), -0.212 per cent, meaning that exports are not sensitive to changes in skill endowment differences between trading partners, indicating that a considerable increase of skill endowment differences between trading partners by 10 per cent decreases bilateral exports, on average, by only 2.1 per cent, ceteris paribus. The positive coefficient of capital endowment difference is confirming the standard trade theory that export increases with differences in relative capital endowments. However, again the size of the coefficient of capital endowment differences between countries is very low, meaning that its impact on exports, although positive, is economically very small, confirming that a sizeable increase of the country differences with respect to relative capital endowment by 10 per cent, increases export performance of exporting countries, at the margin, by only 1 per cent, ceteris paribus.

4   CONCLUSION AND POLICY IMPLICATIONS

The findings of the paper, suggest a broad support for the theory of both horizontal and vertical FDI. Based on the country characteristics, the results of the paper indicate that horizontal FDI is more likely to dominate, confirming the substitutionary relationship between FDI and exports, since countries were found to share similarities in market size and relative factor endowments; both at labor and capital base, and trade costs were found to be moderate to high. However, on the grounds of the relationship between FDI and exports, the results confirm the presence of vertical FDI supporting the complementary relationship between FDI and exports. The paper provides mixed evidence about the nature of FDI in SEE -5 and EU - NMS-10 countries, based on the grounds of country characteristics information's and the relationship between FDI and exports, which largely confirm the empirical evidence on the tested hypothesis related complementarities and substitutionary relationship between FDI and exports.

The contribution of this study is in terms of the methods used for estimating export flows and empirical evidence provided. The study, relying on gravity model provides different estimation methods, like Random Effect Tobit estimates, Poisson – Pseudo maximum

likelihood estimation technique and Heckman selection model, for the purpose of dealing with zero observations in the dependent variable. To this point, we discuss the fit of different estimation procedures applied to a large dataset of bilateral export flows for 35 heterogeneous countries, which differ significantly, with regard to socio-economic level of development. The study provides suggestions for policy makers of SEE-5 and EU-NMS-10, individual countries to apply country specific policies for attraction of more FDI into these countries, in order to better improve the export performance of the respective countries. The recommendation for future research would be to consider intra-industry or intra-firm data for the studies on the relationship between exports and FDI.

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