ISSN 2042-2695

CENTRE *for* ECONOMIC PERFORMANCE

CEP Discussion Paper No 1518

November 2017

Economic Integration, Foreign Investment and International Trade: The Effects of Membership of the European Union

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Abstract
This paper investigates the importance of economic integration in simultaneously fostering foreign direct investment (FDI) and international trade. These have rarely been analyzed jointly using contemporary econometric methods. We estimate the effect of European Union (EU) membership on FDI inflows and trade using annual bilateral data from 34 OECD countries over 1985–2013. We find that EU membership increases FDI inflows by on average 28%. We jointly estimate the impact of EU membership on trade and FDI and find that they are substantial, with the one on trade larger than the one on FDI, in the order of double.

Keywords: special economic integration effects, foreign direct investment, international trade, European Union, gravity model
JEL: F17; F21; F36

This paper was produced as part of the Centre's Growth Programme. The Centre for Economic Performance is financed by the Economic and Social Research Council.

We would like to thank, without implicating, Fabrizio Coricelli, Nicholas Crafts, Swati Dhingra, Peter Egger, Jan Fidrmuc, Michele Ruta, John Springford, John Van Reenen and seminar participants at Brunel University London, DIW Berlin, ECB Frankfurt, LSE, NIESR and World Bank for valuable comments on previous versions. Dustin Voss provided alacritous research assistance.

Randolph Bruno, UCL and IZA-Bonn. Nauro Campos, Brunel University London, ETH-Zurich and IZA-Bonn. Saul Estrin, London School of Economics, Centre for Economic Performance, London School of Economics, CEPR and IZA, Bonn. Meng Tian, Peking University and London School of Economics.

Published by
Centre for Economic Performance
London School of Economics and Political Science
Houghton Street
London WC2A 2AE

1. Introduction

This paper investigates the importance of deep economic integration in jointly fostering foreign investment and international trade for the participating members. Discussions about economic integration have tended to focus on trade, though its potential impact on foreign direct investment (FDI) is also becoming increasingly recognized (Anderson and Van Wincoop, 2003; 2004). Thus, while economic integration is often thought of as a conduit for international trade, recent developments have shown it is also a powerful force in FDI terms (Blomstrom and Kokko 2003; Egger and Pfaffermayr 2004). However, while the determinants and effects of FDI are well established in the economics literature (Helpman et al., 2004; Javorcik, 2004; Haskel et al., 2007), there is much less analysis of how FDI inflows are affected by international integration experiences; a conspicuous lacuna concerns the evolution of the European Union. In fact, it is likely that European Union integration has played an important role in fostering FDI, both between member economies and with the rest of the world, as indicated by the impact of announcements about future EU membership on FDI into transition economies in the 1990s (Bevan and Estrin, 2004).

Our aim in this paper is to use frontier estimation methods to provide the best possible measures of the effects of economic integration on FDI and on both trade and FDI together. Our focus on estimation methods, particularly concerning FDI, is motivated by recent developments in the literature on the trade effects of deep economic integration. Notably, Glick and Rose (2015) find that earlier estimates Glick and Rose (2002) of the positive impact of currency unions on trade are not supported when subject to modern econometric techniques. Our findings also provide an indication of the possible effect of EU exit on FDI for a current member, as is likely to occur given the 2016 referendum vote by the UK.

Our analysis is based on the gravity model, a “work-horse” of the empirical international trade literature (Anderson, 2011). The gravity model has been successfully applied to explain most forms of bilateral cross-border flows, including trade, migration, and foreign direct investment in terms of the relative size and distance between countries and/or regions (Baldwin and Taglioni, 2011; Head and Mayer, 2014). A country's economic size is expected to have a positive effect on bilateral flows while distance is expected to have a (nonlinear) negative effect. Distance is often measured geographically but is usually taken to reflect a whole range of transactional and frictional costs associated with differences in regulations, tariff and non-tariff barriers as well as language and culture (North, 1991; Ghemawat, 2001). The gravity model therefore highlights the large potential for trade and FDI between relatively large economies which are close together geographically. The last two decades have witnessed enormous research progress in the economic application of gravity models including Anderson and van Wincoop (2003) and Santos Silva and Tenreyro (2006). The resulting new structural gravity approach (Fally, 2015) provides the necessary theoretical underpinnings as well as strong support for the econometric estimation of gravity models.

We estimate our structural gravity model using data for 34 OECD countries between 1985 and 2013 for bilateral FDI flows, bilateral distance, GDP and GDP per capita (for sender and target countries) and the shares of manufacturing output, exports and imports in total GDP. Our data represent more than 70% of global FDI flows and, because the countries are all OECD members, they are collected in a homogenous manner and are of uniform and relatively high quality. However, they exclude most developing countries including China and India, which play an increasing role in global FDI especially after 2000 (Rugman, 2009). This is a limitation to which we return in the conclusions.

We find that, between 1985 and 2013, EU membership led FDI inflows to be greater by about 28%. We use a variety of econometric techniques and sensitivity analyses in order to ensure the robustness of our findings, including dynamic estimation, lags, stock rather than flow measures of FDI, and addressing selection issues. Our estimates of the impact of deep economic integration via EU membership endorse FDI as a channel (in addition to trade) for possible payoffs from deep integration. The effect of EU membership on FDI is always estimated to be positive, ranging by estimation method from 14% (Heckman) to 33% (OLS) to 38% (Poisson estimates). Furthermore, when the impact of EU membership on trade and FDI are estimated jointly using seemingly unrelated regression (SUR) methods, the impact on FDI is again found to be positive and falling within the previously estimated range while the effect on trade is also positive and approximately twice as large.

2. FDI, Trade and the European Union: A Conceptual Framework

In this section, we propose a conceptual framework to consider the potential effects of economic integration on trade and FDI. The distinction between shallow and deep integration is useful in this case: shallow integration is epitomized by the free trade area model and is restricted to economic integration, while deep integration combines economic and political aspects (Campos et al., 2015). An important case of deep integration is the customs union in which economic ties are supported by the creation of common institutions to manage conflict which may emerge, for instance, regarding the common external tariff. The European Union represents perhaps the most sophisticated example of deep integration.

2.1 The Literature

The changing nature of international trade is also worthy of note for our understanding of FDI (Baldwin, 2016). Traditionally, international trade was understood to be driven by the exploitation of mutual comparative advantage, implicitly focusing on final products. However, in the last two or three decades, international trade has in fact increasingly involved the exchange of parts and components within firms and industries value chains, rather than final goods, and has been increasingly driven by domestic absorptive capacity (Castellacci, 2011;

Cohen and Levinthal 1990; Mowery and Oxley 1995; Kim 1998). Deep integration has contributed to this emergence of global value chains (GVCs) in which production is spread across various countries or, to put it differently, to a larger role for intra-industry trade. UNCTAD (2013) estimates that now 60% of global trade is in intermediate goods and services.

