DID THE EUROPEAN EXCHANGE-RATE MECHANISM CONTRIBUTE TO THE INTEGRATION OF PERIPHERAL COUNTRIES?

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DID THE EUROPEAN EXCHANGE-RATE MECHANISM CONTRIBUTE TO THE INTEGRATION OF PERIPHERAL COUNTRIES?

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Abstract

This paper analyses the effect on trade of the exchange-rate mechanism I by member country. We find that it has contributed to a deeper integration of those peripheral countries that participated in the mechanism for at least several years, providing a lesson for the ten new European Union members.

Key words: EMS; ERM; trade; peripheral countries.

JEL Classification numbers: F13, F15.

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1. Introduction

The ten new members of the European Union (EU) are expected to join the Economic and Monetary Union (EMU) at some time in the next years. Since the adoption of the euro is compulsory for these countries, the eastern enlargement of the European Union has triggered a broad discussion about the achievability of the Maastricht criteria for the EMU accession candidates. One of these criteria is two years of participation in the Exchange Rate Mechanism II (ERM2) without major tensions in the foreign exchange market.

The ERM, a system of jointly managed fixed and adjustable exchange rates, is seen as having a main potential benefit: providing a nominal anchor for monetary convergence and macroeconomic stability. But, the ERM can also help the path of transition to the euro by fostering trade integration. Despite the relevance of trade integration for the success of a currency union, the impact of the ERM on intra-EU trade has been left out of the discussion in academic literature.[1] To our knowledge, only Fountas and Kyriacos (1999) have investigated whether the ERM1 coincided with an increase in intra-EU exports. Using data for the four largest EU member countries, they conclude that it has not been the case.

This paper empirically investigates the effect on trade of the ERM1 by member country, trying to determine to what extent the fact of participating in this mechanism has contributed to integration of peripheral countries. To deal with this issue, we have estimated a conventional gravity model of international trade on a sample of 24 OECD countries over the period 1960-2004. Our results show that the ERM1 was a successful instrument to strength trade integration of its members and, specially, in the case of

[1] As theory predicts, the greater the degree of integration among countries the higher the probability is of forming an optimum currency area (Mckinnon, 1963).

peripheral countries. It provides a lesson for those countries that have joined the EU in the last enlargement. The monetary discipline of the ERM2 will probably be an effective instrument to pave the road to the EMU not only through macroeconomic stability but also through trade integration.

The plan of this paper is 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 the ERM1 on trade flows by participating countries in this mechanism. To this end, we estimate a conventional augmented gravity model of international trade:

$$\begin{aligned} Ln(X_{ijt}) = {} & \beta_0 + \beta_1 LnGDP_{it} + \beta_2 LnGDP_{jt} + \beta_3 LnDist_{ij} + \\ & \beta_4 Landlocked_{ij} + \beta_5 Contiguity_{ij} + \beta_6 Language_{ij} + \\ & \beta_7 Island_{ij} + \beta_8 LnERvol_{ijt} + \beta_9 RTAone_{ijt} + \beta_{10} RTAboth_{ijt} + \\ & \beta_{11} Snakeone_{ijt} + \beta_{12} Snakeboth_{ijt} + \beta_{13} EMUone_{ijt} + \\ & \beta_{14} EMUboth_{ijt} + \beta_{15} ERM1one_{ijt} + \beta_{16} ERM1both_{ijt} + u_{ijt} \end{aligned} \tag{1}$$

where *i* and *j* denotes trading partners, *t* is time, the suffix "*both*" denotes that *i* and *j* belong to the same agreement, the suffix "*one*" denotes that either *i* or *j* is a member of a particular agreement, and the variables are defined as:

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

GDP denotes the Gross Domestic Product,

Dist denotes the great circle 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 denotes dummy variables for Regional Trade Agreements,[2]

Snake denote dummy variables for the European Monetary Snake,

EMU denote dummy variables for the European Monetary Union,

ERM1 denote dummy variables for the exchange-rate mechanism I,

u_{ijt} is the standard classical error term.

The parameter of interest to us is β_{16}. If trade is created when both countries are members of the ERM1 the coefficient β_{16} should be positive and statistically significant.[3]

3. Data

The trade data (exports and imports) in current US dollars come from the "Direction of Trade" (DoT) data set developed by the International Monetary Found (IMF). The sample covers bilateral merchandise trade between 24 OECD countries (Belgium and Luxembourg considered jointly) during the period 1960-2004. 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. We deflate trade by the

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

[3] The coefficients β_9, β_{11}, β_{13} and β_{15} capture the potential trade diversion effects of each particular integration agreement.

