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Abstract

This paper analyzes the effects of EU integration on intra-EU trade volumes with a special focus on trade *within* and *between* the core and the periphery countries. We find that in all phases of integration core-periphery and intra-periphery growth of trade has experienced stronger positive effects than intra-core trade. An extrapolation of the estimation results suggests that intra-periphery trade and intra-core trade will intensify in course of "typical" additional enlargements at the expense of core-periphery trade. This suggests that either the old core will change or a second, new one may form.

Key words: Gravity Models; Integration Effects; European Union
JEL classification: F14; F15

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1 Introduction[1]

Since the early nineties, a new wave of regionalism has attracted interests of both policy makers and researchers. In general, economists analyze the effects of (new) regionalism in terms of volume of trade[2] and also of welfare effects.[3] With respect to trade volumes, the literature on trading bloc effects typically concentrates on the Vinerian (1950) trade creation and trade diversion. However, the effects of regionalism and the formation of trading blocs on intra-bloc received only minor attention. In particular, third-country effects within a trading bloc induced by bloc-enlargements are widely underresearched. Krugman (1998, p. 115) points out that, especially, the development of core-periphery trade within trading blocs deserves more attention:

"If there is to be a world of regional trading blocs, it seems likely at this point that it will at the very least involve some distinction between the advanced-country cores and developing-country peripheries within each bloc. ...; a crucial question would then be the division of gains within each bloc between the core and periphery."

In this respect, the formation of the European Union forms a prime example, simply because it exists already for a fairly long time and it developed quite dynamically experiencing four enlargements since 1973.[4] Previous research identified both trade creating and trade diverting effects of the EU

[1]We should like to thank Alan Winters for various helpful suggestions.

[2]See Frankel et al. (1998), Sapir (1998), Krueger (1999), Sapir (2001), Soloaga & Winters (2001).

[3]Krugman (1991a, 1991b), Frankel et al. (1996, 1998), Baier & Bergstrand (2001), etc.

[4]See Sapir (1998) and Soloaga & Winters (2001) for a survey of its history.

integration.[5] However, there is little to no attention to how the widening (enlargement) and deepening (e.g., the Single Market Programme) of the EU have affected the different country groups *within* the EU. Below, we investigate whether and how the EU integration process has exerted a different impact on intra-core, core-periphery, and intra-periphery trade relationships. Noteworthy, we always treat the six EU founding members as the core and the other member economies as the periphery.

Previous results on the EU integration effects on trade follow the dummy variables approach and, regarding the specification and econometric methodology, they are potentially biased. Three sources of bias and mismeasurement can be addressed. First, the EU is sometimes incorrectly treated as a stable and time-invariant conglomerate of countries (compare Bayoumi & Eichengreen, 1998, on this problem). Then, the time-invariant EU dummy variable mixes up trade creating and trade diverting effects, since trade between actual and future members is counted as EU trade throughout. Second, many applications use cross-section estimation techniques (repeating OLS for each period) although the underlying data cover large cross-sections *and* long time series. Without controlling for the unobserved bilateral trade relationship specific influences, the estimated integration coefficients may pick up effects, which are not only due to integration but also due to geographic, cultural, political and other time-invariant influences (compare Srinivasan, 1998; Cheng & Wall, 1999; etc.). Third, it is rarely taken into account that trading bloc effects cannot simply be captured by regional dummy coefficients in OLS regressions at all. Proper inference has to be based on the differences

[5] Bayoumi & Eichengreen (1998), Sapir (2001) etc.

of the integration variable coefficients *before* and *after* the involved countries are joining the bloc (Srinivasan, 1998). Accordingly, the integration effects should be estimated by interacting the integration *group* effects with different integration *phase* effects.

The present paper concentrates on the intra-EU bilateral trade effects through both the formation and the enlargement of the EU over the period 1960-1998. It rigorously sets up an analysis of covariance model (ANCOVA), which obtains reliable estimates of the integration effects within a gravity approach. The model controls for the endowment based New Trade Theory type influences (relative and absolute factor endowments) and for all time-invariant and common cycle specific effects. The integration process is captured by a comprehensive set of integration phase×integration group dummies, which account for phase-specific integration effects for each country group of interest in the integration process.[6] In this set-up, the effects are measured with respect to a well-defined reference group, which facilitates the interpretation as compared to previous work. Following Srinivasan's (1998) claim, only the differences of the differences of these group×phase effects are interpreted as specific to integration.

