Do Western European FDI substitute for trade towards Eastern Europe?

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Abstract

This paper aims to assess whether foreign direct investments (FDI) substitute for trade between home and host countries. The concept of trade refers to both exports and imports, hence conclusions on the balance of trade can also be drawn. The analysis deals with the trade/FDI relationship of all EU countries with Eastern Europe, during the period 1995-2002. The 2S-GLS econometric analysis confirms the complementarity hypothesis for both exports and imports. However, the final net impact of FDI on the EU-trade balance appears to be negative. These results are also confirmed when using the fixed effects-models (2S-LSDV and LSDV). In a second step the trade/FDI relationship with Eastern Europe has been analysed for each of the 15 member countries of the EU before the enlargement in 2004. The evidence shows that a relationship of complementarity between trade and FDI is not always associated with an improvement of the trade balance, and that a relationship of substitution between trade and FDI is not always associated with its worsening. Finally, the paper shows that European FDI in Eastern Europe do not seem to displace Japanese and American trade in the same area during the period considered.

Keywords: Foreign Direct Investments, Trade, substitution and complementarity effects, European Union, Eastern European Countries

JEL classification: F14, F23,F43.

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Introduction

Growing globalisation of the economy is pushing firms towards a scenario of world-wide competition. The situation requires international strategies in order to survive. The liberalisation of international trade and investments, together with progress in telecommunications and information technologies, has made it possible for Multinational Companies (MNC) to split their production chain into several parts that can be located in different countries. Most debates about the activity of MNC are focused on the effects of International Investments on the host economies. But how are the home countries affected by Foreign Direct Investment (FDI)? Do they gain or lose from the de-localisation of domestic activities in other countries?

There are several ways to evaluate the impact of international investments on the home country economy, since outward FDI can have their effects on domestic employment, capital stock, productivity, knowledge spillovers and trade. This paper deals with this last issue, since it attempts to assess the impact of outward investments on domestic exports and imports.

The main concern is whether production abroad substitutes for or complements the trade between home and host countries. Since the concept of trade includes both exports and imports, the possible scenarios can be very different. For instance, the transfer of economic activities abroad may replace the previous exports of the parent company from the home to the host economy, and it may also generate imports from the host country with a negative final impact on the balance of trade. Conversely, when a firm moves abroad to produce only for the foreign market and continues to make use of intermediate goods produced by the parent company in the home country, FDI can generate exports rather than substituting for them, with a positive final impact on the balance of trade. An uncertain final effect occurs when FDI turn out to be a complement or a substitute at the same time with respect to both exports and imports. The former case may occur when a firm moving abroad not only continues to import intermediate goods from the parent company, but also exports its final product to the home country: the final net impact on the trade balance will depend on the dimensions of the export and import flows that are generated by FDI. On the other hand, when FDI substitute both exports and imports, which happens when a firm that used to import intermediate goods from a country and export the final product back to the same country moves or replicates its production abroad, the net final impact on the trade balance depends on the intensity of exports and imports that are displaced by FDI. These arguments show that it is very important to assess whether trade and FDI are substitutes for or complements of one another.

Attention is drawn to the effects of European investments on European trade with Eastern European Countries: to the best of our knowledge, no studies concerning this topic have been

conducted that look firstly at all European Union countries pooled together and subsequently at each of its 15 pre-enlargement member countries, taking into account exports, imports and trade balance. This procedure allows us to disentangle Western Europe's heterogeneity in international investments towards Eastern Europe and to better understand the relationship between FDI and trade in terms of exports, imports and trade balance.

The aim is to establish whether European FDI in Eastern Europe complements European trade towards the same area or substitutes it, and whether each single Western European country's FDI in Eastern Europe is a complement to or a substitute for each Western European country's trade towards Eastern Europe. Since trade is intended as both exports and imports, some conclusions on the net final impact of FDI on trade balance also can be drawn both for each of the 15 European Union member countries prior to the 2004 enlargement and for all the European Union consisting of the same 15 European Countries pooled together.

As we will see, the most interesting finding is the demonstration that a complementarity relationship between exports and FDI is not always associated with an improvement in the trade balance, since FDI can also be complements to imports with a higher coefficient than that of exports. For the same reason, a substitution relationship does not always imply a decrease in the trade balance. However, it is worth noting that the CEECs, which have been taken into account to study the relationship between trade and FDI in Europe, are countries that host mainly vertical FDI, which imply the re-location of some phases of the production chain from Europe and hence the starting-up of several trade channels. Therefore the results of this analysis are strongly related to this specific context and may be different when considering other host countries for FDI, such as the USA or Japan.

The paper is organised as follows. The first part reviews the previous literature, with a distinction between the theoretical and empirical approaches. In the second part the methodology and the data are discussed. The third part shows the results of the econometric analysis. Lastly, conclusions about the research are drawn.

1. Previous literature

Since almost all previous authors consider only the export dimension of trade, this review of previous literature will be based mainly on the exports/FDI relationship. The import dimension will also be treated where this is considered in the literature.

The relationship between international investments and exports is a very controversial subject, since it combines different effects that can sometimes pull in different directions. In order to detect all the possible dimensions that may arise from the exports/FDI relationship, it is useful to catalogue the relevant literature by distinguishing between theoretical and empirical considerations. Theoretically, both substitution and complementarity effects arise, whereas empirically, the results mostly show a positive relationship. Behind this apparent discrepancy, there are good reasons that justify the different outputs, according to the aspects that have been taken into account in studying the exports/FDI relationship.

1.1 - The theoretical approach

From the theoretical point of view, we observe some authors supporting the substitution argument, while others find a complementarity relationship between exports and FDI. The divergence of these results can be explained by looking at the historical evolution of Trade Theory, which has gradually incorporated more complex issues related to the relationship between FDI and exports, always coming to newer and more advanced conclusions.

Traditional Trade Theory looks upon FDI as an alternative to exports. The "OLI paradigm" (Dunning [1981]) summarises what are the main determinants in the choice made by firms in serving a foreign market, namely Location advantages, Ownership and Internalisation. Location[1] refers to the advantages that arise from the different endowments of countries, Ownership[2] is related to those intangible assets[3] that firms can exploit only through direct investments and not by exporting, and Internalisation[4] occurs when transaction costs are higher than the costs of organising the same activity inside the firm. According to the OLI paradigm, a firm will engage in FDI instead of exporting whenever all these three conditions are fulfilled. If the Location advantage does not hold, the firm will export. The greater the Ownership advantage, the greater the incentive to invest. The presence of economies of scales and export costs act as a incentive to Internalisation. Hence, we see that in this case exports and FDI are seen as alternatives to each another, according to which determinants prevail.

