

TRADE EFFECTS OF MONETARY AGREEMENTS: EVIDENCE FOR OECD COUNTRIES

Salvador Gil-Pareja*

Rafael Llorca-Vivero*

José Antonio Martínez-Serrano*

University of Valencia

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Abstract

This paper analyses the effects of monetary agreements on trade flows using a sample of 24 OECD countries over the period 1950-2004. The results show that these agreements have boosted intra-bloc trade and that the same occurs, although to a lower extent, in trade with outsiders. We also find evidence that the intensity of monetary integration is associated with larger increases in trade. Taking into account welfare considerations with respect to non-members, rather than diverting trade, all monetary agreements except the EPU significantly increase trade with outsiders.

Key words: Monetary agreements, trade creation, trade diversion, welfare effects.

JEL Classification numbers: F13, F15.

* Facultad de Economía, Departamento de Estructura Económica, Av. de los Naranjos s/n, C.P. 46022, Valencia, Spain. Email: Salvador.Gil-Pareja@uv.es; Rafael.Llorca@uv.es; Jams@uv.es. Tel. 34963828349. Fax 34963828354. Financial support from *Ministerio de Ciencia y Tecnología* (project SEC2003-05836/ECO), *Generalitat Valenciana* (project GV04B-070) and *Agencia Valenciana de Ciencia y Tecnología* (Grupos 03/151) is gratefully acknowledged.

1. Introduction

After the disastrous consequences of the discriminatory trade practices of the 1930s, policy makers thought that international monetary stability was an essential factor in order to promote trade flows. With this aim, the Bretton Woods (BW) system was created in 1944 as a mechanism to ensure international payments and exchange rate stability among national currencies facilitating trade to take place between countries. Since then, there has been a special concern in Europe about the potential negative impact of exchange rates on international trade. As a result, in addition to the BW system (that came into force in Europe in 1958), Western European countries have been involved in a variety of monetary arrangements (henceforth MAs). In particular, after World War II and before BW became operational, European countries were forced to create the European Payments Union (EPU) trying to remove monetary obstacles to international trade derived from the non-convertibility of European currencies. The EPU was dissolved at the end of 1958 when the European currencies were declared convertible with the dollar. The collapse of the BW era led European countries to create the European Monetary Snake (Snake), a regional version of the BW system designed to limit intra-European exchange rate fluctuations. In 1979, the European Monetary System (EMS) was created as a reaction to the disorders that had followed the end of the BW system and by the inability to sustain the Snake arrangement. In this context, large exchange rate movements were viewed as a threat to the Common Market. The EMS played an important role in maintaining exchange rate stability, even though it could not avoid multiple realignments (Fратиanni and von Hagen, 1992). The successive monetary crisis convinced authorities of the need for a deeper monetary agreement as a way to continue with the economic integration in Europe. Finally, in 1999 Economic and Monetary Union (EMU) entered into force.

The steady steps followed by European countries in the last decades towards their monetary integration provide us a unique opportunity to analyze the effects of successive and more institutionally complex MAs on international trade. At one end of the spectrum we find those countries that joined the EPU as a substitute for their currencies' convertibility in the 1950's. At the other end of the spectrum we find the EMU, a pure currency union. In between there are two intermediary regimes with different degrees of economic integration: the Snake and the EMS.

Most of these agreements had among their aims the consecution of exchange rate stability as a way to foster trade. The empirical literature on the effect of exchange rate volatility on trade has not yielded conclusive results casting doubts on the effectiveness of MAs in the promotion of international trade.¹ But, to our knowledge, with the exception of the EMU, no research has been conducted that directly addresses the impact of these MAs on international trade.² This paper empirically investigates the effects on trade of various MAs, trying to determine whether they have encouraged trade in general or they have pushed the geographic source/destination of trade in the wrong direction (trade diversion).

Our analysis covers the period 1950-2004 and focuses on 24 OECD countries with a high level of trade integration and institutional homogeneity. All the countries in our sample are members for a long time of the two main international institutions, IMF and GATT / WTO, who look out for the best national and international practices for

¹ Although some studies show that the volatility of exchange rates negatively affects bilateral trade flows this effect is generally small and not always statistically significant. An exception to this evidence is the recent paper by Klein and Shambaugh (2004) who conclude that fixed exchange rates regimes show a large and significant effect on bilateral trade. For a literature review in this field, see De Grauwe and Skudelny (2000) and Clark, Tamirisa, and Wei (2004).

