The Role of Foreign and Domestic Investment in Promoting Exports and Imports. A Dynamic Panel Approach

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Abstract: The goal of this paper is to evaluate weather domestic or foreign investments are involved in the promotion of exports and imports in eight of the newest European Union member states. We apply the dynamic panel data model for identifying the determinants of both exports and imports in the period 1999-2013. Our main result point that there is a complementary relationship between FDI and both exports and imports. The EU membership is significant for the expansion of the trade activity, but is more relevant for the export activity than for the import one.

Keywords: dynamic panel model, export, import, FDI, domestic investment
JEL Classification: C36, F14, F21

1. Introduction

In this paper, we are interested in what measure foreign direct investments (FDI) and domestic capacity is enhancing both exports and imports. We conduct this investigation in the new European Union (EU) countries as these are the ones that must catch up with the old EU countries in terms of economic development. Given that FDI and domestic investments are, generally, enhancing exports, they

are useful tools for achieving this purpose. Kutan and Vuksic (2007) launch a similar proposition, being interested if FDI are attracted in these countries due to their specific effects that contribute to increasing exports or if the foreign activity mostly relies on the domestic investments for expanding the export supply capacity. The methodology used in this paper and its results allows us making several contributions to the researches carried out to date, as follows:

- We check if the export performance is assigned to FDI or to domestic investment, therefore we can assess if a public policy for attracting FDI is making sense;

- We check the role of multinational companies in the import activity of a country. There are three possible cases:

  Situation 1 (S1): If imports are stimulated by the activity of multinationals, then we can assume that FDI in these countries are resource or strategic asset-seeking, seizing the low labour cost and other strategic assets that could be exploited. Such a hypothesis is strengthened especially if FDI also influences the export activity. In this case, it is possible that manufacturing goods are imported for being processed in the multinationals located in these countries and the new goods with higher value added are exported on larger or more developed markets.

  S2: If FDI only stimulates the imports in a country and not the exports, then we can assume that our sample of countries is mainly chosen by multinationals for their large markets and the high level of revenues of their consumers.

  S3: If FDI only contribute to increasing exports, then foreign investors locate here in seeking resources and strategic assets.

- The importance of EU adhesion in the foreign trade activity.

Usually, studies regarding FDI and its determinants assess the relationship between foreign investments and trade openness, measured as the GDP percentage of total imports and exports. Although trade openness is considered one of the main FDI determinants, there is no large evidence regarding the relationship between FDI and exports, respectively imports.

Studies on the export performance issued lately – among which the present paper could be included – assess if export increases are due to foreign or domestic investment. The results differ, of course, depending on the sample of countries

or the period of time taken into account. The present paper aims to establish the importance of domestic and foreign investment for promoting exports and imports in eight new EU countries in Central and Eastern Europe. The paper is structured as follows: the next section provides the main results in the literature regarding our subject of interest. Section 3 presents the data and the methodology used, while displaying and discussing results. In the last section of conclusions, we focus on the role of the multinational companies in the host economy, by analysing each of the three situations exposed above in the light of the results obtained.

2. Literature review

Leichenko and Erickson (1997) conduct a study on the US states' economies during 1980 to 1991. The authors refer both to the foreign and domestic investments (the new capital investment in each year) in order to discriminate among the effects of FDI and of investments respectively on exports. The authors explore the export performance for the manufacturing goods and, separately, for the food, chemical, metals, industrial machinery and electronics industries and the rest of the manufactured goods. All the independent variables are significant for the export performance in manufacturing, except for the new capital investments. The results vary as regards the sectoral division. FDI have a significant and positive role in increasing the exports of metals, industry machinery and electronics and other manufacturing and no impact on the export of food products or chemicals. The domestic investment appears as significant and positive only for enhancing exports of food products and other manufactured goods. Otherwise, the significance of the exchange rate varies, while only the level of exports in the previous years is significant for all the specifications of the model.

Table 1 comprises the description of the export functions used in the models of several authors that studied this theme.

Still a regional approach, this time for China, is employed by Zheng et al. (2004) with the same purpose of assessing the role of FDI on the export of domestic companies. There are analysed 29 provinces during 1985 to 1999. The study evaluates both the determinants of total exports and the ones of the indigenous firms only. All the dependent variables presented in Table 1 are found to be significant for exports, especially for the models incorporating the whole

provinces. The authors draw the attention that the impact of FDI is smaller on the export performance of the domestic firms as compared to the foreign ones, which has negative repercussions for the national competitiveness.

