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Assessing the enlargement and deepening of regional trading blocs: The European Union case

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Abstract

This paper analyses trade effects of the European Union both from the enlargement and deepening perspectives. In the first case, we examine whether the order of entry into the EU has affected the trade performance of member countries. In the second case, we study the impact of the different phases of integration on trade. We estimate a conventional gravity model over the period 1950-2004. Our results show that the original members did not increase trade with each other in a significant greater magnitude than some of later entrants. Moreover, we find that, in general, the deepening in the integration process has led to more trade creation among members.

Key words: European Union, Original members, Enlargements, Degrees of integration.

JEL Classification numbers: F13, F15.

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1. Introduction

One of the major international developments in the last decade and a half has been the dramatic rise in the number of preferential trade agreements (PTAs). It has led to an increase in the interest on the impact of these agreements on international trade (see, for example, Ghosh and Yamarik, 2004a and 2004b; Lee, Park and Shin, 2004; Holmes, 2005; and Baier and Bergstrand, 2006). One area that traditionally has attracted a particular attention in the empirical work has been Europe and, specially, the nowadays called European Union (EU) that has served as a reference for other integration processes. Early studies by Aitken (1973) and Abrams (1980) or the more recent one by Bayoumi and Eichengreen (1998) found that the European Economic Community (EEC) have had an economically and statistically significant effect on intra-bloc trade.[1] Moreover, in last years, it has emerged a revived interest on the EU case. A number of studies have focused on the last step in its integration process concluding that the formation of the Economic and Monetary Union (EMU) has had a positive effect on trade flows among members.[2]

Trade patterns of EU members are heavily influenced by a web of regional trade and monetary agreements and much can be learn from this integration process. The present EU is the result of successive enlargements and the deepening in the process of economic integration. In 1958, the original members -France, Germany, Italy, Belgium, Luxembourg and the Netherlands- created the European Economic Community (EEC). The first enlargement was formed by the United Kingdom, Ireland and Denmark in 1973. Greece joined the European Communities (EC) in 1981, and Portugal and Spain

[1] Nevertheless, it is worth noting that Bergstrand (1985 and 1989) and Frankel, Stein and Wei (1995) showed insignificant effects, whereas Frankel (1997) obtained significant negative effects from membership in the EEC in certain years.

[2] For a review of the literature about the euro's effect on trade, see Baldwin (2006).

in 1986. Austria, Finland and Sweden became members of the EU in 1995.[3] Simultaneously, since its formation this regional agreement has evolved from the creation of a free trade area in 1958, to a customs union in 1968, a single market in 1993, and an Economic and Monetary Union in 1999.[4]

As noted before, there are several studies on the effect of the formation of EU on trade but, to our knowledge, only Freund (2000) have looked at the enlargement dimension of the EU. Freund estimates the EU effects on trade for the original and late entrants using essentially a cross-sectional approach. She shows that regionalism provides firms in the early entrant nations with first-mover advantages in the intensity of intra-bloc trade. Lee, Park and Shin (2004), using a large sample of multilateral and bilateral regional trade agreements over the period 1948-1999, also find that on average the net trade-creating gains for new members joining an existing trading bloc are much less than the gains from original members.

This paper focuses on the various waves of EU enlargements and the different phases in the European institutional integration on both intra and extra-bloc trade. The European Union provide us a unique experiment because it expanded in successive enlargements from the six original members in 1958, and at the same time, has evolved from a free trade area to an economic and monetary union. To this end, we use the gravity equation which has emerged as the empirical workhorse in international trade to study the ex-post effects of PTAs on bilateral trade flows.

Our main empirical results suggest three important conclusions. First, intra-bloc trade expansion does not depend of the order of entry into the EU. Trade creation of the

[3] We have not considered the last enlargement (Cyprus, Czech Republic, Estonia, Latvia, Lithuania, Hungary, Malta, Poland, Slovakia, Slovenia) since it has taken place in 2004.