² Specifically, the effect of the euro on trade has been analysed in several papers (see, Rose and van Wincoop, 2001; Bun and Klaassen, 2002; Micco, Stein and Ordoñez, 2003; De Nardis and Vicarelli, 2003; Faruqee, 2004; Baldwin, Skudelny, and Taglioni 2005). They find a positive effect that ranges between 2.6% and 140% depending on the sample of countries, the periods analysed and the methodology used. Fountas and Kyriacos (1999) have investigated whether the EMS has coincided with an increase in intra-EU exports. However, they focus only on four EU Member States.

freeing trade. Moreover, some of them have also promoted regional agreements among a number of countries belonging to a particular region.³ In order to control for other influences on trade, such as the existence of regional trade agreements or exchange rate volatility, we have estimated a conventional gravity model. It allows us to determine the effect of MAs on trade, conditional to the role of other factors.

To preview our results we find, first, that all MAs analysed lead to substantially higher international trade. Second, MAs also promote trade with outsiders, and therefore increase foreign trade in aggregate. Finally, the consideration of welfare effects reveals that, in contrast to regional trade agreements, the MAs have non-discriminatory effects with non-members.

The paper is organised as follows. Section 2 presents the methodology. Section 3 describes the data. Section 4 discusses the results. Finally, section 5 concludes the paper.

2. Methodology

We are interested in estimating the effect of MAs on trade flows. 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. 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, a common

³ A great number of studies have tried to investigate whether the regional agreements are trade creating or diverting. The empirical evidence shows that regional trading agreements have usually been trade creating, especially in a world of “open regionalism”, in which the trade blocs have simultaneously promoted external liberalisation (Frankel, 1997, Frankel and Wei, 1998, Rose, 2000, Ghosh and Yamarik, 2004 and Lee, Park and Shin, 2004).

border, or sharing membership in a regional trade agreement (RTA) reduces transaction cost, whereas either 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 MAs with the aim of capturing effects not accounted for the above mentioned bilateral trade determinants. The MAs considered are: Bretton Woods, the European Payments Union, the European Monetary Snake, the European Monetary System, and the Economic and Monetary Union.

We estimate the following general equation:

$$\begin{aligned}
 \ln(X_{ijt}) = & \mathbf{b}_0 + \mathbf{b}_1 \ln(GDP_i) + \mathbf{b}_2 \ln(GDP_j) + \mathbf{b}_3 \ln(DIST_{ij}) + \\
 & \mathbf{b}_4 Landlocked_{ij} + \mathbf{b}_5 Contiguity_{ij} + \mathbf{b}_6 Language_{ij} + \\
 & \mathbf{b}_7 Island_{ij} + \mathbf{b}_8 \ln(ERvol_{ijt}) + \mathbf{b}_9 RTAboth_{ijt} + \mathbf{b}_{10} RTAone_{ijt} + \\
 & \mathbf{b}_{11} MAboth_{ijt} + \mathbf{b}_{12} MAone_{ijt} + u_{ijt}
 \end{aligned} \tag{1}$$

where i and j denotes trading partners, t is time, and the variables are defined as:

X_{ij} are the bilateral trade flows from i to j ⁴,

GDP denotes the Gross Domestic Product,

$Dist$ denotes the distance between i and j ,

$Landlocked$ is the number of landlocked areas in the country-pair (0, 1, or 2),

$Contiguity$ is a dummy variable equal to one when i and j share a land border,

$Language$ is a dummy variable which is unity if i and j have a common language,

$Island$ is the number of islands nations in the pair (0, 1, or 2),

$ERvol$ is the monthly exchange rate volatility between the currencies of countries i and j in year t , defined as 1 plus the variance of the first difference on the monthly natural logarithm of the bilateral nominal exchange rate,

RTA and MA denote dummy variables for Regional Trade Agreements⁵ and Monetary Agreements, respectively; the suffix “both” indicates that i and j belong to the same

⁴ 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.

agreement and the suffix “one” denotes that either i or j is a member of a particular agreement,

u_{ijt} is the standard classical error term.

The parameters of interest to us are β_{11} and β_{12} . On the one hand, β_{11} measures the effect on international trade if both countries belong to a MA. On the other hand, β_{12} measures the trade impact if one country is a member of the MA and the other is not. If trade is created when both countries are members of a MA the coefficient β_{11} should be positive; if trade is diverted from non members, then β_{12} should be negative.