Wang et al. (2007) conduct a more comprehensive investigation on the role of FDI on the Chinese exports. They have a three-fold purpose: to establish what types of firms are more favoured by the presence of investments (foreign or domestic) regarding their exports, to assess the influence of the country of origin in this relationship as a precondition for the China's policy towards foreign investors and to determine whether domestic or foreign firms are more export-oriented. The results point to a significant impact of FDI on the whole exports and on both foreign and domestic companies, with no substantial difference as regards the foreign investor's country of origin. Moreover, the impact of FDI on exports is stronger for the goods intensive in labour than for the ones intensive in capital.

Kutan and Vuksic (2007) employ a pool model estimated through GLS on a sample of 8 new EU countries and 4 Southeast European countries, all of them transition economies. They find that FDI increase the supply capacity in all countries, while its specific effects are more significant in the EU countries. Therefore, exports are increased due to contributions of multinationals.

Vuksic (2006) follows a similar approach, in investigating the factors contributing to export performance. He relates to 14 CEE countries, both EU and non-EU, during 1993 to 2001. The author uses 4 specifications of the panel data model, in the table below being presented the most elaborated one. The role of FDI in promoting exports is higher in EU countries than in the rest of the sample. While there is a clear positive relationship between exports and the conditions on the export markets and a negative relationship between exports and REER in all specifications, the impact of domestic investment and trade liberalization is submitted to changes in sample and model specifications. Vural and Zortuk (2011) conduct a similar analysis for Turkey, using the technique of simultaneous equations. The authors certify for the positive and significant impact of FDI on the export performance, as well as for the negative influence given by the appreciation of the local currency and the increase of the domestic demand. The study covers a period of 27 years, from 1982 to 2009. For the developed countries, in the case of Camarero and Tamarit (2004), for 13 OECD countries (11 from the EU, US and Japan), the result is similar: FDI positively influences exports. The result is available for outward FDI also, when taken the whole sample of countries.

Depending on their size when taken individually, the authors also find negative relationship between exports and inward FDI, pointing to a substitutability relationship between them. The panel analysis is conducted on a quarterly basis, starting from 1981 until 1998.

Prasanna (2010) refines its analysis by considering the total manufacturing exports and the high-tech manufactured exports as dependent variables. The independent variables are the inward FDI and the manufacturing value added. The results are available for India during 1991-2007. While FDI is positive and significant in both equations, the added value is significant only for high-tech exports. The author draws the attention on the need for developing the local capabilities in order to properly reinforce the advantages brought by the foreign investments.

Table 1. Description of the export functions used in the literature

Authors	Equation
Kutan and Vuksic (2007)	Exports = {$REER_t$, potential GDP_{t-1}, trade liberalization index$_t$, exports$_{t-1}$, stock of FDI_{t-1}}
Vuksic (2006)	Exports = {stock of FDI_{t-1}, $REER_t$, developments on export markets$_t$*, domestic investment (gross fixed capital formation)$_{t-1}$, trade liberalization index$_t$} *variable constructed based on the GDP of developed European countries weighted with the share of each CEE country's exports to these economies.
Leichenko and Erickson (1997)	Exports = {FDI_{t-1}, exports$_{t-1}$, new capital investment$_{t-1}$, exchange rate of US dollar$_t$}
Zheng et al. (2004)	Exports = {FDI_{t-1}, domestic investment$_t$, labour employed$_t$, quality of the workforce$_t$, $REER_t$}
Wang et al. (2007)	Exports = {exports$_{t-1}$, FDI_{t-1}, exchange rate$_{t-1}$}
Vural and Zortuk (2011)	Export supply = {export prices relative to domestic prices, domestic demand, net inflows of FDI, exports, dummy*} *reflecting the start of accession negotiations to the EU
Camarero and Tamarit (2004)	Manufacturing exports = {foreign income$_t$, relative prices$_t$, inward FDI_t, outward FDI_t}
Prasanna (2010)	Exports = {FDI_{t-1}, manufacturing value added$_t$}

Source: authors' compilation

Another methodology for assessing the connection between FDI and trade is the use of Granger causality test. The causality analysis of Sharma and Kaur (2013) between FDI and the variables of trade (exports and imports) point to different results according to the country studied. FDI leads to increasing exports in China, while in India not only FDI contribute to promoting exports, but also exports attract new FDI.

Like FDI, imports could also represent a source of technology (Blyde, 2003).

Camarero and Tamarit (2004) check for the relationship between manufacturing imports and several independent variables: real income, relative prices for the imported goods, inward and outward FDI. Generally, imports and FDI are complementary, the substitutability relationship between imports and outward FDI (indicated by the negative sign for the FDI coefficient) being identified at country level, in some cases.

Sharma and Kaur (2013) test for a causality relationship between FDI and imports in China and India using the Granger causality test. The results are different according to the country investigated: while in China, FDI contributes to increasing imports and further improving exports, in India there is a bidirectional relationship between FDI and imports. Pacheco-Lopez (2005) also finds a bidirectional relationship between FDI and imports in the case of Mexico. Such a situation is explained by the need of foreign goods to be incorporated in the future exported goods and for answering the domestic demands, especially related to technology. Alguacil and Orts (2006) find a positive impact of FDI on imports, available for the case of Spain. The authors use a multivariate VAR model.