[4] While the process of institutional integration slowed somewhat during the 1960s, it was rejuvenated in the late 1970s when European monetary cooperation took shape. After another period of low activity in the early 1980s, the integration process was re-intensified again in the second half of the 1980s with the Single European Act (which created the Common Market in Europe) and the start of the process that culminated with the formation of the EMU.

original EU members is not greater than that registered in some later enlargements. Second, the higher the institutional stage of integration the greater the expansion of intraregional trade. Third, with respect to trade with nonmembers in the phases previous the EMU there is evidence of trade creation without damaging extra-bloc trade whereas the EMU has also boosted trade with third countries. So, these results seem to provide convincing evidence that regional integration has contributed to greater cross-border trade in goods delivering efficiency gains from market integration.

The remainder of the paper is organised as follows. Section 2 summarizes the antecedents. Section 3 presents the methodology. Section 4 describes the data. Section 5 presents and discusses the results. Finally, section 6 concludes.

2. Antecedents

The theoretical analysis of PTAs is ambiguous on their effects on trade, welfare, as well as multilateral trade liberalization making the empirical work on PTAs critical in evaluating their effects. [5] Moreover, the theoretical framework says nothing about the economic consequences derived from the order of entry of countries in a PTA. As far as we know, Freund (2000) is the only paper analysing theoretically the effects of expanding regional trading blocs on the original and enlargement countries. Using a three-country two-period model with quantity competition and sunk costs this author finds that firms in the original PTA member countries will have advantages in exporting to each other. The argument is that firms in the founder member countries have the incentive to invest in irreversible distribution networks in partner countries implying the creation of barriers to entry in these markets for later entrants. In the equilibrium, original countries trade disproportionately more between them, which may act against

[5] For a survey about the theory of preferential trade agreements see Panagariya (2000).

expansion of the existing PTAs. Thus, order of entry has a significant impact on firms' market share and the benefits associated with market tenure persist over time.

To evaluate the importance of first-mover advantage in trade empirically, Freund uses the gravity model to adjust for "normal" trade flows with cross–sectional data for the EU. Her hypothesis is that trade between the original six members has to be larger than the predicted by the gravity equation even after the late entrants became members. Additionally, trade between the late entrants and the incumbent members is expected to be below the natural trade flows predicted by the gravity model. Her estimates seem consistent with the results predicted by the theoretical model.

However, in the analysis of the impact of EU enlargements on trade the relevant issue is not the *cross-sectional* question answered by Freund: How much more do the original members of the EU trade than the enlargement ones? but the *time-series* question: What is the effect of EU membership on trade? This is essentially a matter related to a country ex-ante trade barriers with future partner countries and third countries in a static world, and with economic growth determinants (allocation of factors of production, infrastructures, innovation, etc…) in a dynamic one.[6] In this paper, we answer the relevant question by exploiting the panel data nature of the data set.

Additionally, Lee, Park and Shin (2004) investigate empirically the propagation of PTAs using a large sample of regional trading arrangements that take a multitude of forms. They find that countries can benefit more from duplicating a separate PTA than from joining an existing one. That is, stronger trade creation is obtained for original countries in PTAs giving support to Freund's work. However, these results may mask important differences across the distinct PTAs considered. In contrast to Lee, Park and

[6] This issue is similar to that raised by Glick and Rose (2002) in the analysis of the impact of currency unions on trade.

Shin (2004) we focus on a specific PTA (the EU) with a succession of enlargements along a period of several decades.

3. Methodology

We are interested in analysing the trade effects of the EU differentiating between both the original members and the successive enlargements. To this end, we estimate a conventional gravity model of international trade. The gravity model of trade is considered as one of the most successful empirical frameworks in international economics. [7] As it is well known, in its simplest formulation, the gravity model states that bilateral trade flows depend positively on the economic size of both countries and negatively on the distance between them. Usually, gravity equations used in the international trade literature include dummies that try to control for other factors influencing transaction costs. For example, either, a common language or a common border reduces transaction cost, whereas the insularity or the landlocked status of countries increases them. In particular, in addition to these variables, we augment the gravity specification with a measure of exchange rate volatility, and dummies for monetary agreements (MA) and regional trade agreements (RTA) with the aim of capturing effects not accounted for the above mentioned bilateral trade determinants (see Table A1). Among the RTAs, our interest is focused on the EU.