The next section describes the set-up of the model and the measurement and interpretation of the integration effects. Section 3 briefly describes our data set and presents the main estimation results together with the assessment of the integration effects. Section 4 summarizes the main findings and concludes.

[6] We distinguish between the six EU founding members, the four different enlargement groups and the rest of the world.

2 The Econometric Methodology

We base our empirical analysis on a standard gravity model, which explains bilateral trade flows by relative and absolute factor endowments and transaction costs (Bergstrand, 1989). In terms of the covariates, we stick to Helpman's (1987) specification:

$$\log y_{ijt} = \beta_G G_{ijt} + \beta_S S_{ijt} + \beta_R R_{ijt} + \alpha + \pi_{kp} + \mu_{ij} + \lambda_t + \epsilon_{ijt} \qquad (1)$$

with y_{ijt} as the bilateral real export flows from country i to j in year t and

$$G_{ijt} = \log(GDP_{it} + GDP_{jt}) \qquad (2)$$

$$S_{ijt} = \log\left(1 - \left(\frac{GDP_{it}}{GDP_{it} + GDP_{jt}}\right)^2 - \left(\frac{GDP_{jt}}{GDP_{it} + GDP_{jt}}\right)^2\right) \qquad (3)$$

$$R_{ijt} = \left|\log\left(\frac{GDP_{it}}{POP_{it}}\right) - \log\left(\frac{GDP_{jt}}{POP_{jt}}\right)\right|. \qquad (4)$$

GDP denotes the real gross domestic product, POP is population, α is the constant, π represents the integration effects, and ϵ the traditional remainder error term. In analysis of variance (ANOVA) terms, our problem is a nested design with two main effects: the bilateral effects (μ_{ij})[7] and the time effects (λ_t), and π_{kp} integration effects, where the main effects are nested in. To capture the effects of the EU integration on European trade, π is designed to vary across integration phases ($p = 1, ..., 6$) and across bilateral integration group relations ($k = 1, ..., 35$). All effects are treated as fixed for conceptual reasons[8] and to guarantee consistency. The inclusion of fixed bi-

[7] We don't treat the country pair effects (say the France - Germany and the Germany - France effect) as symmetric. Therefore, on average bilateral trade is not necessarily balanced in the considered period. We owe this observation to Alan Winters.

[8] We do not think about our sample of countries as randomly drawn from a large population of bilateral relationships (see Baltagi, 2001).

lateral effects implies that all time-invariant influences, such as the typical examples of transaction costs (distance, adjacency, common language, etc.), are controlled for.

Phase 1 covers 1960-1964 (the pre-EU phase), Phase 2-6 refer to the following time spans in the integration process at the beginning of which a new group of countries entered the EU: 1965-1972 (EU6 or the *core*: Belgium, France, Germany, Italy, Luxembourg, Netherlands), 1973-1980 (Denmark, Great Britain, Ireland), 1981-1985 (Greece), 1986-1994 (Portugal, Spain) and 1995-1998 (Austria, Finland, Sweden). Noteworthy, the time effects are nested in these integration phases. We consider the rest of the countries in the sample (i.e. the rest of OECD) as an additional homogeneous group of countries. The comprehensive set of bilateral trade relations between these integration groups is $K = 6 \times 6 - 1 = 35$, since one of the groups consists of only a single economy (Greece). Similar to above, the bilateral effects are nested in these bilateral integration group effects. Due to the nested model structure, (1) can only be estimated by imposing an appropriate set of restrictions on the parameters π_{kp}, μ_{ij}, and λ_t. Equivalently, one can exclude one phase effect, one bilateral integration group effect, one year effect and one bilateral effect, which is just a reparameterization of the problem (compare Baltagi, 2001). Then, the estimated effects represent deviations from the excluded reference group rather than from the average group. We impose the restriction that the bilateral effects sum up to zero and we omit the first year (1960), the group of the bilateral relations between the rest of OECD economies (neither of the countries there belongs to the EU in 1995 or later), and Phase 6 (1995-1998) as the reference effects. For our purpose, especially