Trade is a critical element of global integration but FDI play a special role in the development of host economies because as a factor input, foreign investment can generate significant spillover benefits horizontally across the industry (Haskel et al., 2007) and vertically up and down the supply chain (Javorcik, 2004.)

FDI is important for economic growth and efficiency, because the entry of foreign firms in the domestic market increases competition and shores up technological innovation both in terms of product and process (Alfaro et al., 2004). It also puts pressure simultaneously on their direct domestic competitors, but also on upstream and downstream firms (Mastromarco and Simar, 2015). Importantly, FDI entails the diffusion of frontier management practices (Bloom et al., 2012). FDI is often conceived as more resilient than other international capital flows (portfolio investment, for instance) and importantly may exhibit complementarity patterns not only with respect to international trade, but also with other elements of financial globalization (Greenaway and Kneller 2007, Lane and Milesi-Ferretti 2008).

Our empirical analysis follows the literature in being based on the gravity model; a staple of international economics (Anderson and van Wincoop, 2003). The gravity theory and related econometric framework was originally developed for international trade flows, but has also been applied to FDI flows and integration effects (Bevan and Estrin, 2004; Anderson, 2011).

The seminal paper in the modern econometric evaluation of free trade area agreements literature on the basis of a gravity model is Baier and Bergstrand (2007). This paper is one of the first to make the point that moving away from a cross-section design to one based on panel data was necessary in order to deal with endogeneity bias (see also Baier and Bergstrand, 2004;

Egger and Pfaffermayr, 2004).

Moreover, this literature generates a number of valuable estimates of the economic benefits of deep vis-à-vis shallow integration. For instance, Baier et al. (2008) estimate that membership in the European Union leads to increases in bilateral international trade of the order of between 127 and 146% in 10 to 15 years after joining. This compares favourably with equivalently estimated benefits from shallow integration as they also find that membership in the European Free Trade Association (EFTA) generates increases in bilateral trade that are of about one quarter of the size of those generated from deep integration agreements (such as the EU and the EEA.) EFTA effects are estimated at only about 35% over the 10 to 15-year period following the start of membership.

There has also been important research on individual aspects of deep integration on FDI inflows. Of interest in our case is the role of deepening monetary integration (for instance, by using a single currency) in affecting trade and FDI inflows. De Sousa and Lochard (2011) is particularly relevant in this respect because they investigate whether the creation of the euro (in the context of the European Monetary Union, EMU) in 1999 explain the sharp increase in inter-European investment flows. They tackle this question using a gravity model for bilateral foreign direct investment (FDI). Their main finding is that the euro increased intra-EMU FDI stocks by around 30% percent. More importantly, they find evidence that this effect varies over time and across EMU members: it is significantly larger for outward investments of less-developed or poorer EMU members.

There has also been an important stream of studies from a regional economics perspective, of which a good example is that of Basile et al. (2008). This paper uses panel firm-level data over the period 1991–1999 covering more than 5500 foreign subsidiaries in 50 regions of eight different EU countries. The methodology they use is the mixed logit location choice model, which allows the investigation of the effects of EU regional policy (Structural Funds) in the location choice of foreign subsidiaries. Their main conclusion is that, accounting for agglomeration economies and various regional and country-level characteristics, those regional policy instruments are found to be an effective factor in explaining FDI location. Although the eligibility criteria for EU regional assistance funds is slightly restrictive (only regions with per capita income below 70% of the EU average qualify), evidence of this positive effect provides an additional reason why we might expect an FDI premium from EU membership.

One important additional issue to investigate is the complex relationship between international trade and FDI flows. This has been traditionally framed in terms of tariff-jumping FDI decisions (Motta, 1992) and has gained further impetus with recent work on heterogeneous firms. Helpman et al. (2004) put forward a multi-country, multi-sector general equilibrium model that highlights the decision of heterogeneous firms to sell in foreign markets either through exports or through a local subsidiary based on FDI. Econometric evidence for the model is presented focusing on US affiliate sales and US exports in 38 countries and 52 sectors. Two particularly salient findings for the impact of` deep integration are (1) strong negative effects on export sales relative to FDI from sector and country-specific transport costs and tariffs and (2) strong support for the effects of firm-level heterogeneity on the relative export and FDI sales with greater firm heterogeneity found to lead to significantly more FDI sales relative to export sales.

A more recent take on this issue is analysed in Conconi et al. (2016), which looks at how uncertainty affects firms' internationalization choices in terms of the trade-off between exports and FDI. The main novel idea in this case is the possibility that a solution to the trade-off is found in the dynamics of this choice, in particular, on the possibility that firms initially choose to export in order to learn about the market and the country and, once learning takes place, they may choose to substitute these exports by investing directly. In other words, firms may export before investing in foreign markets so that the trade-off is not rigid and actually may be resolved over time. The theoretical framework they put forward is centred on the notion that firms are uncertain about their profitability in a foreign market and thus experiment via exports before engaging in FDI. Conconi et al. (2016) find support for this prediction of long term complementarity between trade and FDI in that the probability that a firm starts investing in a foreign country significantly increases with its export experience in that country. Hence one might expect that long-term institutions promoting deep economic integration might have a positive impact on both trade and FDI by amplifying this complementarity.

2.2 The Gravity Model

Although the gravity model started out as a purely empirical model, it has now been given solid theoretical foundations to explain cross country trade patterns. Maybe the simplest way to derive theoretically the gravity equation for trade is to impose a market-clearing condition on an expenditure equation. We follow Baldwin and Taglioni (2007) and, using CES preferences for differentiated varieties, write the expenditure equation as

$$\vartheta_{od} \equiv \left(\frac{p_{od}}{p_d}\right)^{1-\sigma} E_d \qquad (1)$$

where the left-hand side represents total spending in country *d* on a variety produced in country *o* (d for destination, o for origin), p_{od} is the consumer price in country *d* of a variety produced in country *o*, p_d is the price index of all varieties in country *d*, σ is the elasticity of substitution among varieties (assumed greater than 1) and E_d is the total consumer expenditure in the destination country.