3. Data

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 24 OECD countries (Belgium and Luxembourg considered jointly) during the period 1950-2004. In particular, the countries considered in this study are: Australia, Austria, Belgium-Luxembourg, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, 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

⁵ The regional trade agreements considered are CEE/CE/EU (EU in tables), EFTA and NAFTA.

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 Rose web site (www.haas.berkeley.edu/arose).⁶ 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 MAs.

4. Empirical results

In order to address the effect of integration agreements on trade flows the traditional approach extends the basic gravity model by including dummy variables that capture the impact of each particular arrangement on intra-bloc trade. Therefore, we begin by estimating a version of equation (1) that does not consider trade diversion effects. We use panel data techniques with a full set of year-specific intercepts added.⁷ It allows us to control for unobservable country-pair individual effects. We report both random-effect and fixed-effect estimations. The random-effect model has the advantage of allowing the estimation of time-invariant variables and is more efficient when individual effects are not correlated with the regressors. However, if individual effects are correlated with the explanatory variables the random-effect estimates are not consistent. We mainly focus our comments on the fixed effect estimator which, as pointed out by Glick and Rose (2002), is the most appropriate way to exploit the panel data nature of the data set in a study of this kind. Nonetheless, before discussing the fixed-effect estimates, it is worth noting that the results for the parameters of interest are

⁶ We gratefully acknowledge to Andrew Rose for making his data public.

⁷ In all the estimations we have included a dummy variable that takes the value of one for trade flows between Mexico and the rest of the countries in the sample from 1986 onwards in order to capture the Mexico unilateral trade liberalization that began in that year.

in most cases very similar for fixed-effect and random-effect estimations. In fact, the Hausman test does not reject the null hypothesis of no correlation between the individual effects and the explanatory variables in the majority of cases.

Results are presented in column 1 and 2 of Table 1. The estimated coefficients are, in general, economically and statistically significant with sensible interpretations: economically larger countries trade more and more distant countries trade less. With the exception of the *Contiguity* and *Landlocked* variables, all the coefficients are statistically significant at least at the 5 percent level, and only the *Island* coefficient is not intuitively signed. It is worth noting that we find evidence that a reduction in exchange rate volatility is associated with an increase in trade.

In order to evaluate the impact of MAs on trade, RTAs provides us an appropriate benchmark. As it is observed, both RTAs and MAs agreements have a positive and statistically significant impact on bilateral trade flows. In particular, our estimates indicate that a pair of RTAs and MAs members trades about 56% and 14% more, respectively, than otherwise-identical pair including non-members.^{8,9} Therefore, it is worth noting that the results for the MAs holds despite the fact that we control for exchange rate volatility in addition to all standard gravity controls. But, this specification does not take into account the possible existence of trade diversion. In order to capture the MAs effects on trade of bloc members with non-members, in columns 3 and 4, we add the corresponding dummies. According to these results, two comments are in order. First, RTAs have a negative and statistically significant impact on trade with outsiders while MAs strongly increase trade with non-members (by 26%). Second, the impact of RTAs and MAs on intra-bloc trade flows is very similar once trade diversion effects are taken into account. In comparison with column 2, the

⁸ We calculate the effect of a trade or monetary agreement on trade as $\exp(\beta_x)-1$.

⁹ The Wald test indicates that the estimated coefficients for *RTAboth* and *MAboth* are statistically different. The value of this statistic is 165.08 with a marginal significance level equal to 0.000.

estimated coefficient of *MAboth* increases from 0.135 to 0.334. This result is consistent with our estimates for *MAone*. When we exclude the possibility that MAs stimulate trade with non-members the comparison is between intra-bloc trade flows and the rest of trade flows, including those between members and non-members of the same MAs.