We begin by estimating the following general equation:

$$Ln(Trade_{ijt}) = \beta_1 Ln(GDP_{it}GDP_{jt}) + \beta_2 Ln(DIST_{ij}) + \sum_{z=3}^{6} \beta_z X_{ij} + \sum_{z=7}^{9} \beta_z Y_{ijt} + \sum_{i=10}^{16} \beta_i RTAone_{ijt} + \sum_{i=17}^{24} \beta_i RTAboth_{ijt} + \beta_{25} EUone_{ijt} + \beta_{26} EUboth_{ijt} + \alpha_{ij} + \lambda_t + u_{ijt} \quad (1)$$

[7] The early application of the gravity model to international trade was by Timbergen (1962), Pöyhönen (1963) and Linnemann (1966). Specialist in other fields had used the gravity model before international economist did. In particular, regional and urban economists used it as far back as 1946 (Zipf, 1946).

where *i* and *j* denotes trading partners, *t* is time, the suffix "*one*" denotes that *i* belongs to an RTA and *j* does not, or *vice versa,* the suffix "*both*" indicates that *i* and *j* belong to the same agreement, and the variables are defined as: $Trade_{ijt}$ are the bilateral trade flows from *i* to *j*[8], $GDP_{it}GDP_{jt}$ denotes the product of the real Gross Domestic Products, $Dist_{ij}$ denotes the distance between *i* and *j*, X_{ij} denotes control variables invariant to time, Y_{ijt} denotes control variables that vary over time, *RTA* denotes dummy variables for different kinds of multilateral and bilateral Preferential Trade Agreements[9], *EU* is a binary variable for European Economic Community/ European Communities/ European Union (the variable of interest), α_{ij} are country-pair individual effects, λ_t are time dummies, and u_{ijt} is the standard classical error term. In X_{ij} we include dummy variables indicating whether the two countries in the pair share a common border (*Contiguity*) and a common language (*Language*) as well as dummies for the number of islands (*Island*) and landlocked countries (*Landlocked*) in the pair. Y_{ijt} includes a measure of the monthly exchange rate volatility between the currencies of countries *i* and *j* in year *t* ($\text{Ln}ERvol_{ijt}$)[10], and dummy variables for different kinds of Monetary Agreements ($MAone_{ijt}$ and $MAboth_{ijt}$).[11]

[8] Some authors treat the sum of two-way bilateral trade as the dependent variable (see, for example, Rose, 2004). However, all theories that underlie a gravity-like specification yield predictions on unidirectional trade rather than total trade. Hence, our specification is more closely grounded in theory.

[9] The multilateral PTAs considered are the European Free Trade Association (EFTA), the North American Free Trade Agreement (NAFTA), and the free trade agreement between EFTA and EU countries and the subsequent European Economic Area (EEA). In addition to these multilateral trade agreements we have also included in all regressions the Australian-New Zealand Closer Economic Integration, the Greek Association Agreement with the EEC, the Spanish Preferential Trade Agreement with EEC, the Turkish Preferential Trade Agreement, and posterior Custom Union with the EU, and a dummy for Mexican liberalization trade policy. To save on space, the results for the bilateral trade agreement dummies are not reported in the tables but are available from the authors upon request.

[10] The exchange rate volatility is defined as 1 plus the variance of the first difference on the monthly natural logarithm of the bilateral nominal exchange rate.

[11] The monetary agreements considered are: Bretton Woods, the European Payments Union, the European Monetary Snake, the European Monetary System, and the Economic and Monetary Union. In this paper, we consider all monetary agreements altogether to economise space in the tables. At this point it is worth noting that considering monetary agreements individually does not change the results in a significant way. The impact of each one of these monetary agreements on trade is analysed by Gil, Llorca and Martínez-Serrano (2006).