In the early 1980s a new Trade Theory emerged to account for two main aspects of the evidence that traditional theory left unexplained. First of all, half of the economic exchanges occur between industrial countries, which are very similar in factorial endowments. Secondly, one third of

[1] The Location advantage argument has been developed by Heckscher–Ohlin.
[2] The Ownership advantage as justification for FDI was developed originally by Hymer [1960].
[3] E.g. in terms of production technology, trademark or organisation.
[4] Buckley and Casson [1976], together with Coase [1960] and Williamson [1975], are the main referents for the Internalisation theory as justification for FDI.

the exports and imports can be classified as intra-industry flows, namely as exchanges of goods within the same industry. In order to justify this empirical evidence, new Trade Theories consider models based on increasing rather than constant returns to scale, imperfect rather than perfect competition, and heterogeneous rather than homogeneous products and firms. In this context, the more productive firms become international in order to exploit the economies of scale and to gain oligopoly power, by choosing either to export or to invest abroad. Even if these choices still appear as alternatives, FDI do not always substitute exports: indeed FDI can occur either through vertical or through horizontal FDI. Vertical FDI consist of de-localisation of some of the stages of the production process, and these are undertaken when the upstream or downstream activities have different factor intensities and countries differ in factor endowments: as Helpman and Krugman [1985] claim, this situation gives rise to intra-firm exchange of intermediate products and therefore the localisation of activities abroad generates exports and imports. On the other hand, Horizontal FDI refer to foreign manufacturing of products and services roughly similar to those that firms produce in their home market. As Markusen [1984] observes, this generally happens when countries are similar in endowments and one firm wants to enter the foreign market: in this case plants in different locations produce the same good, therefore intra-firm trade does not occur and trade (in terms of both exports and imports) and FDI are substitutes.

Recent theories concerning the trade/FDI relationship show different opinions on their correlation. Horstman and Markusen [1992] and Brainard [1993], who introduce trade costs in horizontal FDI models and develop the proximity/concentration trade-off, consider exports and FDI as alternatives: exports will prevail when the fixed costs of investing are high and transport costs are low, whereas in the opposite scenario, the firm will invest abroad and FDI will substitute for exports. Markusen and Venables [1995, 1998] formulate what they call the "convergence hypothesis": the more countries become similar in size and relative factor endowment, the more MNC will substitute for trade (both exports and imports). The Knowledge-Capital models consider vertical and horizontal FDI by using complex analytical approaches: decisions about exporting rather than engaging in horizontal or vertical FDI is endogenously taken as a function of three main variables, namely trade costs, investment barriers and differences between countries in terms of factor endowments. These models allow both complementarity and substitution effects, according to the combination that emerges from the decision variables[5]. Finally, Baldwin and Ottaviano [2001] and Markusen and Maskus [2001] have provided further contributions to the evidence of

[5] Following the model elaborated by Markusen *et al.*[1996], with the extensions in Markusen [1997, 2000] and Carr *et al.*[2001], we can have the following different scenarios: 1) All horizontal MNC firms, when transport costs are high and countries are similar in endowments and size (substitution); 2) All exporting domestic firms, when countries are similar in endowments but different in size (substitution); 3) Vertical multinational firms, with headquarters in the home country and plants in host countries, when factor endowments are different and sizes are similar (complementarity).

complementarity within the New Economic Geography theory: according to their findings, the possibility of splitting the production chain into different stages and the existence of multi-product firms mainly generates a positive relationship between FDI and trade (exports and imports), either with a scenario of agglomeration or with a context of dispersion. In the former case, inter-industry trade will prevail, whereas in the latter, intra-industry trade will take place, but in both cases FDI and trade turn out to be complementary. Finally Pontes [2005] finds a non-monotonic relationship: exports and FDI behave as complements to high value of trade costs and as substitutes for low values of export costs.

1.2 - The empirical approach

Most of the empirical papers find a positive relationship between FDI and exports. The reliability of these analyses depends on the dimensions that the authors consider when they study the effects of international investments on exports.

First of all, the level of aggregation of the data plays a crucial role in determining the statistical output. Some studies make use of data aggregated by industry (Lipsey and Weiss [1981], Blomstrom, Lipsey and Kulchycky [1988], Brainard [1993, 1997], Yamawaky [1991], Blomstrom, Kokko, Zejan [1994], Pfaffermayr [1996], Lipsey and Ramstetter [2002], Piscitello and Tajoli [2005]) or country (Grubert and Mutti [1991], Graham [1994, 1996], Clausing [2000], Rubio and Munoz [2001], Amiti and Wakelin [2003]). These surveys capture both the direct and the indirect effects, since it might happen that a foreign plant on the one hand substitutes for the exports of the firm that invests abroad, but on the other hand generates exports for other domestic firms such as suppliers of intermediate goods or facilities. Therefore, these studies nearly always report a positive relationship between exports and FDI.

On the other hand, firm-level data studies (Lipsey and Weiss [1984], Swedenborg [1979, 1982, 1985, 2000], Mucchielli et al. [1993], Head and Ries [1994, 2001]) catch only the direct effects that international investments exert on exports, since they refer only to single firms. Therefore these papers should find mostly a negative relationship. Nevertheless almost all studies find a positive correlation between exports and FDI, except for Svensson [1993, 1996], who finds substitution for Sweden. A good explanation for these findings is given by Head and Ries [2004], who claim that MNCs are multi-product and multi-industry firms, which often invest abroad with only one product (or in only one industry) in order to enter the market and to increase their exports with regards to the other products/industries, by exploiting products' and industries' complementarities. Therefore, firm-level data do not allow us to catch the substitution relationship between exports and FDI, since they refer to several products. Product-level data should be used:

indeed, authors who make use of this type of data (Blonigen [1999, 2001]), or who focus only on one industry (Belderbos and Leuwaegen [1998], Gopinath, Pick and Vasavada [1999], Vavilov [2005]), find substitution effects.

A second important issue that must be taken into account when testing the relationship between trade and FDI with data is the nature of investment, which may be either vertical or horizontal. As pointed out in the paragraph on the theoretical approach, theories and models with horizontal FDI sustain substitution, whereas theories and models with vertical FDI uphold complementarity. Few authors distinguish between horizontal and vertical FDI, partly because of the difficulties in finding separate data. Lipsey and Weiss [1984] find complementarity with respect to affiliate production and exports of intermediate goods, but no effects with respect to affiliate production and export of finished goods. Head and Ries [1994, 2001] find that Japanese firms that engage in horizontal FDI and Japanese firms whose affiliates source a high share of intermediate inputs from firms other than the parent company, exhibit a net substitution effect between FDI and exports. Belderbos and Sleuwaegen [1998], who found a negative relationship between exports and FDI for Japan when using product-level data, report a positive correlation between the two when they focus on vertical FDI. Lastly, Amiti and Wakelin [2003] find complementarity between US upstream exports and US downstream unskilled FDI.

Considering the nature of the investment also means understanding the reasons for the FDI. For example, if the investment is undertaken to avoid trade tariffs or high export costs, FDI is likely to substitute for exports. Belderbos and Leuwaegen [1998] find that the "tariff-jumping" investments undertaken by electronic Japanese firms in Europe in the late 1980s has substituted for exports from Japan, as well as Amiti and Wakelin [2003] who find substitution for US horizontal FDI undertaken to avoid trade costs.