Sharing a common currency is not the same as other MAs. For instance, a currency union is indeed a more ambitious, serious and durable commitment than an agreement to maintain exchange rates at a fixed level. Currency unions eliminate the transaction costs derived from the need to operate with different currencies in the situation before the formation of the monetary union. These costs are independent of the exchange rate volatility and can discourage trade even when bilateral exchange rates are completely stable. Moreover, a single currency can increase the transparency of markets and, in this way, promote a more efficient allocation of resources. As a result of these benefits, one can foresee a particularly important increase in trade amongst EMU partners. With the aim of checking whether the impact of the EMU has been different from the rest of MAs altogether, we have excluded EMU pairs from the group of monetary arrangements. Table 2 shows the results. The estimated coefficient for MAs excluding EMU (*MAnoEMUboth*) is equal to 0.096, a value smaller than the *MAboth* coefficient shown in column 2 of Table 1. The variable *EMUboth* presents an estimated coefficient of 0.327, which according to the Wald test is statistically different from the coefficient of the *MAnoEMUboth*.¹⁰ In particular, the impact of the EMU on trade is 39% whereas the average effect of the remaining MAs is 10%.

Columns 3 and 4 admit effects on trade with outsiders. Specifically, we add again dummy variables for country pairs consisting of one member of a particular political association and one non-member. The estimated coefficients of MAs appear

¹⁰ The Wald statistic is 48.65 with a marginal significance level equal to 0.000.

with positive and significant coefficients. Comparing column 2 with 4, we see, in a similar way than in Table 1, that allowing for the agreement's impact on third nations actually increases our estimate of the intra-monetary agreements effect from 0.096 to 0.294 in the group that excludes the EMU and from 0.327 to 0.581 in the EMU case. Moreover, in contrast to RTAs, both kinds of MAs do not produce any trade diversion, and, in fact, they increase trade with outsiders. This result specially applies for the EMU which boosts trade with non-members by 30%. This evidence is not surprising. If some countries form a currency union, there are fewer currencies and fewer units of account in the world and, therefore, lower trade barriers for everyone.¹¹

In Table 3 we analyse the impact on trade of each one of the MAs in the sample. For comparison purposes we also disaggregate the RTAs. To economise on space, we directly present the estimations including both the dummies capturing the impact on intra-bloc trade and on trade with third nations. Columns 1 and 2 report the estimations for the whole sample. All the estimated coefficients for the intra-bloc monetary dummies are positive and highly statistically significant. The results are consistent with the different degree of commitment of the MAs considered, that is, the higher the degree of monetary integration the greater the impact on trade. The monetary arrangement with the largest impact on trade is the EMU (79%) followed by the EMS (57%). In an intermediate position we find the case of the BW system (35%), whereas the Snake and the EPU show the smallest ones (28% and 18%, respectively).¹² With respect to the effect on trade with non-members it is worth noting that, the MAs have a bigger positive effect on trade with third countries than RTAs, and that the NAFTA has provoked a significant trade diversion effect.

¹¹ This is consistent with Mélitz's (2004) arguments about the fact that currency unions may not represent a discriminatory reduction of trade barriers at all.

¹² The Wald statistics show that there are no statistical differences neither between the coefficient of EPU and Snake nor between Snake and BW system. However, both the coefficient of BW system and EMS and those of the EMS and EMU are statistically different.

Soloaga and Winters (2001) introduce in their model separate dummies for member's imports from non-members and their exports to non-members. These dummies measure the extent of import diversion and export diversion, respectively. Acting in this manner, they account for the welfare effects of Preferential Trade Agreements (PTA). In particular, a negative coefficient on the dummy representing a given PTA's exports to non-members indicates that the PTA is likely to be harmful for third countries. Following this line of research we have split the whole sample in exports and imports flows. Columns 3 to 6 report the corresponding estimates. Focusing on the case of exports the picture that emerges differs from the previous one. The NAFTA's negative coefficient doubles its value in this case, the EFTA coefficient changes its sign to negative, remaining statistically significant, and the negative EU coefficient become statistically significant. It means that the three RTAs have a negative welfare effect for non-members. For the case of EPU the estimated coefficient loses the statistical significance at conventional levels. Therefore, the positive impact outlined before comes exclusively from imports of member countries coming from non-members. The remaining monetary agreements show positive coefficients which are similar to those found for the whole sample, suggesting, as noted before, that MAs have positive welfare effects with respect to non members.

5. Conclusion

In this paper, we have analysed the interactions between monetary regimes and trade integration in an explicit and economically meaningful fashion using a sample of 24 OECD countries over the period 1950-2004. We show that the effect of joining a monetary arrangement go beyond the reduction of exchange rate volatility. Moreover, we find strong evidence that participation in a monetary regime is correlated with higher

trade and that the intensity of monetary integration is associated with larger increases in trade. In particular, the results suggest that all five monetary agreements have increased global trade by raising intra-bloc and extra-bloc trade. The effect on intra-bloc trade ranges between 18% for the EPU and Snake and around 79% for the EMU. Taking into account welfare considerations with respect to non-members, rather than diverting trade away from other trading partners, with the exception of the EPU, all monetary agreements significantly increase trade with outsiders.