Profit maximization by producers in country *o* yields $p_{od}=\mu_{od}m_o\tau_{od}$ where μ_{od} is the optimal mark-up, m_o is the marginal cost, and τ_{od} represents bilateral trade costs. Assuming monopolistic or perfect competition, the mark-up is identical for all destinations. For the case of Dixit-Stiglitz monopolistic competition, the mark-up is σ/(σ-1) which means that consumer prices in country i are p_{oo}= (σ/(σ-1)) $m_o\tau_{oo}$ and τ_{oo} =1 if we assume there are no internal/domestic barriers. Assuming symmetry of varieties for convenience and summing over all varieties yields

$$V_{od} = n_o p_{oo}^{1-\sigma} \quad \frac{\tau_{od}^{1-\sigma}}{p_d^{1-\sigma}} E_d \tag{2}$$

where V_{od} is the aggregate value of the bilateral trade flow from origin to destination and n_o is the number of varieties produced in origin and sold in destination.

The market-clearing condition requires that supply and demand match: when summing equation (2) over all destinations (including own sales) is equal to the country total output (Y_o). The condition can then be stated as

$$Y_o = n_o p_{oo}^{1-\sigma} \sum_d \frac{\tau_{od}^{1-\sigma}}{p_d^{1-\sigma}} E_d \tag{3}$$

and solving it yields $n_o p_{oo}^{1-\sigma} = Y_o/\Omega_o$where $\Omega_o$is an index of market-potential. Substituting this market-clearing condition on the expenditure function yields the gravity equation:

$$V_{od} = \tau_{od}^{1-\sigma} \frac{E_d Y_o}{p_d^{1-\sigma}\ \Omega_o} \tag{4}$$

For the econometric implementation of (4), E_d is proxied by the destination (host) country's GDP, Y_o is proxied by the origin (source) country's GDP, $p_d^{1-\sigma}\ \Omega_o$ is the multilateral trade resistance term, and τ is proxied by bilateral distance. The intuitive interpretation of the model is easy to visualise: bilateral trade is a positive function of the size of the economies of the two trade partners and a negative function of the distance between them. However, one cannot apply a parallel argument to derive a gravity model for FDI, because as a factor input one cannot aggregate across product markets in the same way. Hence, while there is a theoretical derivation of the gravity model for trade, currently the assumed relationship is empirical for the FDI gravity equation (Anderson, 2011).

3. Reduced Form Model

The gravity equation model for FDI in the empirical literature parallels equation (4) above for trade in the following way:

$$ln(bilateral\ flow\ of\ FDI_{o,d,t}) = \alpha_0 + \alpha_1 lnX_{o,t} + \alpha_2 lnX_{d,t} + \mathrm{I_t} + \eta_{o,d} + u_{o,d,t} \quad (5)$$

where *ln(.)* stands for a natural logarithm of a unidirectional flow and the $X_{o,t}$ is a vector of characteristics of the origin country, *o*, in year *t*. Similarly, $X_{d,t}$ is a vector of destination nations' characteristics in year *t*. As for trade these include measures of the size of the economy (GDP) of the countries as well as indicators of *time-varying* economic distance.

However, many of the key host and home economy variables in a gravity equation, including almost all potential indicators of distance (transportation costs, cultural affinity, geography, etc.), common borders, landlocked countries, ocean harbors, lack of mountains, tariffs, customs, different language/money, regulation, legal origin, are either invariant or do not change greatly over time for each pair (dyad) of countries. For these reasons, we instead include a dyadic fixed effect ($\eta_{o,d}$), a dummy variable for each pair of countries. The coefficients of interest, the variable indicating deeper ties of integration such as the EU membership are identified from the impact of changes in trading/economic/political relationships (and other economic variables) *over time* on the change in FDI flows *over time*. Being a member of the EU will be one of the time-varying observable characteristics of a country that enter the $X_{o,t}$ and $X_{d,t}$ vectors of characteristics specific to a country and will include things like *time-varying* pair proxy for trade/investment costs and *time-varying* regulatory cultural distance. We also include a full set of time dummies to control for global macroeconomic shocks. The $u_{o,d,t}$ is the idiosyncratic error term. The standard errors are clustered by dyadic pair to allow for serial correlation of the errors.

In short, our modelling strategy to explain the impact of deep economic integration on

FDI follows the *structural gravity approach*; a similar specification is used for example by Baier and Bergstrand (2007). In terms of estimation method, we first estimate a baseline model using the natural logarithm of bilateral unidirectional FDI flows; second, we estimate a Poisson model (Santos Silva and Tenreyro, 2006). In all cases, we control for dyadic fixed effects and time dummies. The inclusion of bilateral fixed effects helps to minimise the effects of the exclusion of many of the usual suspects in explaining FDI flows. They control for country pair unobserved heterogeneity and implicitly for factors such as cultural distance, bilateral regulatory agreements, etc. The usual concern regarding omitted variable bias is mitigated in this way in these types of models. Year fixed effects are also important as they reflect the macro phenomena that are common across all country-pairs.

In our sensitivity analysis, we also address the following selection problem. Suppose that the OLS and Poisson regressions are biased by the inclusion of 'positive only' data of bilateral FDI flows. 41% of the observations are zero and the OLS model traditionally deals with this by giving a value of $1 of FDI to the missing value so we can take logarithms. But this is arbitrary and the fact that there are no bilateral trade flows between two countries may be telling us about the sunk costs of doing business between the dyad of countries. We try to address this issue *via* a Heckman selection model in which we first estimate a selection equation in which the likelihood of non-zero flows is modelled as a function of manufacturing, exports and import shares as well as per capita GDP of the destination country. As discussed in detail below, the selection equation generates some interesting lessons: a higher likelihood of positive FDI flows is related to lower per capita GDP (i.e. FDI goes to countries where the return to capital is higher), higher industry shares (i.e. a signal of better integration in the global value chain), lower export shares (which might indicate a substitution effect between FDI and trade) and higher import shares (countries more depended on international factor and goods movements) in the destination country.[1]

We undertake a number of additional robustness tests on our estimate of the impact of deep economic integration on FDI, using stock rather than flow measures of foreign investment and considering dynamic specifications as well as lag structures. We also consider the impact of other integrative institutions such as the EEA and EFTA. Finally, we turn to the simultaneous effects of deeper integration on trade and FDI together estimating two equations jointly using seemingly unrelated regression analysis to identify the separate impacts of EU membership on both variables.