A third element that should be taken into account is counterfactual analysis. Indeed, when dealing with FDI and trade relationships one should ask what would have happened to exports if the MNC had not invested abroad. Would the firms have been able to maintain their market share or would they have been driven out of the market by international competition, with a consequent reduction in exports? Would the parent company have been able to supply the same markets served by affiliates through exports alone?

The evaluation of the alternative "exporting scenario" against the benchmark of FDI is called counterfactual analysis. Frank and Freeman [1978] show that US MNC would not have been able to maintain their market share if they had attempted to serve the foreign countries by exporting

instead of investing. Lipsey and Weiss [1981] find that the production of US foreign affiliates is positively related to US exports, but negatively to exports to the same host country by a third developed country; in other words, the presence of affiliates in a country tends to attract exports from the home to the host country and to discourage exports from other countries to the host economy, and this reveals that countries that did not engage in FDI are suffering from market share losses. Lipsey and Weiss [1984] also find that US foreign affiliates that produce to export to third countries displace US exports towards that country, but this effect is more than offset by the increase in exports of US MNCs towards the host economy; they also argue that, even if there is a short-run displacement effect, in the long run the activity of foreign affiliates, which export their production to third countries, could later give rise to exports from the US to the third country. Lipsey [1994], by comparing the share that the US, Japan and Sweden have in world exports in different periods of time, demonstrates that one major role for overseas production was that of retaining market shares when home country economic conditions and exchange rates made them less competitive in international trade. Lastly, Lipsey and Ramstetter [2001] find that Japanese exports towards a country is negatively correlated with American affiliates' production in the same country, and this shows that, without investing abroad, a country runs the risk of losing market shares.

Another issue that must be controlled for is the endogeneity problem. As Barba Navaretti and Venables [2004] underline, the basic problem of all econometrics studies that evaluate the impact of FDI on exports is that the determinants of FDI often coincide with the determinants of exports. This generates an endogeneity problem, which alters the econometric results derived from regressing the FDI proxy on exports. There are several ways to control for this problem. Most of the authors (Swedenborg [1985], Blomstrom, Lipsey and Kulchycky [1987], Grubert and Mutti [1991], Head and Ries [1997], Swedenborg [2000], Clausing [2000], Marchant, Cornell and Koo [2002]) adopt the 2-SLS technique by using from time to time different instruments, such as estimated production levels by foreign affiliates, European Community membership, taxes and wages, and they still find complementarity between exports and FDI. Graham [1996] and Pfaffermayer [1996], estimate two equations simultaneously, one for FDI and one for exports, and they look at the correlation between the residuals. They both still find a positive relationship between exports and investments. Finally, other authors face the problem of endogeneity by using different proxies for FDI. Brainard [1993] use the affiliates' employment level and their net assets, and still obtains a positive relationship between American exports and American FDI. Clausing [2000], Belderbos and Sleuwaegen [1998], and Amiti and Wakelin [2003], use "price variables", which are proxies that

represent the cost of investing abroad. To assess whether there is substitution or complementarity, they look at the cross-price elasticity: if the price variable is negatively correlated with exports, then a positive relationship holds between exports and FDI, since it means that when the cost of investing abroad rises the FDI decrease and exports also decrease.

Heterogeneity of firms is another item that should be considered, even if few authors take it into account. Helpman, Melitz and Yeaple [2003] find that heterogeneity plays a crucial role in the export/FDI relationship, not solely because only the productive firms become international and only the most productive become multinational, but also because they show that more heterogeneity leads to significantly more FDI sales compared to export sales, and therefore to a substitution relationship.

Another issue that is debated within the trade/FDI relationship is the proxy for FDI. Since the earliest studies (Lipsey and Weiss [1981, 1984]), the most-used variable has been net sales, which is constructed by subtracting from the sales of the foreign affiliates the imports of intermediate goods coming from the parent company. In this way, we decrease the correlation between exports and FDI due to the import of intermediate goods from the parent company. To further avoid spurious correlation between sales and FDI, several authors (again Lipsey and Weiss [1981, 1984], Blomstrom Lipsey and Kulchycky [1988], Clausing [2000] and many others) have considered net local sales, which refer to the sales of foreign affiliates in the market where they produce. This further adjustment allows us to avoid the correlation between the exports from home to host country and the exports from the home country to third countries through foreign affiliates.

Alternatively, when there is lack of this type of data, the added value of foreign affiliates can be used as a good proxy of net sales of foreign affiliates, as we find in Lipsey, Ramstetter and Blomstrom [2000].

Finally, to face the endogeneity problem, different variables have been used for FDI in other studies, such as the affiliates' employment level and net assets of firms in Brainard [1997] and the price variables in Clausing [2000], Belderbos and Sleuwaegen [1998], and Amiti and Wakelin [2003]. Belderbos and Sleuwaegen [1998] also used different dependent variables for export, such as trade barriers (tariffs, anti-dumping measures, quotas and voluntary export restraint).

A final aspect that could be considered in assessing the trade/FDI relationship is the concept of trade, which is generally intended only as exports without considering the imports. As Forte (2004) claims, if the main purpose is to understand how international trade is affected by FDI, the

fact that most of the studies do not include the import side means that their analysis cannot achieve rigorous conclusions.

Very few studies focus on the impact of foreign investments on the imports of the home country. Brainard (1993), Howe (1994) and Hufbauer, Lakdawalla and Malani (1994) find a positive relationship between imports and FDI for the US, Australia and Japan, respectively. In another two econometric studies, Hufbauer, Lakdawalla and Malani (1994, 1994) find no effect for Germany and the US. Clausing (2000) analyses the effect of FDI on US imports and she finds a complementarity, as well as Camarero and Tamarit (2003) who find the same for US, Japanese and European imports.

Another mainstream of literature deals with the impact of outsourcing on exports, instead of looking only at FDI. The outsourcing is generally measured as the share of imported inputs, whereas the relationship between outsourcing and exports is studied by comparing the share of exports that contains imported inputs. Most of the papers that study the relationship between outsourcing and exports find a positive relationship (see Yeats, 1997 – Feenstra, 1998 – Hummels *et al.*, 1999).

2. The Methodology and the Data

The main benchmark of this analysis concerning the relationship between trade and FDI is the paper of Clausing [2000], which is considered to be one of the most complete studies in this field[6], since she tries to control for as many biases as possible. Furthermore, the use of Clausing's specification makes it possible to strictly compare US and EU experiences, since the econometric technique is similar. Indeed, while Clausing studied the effects of US foreign investments in 29 host countries from 1977 to 1994, this paper investigates the impact of European investments towards Eastern Europe on European trade. The only difference is the historical period, which will be controlled for through time dummies as Clausing did.

However, this work goes beyond that of Clausing for three reasons. First, it takes into account not only the relationship between FDI and exports and imports, but also the impact of foreign investments on the trade balance. Second, it also disentangles the European heterogeneity by looking at the relationship between trade and FDI of each of the 15 European Union member countries before the 2004 enlargement. Finally, it analyses the displacement effects of European FDI with respect to Japanese and US exports.