the latter two are relevant. The estimated integration effects have to be interpreted as deviations from Phase 6 *and* the typical trade relationship between two rest of OECD economies. Time effects represent differences to the base year (1960), while the bilateral effects are deviations from the average bilateral relationship. We come up with 38 time effects, 755 bilateral effects and $(K-1) \times (P-1) = 175$ possible integration effects (π) in the regression analysis.[9]

3 Data, Regression Results and the Assessment of EU Integration Effects

We use nominal intra-OECD export flows (OECD, Monthly Statistics of International Trade) in US dollars, export price indices (OECD, Economic Outlook), nominal GDP (OECD, Economic Outlook and National Accounts Volume 1) in US dollars, GDP deflators and population (same sources as GDP) to construct real bilateral exports and the Heckscher-Ohlin variables (G, S, R) as described above, with 1995 as the base year. The data set comprises 22323 non-missing observations and it is unbalanced.

The size effects are highly relevant and significant at the 1% level ($\beta_G = 3.226$; $\beta_S = 1.027$), which is in line with the New Trade Theory.[10] The absolute difference in relative factor endowments exerts a negative, significant (at 5%) impact on bilateral exports ($\beta_R = -0.095$), which is in accordance

[9] In fact 11 of them cannot be estimated due to missing data. Compare the next section for more details on the data.

[10] Compare Helpman (1987) and many other applications for similar results.

with the Linder hypothesis but squares with the Heckscher-Ohlin view (no gains from specialization but from similarity in the structure of demand, see Bergstrand, 1990). According to the adjusted R^2, the model explains 96% of the variation in bilateral intra-OECD export flows.

In assessing the EU integration effects, we focus on intra-EU trade and on core-periphery trade in particular. We define the core as the EU6 founding members in each phase, and the periphery as the remaining EU economies, so that the composition of the periphery changes from phase to phase. We base our inference on the integration effects on the appropriately weighted linear combinations of the estimated group×phase effects (π) in Tables 1 to 3.[11] The corresponding weights are the numbers of observations in each bilateral integration group×phase combination. As mentioned above, the estimated effects represent deviations from the base categories (i.e., the bilateral trade relations between the rest of OECD countries *and* Phase 6), and the significance levels indicate, whether these deviations are different from zero or not.

> Tables 1 - 3 <

In order to provide a rich picture of the integration process, we decided to present three different aggregation concepts. First, Table 1 displays the effects on intra-EU trade of different, time-invariant aggregates. For example, the last row concentrates on intra-EU15 trade in all phases, irrespectively of whether the involved countries participated in the EU in this phase or

[11] Weighting is necessary since, for example, the integration effect on the intra-EU15 trade is an aggregate, which consists of the effect on trade within and between all involved country groups: EU6, first enlargement group, second enlargement group, etc.

not. Second, we look at the effects on trade between the core EU economies and other integration groups (different enlargement groups as well as the rest of the OECD; Table 2). Third, the effects on EU intra-group trade of the different integration groups are considered (Table 3). On the basis of the figures in Tables 1-3, one can obtain group-specific phase-to-phase changes in the integration effects by subtracting cells from each other within rows. As mentioned above, only these obtained trade growth effects can be interpreted as *pure* integration effects. They exclude the differences between both the phase specific main effects and also the integration group main effects. This is also in accordance with Srinivasan's (1998, p. 117) claim that "the effect of the formation of a trade bloc is not the coefficient of the regional dummy, but the change in it in separate regressions before and after the region formally becomes a trading bloc." Note that this procedure is equivalent to a difference-in-difference analysis.