4. Data

Foreign direct investment reflects the objective of obtaining a lasting interest by a resident entity in one economy ("direct investor") in an entity resident in an economy other than that of the investor ("direct investment enterprise"). The lasting interest implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence on the management of the enterprise. In general, direct investment involves both the initial transaction between the two entities and all subsequent capital and income transactions between them. As far as measurement accounting is concerned, FDI flows record the value of cross-border transactions related to direct investment during a given period of time. Financial flows consist of equity transactions, reinvestment of earnings, and intercompany debt transactions. On the one hand, outward flows represent transactions that increase the investment that investors in the reporting economy have in enterprises in a foreign economy, such as through purchases of equity or reinvestment of earnings, less any transactions that

[1] We note that the lambda term is significant and negative, suggesting that the error terms in the selection and primary equations are negatively correlated so the selection equation is needed.

decrease the investment that investors in the reporting economy have in enterprises in a foreign economy, such as sales of equity or borrowing by the resident investor from the foreign enterprise. On the other hand, inward flows represent transactions that increase the investment that foreign investors have in enterprises resident in the reporting economy less transactions that decrease the investment of foreign investors in resident enterprises. In our data, we look directly at unidirectional and bilateral FDI flows (inflows for one country and outflow for the other) in millions of current US dollars. We used the OECD International Direct Investment Statistics as our primary data source.[2] It includes data on FDI into and out of OECD countries according to the benchmark definition, 3rd edition. In this paper, we focus on FDI inward flows and in our sensitivity analysis on FDI stocks from the same dataset[3]. For the purpose of international comparison, we use millions of USD as currency units. The FDI data was merged with World Bank data[4] on macroeconomic indicators of these OECD countries including GDP and GDP per capita (USD, PPP). Furthermore, as required by the Heckman model set-up, we calculated the share of manufacturing output as percentage of total GDP, the share of export as percentage of total GDP, and the share of imports as percentage of total GDP from the World Bank dataset.

We constructed our key variable of interest for deeper economic integration, EU

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[2] The data are available online and can be accessed here: http://dx.doi.org/10.1787/bmd3-data-en

[3] Some FDI flows are negative sign. These instances of disinvestment arise because either equity capital, reinvested earnings or intra-company loans) are negative and not offset by the remaining components. Negative flows have real economic meaning, and, because of their numerical importance, we cannot eliminate them without losing consistency, so we treat them as zero.

[4] WDI Database Archives (WDI-DA): http://databank.worldbank.org/data/reports.aspx?source=wdi-database-archives-(beta)

membership, on information provided on the European Union website.[5] Our EU membership variable is a binary time-variant variable equal to 1 if the country is in the EU at a specific year, 0 if the country is not in the EU at that year. The list of variables used in this paper is provided in Table 1. In our dataset, each observation contains information of FDI flows into the target country, EU membership status of both target and source countries, macroeconomic conditions of both target and source countries, and other relevant information such as if they are in other multilateral agreements.

We conducted our research within the OECD framework, primarily because the international capital markets are well established between OECD countries allowing for the comparative analysis of bilateral FDI flows. Such data are rare or non-existent for developing and emerging markets over a reasonable period of time. The main disadvantage of our dataset is therefore the exclusion of most developing countries including China and India. Notice that a by-product of this drawback is that we are limited in the currency unions we can study (for example, vis-à-vis Glick and Rose, 2015). On the other hand, bilateral FDI flows within OECD accounts for 70% of global FDI inflows. Also, the data are easily available for those countries with reassuring quality standards. The 34 OECD countries included are Austria, Australia, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, Norway, New Zealand, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, UK and the USA. “Target/destination” indicates the country which is the recipient of the FDI and “Source/origin” indicates the country is the sender of the FDI.

As far as the time span is concerned, we used all available years covered by the database (3rd edition), from 1985 to 2013. The maximum possible number of observations is

[5] https://europa.eu/european-union/about-eu/countries/member-countries_en

34*33*29=32,538. We constructed our data as a balanced panel with assigned zeros due to missing values (no flows). For many country-year pairs, especially before the 1980s, bilateral FDI flows were in fact zero. The missing values for FDI in the data reflect these zeros and as explained above we used the Pseudo Poisson Maximum Likelihood (PPML) estimator (Santos Silva and Tenreyro, 2006; WTO, 2012) and Heckman selection model to address the non-random assignment of zero FDI flows. For missing values in other variables, we imputed the mean together with a missing dummy to flag the imputation. Basic statistics are provided in Table 2, which has the mean, standard deviation, minimum value, and maximum value of each variable.

5. Empirical Analysis

5.1 Benchmark-Baseline Specification

Table 3 shows estimates of the gravity equation (5) with the dependent variable being bilateral FDI flows. We compare the baseline panel FE estimator with the Poisson Pseudo-Maximum Likelihood (PPML) model for two main reasons: the current stage in the evolution of modelling gravity equations is the PPML estimator (for an account of the advantages see Santos Silva and Tenreyro, 2006); we do not exclude from the data the 0 bilateral flows observations (see description section) and the PPML estimator can deal well with the highly right-skewed nature of the distribution of flows due the presence of many 0's. We analyse the regressors in order. The size of the two countries is measured by GDP and the level of development is measured by GDP per capita. First of all, the size of both sender and target matters for FDI, as we would expect in a standard gravity estimation, and exert a positive and significant effect on FDI flows. The level of development is significant only for the sender, and even this result is not robust to the PPML estimation.

However, the main variable of interest for our present purposes is the one capturing deep economic integration via the effect of EU membership, namely the estimated coefficients for the EU *target* dummy for the host economy. This takes a value between 33% and 38% for the Panel FE and PPML estimator, respectively. These coefficients are statistically significant. On the baseline OLS estimate of column (1) the effect is 33% being calculated as $e^{0.285}$-1, in the Poisson model of column (2) it is 38%= $e^{0.32}$ - 1.

5.2 Sensitivity and Robustness Analysis

We subject the baseline estimation results to four demanding alternative specifications and estimation methods in order to test the robustness of our results concerning the impact of EU membership on FDI. These are replacing FDI flows by the stock of FDI as the dependent variable in equation (5); exploring the effects of gradual adjustment to EU membership through a distributed lag structure; using a difference model to tackle potential serially correlated errors; and addressing possible sample selection bias through a Heckman procedure. We report and discuss these results in the sub-sections below.

5.2.1 *FDI stocks instead of flows as dependent variable*

Information about FDI is available both as flow and stock data and is recorded in a country's Financial Account of the Balance of Payments (BOP) or International Investment Position (IIP), respectively. The inward FDI stock is the value of foreign investors' equity in and net loans to enterprises resident in the reporting economy. FDI stocks are therefore the (revalued) accumulation of past flows, while flows are the current transactions taking place in a certain period t. We should note here that FDI flows are generally not equal to the first difference of FDI stocks because revaluation, currency fluctuations and other factors.

FDI stock data has been used in the literature because it is more stable than flow data (Beugelsdijk et al., 2010), which can be subject to large annual fluctuations, and has the advantage that FDI stock are unlikely to be negative. In our case, the latter points mean we end up with more observations. However, there are specification problems with estimating our equations using bilateral FDI stocks as dependent variable because the data series for the independent variables are flow variables; FDI inflows are therefore more coherent with the theoretical derivation of the structural gravity model.