As starting point, equation (1) allows us to estimate the impact of the EU on trade. However, we are interested in the differential impact of this agreement on the original members versus the enlargement ones. To this end, in equation (2) we have split EU dummies into two. In the case of *EUboth*, one of these variables (*EUoriginalboth*) is unity if the two countries are original members of the EU and zero otherwise. The other (*EUenlboth*) is unity if one of the members in the pair is a newly joined member and the trading partner is an original member or another newly joined member. Obviously, *EUoriginalone* and *EUenlone* are defined in a similar way but now one of the members of the pair does not belong to the EU. Equation (2) takes the following form:

$$\begin{aligned} Ln(Trade_{ijt}) = {} & \beta_1 Ln(GDP_{it}GDP_{jt}) + \beta_2 Ln(DIST_{ij}) + \sum_{z=3}^{6} \beta_z X_{ij} + \sum_{z=7}^{9} \beta_z Y_{ijt} + \sum_{i=10}^{16} \beta_i RTAone_{ijt} \\ & + \sum_{i=17}^{24} \beta_i RTAboth_{ijt} + \beta_{25} EUoriginalone_{ijt} + \beta_{26} EUoriginalboth_{ijt} \\ & + \beta_{27} EUenlone_{ijt} + \beta_{28} EUenlboth_{ijt} + \alpha_{ij} + \lambda_t + u_{ijt} \end{aligned} \tag{2}$$

Finally, in order to estimate the impact on trade of the successive and deeper degrees of integration that have taken place in the EU, we estimate equation (3):

$$\begin{aligned} Ln(Trade_{ijt}) = {} & Othercontrols + \beta_1 EUFTAone_{ijt} + \beta_2 EUFTAboth_{ijt} + \beta_3 EUCUone_{ijt} \\ & + \beta_4 EUCUboth_{ijt} + \beta_5 EUCMone_{ijt} + \beta_6 EUCMboth_{ijt} + \beta_7 EUEMUone_{ijt} \\ & + \beta_8 EUEMUboth_{ijt} + \beta_9 EMUboth_{ijt} + \beta_{10} EMUone_{ijt} + \beta_{11} MAnoEMUboth_{ijt} \\ & + \beta_{12} MAnoEMUone_{ijt} + \alpha_{ij} + \lambda_t + u_{ijt} \end{aligned} \tag{3}$$

where $EUFTAone_{ijt}$, $EUFTAboth_{ijt}$, $EUCUone_{ijt}$, $EUCUboth_{ijt}$, $EUCMone_{ijt}$, $EUCMboth_{ijt}$, $EUEMUone_{ijt}$, $EUEMUboth_{ijt}$, are binary dummy variables for EU pairs for the periods in which the EU was a Free Trade Agreement, a Custom Union, a Common Market and a Monetary Union, respectively (see Appendix A1). At this point, it is important to note that since some countries of the EU have not adopted the euro, we also include in equation (3) the EMU agreement (*EMU*) separately from the list of the

rest of monetary agreements (*MAnoEMU*) in order to capture the actual impact of the last step in the European integration process among EMU members. We expect that the deeper the degree of integration, the larger the impact on trade.

4. Data and description of the variables

The trade data for the dependent variable (exports and imports) come from the "Direction of Trade" (DoT) data set developed by the International Monetary Fund (IMF). The sample covers bilateral merchandise trade between 25 OECD countries during the period 1950-2004. In particular, the countries considered in this study are: Australia, Austria, Belgium-Luxembourg (considered jointly), Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea[12], Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States. Despite the fact that our sample focuses on developed countries some values are missing and, therefore, we have estimated unbalanced panels. The DoT data set provides bilateral trade on FOB exports and CIF imports in American dollars. We deflate trade by the American GDP deflator taken from the Bureau of Economic Analysis (US Department of Commerce).

The independent variables come from different sources. The GDPs in constant US dollars are taken from the World Development Indicators (World Bank). When the data were unavailable from this source, the Penn World Table (University of Pennsylvania) and the International Financial Statistics (IMF) were used. The distances (great-circle distances) as well as the dummy variables for language, island and landlocked status, and physically contiguous neighbours are taken from the Andrew

[12] The missing values and mainly the erratic behaviour of Korean data during the 1950s and 1960s have led us to restrict the sample period for this country to 1970-2004.