The host economies that have been considered are eleven Central Eastern European Countries (CEECs), seven of which joined Europe in May 2004 while another two joined Europe in January 2007. Two countries are not in the EU[7]. The panel data that have been used refer to the period 1995 – 2002. The starting date is due to the nearly absolute absence of data on FDI in Eastern Europe before 1995, since Eastern Countries started quite late to gather statistical data after the fall of the Berlin Wall. However, most of the FDI from Western to Eastern Europe have been massively undertaken from the mid-1990s, with a significant growth since 1996[8]. For the closing date 2002 has been chosen because this year was the last available in the database used for the trade data[9].

Following Clausing, country level data on trade and FDI have been considered, in order to catch both the direct and the indirect effects. It was not possible to use firm-level data to isolate the direct effects and to better discriminate between horizontal and vertical FDI, since no data on single firm trade were available in the databases used. Data at product level and industry level were not available either[10].

The specification used to evaluate the effects of European FDI on trade with the CEECs is the "gravity equation", which is a popular formulation for statistical analyses of bilateral flows between two geographical entities. The multiplicative nature of the gravity equation makes it possible to take the natural logarithm of the variables, and it permits us to obtain a linear relationship between trade flows and the other variables included in the equation. The advantage of using the logarithm is that we can interpret the coefficient as elasticity. The equation is therefore:

$$\ln Trade_{e,c}^{t} = \alpha + \beta_1 \ln(GDP_c^t * GDP_e^t) + \beta_2 \ln(GDPpc_c^t * GDPpc_e^t) + \beta_3 \ln(dist_{e,c}) + \beta_4 \ln(ExchRate_{c,e}^t) + \beta_5 \ln(ExchRate_{c,e}^{t-1}) + \beta_6 \ln(ExchRate_{c,e}^{t-2}) + \beta_7 \ln(AddedValue_{e,c}^t) + \beta_8 Z + \varepsilon_{c,e}^t$$

[6] Two noticeable works that deal with the effects of FDI on trade, namely the survey of Forte [2004] and the book of Navaretti and Venables [2004], have this opinion about Clausing's paper.

[7] The 11 CEECs that have been taken into account to evaluate the effects of European FDI on European Trade are: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Poland, Romania, Slovak Republic, Slovenia and Ukraine. Bulgaria and Romania joined Europe in 2007, while the other countries (except Croatia and Ukraine) joined Europe in May 2004. Lithuania has been excluded because of the difficulties in finding detailed data on exports. Other studies admit the difficulties in finding detailed data on trade and/or FDI for Lithuania, such as Lovino [2002] in her survey "Foreign Direct Investment in the Candidate Countries: sector and country composition".

[8] Source: Eurostat, Statistics in focus, Economy and Finance, Survey from Lovino [2002]: "Foreign Direct Investment in the Candidate Countries: sector and country composition". See also Passerini [2000]: "European Union FDI with Candidate Countries: an overview".

[9] As will be explained later, data on trade of Western Europe towards and from the CEECs come from the WIIW database.

where *e* represents the countries of the European Union, while *c* is the CEEC and *t* is time.

Trade represents three different dependent variables. The first one is the exports from each country of European Union towards each CEEC; the second is the imports of each European Union country from each CEEC; the third one is the trade balance of each European Union country with respect to each CEEC country, which is obtained as the difference between the exports and the imports. All the trade flows refer to the period 1995-2002[11].

The *GDP* term is used as a proxy of the economic sizes of the exporting and importing countries. The idea is that the closer the characteristics of the markets the more the countries trade, and therefore we expect a positive sign from this variable.

The *GDPpc* term represents the per-capita GDP of EU countries and the CEEC. The idea behind this variable is that higher income countries trade more, according to the New Trade Theory which states that intra-industry trade prevails. However, a negative coefficient could be consistent with conclusions from Traditional Trade Theory, which states that trade across countries is determined by their factorial differences, hence the more different the countries (also in terms of *GDPpc*) the more they trade. We can also expect thereby a negative sign, since most of the investments that take place in the CEECs are justified by the lower wage costs. Hence European countries might prefer to locate their FDI in the CEECs with a low *GDPpc*: this means that if trade follows FDI, there also will be more exchanges with countries that have a lower GDP per-capita, and the relationship between trade and *GDPpc* will be negative[12].

The variable *dist* is the distance, which is normally used as a proxy for transportation costs. We expect a negative sign, because the greater the distance the higher the costs of trading and, hence, the lower the exports and imports. However, the impact of transportation costs on the trade balance may be different according to how it affects exports and imports: if the imports are more harmed by distance than exports, the balance of trade will improve. Transportation costs are calculated for each pair of EU-Eastern countries as the distance between the capitals[13].

ExchRate is the exchange rate, which plays a significant role in explaining trade, so it needs to be included in the gravity equation. It is calculated as the exchange rate between each CEEC currency against each of the EU-15 countries' currency (the euro after 2001), starting from 1995 until 2002. We expect a negative sign for exports and a positive sign for imports, since whenever

[10] Neither the AMADEUS nor the WIIW databases, which have been used for the econometric analysis, contained firm-level or industry-level data for trade.

[11] All data on trade between Europe and CEECs from 1995 until 2002 come from the WIIW (The Vienna Institute for International Economic Studies) database, except for the data on Estonia and Latvia which come from the respective national statistics offices.

[12] *GDP* and *GDPpc* come from the Eurostat database, except for Ukrainian data which come from the WIIW database.

the CEEC currency depreciates the exports of the European country decrease and the imports from the CEECs increase. The impact on trade balance may vary according to how much and how differently the exchange rate affects exports and imports[14].

However, the "J-curve effect" may also operate. According to this phenomenon, it could be that in the short term a variation of the exchange rate might not immediately affect the trade due to the low price elasticity of demand for exported and imported goods and due to the fact that the contracts last generally at least 1 year, so prices are not adjusted immediately. This means that, for instance, when there is an appreciation of the Western European currency (increase of the exchange rate since it is computed as the exchange rate of Eastern currency versus Western currency), not only do the exports not decrease immediately but also the nominal value of European Union exports increases. Hence in this case the impact of the exchange rates on trade might be the opposite to those expected, reporting a positive sign for exports and a negative sign for imports. In order to account for this phenomenon, lagged values of the exchange rates have been included inside the equation, since the exchange rate may affect the exports and the imports with the right sign only after one or two years. The lag of exchange rate is therefore expected to be negative for exports and positive for imports.

Lastly we have the proxy for the FDI. It was not possible to use the variable *net local sales* as most of the studies do, since the database[15] used did not allow us to distinguish between imports from parent companies and material costs. Therefore the variable *Added Value* of foreign European affiliates in the CEECs have been used, since it is considered a good proxy both for FDI and (even if imprecise) for net sales, as Lipsey, Ramstetter and Blomstrom [2000] claim. This variable is crucial to understanding the relationship between trade and FDI. A positive sign would reveal complementarity, while a negative sign would show the existence of substitutability.