3. Methodology and results

We base the construction of our empirical model on the examples provided above in the literature.

3.1 Data
We use the volume of exports (EX) expressed as percentage of GDP in the first model and the volume of imports (IM), also as a percentage of GDP, in the second model. We maintain the same independent variables in the two models. In order to proxy for the level of domestic investment, we use the gross fixed capital formation

(GFCF), while the foreign direct investment (FDI) volume relates to the foreign capital in the host country. Based on the literature, we also encompass the effect of prices and exchange rate by using the real effective exchange rate (REER). We add a dummy variable (DUM) for assessing the impact of the EU adhesion, which takes the value 1 if the country is an EU member state and 0 otherwise. The volume of exports, imports, FDI and GFCF are expressed as a percentage of GDP, while REER is an index expressed relative to 37 trading partners, with the value of 100 in 2005. The source for all data is Eurostat.

The descriptive statistics are presented in Table 2.

Table 2. Descriptive statistics

	EX	FDI	GFCF	IM	REER
Mean	51.89917	44.88405	24.97083	56.67583	104.4678
Maximum	93.80000	98.04618	38.40000	89.60000	134.2000
Minimum	24.10000	15.29572	16.40000	29.90000	68.09000
Std. Dev.	17.13859	21.06005	4.858543	14.93302	14.55637
Observations	120	120	120	120	120

Source: authors' computations

3.2 Model

Due to the data availability, our analysis is developed for the period 1999-2013 for eight countries in Central and Eastern Europe, members of the European Union: Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania and Slovakia.

We employ the dynamic panel data model, as provided in (1) due to the fact that the volume of exports or imports in country i at moment t is explained, besides other variables, by the level obtained in the previous period of time. We use two panel models, one for assessing the determinants of exports and the other for imports. We use the general panel model described by Hsiao (2006) for eight CEE countries i, with $i = 1, ..., N$ and with the time dimension t, where $t = 1,... T$:

$$Y_{it} = \alpha Y_{it-1} + \beta_{it} X'_{it} + \varepsilon_{it} \qquad (1)$$

$$\varepsilon_{it} = \mu_{it} + \upsilon_{it} \qquad (2)$$

where Y_{it} is the dependent variable – in our case, the volume of exports or imports –, X_{it}' is the vector of k-independent variables, ε_{it} is the error term composed from the specific effects μ_{it} and the stochastic error term υ_{it}. For avoiding the drawbacks of a simple OLS estimation, we use the approaches of Arellano and Bond (1991) who propose the use of the general method of moments (GMM) estimator and Blundell and Bond (1998).

3.3 Estimation results

According to the results of the stationary test provided in Table 3, our variables must be used in first difference.

Table 3. Stationary test for variables

		Levin, Lin & Chu	ADF - Fisher	PP - Fisher
EX	Level	3.47531	1.53669	0.76213
	First difference	-5.65079*	47.8458*	71.3001*
FDI	Level	3.59345	1.88602	0.51878
	First difference	-4.66540*	51.1101*	81.5008*
GFCF	Level	-2.31686***	15.9171	26.4106***
	First difference	-8.81640*	83.9379*	74.4548*
REER	Level	3.43252	2.13142	0.74665
	First difference	-5.31542*	51.1105*	76.4336*
IM	Level	2.24447	2.64762	1.65427
	First difference	-8.06070*	72.1269*	101.114*

Note: ***, **, and * denote significance of parameters at 1%, 5% and 10% respectively.
Source: authors' computations

For the first model, where the volume of exports expressed as percentage of GDP is the dependant variable, the results are presented in Table 4. We obtain the expected results for all the independent variables, except for the domestic investment (GFCF). Mainly, the capacity to attract foreign investments will provide higher amounts of exports in the next year, indicating that foreign companies located in the host countries are developing export activities. Therefore, a 1% increase in FDI will lead to a growth in exports of 0.28% in the next year. On

the other hand, the increase of the prices, reflected in a similar trend of REER, is able to completely cancel the increase provided by FDI, given that a 1% growth in REER decreases exports by 0.3%. The negative impact of REER on exports was expected, especially that our sample is comprising small and developing countries. The coefficient of GFCF is negative, contrary to expectations, but at the same time is insignificant for exports. Finally, we find that the EU adhesion had an important impact on the volume of exports, as the dummy variable is significant and positive.