Rose web site (www.haas.berkeleyedu/arose).[13] Data on monthly exchange rates are taken from International Financial Statistics (IMF). We use data from the World Trade Organization in order to create the indicators of regional trade agreements, and from Gros and Thygesen (1992), Baldwin and Wyplosz (2004) and IMF web site to elaborate the indicators of monetary agreements. The full list of trade and monetary agreements considered appears in Table A1.

5. Empirical results

We apply two different estimation techniques random effects and fixed effects. Column 1 and 2 of Table 1 present the estimation results of equation (1). The gravity model fits the data well explaining around three-quarters of the variation in bilateral trade flows. Moreover, the coefficients are, on the whole, intuitive in sign and size, and statistically significant. Exceptions are the coefficient of the *Landlocked* and the *Contiguity* variables which do not reach the statistical significance at conventional levels, and the *Island* coefficient which is not intuitively signed. Countries trade less with more distant partners (the elasticity is slightly above -0.75) whereas larger exporters and importers trade more as do countries with a common language. In a similar way, a reduction in exchange rate volatility is associated with an increase in trade. Additionally, both RTAs and MAs agreements have a positive and statistically significant impact on bilateral trade flows, except for the case of NAFTA's trade diversion effect.[14] Finally, the variable of interest shows a positive impact on trade between members of the EU slightly above 60% (exp[0.474]-1=60.6% and exp [0.492]-1=63.6% for the fixed and random effects estimators, respectively), whereas no significant effect is found in trade with third countries.

[13] We gratefully acknowledge to Andrew Rose for making his data public.
[14] The evidence of trade diversion of NAFTA is consistent with Romalis (2005).

According to the Hausman test, the fixed effects estimation is preferred. Therefore, henceforth we present and discuss the estimation results with fixed effects only. As it is well known, country-pair fixed effects control for unobservable characteristics of the country pairs that are invariant over time and impact bilateral trade. Column 3 reports the estimation of equation (2). As can be observed, the impact on trade of the European Union membership for original countries (83.3%) is larger than that for countries that joined later in the successive enlargements (56.0%), and the difference is statistically significant according to the Wald test (6.15 with a marginal significance level equal to 0.01). That is, trade creation from the newly expanded membership is significantly lower than that from the original membership which is in line with the results reported by Freund (2000) and Lee, Park and Shin (2004). Moreover, we find that the estimated coefficient on extra-bloc trade is negative (-0.123, t-statistic = -4.60) for the original members, and no significant impact is found for the case of the enlargement countries.

However, this general result may hide differential trade impacts for each one of the successive enlargements. In order to investigate this possibility, in column 4 we have split the enlargement dummy variables (*EUenlone* and *EUenlboth*) to take into account the four expansions that we analyse. As expected, there is a high heterogeneity. The 3rd enlargement (Spain and Portugal) has the greatest impact on intra-bloc trade followed by the 1st enlargement (the UK, Denmark and Ireland) and in both cases the coefficient is not statistically different from that of the original members. The coefficient of the 2nd enlargement (Greece) is approximately half of that for the original members whereas the coefficient of the 4th enlargement is one third (Austria, Finland

and Sweden) of that, and in both cases the Wald test shows an statistically significant difference.[15]

In summary, when considering the enlargements altogether, the Freund's hypothesis is confirmed. However, this does not occur if we analyse separately each enlargement. Therefore, the date of entry does not seem essential in this respect and the EU has boosted trade for both the original members and the countries that become members later.