Table 4 reports estimates of the bilateral FDI stock equation replicating Table 3 in using both panel fixed effects and Poisson estimation methods. As we would expect given the arguments above, the gravity model provides a less satisfactory explanation of FDI stocks than flows; indeed, the source and host GDP variables are not significant in the Poisson estimates and only source GDP in the fixed effects model. Even so, we continue to obtain a significant and positive estimated impact of EU membership of 0.34 from the Poisson regression.

5.2.2 *Adjustment effects and distributed lags*

The effects of deep economic integration may not be felt contemporaneously. Indeed, the impact could be gradual, or anticipated prior to EU membership. These possibilities led us to explore the effects of lagged EU membership dummies on FDI inflows. In this regression model, FDI inflows are the dependent variable and EU membership and other independent variables have been lagged. Our specifications include up to the fourth lag effects, and one forward effect. The estimates of the lagged EU coefficients are presented in Table 5.

The coefficients of FDI target country EU membership dummies in columns (1) to (4) demonstrate a stable long-term positive effect of EU membership on FDI inflows, which is more than 1.5 times larger than our baseline specifications. For column (5), because we have a forward term, the first lead dummy represents the long-term positive effect, which is also significant and positive.

We also find that by adding up the coefficients of contemporaneous and lagged term of EU membership (target), the baseline overall impact can be gauged as a sum of between 16 and 18% which is a more conservative estimate than we have shown above.

5.2.3 *First-differencing*

When unobserved heterogeneity in FDI flows is temporally correlated, first-differencing the data offers clear advantages as an alternative estimator. This is because the panel fixed effects estimator is inefficient when t is large enough, if the errors are highly serially correlated. We do incur this risk, because the year data points range from 1985 to 2013. First differences might therefore be a more appropriate estimation technique when the randomness tends to be correlated over time, while fixed-effects, as reported in Table 3, might be more appropriate when randomness tends to dissipate between periods. In the trade literature, the former is often used due to the higher 'persistent' nature of data, but this is less clear-cut with FDI data. In other words, we use the first-differencing model to check if the time pattern *could* undermine our results from baseline model.

Hence, we estimate equation (6); the gravity equation in first differences:

$$dln(bilateral\ flow\ of\ FDI_{o,d,t-(t-1)}) = \alpha_1 dlnX_{o,t-(t-1)} + \alpha_2 dlnX_{d,t-(t-1)} + v_{o,d,t-(t-1)} \quad (6)$$

We then rewrite the equation when we drop the GDP and GDP per capita from the regression and focus on the EU variables for the sender *(o)* and the target *(d)* only, now $v_{o,d,t-(t-1)} = u_{o,d,t} - u_{o,d,(t-1)}$ being a white noise

$$log(1+FDI)_t - log(1+FDI)_{(t-1)} = \alpha_1 EU_{o,t-(t-1)} + \alpha_2 EU_{d,t-(t-1)} + \alpha_3 EU_{o,(t-1)-(t-2)} + \alpha_4 EU_{d,(t-1)-(t-2)} + \alpha_5 EU_{o,(t-2)-(t-3)} + \alpha_6 EU_{d,(t-2)-(t-3)} + u_{o,d,t} - u_{o,d,(t-1)} \quad (7)$$

This specification has the advantage of eliminating the effects of possible auto-correlated disturbances, controlling at the same time for heterogeneity. Compared to standard fixed effects, first differencing removes by construction both source and target country dyadic effects, so that they are no longer identified.

The results are reported in Table 6. We again find consistently significant and positive estimates of the impact of EU target on FDI inflows in these specifications, the coefficients ranging from 0.299 to 0.509. Hence our findings still hold after taking into consideration of auto-correlation over time. The ATE (average treatment effect) is calculated in the last line of the table, being the sum of all statistically-significant EU target coefficients.

5.2.4 *Sample selection bias and Heckman estimation*

We noted above that for some pairs of countries, no data are reported on bilateral FDI flows. The common practice in the literature seems to be recoding the missing values to zero and then simply ignoring these observations by estimating the gravity model on dyads which report strictly positive (and higher than 1) FDI flows (Santos Silva and Tenreyro, 2006). Alternatively, other papers substitute missing/zero values with an arbitrarily small constant so that the natural log of these observations is defined and log-computable (Santos Silva and Tenreyro, 2006). There is no entirely satisfactory solution to this problem since the missing values could be due to the fact that FDI is truly zero, or because it is non-zero and it is measured with error but relatively small and escapes statistical reporting or because it is non-reported for other unknown reasons. However, in all these cases, the estimation can lead to biased coefficients' estimates due to *sample selection*.

The Heckman sample-selection model works by estimating the determinants of being selected into the sample simultaneously with estimating the determinants of the levels of FDI flows for the dyads selected into the sample because they are non-zero. We therefore re-estimate the model for FDI inflows reported in Table 3 using the inverse Mills-ratio, with the results reported in Table 7.

This procedure considerably reduces the estimated size of EU membership effect on FDI but not its significance. The effect is now estimated to be 14% (= $e^{0.13}$-1). In the selection equation, we have used three 'excluded' variables from the target database, manufacturing Value Added/GDP, export/GDP, import/GDP.

Concerning these, three comments are in order. First, the manufacturing value added over GDP variable signals a positive selection into the sample, meaning that target countries with bigger manufacturing share as a percentage of GDP tend to also experience positive (vis-à-vis none) FDI inflows. Second, the trade pattern in the target countries works in two directions, with exports having a negative and imports a positive selection effect for non-zero FDI flows. Finally, and most importantly, the coefficient on the inverse Mills-ratio is positive indicating positive selection; this means that, without the correction, the estimate of the impact would have been upward-biased.

5.3 Alternative scenarios

We consider two further extensions to our framework. We first analyse the impact of joining the EU on FDI, having not previously been a member, rather than the average effect of EU membership as we did before. We also study the effects on FDI of membership in other economic integration structures rather than WTO membership as the alternative to EU membership. These might be realistic alternatives for countries either joining or leaving the EU, and as such might provide a more positive alternative scenario, therefore reducing the size of the EU membership effects.

5.3.1 *The effect of joining the EU*

In our sample, 11 countries joined the EU during the sampled period[6], 13 countries were never

[6] These are Austria in 1995, Czech Republic in 2004, Spain in 1986, Estonia in 2004, Finland in 1995, Hungary in 2004, Poland in 2004, Portugal in 1986, Slovakia in 2004, Slovenia in 2004, and Sweden in 1995.

in the EU[7], and 10 countries have always been a member in the period of our focus[8]. To investigate the joining effect of EU membership, we further restricted our sample to FDI flows between countries that joined EU between 1985 and 2013. Table 8 reports the results for the three main methods of estimation of the base regression used in the paper; OLS, Poisson and Heckman methods respectively. It can be seen that the estimated effects of EU membership on FDI inflows for these countries are unambiguously larger than for all EU members as reported in Table 3. Therefore, we have to be aware that we are not estimating the average treatment effects of EU membership on FDI, but a more specified "joining effect" of EU membership.