In the following, we use these differences and compare the integration-induced trade growth performance between different integration groups and phases. This can easily be done by subtracting the obtained trade growth effects from those of another group in the same table. E.g., consider the difference between Phase 3 and Phase 2 of EU9 in Table 1: $(-0.202) - (-0.673) = 0.471$, which indicates that the phase-to-phase EU9 effect is positive. Obtain a similar difference for the EU6: $(0.004) - (-0.229) = 0.234$. The difference between the two estimated log differences amounts to $0.471 - 0.234 = 0.237$. That means, from Phase 2 to Phase 3 intra-EU9 trade has grown at about $100 \cdot (\exp(0.237) - 1) = 26.7\%$ faster than intra-core trade, due to EU integration only. We leave it to the interested reader to carry out

other possible calculations on the basis of the reported information.

Below, we use the estimated coefficients to investigate the following questions. Did previous enlargements foster core *and* periphery integration (intra-core, core-periphery, intra-periphery) and *how* did intra-EU trade, core-periphery trade and intra-periphery trade, always compared to intra-core trade, respond to EU integration? Do we observe decreasing trade growth effects of the integration process? Are there any tentative conclusions, which could eventually be drawn for *typical* further enlargements?

> Table 4 <

Table 4 enables us to answer the first two questions. It basically reports comparisons of the EU integration effects on trade growth when moving down the properly aggregated diagonals of the previous tables. More precisely, "EU" and "periphery" now refer to the member countries as observed. For example, in the first column of the table the EU consists of 9 countries, which are treated as EU members in both Phase 2 and 3.[12] This is the proper *pre* and *post* entry comparison as suggested by Srinivasan (1998). Similarly, the periphery consists of three economies (Denmark, Great Britain and Ireland) in both phases as well. It is evident from Table 4 that in all phases the average intra-EU country pair's trade increased faster than the intra-core trade. From Table 1, we know that the average phase-to-phase intra-core growth of trade effect was significantly positive and amounted to about 5.9%. This implies that the average phase-to-phase intra-EU trade growth effect amounted to 25.4%, which squares with the results in Frankel et al. (1998), Krueger (1999)

[12] Note that the enlargement exactly occured in between Phases 2 and 3.

and Soloaga & Winters (2001).[13]

The results indicate that EU integration leads to a stronger growth of trade *between* the core and the periphery and *within* the periphery than within the core itself (compare the second and the third row of coefficients in the table). Except in column one (comparing Phase 3 with Phase 2), the intra-periphery integration effects have been stronger (roughly by 8 percentage points) than the effects on core-periphery integration. In this regard, EU integration did not foster "peripherality" in terms of volumes of trade flows. To some extent, this coincides with and complements Krugman's (1991, p. 97f.) conclusion that we seem to be "at the good part of the U, not the bad [i.e. there is no deindustrialization of the periphery through integration] ..., but that 1992 will actually favor peripheral manufacturing." Indeed, we find that integration-induced core-periphery and intra-periphery trade expands faster than intra-core trade during the *whole* integration process.

Our findings suggest that the EU history of integration has been "successful" in so far as it had not resulted in a hub-and-spoke pattern of integration. I.e., inter-spoke trade has developed fairly well and there is no indication for diversion from intra-periphery to core-periphery trade. Rather, the establishment of infrastructure and communication networks has also proliferated integration between the non-founding member economies (the periphery).

The results identify a negative effect of the southern enlargements (Greece,

[13] Frankel et al. (1998, p.97) find that the within EU bias "trend is not statistically significant". Krueger (1999, p. 19) argues that "If anything, there is an estimated marginally significant decrease in the tendency of EU partners to trade with each other over time." Soloaga & Winters (2001, p. 19) suggest that "The gross-intratrade effects for the EU ... fall through time, but ... the changes are not significant."

Portugal, Spain) and the so-called *Eurosclerosis* on the intra-core volume of trade growth. Whereas the first two enlargements increased intra-core volume of trade by 24.0% per phase, we observe an average reduction of intra-core trade by 9.6% in the last two phases.[14] However, there are no detrimental effects on the relative performance of core-periphery or intra-periphery as compared to intra-core volume of trade growth. The results also suggest that the last enlargement (Austria, Finland, Sweden) does not yet show up in a come-back of positive intra-core integration effects, which might have two reasons.[15] Either the deepening via the *Single Market Programme* has not been strong enough a force vis-à-vis the widening process, or it just takes a longer time span to develop its full power.