In the above analysis the coefficient of interest has been constrained to be the same for every country in each enlargement. However, a number of reasons justify a differential impact across countries (for instance, differences in the initial protection level, industrial structure,…). In order to isolate the EU trade effect in each of the individual countries we have estimated equation (1) isolating the EU impact on trade for each individual member States. To this end, we perform 14 separate regressions (Belgium-Luxembourg considered jointly), one for each EU15 member State. Table 2 presents the results for the parameters of interest only. Taking the case of Austria as an example, in the regression for this country, in addition to the *EUboth* and *EUone* dummies, we have included two additional dummy variables labelled *EUoneCountry* and *EUbothCountry* in Table 2. The first one is a dummy that is unity for trade between Austria (in the period it belongs to the EU) and nonmember countries of the EU, and zero otherwise. The second variable (*EUbothCountry*) is a dummy that takes the value of one for trade between EU members and Austria (again since the year Austria is an EU country), and zero otherwise. In this estimation, total intra-bloc trade impact for Austria by being member of the EU is obtained by summing up the coefficients of the

[15] Our results are robust to the exclusion of control variables of equation (1) and (2). In fact, including only the basic variables of the gravity model (GDPs and distance) the results of the paper are qualitatively similar. Moreover, the results do not change in a significant way if we restrict the sample to the EU countries.

dummy variable *EUboth* and that for Austria. In a similar way, the Austria EU membership impact on trade with outsiders is calculated by summing up the coefficients of the dummy variable *EUone* and the corresponding dummy for Austria (*EUoneCountry*).

The countries that show the greatest impacts on intra-bloc trade are Spain, Ireland, and Italy. In the opposite extreme, the countries with the smallest effects are Greece, Sweden, UK, and Finland. Therefore, we do not find any correspondence between the date of entry into the EU and trade expansion effects. Additionally, Belgium, France, Greece, The Netherlands, Portugal and the UK show negative impacts on trade with third countries.

Another important issue that is an aim of this paper is the analysis of the impact on trade of the different stages that have taken place in the deepening of the European integration process. Again in Table 3 we report only the parameters of interest from equation (3). As was expected, the smallest impact is found for the first stage of the EU integration process (Free Trade Agreement) with an effect on intra-bloc trade of 19.1%. The effect on trade clearly increases in the next stage of integration (Custom Union) with an impact equal to 69.0%. This effect on trade is not statistically different from that found for the Common Market case (73.1%), It is not surprising since a Common Market only implies additionally, free movements of factors of production. Finally, in the case of EMU countries the intra-bloc impact directly attributable to the euro is exp(0.618)-1= 85.5%. These results can be taken as evidence that the deepening in the integration process in the EU has led to more trade among members. This result is consistent with Ghosh and Yamarik (2004a) who conclude that more integrated regional trade agreements generate greater total trade creation. With respect to trade with third

nations no impact is found except for the EMU which has foster trade with nonembers in a significant way (exp(0.254)-1=28.9%).

6. Conclusions

This paper has empirically investigated the effects of both the successive enlargements and deepening in the European Union integration process. We use an augmented gravity equation with a comprehensive set of dummies which control for all types of trade and monetary agreements to a data set that include 25 OECD countries from 1950 to 2004.

The estimations show that all steps towards greater integration either through enlargement or deepening have led to a significant increase in trade. We find that new EU members could expand the intra-bloc trade at the same pace than the original members. Our results show that there are not first mover advantages of being a founder member. Hence, it seems that the date of entry has not been an essential factor in the European integration process. Moreover, there is strong evidence of a gradual increase in trade intensity between European countries as they evolve from a free trade area to deeper degrees of integration. Finally, we find that the phases of Free Trade Agreement, Custom Union and Common Market have not damaged extra-bloc and the EMU has increased trade with outsiders.

The evidence reported in this paper is consistent with the evolution of the European integration process. In fact, there has been no attempt of proliferating new PTAs in Europe and even some members of a long established PTA in Europe (EFTA) have been successively incorporated into the EU.

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Table 1. Estimation results of the gravity equations (1) and (2). Dependent variable: log of bilateral trade. Sample period: 1950-2004.