5.3.2 *Being a member of NAFTA & EFTA as an alternative to EU membership*

European Free Trade Association (EFTA)[9] and North American Free Trade Agreement (NAFTA)[10] are two important 'Free Trade Areas' (FTAs), which include some of the OECD countries in our dataset. The reason why we might want to control for the membership to those FTA above and beyond EU is that so far, we have been implicitly treating the counterfactual to EU membership as the standard membership of the World Trade Organization (WTO). This might be an implausible hypothesis for some of the wealthy countries such as Norway (EFTA) and USA and Canada (NAFTA) within OECD economies. In Table 9, when we add these two dummy variables (both for the sender and recipient) the NAFTA and EFTA coefficients are statistically insignificant for the recipient and the EU recipient dummy, instead, remains positive and significant. This suggests that being a member of the EU matters even when

[7] These countries are Australia, Canada, Switzerland, Chile, Israel, Iceland, Japan, Korea, Mexico, Norway, New Zealand, Turkey, and USA.

[8] These countries are Belgium, Germany, Demark, France, Great Britain, Greece, Ireland, Italy, Luxemburg, and the Netherlands.

[9] Iceland, Lichtenstein, Norway, and Switzerland.

[10] Canada, Mexico, and USA.

controlling for close alternatives.

5.3.3 *The effects of EU membership on FDI and trade; SUR methods*

Finally, we consider the effects of deeper economic integration through EU membership on trade and FDI jointly. We have established robustly the impact on FDI in a structural gravity model, and the literature has analysed extensively such models for trade and EU membership (Baier and Bergstrand, 2007; Dhingra et al. 2017). Our approach is to use seemingly unrelated regressions (SUR) modelling to estimate structural gravity models on FDI and trade data jointly. For FDI, we will estimate our baseline fixed effect specification. The trade equation is similar, but as we have already noted, trade equations do not typically control for GDP per capita. This is because FDI equations capture cross country flows in a factor input, which is argued to be sensitive to levels of development in the host economy and the economic distance between the home and host economy. The factors are not considered to be of comparable relevance in modelling flows in goods markets. Thus, the trade equation does not contain GDP per capita of the source and host economy. We estimate a SUR gravity model for both FDI-imports and FDI- exports and the results are reported in Table 10.

The findings for GDP of the home and host economies as well as GDP per capita are as expected and conform to the literature. We focus primarily on the estimated effects of deeper economic integration. We identify positive effects on EU membership on both FDI and exports, and FDI and imports. The estimated FDI effects are similar when estimated jointly with both imports and exports, and somewhat smaller than in our FDI only regressions, though still positive and significant. However, the trade effects of EU membership are somewhat larger, and more marked for exports than imports. The effect is in fact 13% for FDI (vis-à-vis 29% for import) in the first SUR model and 14% for FDI (vis-a-vis 41% for export) in the second SUR model.

6. Conclusions

How much additional FDI does a country receive as a consequence of being a member of the European Union? This is obviously an important question for which, surprisingly, one still finds very few answers. After showing how the structural gravity model can be theoretically derived and empirically tested (vis-à-vis other major contributions in the literature), we report our findings that EU membership increases FDI inflows by between 14% and 38% depending on the choice of econometric technique. We find that, between 1985 and 2013, EU membership led FDI inflows to be greater, on average, by about 28%. We undertook a thorough and systematic robustness analysis of these estimates *via* four further checks. First, we looked at the data on FDI stock instead of flows; the literature has suggested that stock data might also have some empirical advantages. We do not find that the use of FDI stock versus flows alters our findings about the impact of EU membership, indeed they are mostly reinforced in the Poisson estimation. Next, we looked at the possibility that impact of EU membership on FDI might not be instantaneous, but rather subject to either forward or backward lags. We find evidence for such lagged effects which actually strengthen our proposition about the effects of EU membership and confirm that the EU membership 'expectations' build up until the year of joining and then beyond the date of membership. We went on to look at an alternative specification model, first differencing, to address potential problems of serial correlation and we continue to find confirmation of our baseline results concerning the impact of EU membership on FDI. Finally, we sought to address potential sample selection bias in the data, which may arise because the pattern of missing or zero flows is not random; hence our models would 'select' only countries which are prone to have bilateral FDI. We show that this selection effect is relevant and leads us to overstate the impact of EU membership, but deeper economic integration is still found to have a positive and significant impact on FDI. We next performed two extensions to the framework. In the first, we exclude all countries that are always or never members, hence focusing on the effects of joining the EU rather than being a member of it. The impact of joining the EU in our sample period is found to be larger than the effects of membership more generally. Secondly; we introduce other possible routes to economic integration namely membership of EFTA and NAFTA as the alternative to EU membership, rather than (implicitly) WTO rules. The impact of EU membership on FDI is not changed significantly by this adjustment.

Finally, we build on our structural gravity equation framework to consider the effects of EU membership on FDI and trade jointly. We estimate two systems of equations; FDI and imports, and FDI and exports, respectively. We find that deep economic integration such as developed within the EU has the most marked effects on trade, but simultaneously does increase FDI significantly to a level within our original range of estimates.

These results have enormous implications for the European integration project and for countries like the UK (and not exclusively), that are currently considering substantial changes of the terms of their relationship with the EU (Dhingra et al., 2016). Countries that choose to leave the European Union may suffer significant falls in the inflows of foreign direct investment in addition to major disruptions to their trade flows. While the impact on trade will be perhaps twice as great, the effects on FDI are also large, in the order of 14 to 38%. This estimate is robust to the array of alternative methods and specifications outlined above. Furthermore, given the strong spillover effects from FDI to the host economy identified in the literature (see e.g. Javorcik, 2004), this suggests that the broader economic effects of leaving a deeply integrated trade group such as the European Union might be considerable and negative.