Table 4. Results for exports

Independent variables	Coefficient	Std. Error	t-Statistic	Prob.
D(EX(-1))	0.090306	0.017736	5.091759	0.0000
D(FDI(-1))	0.282848	0.027498	10.28612	0.0000
D(REER)	-0.305605	0.035334	-8.648944	0.0000
D(GFCF)	-0.001756	0.045428	-0.038663	0.9692
DUM	1.085486	0.372346	2.915265	0.0045

Effects Specification				

Cross-section fixed (orthogonal deviations)				

Total panel (balanced) observations: 96
J-statistic   65.67186

Source: authors' computations

The results obtained in the second model, where imports are the dependent variable, are quite interesting (Table 5), given that there are few studies in the literature for making a comparison. The level of imports in the previous year has a negative impact on the present imports; that would be the case, for example, for goods imported to be used in the production of new goods (for example, in constructions), where intermediary goods are needed for a determined period of time. For consuming goods, it is reasonable to think that the same amount would be requested each year, unless these goods start to be produced in the host country. The positive and significant value of GFCF rather supports the first assumption, that imports are needed for building internal capacity. Moreover, the

coefficient of FDI has a positive sign, indicating a complementary relationship with imports, as in the case of Camarero and Tamarit (2004). It seems that the inflows of FDI also increase the volume of imports, having an impact almost similar with the one registered in the case of exports. This time, the dummy variable is no longer significant. This result expresses the need of imports for the sample of eight countries regardless the openness and the advantages that could be enhanced by the membership to an economic union.

Table 5. Results for imports

Independent variables	Coefficient	Std. Error	t-Statistic	Prob.
D(IM(-1))	-0.131971	0.004233	-31.17861	0.0000
D(FDI(-1))	0.273065	0.004135	66.03791	0.0000
D(REER)	-0.364723	0.001383	-263.7281	0.0000
D(GFCF)	1.028406	0.014461	71.11756	0.0000
DUM	0.953223	0.597217	1.596108	0.1139

Effects Specification				

Cross-section fixed (orthogonal deviations)				

Total panel (balanced) observations: 96
J-statistic   72.57825

Source: authors' computations

As regards the role of FDI on exports and imports, we are in the first situation exposed in the Introduction. Still, before drawing a clear-cut conclusion, we must carefully interpret the results. Really useful, in this case, would be to assess the main groups of goods imported and exported in these countries, for supporting the aspect we mentioned above. In general, the literature points to the advantages of Central and Eastern European countries as regard the cheap labour and educated work force. If this is true, then these countries should pay attention to the growing possibility of losing such advantages, because that would mean an important relocation of production of the multinational companies.

S2 is difficult to be supported, as our sample of countries is composed mostly from small countries in EU. Except for Poland, Romania and the Czech Republic, all the others have less than 7.5 million citizens as regards the population. Totally, the population of these countries represent 17.4% of the EU-27 population (in 2013). Moreover, in terms of economic development, the ranking according to the value of GDP per capita in PPS as percentage of the EU average places them in the half with the lowest values in 2013, according to Eurostat. The values range from 83% in the Czech Republic to 46% in Bulgaria, the lowest value in the EU. Therefore, they are not large, neither very developed countries, important enough for being sought by investors for their markets.

As regards S3, the countries analysed here are neither the most endowed with natural resources, which supports the need of ensuring supplies for the manufacturing process through imports. Instead, the most used resource is the human capital, due to its low cost for both the qualified and unqualified labour force.

4. Conclusions

In this paper, we assess the measure in which FDI and domestic investment promote exports and imports in several Central and Eastern EU countries. In this respect, we employ the dynamic panel data analysis firstly for explaining exports, then for assessing imports in the period 1999-2013.

The results obtained for the first model with exports as the dependent variable mostly confirm the results in the literature. The exports are positively influenced by the FDI attracted in the previous year, while the EU adhesion is also likely to enhance the volume of exports. We found no evidence of the impact of domestic investment on exports. As expected, there is a negative and significant relationship between REER and exports.

We obtain more interesting outcome for the second panel, where the volume of imports is the dependent variable, as there are fewer studies in the literature for performing a comparison with the previous results. Both foreign and domestic investments seem to positively influence imports, which could point to an important amount of intermediary goods' imports in these countries. The same conclusion is supported by the sign for the REER variable.

We found a complementary relationship between FDI and both exports and imports, in line with other studies in the literature (see, for example, Camarero and Tamarit, 2004). Also, the EU membership is more important for the export activity than for the import one. Sharma and Kaur (2013) suggest that such a relationship between exports and FDI is welcomed as it does not affect the export activity of the local companies; on the contrary, it improves the competitiveness of domestic industries.

Clearly, our results suggest a deeper approach on the issue regarding the foreign or domestic factors that supports exports and imports. A first direction would be to apply a similar analysis and methodology on the exports and imports in different sectors of activity, in order to see if the impact of foreign and domestic investment is similar.

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