	(1)	(2)	(3)	(4)
Ln (GDP GDP)	1.032 (77.64)	1.187 (62.24)	1.190 (62.37)	1.198 (61.66)
Ln Dist	-0.769 (-21.46)			
Landlocked	-0.003 (-0.03)			
Contiguity	0.161 (1.10)			
Language	0.676 (5.54)			
Island	0.367 (6.14)			
LnERVol	-3.857 (-3.42)	-3.669 (-3.27)	-3.730 (-3.33)	-4.012 (-3.59)
MAone	0.160 (10.73)	0.152 (10.27)	0.160 (10.79)	0.137 (9.13)
MAboth	0.292 (13.62)	0.279 (13.12)	0.281 (13.19)	0.244 (11.39)
EUEFTA	0.102 (4.27)	0.112 (4.69)	0.098 (4.08)	0.068 (2.83)
EFTAone	0.049 (2.47)	0.040 (2.05)	0.048 (2.41)	0.060 (3.08)
EFTAboth	0.377 (10.36)	0.333 (9.15)	0.335 (9.21)	0.337 (9.31)
NAFTAone	-0.193 (-8.14)	-0.194 (-8.24)	-0.198 (-8.42)	-0.214 (-9.13)
NAFTAboth	0.252 (2.64)	0.205 (3.16)	0.211 (2.23)	0.172 (1.83)
EUone	-0.004 (-0.22)	-0.014 (-0.67)		
EUboth	0.474 (14.20)	0.492 (14.71)		
EUoriginalone			-0.123 (-4.60)	-0.106 (-3.90)
EUoriginalboth			0.606 (9.16)	0.615 (9.34)
EUenlone			0.035 (1.57)	
EUenlboth			0.445 (12.85)	
EUenl1one				0.177 (6.43)
EUenl1both				0.564 (12.60)
EUenl2one				-0.502 (-9.87)
EUenl2both				0.287 (4.38)
EUenl3one				-0.014 (-0.40)
EUenl3both				0.667 (14.90)
EUenl4one				0.005 (0.15)
EUenl4both				0.205 (4.84)
Year dummies	Yes	Yes	Yes	Yes
Adj-R^2	0.78	0.70	0.70	0.70
No of obs.	28,978	28,978	28,978	28,978
Estimation Method	RE	FE	FE	FE
Hausman test	554.41 [0.00]		256.18 [0.00]	380.46 [0.00]

Note: t-statistics in parentheses are robust to heteroscedasticity and autocorrelation. The regressions also include dummies for Mexican liberalization trade policy, the Australian and New Zealand FTA and for every preferential trade agreement of the EU with the other countries in our sample (Greece and Spain before accession and Turkey). To save on space the estimated coefficient of this variables are not reported. Test original=enlargements: F(1,28609)=6.15 (0.01); Test original=enlargement1st: F(1,28603)=0.53 (0.47); Test original=enlargement2nd: F(1,28603)=14.92 (0.00); Test original=enlargement3rd: F(1,28603)=0.55 (0.46); Test original=enlargement4th: F(1,28603)=34.98 (0.00)

Table 2: Fixed-effects estimation results of the gravity equation (1) including EU-country dummies. Dependent variable: log of bilateral trade. Sample period: 1950-2004.

COUNTRY	EUone	EUboth	EUoneCountry	EUbothCountry
AUSTRIA	-0.025	0.503	0.125	-0.115
	(-1.20)	(14.89)	(3.18)	(-2.06)
BELGIUM	0.002	0.506	-0.266	-0.187
	(0.08)	(14.87)	(-5.64)	(-3.43)
DENMARK	-0.042	0.519	0.223	-0.083
	(-2.08)	(15.58)	(6.23)	(-1.82)
FINLAND	-0.009	0.540	0.062	-0.291
	(-0.43)	(15.56)	(1.58)	(-5.22)
FRANCE	-0.006	0.480	-0.092	0.074
	(-0.32)	(14.08)	(-1.88)	(1.32)
GERMANY	-0.022	0.488	0.132	0.074
	(-1.06)	(14.31)	(2.80)	(1.36)
GREECE	0.020	0.546	-0.531	-0.375
	(1.00)	(15.92)	(-10.74)	(-6.89)
IRELAND	-0.110	0.319	0.517	0.616
	(-5.27)	(8.96)	(13.87)	(12.85)
ITALY	-0.013	0.459	0.044	0.251
	(-0.65)	(13.46)	(0.94)	(4.64)
NETHERLANDS	-0.003	0.499	-0.179	-0.099
	(-0.15)	(14.64)	(-3.98)	(-1.86)
PORTUGAL	-0.009	0.498	-0.038	-0.039
	(-0.45)	(14.60)	(-1.05)	(-0.81)
SPAIN	-0.049	0.373	0.098	0.612
	(-2.33)	(10.69)	(2.28)	(11.95)
SWEDEN	-0.019	0.520	0.007	-0.325
	(-0.92)	(15.35)	(0.18)	(-5.73)
UNITED KINGDOM	0.013	0.545	-0.221	-0.325
	(0.61)	(15.91)	(-5.85)	(-6.71)