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). The 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.berkeleyedu/arose).[4] 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.

4. Empirical results

We begin by estimating equation (1) using panel data techniques with a full set of year-specific intercepts added.[5] It allows us to control for unobservable country-pair individual effects. The results are presented in column 1 and 2 of Table 1. The Hausman tests reject the null hypothesis of no correlation of the individual effects with the explanatory variables (at the 1 per cent level). Hence, the random-effect coefficients could be biased, and one should rely on the fixed-effect estimators. Nonetheless, it is worth noting that the results for the parameters of interest are very similar for fixed-effect and random-effect estimations.

[4] We gratefully acknowledge to Andrew Rose for making his data public.

[5] 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.

The gravity model works well. The traditional gravity variables are economically and statistically significant with sensible interpretations: larger countries trade more and more distant countries trade less. Membership in a regional integration agreement encourages trade, as do the fact of sharing a language. Moreover, we find that a reduction in exchange rate volatility is associated with a small increase in trade in accordance with the empirical evidence (Clark, Tamirisa and Wei, 2004). Only the *Island* coefficient is not intuitively signed.

Focusing attention on the parameter of interest, the coefficient of the ERM1 variable is positive and statistically significant which suggests that this mechanism boosted trade flows among participant countries. The results show that the ERM1´s effect on intra-bloc trade amounts to 55%.[6] This effect is economically important, but it hides differences across member countries that are interesting to know in order to evaluate the effectiveness of this system to integrate peripheral markets. To this end, we have estimated the effect of the ERM1 by country using interactive dummy variables. The results are reported in columns (3) and (4). As can be observed, there are clear differences across countries. At one end of the spectrum, the largest impact of the ERM1 on trade flows is found for Spain (86%), Ireland (63%), and Portugal (50%), countries that belonged to the less developed group of EU15 and were members of the ERM1 for a long time (at least 7 years). At the other end of the spectrum, we find the members of the ERM1 that do not show any significant impact on trade flows (the United Kingdom, Finland and Greece). This last result is not surprising since these countries participated in the ERM1 only for one or two years before the beginning of the EMU in 1999. The estimated coefficients for the remaining countries show a

[6] It is worth noting that ERM1 has also increased extra-bloc trade by 24%.

positive effect of membership in the ERM1 on trade that ranges between 10% (Denmark) and 29% (France).[7]

Our results show that the ERM1 of the EMS was a useful instrument to enhance the economic integration of the European economies. Being member of the ERM1 has had an effect on trade that goes beyond the reduction of exchange rate volatility. Moreover, the large impact for Spain, Ireland and Portugal reveal that the ERM1 had an important contribution to the trade integration of peripheral countries of the EU15.

5. Conclusion

In this paper, we have analysed the effect of the ERM1 of the European Monetary System on trade flows by member states using a sample of 24 OECD countries over the period 1960-2004. The results suggest that the impact on trade of the ERM1 did not come from the reduction of the exchange rate volatility. After controlling for this variable, we find that the ERM1 has promoted trade among the participant countries, except for those members that joined the mechanism for a short time period (two years or less) before the beginning of the EMU. The greatest impact is found for the peripheral countries (Spain, Ireland and Portugal). Therefore, the ERM can be regarded as a successful instrument to strength economic integration of its members.

Since the new EU members have expressed their strong intention to join the EMU as soon as possible and as far as the ERM1 has enhanced trade integration, our results suggest that early ERM2 accession is a rational choice.

[7] The corresponding Wald statistics for equality of the coefficients of interest indicate that the estimated parameters for Spain, Ireland and Portugal differ from the rest in a statistically significant way.

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Table 1. Estimation results of the gravity equation (1). Dependent variable: log of bilateral trade. Sample period: 1960-2004.