The variable *Z* expresses the two dummies that have been introduced in the regressions to control for other elements that may have influenced the trade between Europe and CEECs from 1995 till 2002. The first one, named *dummyEU*, controls whether the seven CEECs that joined Europe in 2004 traded more than the other four countries, in view of their future membership. The other dummy is *dummyborder* and its function is to control for the advantages that some CEECs may have had in trading with Western Europe because of their contiguity with the EU border.

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[13] The distances between each pair of capitals have been calculated using the website www.michelin.com, by choosing the option "the shortest route" in the "Driving directions" menu.

[14] The exchange rates between each CEEC and each European country have been calculated via the exchange rate against the dollar. The exchange rate between the CEECs' currencies and the dollar comes from the WIIW database, whereas the exchange rate between each EU-15 currency and the dollar comes from the Datastream database.

[15] Data on FDI have been downloaded from the AMADEUS database. The data refer to the added value of Eastern countries' foreign affiliates at least 51% owned by EU shareholders.

The econometric technique that has been used to estimate the relationship between trade and FDI is a two-stage GLS (2S-GLS). The GLS technique allows us to take into account both the variation within the observations (fixed effects) and the variation across the observations, hence it is a weighted mean of the Within and Between estimators. However, a Hausman test has been performed in order to check whether the fixed-effect model is better than the GLS estimator. The null hypothesis claiming that there is no difference between a fixed and a random effects models has been accepted, hence it seems that there is not a correlation between the fixed effects and the regressors strong enough to justify the use of the Within estimator. In this case, the GLS estimators guarantee more efficient estimations than a fixed effects model. However, in order to offer a more complete analysis and to avoid bias deriving from the choice of the estimation model, both a pooled (2SLS) and a two-stage fixed effect (2S-LSDV) analysis have also been performed and reported in the appendix, without any change in the main results.

Furthermore, since the explanatory variables affect not only the trade but also FDI, an endogeneity problem, which must be controlled for, rises. Indeed, the decision concerning the location of FDI are often affected by the *GDP* and *GDPpc* of countries, since the dimension of the markets and the incomes of the workers are crucial to deciding whether to invest in that country and what type of investment to perform (horizontal vs. vertical FDI). For vertical investments, which often imply the exchange of intermediate goods between the home and host countries, the exchange rates may also be important to deciding whether and how much to invest in a country. Hence, since the explicative variable may also affect our key variable concerning the FDI, the endogeneity problem needs to be controlled for. Furthermore, the causality between trade and FDI may also be reversed: are FDI to cause trade, or is trade to generate FDI? For instance, it might be that in order to export to a country, the importer requires the exporter to set up some productive activities in the importer's country. It may also be that it is more convenient to assemble the final product in the market where the good will be sold than exporting the final product directly. The exporting activity by itself requires some logistic investments in order to facilitate the export.

In order to control for all these possible sources of endogeneity, two price variables and a measure of the openness of each European country have been introduced in the regression as instruments, and a 2S-GLS analysis has been performed. Brainard [1993], Clausing [2000], Belderbos and Sleuwaegen [1998], and Amiti and Wakelin [2003] also make use of instrumental two-stage econometric analyses in order to control for these endogeneity problems.

The price variables express the cost of investing in the host countries and hence they should be correlated with FDI but not (or much less) with trade. The price variables that have been taken into account are *taxrate* and *compensation*. The *taxrate* variable has been built as the ratio between

the average taxes paid every year by the foreign European affiliates in each Eastern country weighted for the average gross income. *Compensation* refers to the cost of work and is computed as the average wage plus other costs concerning the employees of foreign European affiliates in each Eastern country from 1995 until 2002[16].

The openness of a country is also used as an instrument for FDI, since an open country is likely to receive more inward FDI than a closed country. Hence the level of openness to trade of each CEEC country for every year has been used as a further instrument for FDI. Following Clausing's (2000) method, *openness* is expressed as the residual of the following regression: Imports/GDP = $\alpha + \beta_1$ population + β_2 population square[17]. The measure is clearly very rough, but it has been kept in the same form as Clausing's (2000) formulation, in order to keep the analysis as comparable as possible to the original benchmark. The sign of the openness is expected to be positive, since clearly the more open a country is the more it trades[18].

Lastly, the "displacement effects" have been evaluated. Following the procedure of Blomstrom, Lipsey and Kulchycky [1988], the aim is to understand the impact of A's investments in B, on C's exports towards B, where in our case A is the European Union, B consists of the Eastern countries and C incorporates the US and Japan[19].

The equations used to evaluate the displacement effects of European FDI on American and Japanese exports are the following:

$$\ln Export_{u,c}^{t} = \alpha + \beta_1 \ln(GDP_c^t * GDP_u^t) + \beta_2 \ln(GDPpc_c^t * GDPpc_u^t) + \beta_3 \ln(ExchRate_{c,u}^t)$$
$$+ \beta_4 \ln(ExchRate_{c,u}^{t-1}) + \beta_5 \ln(ExchRate_{c,u}^{t-2}) + \beta_6 \ln(AddedValue_{e,c}^t) + \beta_7 Z + \varepsilon_{c,u}^t$$

for the United States, and

$$\ln Export_{j,c}^{t} = \alpha + \beta_1 \ln(GDP_c^t * GDP_j^t) + \beta_2 \ln(GDPpc_c^t * GDPpc_j^t) + \beta_3 \ln(ExchRate_{c,j}^t)$$
$$+ \beta_4 \ln(ExchRate_{c,j}^{t-1}) + \beta_5 \ln(ExchRate_{c,j}^{t-2}) + \beta_6 \ln(AddedValue_{e,c}^t) + \beta_7 Z + \varepsilon_{c,j}^t$$

for Japan.

[16] Both the tax rate and the cost of workers come from the AMADEUS database.

[17] In the literature the standard way openness is calculated is by considering both imports and exports, according to the following regression: (Imports+Export)/GDP = $\alpha + \beta_1$population + $\beta_2$populationsquare. In a separate regression the residuals from this specification have also been used as a proxy for openness, and the results of the other regressions did not change.

[18] Data on population have been downloaded from the Eurostat database, while data on the total imports and exports come from the WTO internet site.

[19] This analysis can not be considered a counterfactual analysis because both Japan and the United States invest in the CEECs.

The index *u* is for the US while *j* is for Japan. The variable *AddedValue* presents the *e* index since it refers to the added value of European MNC in the CEECs. A negative relationship between *AddedValue* and American or Japanese exports would mean that European FDI displace Japanese and US exports, otherwise the US and Japan gained as well as Europe from European investments in the CEECs.

The distance has been omitted since the countries of destination of the exports are all located very far from the US and Japan and are concentrated in the same area, all close to each other, therefore distances have been considered insignificant for the gravity equation. All the other variables have been built in the same way and come from the same databases as the other specifications.

3. Results

3.1 – European Union

Table 1 refers to the impact of FDI on exports and imports of all the European countries pooled together. Columns [1] and [4] present the results for exports and for imports, respectively, without any dummy. Columns [2] and [5] introduce dummies for the CEECs while the last two columns make use of EU dummies. In the appendix the results of the two-stage pooled model (columns [1] and [4]) and the 2S-LSDV model (columns [2] and [3] for exports and [5] and [6] for imports) have been reported.