We can use the obtained figures to look at the possible effects of further enlargements on integration. Of course, we have to limit ourselves to a projection, which relies on rather restrictive assumptions, especially, that further enlargements are equivalent to *typical* previous ones. Hence, the analysis below is not a forecast but only a thought experiment, which takes the estimated model literally.

> Figures 1-3 <

Figures 1-3 extrapolate the trade growth effects due to EU enlargements on intra-EU, core-periphery and intra-periphery trade using third order polynomials and the effects from Table 4. Noteworthy, this experiment fo thought should not be interpreted as a prediction. Rather, it looks at the impact

[14] Calculated on the basis of phase-to-phase differences in the first row of Table 1.

[15] Compare the negative Phase 6 to Phase 5 difference in the first row of Tables 1-3 ($= -0.064$).

of two hypothetical further enlargements under the assumption that these are comparable to the *average* enlargement in the past.[16] The figures suggest that a fifth *typical* enlargement should produce additional positive (i.e., larger than intra-core) integration effects on intra-EU trade volumes as a whole and, especially, on core-periphery trade. According to the projections, a *sixth* enlargement changes this trend. Then, intra-periphery and intra-core trade becomes increasingly more important than core-periphery trade. Of course, this is cannot be interpreted in welfare terms and it does not imply that any further enlargement is not desirable. However, it suggests that there may be an optimal size in terms of the union's potential integration effects on the volume of trade growth, *given the single EU6 core*. The increase of the intra-periphery trade effects from any further enlargement supports the view that an endogenous formation of a second core within the periphery becomes more likely. The periphery gets access to its full natural "hinterland" (compare Krugman, 1991, p. 86f.) and expands its activity at the expense of the old core.[17] In this respect and in accordance with Krugman (1991), the results indicate that the present EU should not simply be viewed as a single, homogeneous core (or hub), which only fosters its trade with several, different spokes in course of enlargements (compare Enders & Wonnacott, 1996).

[16] Noteworthy, the past enlargements have been considerably different from the future ones in terms of the number, the size and the characteristics of entrants. Our projection should not be read as a prediction, since the previous enlargements have not been sufficiently uniform to permit treating them as a single sample.

[17] A prime example would be Austria, which gets better access to the adjacent Central and Eastern European countries.

Another possibility would be an endogenous enlargement of the old core. It remains a question for future research, whether a growing old core or the formation of a second core emerges as a result from the EU enlargement process.

4 Conclusions

This paper contributes to the discussion on the role of new regionalism for bilateral trade volumes. It concentrates on the EU and, in contrast to previous research, on the pattern of the intra-EU integration effects with a special focus on trade *within* and *between* the EU core and periphery. We use a gravity model and set up a rigorous, nested analysis of variance framework, where the integration effects are measured by a comprehensive set of integration group dummies, which vary over integration phases. Equivalent to difference in difference estimates, this allows the isolation of the EU integration effects on trade volumes as claimed in Srinivasan (1998).

Treating the six founding members as the core and the rest of EU countries as the (inhomogeneous and evolving) periphery, we find that both core-periphery and intra-periphery trade faced a stronger positive effect from integration than intra-core trade itself. Hence, EU integration did not foster "peripherality". We identify a negative effect of the southern enlargements and Eurosclerosis on the intra-core volume of trade. However, intra-periphery trade and core-periphery trade did not experience a relative disintegration from this development. In general, the positive integration effects seem to weaken in course of the enlargements. Taking the model literally and un-

dertaking extrapolations of our estimates in an experiment of thought leads to the tentative conclusion that *typical* further enlargements are likely to intensify both intra-periphery and intra-core trade at the expense of core-periphery trade. In terms of the multi-region models of economic geography, this could be interpreted as an implicit indication that either the old core enlarges or a multiple-core structure evolves with a second core coming into existence in the periphery.