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

	(1)	(2)	(3)	(4)
Ln GDP _{it}	1.031 (65.85)	1.134 (54.77)	1.034 (66.14)	1.142 (55.26)
Ln GDP _{jt}	0.985 (62.98)	1.088 (52.61)	0.988 (63.27)	1.096 (53.09)
Ln Dist _{ij}	-0.847 (-18.13)		-0.837 (-17.89)	
Landlocked _{ij}	-0.083 (-0.74)		-0.038 (-0.34)	
Contiguity _{ij}	0.048 (0.26)		0.073 (0.40)	
Language _{ij}	0.681 (4.45)		0.661 (4.31)	
Island _{ij}	0.248 (3.15)		0.271 (3.44)	
Volatility _{ij}	-4.958 (-4.42)	-4.995 (-4.47)	-4.834 (-4.33)	-4.908 (-4.41)
RTAboth _{ijt}	0.444 (28.42)	0.446 (28.64)	0.362 (14.49)	0.354 (14.18)
MAboth _{ijt}	0.139 (8.57)	0.135 (8.40)	0.340 (16.63)	0.334 (16.39)
RTAone _{ijt}			-0.056 (-2.80)	-0.068 (-3.36)
MAone _{ijt}			0.228 (16.35)	0.226 (16.24)
Year dummies	Yes	Yes	Yes	Yes
Country-pair dummies	Yes	Yes	Yes	Yes
Adj-R ²	0.80	0.70	0.80	0.70
No of obs.	27371	27371	27371	27371
Estimation Method	RE	FE	RE	FE
Hausman test	51.97 [0.79]		56.91 [0.69]	

Notes: t-statistics in parentheses are robust to heteroscedasticity and autocorrelation

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

	(1)	(2)	(3)	(4)
Ln GDP _{it}	1.0269 (65.91)	1.128 (54.48)	1.027 (66.53)	1.136 (54.90)
Ln GDP _{jt}	0.980 (63.02)	1.082 (52.31)	0.981 (63.63)	1.090 (52.74)
Ln Dist _{ij}	-0.850 (-18.43)		-0.838 (-18.48)	
Landlocked _{ij}	-0.089 (-0.80)		-0.045 (-0.42)	
Contiguity _{ij}	0.053 (0.29)		0.083 (0.47)	
Language _{ij}	0.684 (4.52)		0.666 (4.48)	
Island _{ij}	0.246 (3.17)		0.269 (3.52)	
Volatility _{ij}	-4.913 (-4.39)	-4.945 (-4.43)	-4.838 (-4.34)	-4.907 (-4.42)
RTAboth _{ijt}	0.423 (26.56)	0.426 (26.79)	0.339 (13.46)	0.331 (13.16)
MAnoEMUboth _{ijt}	0.098 (5.64)	0.096 (5.54)	0.297 (13.80)	0.294 (13.68)
EMUboth _{ijt}	0.335 (9.85)	0.327 (9.64)	0.597 (14.70)	0.581 (14.35)
RTAone _{ijt}			-0.049 (-2.42)	-0.060 (-3.00)
MAnoEMUone _{ijt}			0.219 (15.49)	0.218 (15.50)
EMUone _{ijt}			0.273 (8.87)	0.264 (8.62)
Year dummies	Yes	Yes	Yes	Yes
Country-pair dummies	Yes	Yes	Yes	Yes
Adj-R ²	0.80	0.70	0.80	0.70
No of obs.	27371	27371	27371	27371
Estimation Method	RE	FE	RE	FE
Hausman test	55.89 [0.69]		55.70 [0.79]	

Note: t-statistics in parentheses are robust to heteroscedasticity and autocorrelation

Table 3. Estimation results of the gravity equation (1). Dependent variable: log of bilateral trade. Sample period: 1950-2004.