The results are robust to the econometric techniques used for the estimations. The GDP term is always positively and significantly correlated with both the exports and the imports, meaning that that market size matters in the international economic relationships: the more similar countries are, the more they trade.

The negative sign of *GDPpc* is also confirmed regardless of the econometric technique used for the estimations, although it is not always significant. However, the sign appears to reveal that Europe trades more with the poorest CEECs. So it seems that the fundamental hypothesis of the traditional Trade Theory, which states that countries trade because of the differences in their endowments, holds in this case. In other words Western Europe, which is capital-abundant and has an abundance of skilled workers, trades more with countries that have a lower per capita GDP, since they have an abundance of low-skilled workers and they produce low-cost, labour-intensive products, which are traded with capital from Europe.

The exchange rate is negative (even if nearly always not significant in the 2S-GLS equation) for the exports as it should be, since as soon as CEECs' currencies depreciate (that is, the exchange

rate between the CEEC and the European country increases) the exports towards the CEECs decrease. The anomalous result is the coefficient of the lagged values of the exchange rate, which turns out to be positive, meaning that the appreciation of European currency in the past years increased the exports towards Eastern Europe. A possible explanation for this result can be found in the pricing and marketing strategies that firms set up to protect themselves against exchange rate fluctuations. Indeed, European enterprises might be willing to defend their market share, e.g. by appropriate price concessions. Despite the temporary losses of earnings associated with such a strategy, offering discounts allows firms to keep their market position, or even to increase it. Therefore it might be the case that European firms after one year react to the appreciation of their currency through a bulk of strategies (such as discounts) that allow them not only to stem the decrease of the exports, but also to invert the trend[20].

Looking at the imports, we would have expected a positive sign, since whenever CEECs' currencies depreciate, imports of the European Union should increase. Nevertheless, the negative (even if not significant) sign can be explained through the J-curve effect. The demand for imports appears to be more inelastic than the demand for exports in the short run. This means that in the aftermath of exchange-rate change, a depreciation of the CEECs' currency positively affects the European balance of trade, thanks to the import entry whose nominal value decreases. Only in the long run does the effect of a depreciation (appreciation) of the CEECs' currencies manifest itself through the increasing (decreasing) of imports, as shown by the positive and significant sign of the coefficient of the first lag of the exchange rate.

However the coefficient of both the exchange rate and its lags is hardly ever significant: a Wald test on all three coefficients accepts the null hypothesis of all coefficients being jointly equal to zero, hence the regressions can be run also without these variables, also because they create a problem of collinearity due to the fact that they are highly correlated. The regressions without the exchange rates, which have not been reported in the paper, do not change the main results.

The distance is negative both for exports and for imports, revealing that the more the trade costs the less the trade between countries. The positive and often significant sign of the *EU member* dummy reflects the advantage that the candidate Eastern countries had in their economic exchange with Europe, in view of their forthcoming accession to European markets. Finally the evidence on the border dummy is not clear, since sometimes the variable is negatively correlated to the exports

[20] This explanation has been provided also by the Deutsche Bundesbank Monthly Report [1997] to account for the anomalous reactions of the German trade balance to the fluctuations of the exchange rate of the Deutschmark against the US dollar. Indeed, it has been observed that during the mid-1980s, when the mark appreciated, German exports increased noticeably.

and imports and sometimes positively correlated, hence this variable seems to be sensitive to the econometric technique used and no conclusion can be drawn about it.

Turning our attention to the FDI, the proxy is always positively and significantly correlated both with the exports and with the imports, regardless of the econometric technique used. This is coherent with the findings of most of the relevant literature (especially Clausing [2002]) about trade and FDI, according to which international investments and international exchanges are complements rather than substitutes. However, the positive impact of FDI on both exports and imports does not make it possible to draw direct conclusions concerning the final net effect on the balance of trade[21]. Looking at the magnitude of the coefficients, which can be interpreted as elasticities given that all the variables are expressed in logarithms, it seems that the positive impact of FDI is always higher on imports than on exports, hence the final net effect of internationalization on the balance of trade is likely to be negative.

In order to better understand the impact of FDI on the final trade balance of all the European Union countries, a further regression has been performed by using, as dependent variable, the Trade Balance (given by *logexport – logimport*) of all the European Union Countries. The proxy for FDI appears to be nearly always negative across all the econometric techniques (2S-GLS, 2S-LSDV, LSDV), even if not significant except for the LSDV model with dummy CEECs. All these results show that, although FDI boosted European trade both in terms of exports and in terms of imports during the period 1995-2002, the balance of trade with respect to CEECs seems to have worsened due to the stronger impact of FDI on imports than on exports. This is likely due to the fact that the vertical FDI undertaken in the CEECs during that period implied the transfer of more backward than forward activities along the production chain, with a negative impact on the balance of trade.

3.2 – European Countries

After assessing the positive impact of FDI on exports and imports of the 15 European Union countries pooled together, even with a negative final impact on the balance of trade, it is interesting to disentangle the heterogeneity given by the 15 different countries that make up the EU. Therefore the data-set has been separated to analyse the specific relationship between trade and FDI of each of the EU-15 countries towards Eastern Europe, by applying the same gravity equation and the same proxies used for the European Union. The regressions have been run without the exchange rates and

[21] Some regressions having the balance of trade as dependent variables have been run, but with non-significant results for any specification.

its lags, since they were never significant and since the Wald test confirms the null hypothesis of all three coefficients being jointly equal to zero.

Table 3 shows only the coefficients of the FDI proxy (*AddedValue*): few of them are significant, because of the scarcity of observations after isolating each country. For Portugal and Greece, the missing values were so numerous as to prevent us from running any analysis. However, if for a while we consider only the sign of the coefficients, we can classify all the countries in 5 different groups: i) countries with a positive impact on the whole trade in terms of exports, imports and trade balance (e.g. Italy and Sweden); ii) countries with a positive impact on exports and imports but a negative impact on trade balance (e.g. France and Finland); iii) countries with a negative impact on the whole trade in terms of exports, imports and trade balance (e.g. Ireland); iv) countries with a negative impact on both exports and imports but a positive impact on trade balance (e.g. Austria, Belgium, Luxembourg, Netherlands, UK); v) mixed cases, with a positive impact on exports and negative impact on imports or vice-versa, and with different outputs as far as trade balance is concerned (the remaining countries).

This picture shows that a complementarity relationship between FDI and exports/imports is not always associated with a positive impact on the trade balance (case ii), and that a substitution relationship is not always associated with a negative impact on the trade balance (case iv).

However, few coefficients turned out to be significant. In particular, only France and Finland report a positive and significant sign both for exports and for imports, but the significance is lost for Finland when running the regression with the trade balance as a dependent variable. Italy and Sweden exhibit a positive and significant impact only on exports, while only the UK displays a negative and significant impact on exports. Finally, Spain, Belgium and Luxembourg show a negative and significant impact both on imports and on exports; Belgium is the only country, together with France, to exhibit a significant impact on trade balance.