5 References

Aitken, Norman D. (1973), The Effect of the EEC and EFTA on European Trade: A Temporal Cross-Section Analysis, *American Economic Review* **63**, pp. 881-892.

Baier, Scott, and Jeffrey H. Bergstrand (2001), Is Bilateralism Good? On the Economics of Free Trade Agreements, unpublished manuscript, University of Notre Dame.

Baldwin, Richard E. (1994), *Towards and Integrated Europe* (CEPR: London).

Baltagi, Badi H. (2001), *Econometric Analysis of Panel Data* (Wiley: Chichester).

Bayoumi, Tamim and Barry Eichengreen (1998), Is Regionalism Simply a

Diversion? Evidence from the Evolution of the EC and EFTA, in Takatoshi Ito and Anne O. Krueger (eds.), *Regionalism versus Multilateral Trade Arrangements* (University of Chicago Press: Chicago).

Bergstrand, Jeffrey H. (1989), The Generalized Gravity Equation, Monopolistic Competition, and Factor Proportions Theory in International Trade, *Review of Economics and Statistics* **71**, pp. 143-153.

Bergstrand, Jeffrey H. (1990), The Heckscher-Ohlin-Samuelson Model, the Linder Hypothesis and the Determinants of Bilateral Intra-Industry Trade, *Economic Journal* **100**, pp. 1216-1229.

Cheng, I-Hui and Howard Wall (2001), Controlling for Heterogeneity in Gravity Models of Trade, with I-Hui Cheng, Federal Reserve Bank of St. Louis Working Paper no. 99-010B.

Enders, Alice and Ronald J. Wonnacott (1996), The Liberalisation of East-West Trade: Hubs, Spokes and Further Complications, *The World Economy* **19**, pp. 253-272.

Frankel, Jeffrey A., Ernesto Stein, and Shang-Jin Wei (1996), Regional Trade Arrangements: Natural or Supernatural?, *American Economic Review Papers and Proceedings* **86**, pp. 52-56.

Frankel, Jeffrey A., Ernesto Stein, and Shang-Jin Wei (1998), Continental

Trading Blocs: Are They Natural or Supernatural?, in Jeffrey A. Frankel (ed.), *The Regionalization of the World Economy* (University of Chicago Press: Chicago), pp. 91-113.

Helpman, Elhanan E. (1987), Imperfect Competition and International Trade: Evidence from Fourteen Industrial Countries, *Journal of the Japanese and International Economies* **1**, pp. 62-81.

Helpman, Elhanan E. and Paul R. Krugman, *Market Structure and Foreign Trade*, (MIT Press: Cambridge, Mass.)

Krueger, Anne O. (1999), Trade Creation and Trade Diversion Under NAFTA, NBER Working Paper no. 7429.

Krugman, Paul R. (1991a), Is Bilateralism Bad?, in Elhanan Helpman and Assaf Razin (eds.), *International Trade and Trade Policy* (MIT Press: Cambridge MA.).

Krugman, Paul R. (1991b), The Move toward Free Trade Zones, in Federal Reserve Bank of Kansas City, *Policy Implications of Trade and Currency Zones* (Federal Reserve Bank: Kansas City).

Krugman, Paul R. (1991c), *Geography and Trade* (MIT Press: Cambridge MA.).

Krugman, Paul R. (1998), Comment on Frankel, Stein and Wei (1998), in Jeffrey A. Frankel (ed.), *The Regionalization of the World Economy* (University of Chicago Press: Chicago), pp. 114-115.

Sapir, André (1998), The Political Economy of EC Regionalism, *European Economic Review* **42**, pp. 717-732.

Sapir, André (2001), Domino Effects in Western European Regional Trade, 1960-1992, *European Journal of Political Economy* **17**, pp. 377-388.

Soloaga, Isidro and Alan L. Winters (2001), Regionalism in the Nineties: What Effect on Trade?, *North American Journal of Economics and Finance* **12**, pp. 1-29.

Srinivasan, T. N. (1998), Comment on Frankel, Stein and Wei (1998), in Jeffrey A. Frankel (ed.), *The Regionalization of the World Economy* (University of Chicago Press: Chicago), pp. 116-120.