	WHOLE SAMPLE		EXPORTS		IMPORTS	
	(1)	(2)	(3)	(4)	(5)	(6)
Ln GDP _{it}	1.014 (71.40)	1.164 (55.32)	1.125 (48.11)	1.338 (34.87)	1.039 (47.80)	1.361 (41.60)
Ln GDP _{jt}	0.969 (68.25)	1.119 (53.21)	0.835 (39.03)	0.967 (32.62)	0.956 (40.73)	0.911 (21.05)
Ln Dist _{ij}	-0.828 (-21.64)		-0.855 (-20.04)		-0.783 (-19.27)	
Landlocked _{ij}	-0.069 (-0.75)		0.116 (1.13)		-0.223 (-2.28)	
Contiguity _{ij}	0.089 (0.60)		0.063 (0.38)		0.212 (1.35)	
Language _{ij}	0.701 (5.68)		0.564 (4.09)		0.785 (6.02)	
Island _{ij}	0.252 (3.95)		0.080 (1.12)		0.382 (5.62)	
Volatility _{ij}	-4.419 (3.95)	-4.602 (-4.14)	-5.557 (-4.52)	-5.581 (-4.62)	-3.434 (-2.40)	-4.305 (-3.05)
EUone _{ijt}	0.008 (0.41)	-0.010 (-0.51)	-0.034 (-1.60)	-0.051 (-2.42)	0.071 (3.09)	0.052 (2.26)
EUboth _{ijt}	0.387 (11.37)	0.379 (11.15)	0.212 (5.54)	0.206 (5.41)	0.588 (13.94)	0.568 (13.51)
EFTAone _{ijt}	0.072 (3.83)	0.056 (2.97)	-0.048 (-2.28)	-0.068 (-3.20)	0.216 (9.22)	0.169 (8.50)
EFTAboth _{ijt}	0.318 (8.63)	0.260 (7.04)	0.193 (4.67)	0.135 (3.28)	0.495 (10.83)	0.420 (9.21)
NAFTAone _{ijt}	-0.117 (-4.90)	-0.121 (-5.11)	-0.259 (-9.63)	-0.262 (-9.93)	0.005 (0.15)	0.001 (0.02)
NAFTAboth _{ijt}	0.408 (4.33)	0.361 (3.86)	0.012 (0.11)	-0.030 (-0.29)	0.794 (6.77)	0.729 (6.31)
EPUone _{ijt}	0.175 (3.84)	0.155 (3.42)	0.016 (0.32)	-0.020 (-0.41)	0.295 (5.09)	0.332 (5.75)
EPUboth _{ijt}	0.205 (3.77)	0.166 (3.07)	0.177 (2.95)	0.121 (2.02)	0.187 (2.70)	0.202 (2.93)
SNAKEone _{ijt}	0.130 (5.02)	0.121 (4.68)	0.142 (4.84)	0.130 (4.50)	0.121 (3.74)	0.112 (3.52)
SNAKEboth _{ijt}	0.269 (5.07)	0.248 (4.72)	0.393 (6.58)	0.369 (6.29)	0.141 (2.14)	0.127 (1.95)
EMSone _{ijt}	0.221 (12.37)	0.217 (12.61)	0.250 (12.84)	0.245 (12.77)	0.167 (7.72)	0.163 (7.65)
EMSboth _{ijt}	0.466 (14.97)	0.454 (14.70)	0.497 (14.18)	0.480 (13.95)	0.408 (10.52)	0.402 (10.51)
EMUone _{ijt}	0.277 (8.66)	0.258 (8.22)	0.264 (7.49)	0.246 (7.07)	0.258 (6.54)	0.246 (6.33)
EMUboth _{ijt}	0.616 (14.30)	0.584 (13.62)	0.580 (11.99)	0.543 (11.39)	0.619 (11.53)	0.588 (11.08)
BWone _{ijt}	0.178 (5.46)	0.193 (5.96)	0.222 (6.08)	0.236 (6.55)	0.115 (2.81)	0.147 (3.65)
BWboth _{ijt}	0.252 (4.24)	0.301 (5.09)	0.304 (4.54)	0.343 (5.19)	0.169 (2.26)	0.293 (3.96)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair dummies	No	Yes	Yes	Yes	Yes	Yes
Adj-R ²	0.80	0.70	0.80	0.80	0.81	0.77
No of obs.	27371	27371	13719	13719	13652	13652
Estimation Method	RE	FE	RE	FE	RE	FE
Hausman test	317.42 [0.00]		85.22 [0.18]		161.27 [0.00]	

Note: t-statistics in parentheses are robust to heteroscedasticity and autocorrelation.