Note: t-statistics in parentheses are robust to heteroscedasticity and autocorrelation. We have estimated 14 separate regressions in order to investigate the EU effect in each one of the EU15 member States. The regressions also include dummies for Mexican liberalization trade policy, the Australian and New Zealand FTA and for every preferential trade agreement of the EU with the other countries in our sample (Greece and Spain before accession and Turkey).

Table 3. Estimation results of the gravity equation (3). Dependent variable: log of bilateral trade. Sample period: 1950-2004.

	(1)
EUFTAone	0.037 (1.42)
EUFTAboth	0.175 (2.87)
EUCUone	-0.035 (-1.42)
EUCUboth	0.525 (13.87)
EUCMone	-0.000 (-0.01)
EUCMboth	0.549 (11.02)
EUEMUone	-0.037 (-0.73)
EUEMUboth	0.294 (4.24)
EMUone	0.254 (6.34)
EMUboth	0.618 (10.37)
Year dummies	Yes
Adj-R^2	0.70
No of obs.	28,978
Estimation Method	FE
Hausman test	1,235.12 [0.00]

Note: t-statistics in parentheses are robust to heteroscedasticity and autocorrelation. The regressions also include dummies for Mexico liberalization trade policy, the Australian and New Zealand FTA, and for every preferential trade agreement of the EU with the other countries in our sample (Greece and Spain before accession and Turkey). Test FTA=CU: F(1,28603)=33.76 (0.000); Test FTA=CM: F(1,28603)=27.85 (0.00); Test FTA=Euro: F(1,28603)=28.18 (0.00); Test CU=CM: F(1,28603)=0.32 (0.57); Test CU=Euro: F(1,28603)=1.61 (0.20); Test CM=Euro: F(1,28603)=0.72 (0.39).

Table A1: List of regional trade and monetary agreements

Agreement	**Description**	**Period (from date entered into force)**
Australian-New Zealand closer economic relationship	Bilateral Free Trade Agreement	1966-2004
Bretton Woods (BW)	Adjustable peg exchange rate.	1959-1971 for the European countries. 1950-1971 for other countries
European Free Trade Agreement (EFTA)	Plurilateral Free Trade Agreement	1960-2004. Varies by countries
European Union (EU)	Free Trade Agreement Custom Union Common Market	1958-1967 1968-1992 1993-1998 for the 11 original EMU countries; 1993-2000 for Greece; 1993-2004 for Denmark, Ireland and UK.
EU-EFTA Free Trade Agreement (EUEFTA)	Free Trade Agreement European Economic Area	1973-1991. Varies by countries 1992-2004. Varies by countries
European Exchange Rate-Mechanism (ERM)	Jointly managed fixed and adjustable exchange rate	1979-1998. Varies by countries. 1998-2000 for Greece. 1979-2004 for Denmark
Economic and Monetary Union (EMU)	Currency Union	1999-2004 for the 11 original members. 2001-2004 for Greece
European Monetary Snake (Snake)	Adjustable peg exchange rate.	1973-1978. Varies by countries
European Payment Union (EPU)	Agreement of monetary convertivility	1951-1958
Greece-EU association agreement	Association agreement	1962-1980
North American Free Trade Agreement (NAFTA)	Free Trade Agreement	1989-2004: for US and Canada 1994-2004: for Mexico
Spanish-EU Preferential Trade Agreement	Preferential Trade Agreement	1970-1985
Turkey-EU Preferential Trade Agreement Turkey-EU Custom Union	Preferential Trade Agreement Custom Union	1963-1995 1996-2004

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