	(1)	(2)	(3)	(4)
Ln GDP$_{it}$	0.922 (59.70)	0.964 (38.69)	0.914 (64.30)	0.947 (37.52)
Ln GDP$_{jt}$	0.892 (57.81)	0.934 (37.53)	0.885 (62.23)	0.917 (36.37)
Ln Dist$_{ij}$	-0.837 (-21.35)		-0.836 (-24.29)	
Landlocked$_{ij}$	-0.082 (-0.88)		-0.095 (-1.16)	
Contiguity$_{ij}$	0.202 (1.33)		0.220 (1.65)	
Language$_{ij}$	0.709 (5.59)		0.705 (6.38)	
Island$_{ij}$	0.214 (3.27)		0.187 (3.25)	
Volatility$_{ij}$	-2.069 (-1.94)	-1.888 (-1.78)	-2.421 (-2.26)	-2.195 (-2.07)
RTAone$_{ijt}$	-0.001 (-0.10)	-0.011 (-0.82)	-0.029 (-2.00)	-0.046 (-3.17)
RTAboth$_{ijt}$	0.294 (10.38)	0.274 (9.60)	0.224 (7.36)	0.184 (5.98)
SNAKEone$_{ijt}$	0.127 (5.14)	0.119 (4.85)	0.115 (4.59)	0.098 (3.94)
SNAKEboth$_{ijt}$	0.299 (5.95)	0.286 (5.73)	0.140 (1.54)	0.219 (4.32)
EMUone$_{ijt}$	0.294 (9.98)	0.293 (9.97)	0.268 (9.15)	0.268 (9.24)
EMUboth$_{ijt}$	0.638 (16.06)	0.638 (16.13)	0.691 (17.02)	0.700 (17.39)
ERM1one$_{ijt}$	0.214 (13.02)	0.213 (13.02)		
ERM1both$_{ijt}$	0.440 (15.14)	0.444 (15.33)		
ERM1AUSTRIAone$_{ijt}$			0.256 (5.92)	0.268 (6.27)
ERM1AUSTRIAboth$_{ijt}$			0.140 (1.54)	0.147 (1.64)
ERM1BELGIUMone$_{ijt}$			0.118 (3.27)	0.095 (2.65)
ERM1BELGIUMboth$_{ijt}$			0.129 (2.53)	0.114 (2.26)
ERM1DENMARKone$_{ijt}$			0.174 (5.12)	0.154 (4.52)
ERM1DENMARKboth$_{ijt}$			0.100 (1.92)	0.096 (1.84)
ERM1FINLANDone$_{ijt}$			0.166 (3.75)	0.160 (3.64)
ERM1FINLANDboth$_{ijt}$			0.105 (1.00)	0.101 (0.97)
ERM1FRANCEone$_{ijt}$			0.210 (5.90)	0.212 (5.97)
ERM1FRANCEboth$_{ijt}$			0.243 (4.77)	0.252 (4.98)
ERM1GERMANYone$_{ijt}$			0.144 (4.00)	0.123 (3.44)
ERM1GERMANYboth$_{ijt}$			0.160 (3.12)	0.152 (2.99)
ERM1GREECEone$_{ijt}$			0.046 (1.07)	0.081 (1.92)
ERM1GREECEboth$_{ijt}$			0.031 (0.25)	0.064 (0.52)
ERM1IRELANDone$_{ijt}$			0.454 (12.58)	0.476 (13.26)
ERM1IRELANDboth$_{ijt}$			0.470 (9.09)	0.490 (9.55)
ERM1ITALYone$_{ijt}$			0.135 (3.90)	0.140 (4.05)
ERM1ITALYboth$_{ijt}$			0.208 (3.82)	0.219 (4.04)
ERM1NETHERLANDSone$_{ijt}$			0.148 (4.11)	0.125 (3.47)
ERM1NETHERLANDSboth$_{ijt}$			0.195 (3.80)	0.183 (3.59)
ERM1PORTUGALone$_{ijt}$			0.104 (2.70)	0.110 (2.88)
ERM1PORTUGALboth$_{ijt}$			0.405 (5.99)	0.406 (6.05)
ERM1SPAINone$_{ijt}$			0.268 (7.22)	0.301 (8.18)
ERM1SPAINboth$_{ijt}$			0.583 (9.63)	0.620 (10.33)
ERM1UKone$_{ijt}$			-0.025 (-0.58)	-0.015 (-0.35)
ERM1UKboth$_{ijt}$			0.005 (0.04)	0.009 (0.08)
Adj-R^2	0.80	0.62	0.82	0.62
Hausman test	143.99 [0.00]		323.88 [0.00]	
No obs.	22903	22903	22903	22903
Estimation Method	R.E.	F.E.	R.E.	F.E.

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

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