These results confirm the high heterogeneity among the European countries as far as the relationship between trade (in terms of exports, imports and balance of trade) and FDI is concerned.

3.3 – Displacement Effects on US and Japanese exports.

Following the procedure of Blomstrom, Lipsey and Kulchycky [1988], and Lipsey and Weiss [1981], a final analysis has been conducted to assess whether European FDI in Eastern Europe displace US and Japanese exports towards the same area. The goal is to understand whether the positive relationship between European exports and European FDI during the period 1995-2002 occurred to the disadvantage of the US and Japan. In other words, any negative coefficient would reveal that European FDI decreased the American and Japanese market share in Eastern countries,

whereas a positive relationship would tell us that even the US and Japan benefited from European FDI in terms of market expansion.

Table 4 shows positive coefficients for European affiliates' added value with respect to both Japanese and US exports. This disproves the hypothesis that European FDI displaced third countries' trade during the period 1995-2002, at least as far as the US and Japan are concerned.

A final interesting finding from this regression is the coefficient for per capita GDP. It turns out to be positive instead of negative as it is for Europe. This might mean that, contrary to the European Union, the economic justification of US and Japanese trade with Eastern Europe is linked to reasons other than differences in endowments and wage differentials, and that US and Japanese firms are more market seekers than asset exploiters with respect to European firms.

4. Conclusions

This paper attempts to evaluate whether FDI substitute for trade of the home country with the host economy. Trade is understood as exports, imports and trade balance. Looking at the previous literature, we can distinguish between a theoretical and an empirical approach. While the theory is divided between supporters of substitution and backers of complementarity, the empirical papers are fairly homogeneous in finding a positive relationship between trade and FDI.

The analysis refers to the empirical paper on trade and FDI from Clausing [2000], who evaluated the impact of US FDI on US trade with some host countries. Following the basic formulation of this author, the same specifications have been applied to assess whether Western European FDI have substituted for European trade towards Eastern Europe during the period 1995-2002. To the best of our knowledge, there are no studies concerning this topic that both look at the whole European Union and disentangle the pattern of each of the 15 pre-2004-enlargement European Union countries, and which take into account exports, imports and trade balance. In order to control for the endogeneity problem, which arises from the fact that FDI and trade share the same determinants, and in order to exploit both the within and the between variance of the panel data, a 2S-GLS has been performed. To give more robustness to the results, the same analysis has been repeated by using within estimators (2S-LSDV and LSDV models).

The empirical findings confirm the complementary relationship between trade (in terms of both exports and imports) and FDI, in line with the mainstream of the literature. However, the relationship between FDI and trade balance of all European Union countries tends to be negative. A second analysis has been run over the single countries that made up the EU before the 2004

enlargement. The results show 5 different cases: i) countries with a positive impact on the whole trade in terms of exports, imports and trade balance (e.g. Italy); ii) countries with a positive impact on exports and imports but a negative impact on trade balance (e.g. France); iii) countries with a negative impact on the whole trade in terms of exports, imports and trade balance (e.g. Ireland); iv) countries with a negative impact on both exports and imports but a positive impact on trade balance (e.g. Belgium); v) mixed cases, with a positive impact on exports and negative impact on imports or vice-versa, and with different outputs as far as trade balance is concerned.

A final analysis shows that no displacement effects have occurred between European FDI in Eastern countries and US and Japanese trade within the same area during the period considered.

Nevertheless, these results must be interpreted with caution. Indeed what has been analysed is the country-level dimension of the impact of FDI on trade, which is able to capture the direct and indirect effects, but not to isolate either the effects of internationalisation on the individual firms nor the patterns of different industries. Furthermore the investments that have been taken into account are mainly of the vertical type, since Western Europe is capital abundant while Eastern Europe is labour abundant, and the negative sign of both the GDPpc and the cost of workers confirms this hypothesis. As we have seen, vertical FDI tend to be complements with respect to trade, even if it has a negative impact on FDI. The same analysis run between European trade and European FDI towards OECD countries, where FDI are more horizontal than vertical, could give different results. All these issues could provide lines of further research to be undertaken in future work.

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Table 1: European Union All Countries - Export and Import (2S-GLS)

Independent Variables	*Export*			*Import*		
	[1]	[2]	[3]	[4]	[5]	[6]
Log Added Value	0.0645 **	0.0793 **	0.0846 ***	0.0834 *	0.1003 **	0.0884 *
Log GDP term	0.8010 ***	0.8972 ***	0.5686 ***	0.8483 ***	1.0059 ***	0.4694 ***
Log GDP per capita term	-0.1259	-0.1935	-0.0062	-0.7513 ***	-0.8574 ***	-0.5267 ***
Log Distance	-1.0662 ***	-1.0610 ***	-1.0946 ***	-1.3432 ***	-1.3785 ***	-1.4826 ***
Log Exchange rate	-0.1028	-0.0911	-0.1015	-0.0995	-0.0388	-0.0668
Log Exchange Rate Lag 1	0.2670 *	0.2796	0.1475	0.2373	0.3184	-0.018
Log Exchange Rate Lag 2	-0.1738	-0.1750	-0.0859	-0.1804	-0.2457	-0.0286
Dummy border EU	-0.0199	-0.9458 **	0.2294 **	0.2850	-0.2831	0.7142 ***
Dummy member EU	0.3231 *	0.8188 *	0.1477	1.1050 ***	0.8339	0.8877 ***
Constant	-9.6862 ***	-12.9605 ***	-1.1739	-7.7780 ***	-12.414 ***	6.5659 *
Year	yes	yes	yes	yes	yes	yes
Fixed Effects EU	no	no	yes	no	no	yes
Fixed Effects CEECs	no	yes	no	no	yes	no
Number of observations	306	306	306	306	306	306
chi-2	1129.2500	1296	1953.4	1129.2500	923.84	1012.4
Prob >chi2	0.0000	0.0000	0	0.0000	0.0000	0
R-sq overall	0.8551	0.8797	0.9386	0.8551	0.8517	0.8851

Notes:*Significance at 1%. **Significance at 5%. ***Significance at 10%. Specifications [1] and [4] are without fixed effects, specifications [2] and [5] make use of Ceecs dummy variables while specifications [3] and [6] make use of EU dummy variables. The variable Log Added Value has been considered endogenous and instrumend through the wage (logCompensation) and the taxrate (tax/turnover) paid by the European MNC in the Eastern countries, plus an openess measure (see section 2). The regressions ha- been run also without the exchange rates, in order to avoid problems of multicollinearity: the main results do not change.