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Table 1: List of Variables

	Definition	Unit	Source
Bilateral FDI flow	Inward FDI flows (sender to target)	USD, Millions	OECD database
Bilateral FDI stocks	Inward FDI Stocks (sender to target)	USD, Millions	OECD database
GDP (sender)	Total GDP of FDI sender	USD, millions	World Bank
GDP (target)	Total GDP of FDI target	USD, millions	World Bank
GDP per capita (sender)	GDP per capita of FDI sender	USD, PPP	World Bank
GDP per capita (target)	GDP per capita of FDI target	USD, PPP	World Bank
EU member (sender)	Sender country is EU member	0,1	EU website
EU member (target)	Target country is EU member	0,1	EU website
Manufacturing share (target)	Share of manufacturing output as percentage of total GDP	%	World Bank
Export share (target)	Share of export as percentage of total GDP	%	World Bank
Import share (target)	Share of import as percentage of total GDP	%	World Bank

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Bilateral FDI flows (inward)	32,538	385.57	3157.74	-59483.33	117839.40
Bilateral FDI stock	32,538	3819.88	19102.98	-7346.23	486833.00
Import	32,538	3156.96	12651.24	0.00	339074.10
Export	32,538	3196.13	13315.90	0.00	353787.10
GDP	32,538	878344.70	1885361.00	4075.01	16700000.00
GDP per capita	32,538	24762.44	12632.88	3415.68	95587.31
Manufacuring share of GDP	32,538	18.04	4.29	5.06	31.37
Import/GDP	32,538	35.01	19.25	0.00	97.75
Export/GDP	32,538	34.91	20.43	0.00	99.83

Table 3: Panel estimates of the effects of EU membership on FDI inflows

	(1)	(2)
Dependent variable:	**Panel Fixed Effects**	**PPML**
EU member (target)	0.285***	0.320*
	(0.077)	(0.163)
EU member (sender)	-0.01	0.828***
	(0.079)	(0.191)
Ln(GDP, target)	0.473***	3.799***
	(0.056)	(1.432)
Ln(GDP, sender)	0.500***	3.903***
	(0.154)	(1.462)
Ln(GDP per capita, target)	0.18	-1.489
	(0.158)	(1.513)
Ln(GDP per capita, sender)	1.450***	-1.125
	(0.154)	(1.623)
Constant	-25.208***	-27.125***
	(2.958)	(5.130)
Observations	32,528	32,147
R-Squared	0.470	0.423
Year FE	Yes	Yes
Bilateral FE	Yes	Yes
Clustered	Country Pair	Country Pair

Notes: *** indicates significance at the 1% level, ** at the 5% level and * at the 10% level. Coefficients with standard errors (clustered by 630 bilateral country pair in first two columns) in brackets. All regressions include fixed effects for years and dyadic pair. Column (1) is estimated by OLS. Column (2) is estimated by Poisson PML. The 34 OECD countries included are Austria, Australia, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, Norway, New Zealand, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, UK and the US. "Target" indicates the country which is the recipient of the FDI and "sender" indicates the country is the sender of the FDI.

Table 4: FDI Stock as dependent variable

	Panel Fixed Effects	PPML
logGDP(sender)	0.46807***	1.02995
	0.0777	0.84138
logGDP(target)	0.51009***	1.14044
	0.07765	0.8587
lnGDPPC(sender)	1.61543***	2.86921***
	0.14324	0.93212
lnGDPPC(target)	-0.0272	0.70833
	0.14671	0.91731
EU member(sender)	0.0514	0.93230***
	0.1076	0.16769
EU member(target)	0.16581	0.34052***
	0.1089	0.11255
Constant	-26.48975***	-63.14862***
	2.03021	11.07743
Observations	34,510	30,399
R-squared	0.64802	0.83714
Year FE	Yes	Yes
Bilateral FE	Yes	Yes
Clustered	Paired	Paired

Notes: * indicates significance at the 1% level, ** at the 5% level and * at the 10% level.

Table 5. Panel Gravity Equation with Bilateral Fixed and Time Fixed Effects-with lags

	(1)	(2)	(3)	(4)	(5)
VARIABLES	log(1+FDI)	log(1+FDI)	log(1+FDI)	log(1+FDI)	log(1+FDI)
EU member(target)	0.47750***	0.48156***	0.48485***	0.47971***	0.03956
	(0.11919)	(0.13189)	(0.13142)	(0.13091)	(0.11219)
EU member(sender)	-0.21377**	0.15597	0.13994	0.12660	0.16993
	(0.10610)	(0.11888)	(0.11864)	(0.11832)	(0.10385)
lag1EU member(sender)	0.36161***	-0.24870**	-0.25004**	-0.25004**	-0.25004**
	(0.09549)	(0.11551)	(0.11917)	(0.11922)	(0.11927)
lag1EU member(target)	-0.33219***	0.04467	0.02608	0.02608	0.02608
	(0.10476)	(0.12207)	(0.12894)	(0.12899)	(0.12905)
lag2EU member(sender)		0.58412***	0.03422	0.02915	0.02915
		(0.09623)	(0.11858)	(0.12706)	(0.12712)
lag2EU member(target)		-0.37082***	0.00573	0.10340	0.10340
		(0.10916)	(0.12750)	(0.13333)	(0.13339)
lag3EU member(sender)			0.57328***	0.03776	0.03003
			(0.10252)	(0.11443)	(0.11475)
lag3EU member(target)			-0.29740***	0.41898***	0.41000***
			(0.11347)	(0.13511)	(0.13502)
lag4EU member(sender)				0.55228***	0.49703***
				(0.11373)	(0.11419)
lag4EU member(target)				-0.61537***	-0.65023***
				(0.11680)	(0.11627)
lead1EU member(sender)					-0.30928***
					(0.11329)
lead1EU member(target)					0.44527***
					(0.12597)
Joint F-test EU membership of recipients					
F	8.14000	7.21000	4.66000	7.75000	7.00000
p-values	0.00030	0.00010	0.00100	0.00000	0.00000
Constant	1.72163***	6.04786***	7.08343***	7.15384***	3.01739***
	(0.20174)	(0.04815)	(0.20906)	(0.20800)	(0.17251)
Observations	31,416	30,294	29,172	28,050	26,928
R-squared	0.45249	0.45074	0.44865	0.44671	0.4602
Year FE	Yes	Yes	Yes	Yes	Yes
Bilateral FE	Yes	Yes	Yes	Yes	Yes
Clustered	pairid	pairid	paired	paired	Paired

Notes: *** indicates significance at the 1% level, ** at the 5% level and * at the 10% level.

Table 6. First differenced panel gravity model

VARIABLES		log(1+fdi)[t-t(t-1)]	log(1+fdi)[t-t(t-1)]	log(1+fdi)[t-t(t-1)]
D.EU member(target)	t-(t-1)	0.29890***	0.47226***	0.45682***
		(0.111)	(0.124)	(0.125)
D.EU member(sender)	t-(t-1)	-0.19203*	0.04356	0.02877
		(0.107)	(0.120)	(0.121)
LD.EU member(target)	(t-1)-(t-2)		0.34448***	0.47786***
			(0.113)	(0.129)
LD.EU member(sender)	(t-1)-(t-2)		-0.36655***	-0.10008
			(0.112)	(0.128)
L2D.EU member(target)	(t-2)-(t-3)			0.50283***
				(0.113)
L2D.EU member(sender)	(t-2)-(t-3)			-0.12123
				(0.111)
Total ATE		0.30	0.82	1.44
Observations		25,030	23,970	22,931
R-squared		0.5354	0.54313	0.5499
Clustered		Paired	Paired	paired

Notes: * indicates significance at the 1% level, ** at the 5% level and * at the 10% level.