Table 2: European Union All Countries - Trade Balance

Independent Variables	*2SGLS estimation*			*2SLSDV estimation*		*LSDV estimation*	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Log Added Value	-0.0106	-0.0047	0.0028	-0.0205	-0.0100	-0.0309 **	-0.0146
Log GDP term	-0.0409	-0.1029 **	0.1021	-0.0461	0.1087 **	-0.0399 *	0.1238 ***
Log GDP per capita term	0.6693 ***	0.7543 ***	0.5364 ***	0.8754 ***	0.5093 ***	0.8490 ***	0.4655 ***
Log Distance	0.3133 ***	0.3620 ***	0.413 ***	0.3519 ***	0.4186 ***	0.2977 ***	0.4252 ***
Log Exchange rate	-0.0086	-0.0582	-0.0409	-0.1319	-0.0677	0.1748	0.1837 *
Log Exchange Rate Lag 1	0.0161	-0.0396	0.1426	0.0010	0.1017	0.1083	0.1038
Log Exchange Rate Lag 2	0.0315	0.0931	-0.0248	0.1578	0.045	-0.2745 ***	-0.2346 ***
Dummy border EU	-0.3175 **	0.0471	-0.492 ***	-0.1081	-0.4611 ***	-0.2583 *	-0.4587 ***
Dummy member EU	-0.8161 ***	-0.1175	-0.7453 ***	-0.3950	-0.6886 ***	-0.5433 **	-0.5858 ***
Constant	-2.6733	-1.5514	-8.1719	-3.1572 **	-8.1334	-2.3005 **	-8.26 ***
Year	yes	yes	yes	yes	yes	yes	yes
Fixed Effects EU	no	no	yes	no	yes	no	yes
Fixed Effects CEECs	no	yes	no	yes	no	yes	no
Number of observations	306	306	306	306	306	626	626
chi-2 (F-test for 2SLSDV & LSDV)	93.29	116.1600	159.99	8.03	9.46	15.56	17.82
Prob >chi-2 (F for 2SLSDV & LSDV)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R-2 overall (R-2 for 2SLSDV & LSDV	0.3159	0.3735	0.4877	0.3356	0.4455	0.3388	0.4384

Notes:*Significance at 1%. **Significance at 5%. ***Significance at 10%. Specification [1] is without fixed effects, specifications [2], [4] and [6] make use of CEECs dummy variables while specifications [3], [5] and [7] make use of EU dummy variables. The variable Log Added Value has been considered endogenous and instrumend through the wage through the wage (logCompensation) and the taxe rate (tax/turnover) paid by the European MNC in the Eastern countries, paid by European MNC in the Eastern countries, plus an openess measure (see section 2). The regressions have been run also without the exchange rates, in order to avoid problems of multicollinearity: the main results do not change.

Table 3: 15-EU Countries (2SGLS estimation)

EU - 15 Countries	*Export*	*Import*	*Trade Balance*
Austria	-0.0755	-0.1627	0.0872
Belgium	-0.0400	-0.3901 **	0.3501 **
Denmark	-0.0026	0.0655	-0.0681
Finland	0.1862 ***	0.2444 ***	-0.0582
France	0.1821 ***	0.5483 ***	-0.3662 **
Germany	0.2023	0.3124	-0.1101
Greece	-	-	-
Ireland	-0.5744	-0.0115	-0.5629
Italy	0.2551 **	0.2393	0.0158
Luxembourg	-0.2344	-0.3931 **	0.1587
Netherland	-0.0057	-0.0937	0.0881
Portugal	-	-	-
Spain	0.0763	-0.1924 **	0.2688
Sweden	0.0734 **	0.0039	0.0695
United Kingdom	-0.0933 *	-0.2779	0.1845

Notes:*Significance at 1%. **Significance at 5%. ***Significance at 10%. Greece and Portugal have not enough observations to run the analysis. The regressions have been run without neither the exchange rates nor its lags, since they never result significant and since the Wald test confirms the null hypothesis of all the three coefficients beeing jointly equal to zero.

Table 4: Displacement Effects on U.S. and Japanese Export

Independent Variables	USA		Japan	
	[1]	[2]	[3]	[4]
Log Added Value	0.1162 *	0.1117 *	0.3039 *	0.3079 *
Log GDP term	0.6901 *	0.6839 *	0.3847 *	0.3382 **
Log GDP per capita term	0.1041	0.1754 ***	0.5083 **	0.6065 *
Log Exchange rate	-0.5086 **	-0.5666 **	-0.5498	-0.5581
Log Exchange Rate Lag 1	0.5356 ***	0.6031 **	0.7108	0.7245
Log Exchange Rate Lag 2	-0.0476	-0.4937	-0.2250	-0.2245
Constant	-16.9383 *	-17.2442 *	-18.8188 *	-19.87 *
Year	no	no	no	no
Fixed Effects CEECs	no	yes	no	yes
Number of observations	60	60	60	60
F	51.67	21.30	20.78	8.11
Prob (F)	0.0000	0.0000	0.0000	0.0000
Adjusted R^2	0.8375	0.8463	0.6680	0.6584

Notes: *Significance at 1%. **Significance at 5%. ***Significance at 10%. Sales, Dummy border EU and Dummy member EU never resulted significant. Specifications [1] and [3] are without fixed effects, while specifications [2] and [4] are with CEECs fixed effects. Distance has not been included since the Eastern countries all far from Japan and USA and concentrated in the same area. The Year dummy has been dropped by the statistical program.

Appendix: European Union All countries - Pooled (2SLS) and Fixed Effects (2S-LSDV) models

Independent Variables	*Export*			*Import*		
	[1]	[2]	[3]	[4]	[5]	[6]
Added Value	0.1309 *	0.1719 *	0.1535 *	0.1503 *	0.1810 *	0.1739 *
GDP term	0.7481 *	0.4891 *	0.8283 *	0.7569 *	0.3804 *	0.8744 *
GDP per capita term	-0.1842 ***	0.0361 *	-0.2210	-0.9369 *	-0.4731 *	-1.0964 *
Distance	-0.9373 *	-0.9765 *	-0.9029 *	-1.2723 *	-1.3950 *	-1.2548 *
Exchange rate	-0.1304	-0.1313	-0.0411	-0.0518	-0.0636	-0.0907
Exchange Rate Lag 1	0.4649	-0.0957	-0.0451	0.5910	-0.1974	-0.0461
Exchange Rate Lag 2	-0.3538	0.1913	0.1024	-0.6148	0.1463	-0.0553
Dummy border EU	-0.1989 **	0.2207 **	-1.0644 **	0.0580	0.6818 *	-0.4483
Dummy member EU	0.2751 **	0.1217	0.0426	1.0999 *	0.8103 *	-0.4483
Constant	-8.7052	-2.3165	-11.2170 *	-4.7624	4.8379 **	0.9451 *
Year	yes	yes	yes	yes	yes	yes
Fixed Effects EU	no	yes	no	no	yes	no
Fixed Effects CEECs	no	no	yes	no	no	yes
Number of observations	306	306	306	306	306	306
F	118.00	152.24	96.40	76.08	75.37	76.08
Prob (F)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adjusted R^2	0.8513	0.9348	0.8728	0.8436	0.8758	0.8436

Notes:*Significance at 1%. **Significance at 5%. ***Significance at 10%. Specifications [1] and [4] refers to a 2SLS analisys, since they are without fixed effects, while specifications [2], [5], [3] and [6] refers to a 2S-LSDV analysis, since they control for CEECs ([2], [5]) and EU ([3] and [6]) fixed effects.