Table 7: Panel estimates of the effects of EU membership on FDI inflows-Heckman selection

	Heckman	
Dependent variable:	Ln(1+FDI)	Dummy 1(FDI>0)
EU member (target)	0.132***	
	(0.050)	
EU member (sender)	0.199***	
	(0.050)	
Ln(GDP, target)	0.686***	
	(0.226)	
Ln(GDP, sender)	0.766***	
	(0.226)	
Ln(GDP per capita, target)	-0.01	0.230***
	(0.255)	(0.017)
Ln(GDP per capita, sender)	1.655***	
	(0.254)	
Manufacturing value added/GDP (target)		0.005***
		(0.002)
Exports/GDP		-0.013***
(target)		(0.001)
Imports/GDP		0.011***
(target)		(0.002)
Mills' Ratio	1.043***	
	(0.164)	
Observations	32,528	32,528

Notes: *** indicates significance at the 1% level, ** at the 5% level and * at the 10% level.

Table 8. Panel Gravity Equation with Bilateral Fixed and Time Fixed Effects-subsample

	Sample restricted to FDI recipient & sender countries who join EU between 1985-2013				
	OLS	Poisson	Heckman		
VARIABLES	log(1+FDI)	FDI_inflows	log(1+FDI)	Dummy 1(FDI >0)	mills
logGDP(sender)	0.42764***	0.39844	-1.03535		
	0.07727	2.63172	0.676		
logGDP(target)	0.59833***	0.46133	-0.91516		
	0.10929	2.6268	0.6774		
lnGDPPC(sender)	2.18083***	6.02201*	5.27941***		
	0.38417	3.15465	0.71058		
lnGDPPC(target)	0.05458	2.29574	1.35254*	0.34152***	
	0.35402	2.98444	0.72115	0.07218	
EU member(sender)	0.29005	0.08019	-0.26406*		
	0.18231	0.37916	0.14001		
EU member(target)	0.78282***	1.33315***	0.39554***		
	0.16365	0.207	0.14735		
share of industry				-0.03009***	
				0.00884	
share of export				-0.02569***	
				0.00695	
share of import				0.03009***	
				0.0069	
lambda					0.46495
					0.37946
Constant	-35.10623***	-68.19177***	-45.98066***	-3.26563***	
	7.46116	12.70742	9.65016	0.80567	
Observations	3,509	3,480	3,509	3,509	3,509
R-squared	0.4487	0.51735			
Year FE	Yes	Yes	Yes	Yes	Yes
Bilateral FE	Yes	Yes	Yes	Yes	Yes
Clustered	pairid	pairid	No	No	No

Notes: * indicates significance at the 1% level, ** at the 5% level and * at the 10% level.

Table 9: Panel estimates of the effects of EU membership on FDI inflows

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel Fixed Effects	PPML	Panel Fixed Effects	PPML	Panel Fixed Effects	PPML
VARIABLES	logFDI	FDI	logFDI	FDI	logFDI	FDI
EU member (target)	0.31653***	0.35245**	0.30984***	0.50805***	0.30414***	0.52047**
	(0.07549)	(0.16365)	(0.07591)	(0.16132)	(0.09836)	(0.21072)
EU member (sender)	-0.03757	0.79253***	-0.04699	0.65443***	-0.00523	1.18216***
	(0.07742)	(0.18803)	(0.07653)	(0.18366)	(0.09599)	(0.28196)
NAFTA (target)			-0.19621	-0.38983	-0.20947	-0.61373**
			(0.14140)	(0.27098)	(0.14177)	(0.28089)
NAFTA (sender)			-0.21594	-1.11872***	-0.21004	-0.95284***
			(0.14492)	(0.3061)	(0.14640)	(0.33021)
EFTA (target)					-0.02428	-0.06165
					(0.14343)	(0.30001)
EFTA (sender)					0.11124	1.02931***
					(0.14742)	(0.37204)
ln (GDP, target)	0.42705***	3.80584***	0.43231***	5.20112***	0.42817***	5.26744***
	(0.05254)	(1.41892)	(0.05259)	(1.57988)	(0.05288)	(1.59064)
ln (GDP, sender)	0.44033***	3.90119***	0.44673***	5.37993***	0.45188***	5.47513***
	(0.05401)	(1.44654)	(0.05365)	(1.60983)	(0.05417)	(1.62015)
ln(GDPPC, target)	-0.40401***	-1.34307	-0.43776***	-3.16803**	- 0.42763***	-3.27052**
	(0.13285)	(1.42114)	(0.13523)	(1.61103)	(0.14490)	(1.65208)
ln(GDPPC, sender)	0.92933***	-0.95913	0.89598***	-2.57925	0.85867***	-2.75735
	(0.13217)	(1.52164)	(0.13314)	(1.70781)	(0.13829)	(1.73930)
Observations	32,538	30,535	32,538	30,535	32,538	30,535
R-squared	0.48208	0.4354	0.48228	0.44553	0.48236	0.45183
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Bilateral FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered	pairid	pairid	pairid	pairid	pairid	pairid

Table 10: SUR Models

VARIABLES	FDI inflow logFDI	Import Log(IM)	FDI inflow logFDI	Export Log(EX)
logGDP_sendercon	0.54279***	1.07595***	0.52139***	1.27347***
	0.10202	0.02701	0.1017	0.03163
logGDP_recipientcon	0.46585***	1.06920***	0.44566***	1.57108***
	0.10193	0.02704	0.10162	0.03177
logGDPercapita_sendercon	1.42511***		1.48426***	
	0.04478		0.04483	
logGDPercapita_recipientcon	1.48477***		1.48426***	
	0.04482		0.04483	
EU Recipient	0.12489**	0.25311***	0.12772***	0.34140***
	0.04953	0.01329	0.04953	0.01411
EU Sender	-0.15472***	0.41270***	-0.16459***	0.22626***
	0.04967	0.01319	0.04968	0.01405
Constant	-28.61701***	-23.85910***	-28.58989***	-20.48800***
	3.0882	0.82949	3.07894	0.64634
Observations	25,113	25,113	25,109	25,109
R-squared	0.46559	0.94236	0.46558	0.94697
Year FE	Yes	Yes	Yes	Yes
Bilateral FE	Yes	Yes	Yes	Yes
Clustered	pairid	pairid	pairid	pairid

*** p<0.01, ** p<0.05, * p<0.1

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