Viner, Jacob (1950), *The Customs Union Issue* (Carnegie Endowment for International Peace: New York)

Table 1: Intra-EU Trade - Different EU Concepts

EU definition	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**
	1960-1964	1965-1972	1973-1980	1981-1985	1986-1995
EU6 (core: BEL, FRA, GER, ITA, LUX, NLD)	-0.633 ***)	-0.229 ***)	0.004	0.201 ***)	0.064 *)
EU9 (EU6 + DNK, GBR, IRL)	-0.969 ***)	-0.673 ***)	-0.202 ***)	0.153 ***)	0.030
EU10 (EU9 + GRC)	-0.960 ***)	-0.706 ***)	-0.248 ***)	0.130 ***)	0.030
EU12 (EU10 + ESP, PRT)	-0.998 ***)	-0.789 ***)	-0.496 ***)	-0.081 *)	-0.052
EU15 (EU12 + AUT, FIN, SWE)	-0.855 ***)	-0.673 ***)	-0.437 ***)	-0.076 *)	-0.063 *)

Note: The effects in this table are weighted averages of the corresponding group x phase effects.

Table 2: Trade of the EU6 Core with Different Enlargement Groups and the Rest of OECD Countries

Partner group	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**
	1960-1964	1965-1972	1973-1980	1981-1985	1986-1995
EU6 (core: BEL, FRA, GER, ITA, LUX, NLD)	-0.633 ***)	-0.229 ***)	0.004	0.201 ***)	0.064 *)
First enlargement (DNK, GBR, IRL)	-1.207 ***)	-0.998 ***)	-0.382 ***)	0.078	-0.009
Second enlargement (GRC)	-0.796 ***)	-0.504 ***)	-0.208 ***)	0.111 *)	0.071
Third enlargement (ESP, PRT)	-1.028 ***)	-1.021 ***)	-0.970 ***)	-0.448 ***)	-0.194 ***)
Fourth enlargement (AUT, FIN, SWE)	-0.506 ***)	-0.528 ***)	-0.397 ***)	-0.076 *)	-0.108 ***)
Rest of the OECD	-0.337 ***)	-0.284 ***)	-0.236 ***)	0.004	-0.059

Note: The effects in this table are the corresponding, directly estimated group x phase effects.

Table 3: Intra-Group Trade - Different Enlargement Groups

Partner group	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**
	1960-1964	1965-1972	1973-1980	1981-1985	1986-1995
EU6 (core: BEL, FRA, GER, ITA, LUX, NLD)	-0.633 ***)	-0.229 ***)	0.004	0.201 ***)	0.064 *)
First enlargement (DNK, GBR, IRL)	-1.806 ***)	-0.444 ***)	0.009	0.368 ***)	0.106
Second enlargement (GRC)	-	-	-	-	-
Third enlargement (ESP, PRT)	-	-2.368 ***)	-2.266 ***)	-1.403 ***)	-0.483 ***)
Fourth enlargement (AUT, FIN, SWE)	-0.943 ***)	-0.288 ***)	0.037	0.133 **)	0.002

Note: The effects in this table are the corresponding, directly estimated group x phase effects.

Table 4: EU Integration and Intra-Group Trade Growth

Integration group concept	Phase 3-2	Phase 4-3	Phase 5-4	Phase 6-5
Intra-EU trade growth minus intra-core trade growth				
Estimated growth difference effect (log differences)	0.237 ***)	0.181 ***)	0.166 ***)	0.127 ***)
F-statistic	137.57	131.83	96.43	35.56
Core-periphery trade growth minus intra-core trade growth				
Estimated growth difference effect (log differences)	0.382 ***)	0.228 ***)	0.171 ***)	0.139 ***)
F-statistic	158.31	103.84	67.26	31.97
Intra-periphery trade growth minus intra-core trade growth				
Estimated change of growth difference effect (log differences)	0.219 **)	0.327 ***)	0.266 ***)	0.149 ***)
F-statistic	6.47	46.05	57.57	22.10

Note: The effects in this table are phase-to-phase differences between the weighted averages of the corresponding group x phase effects.

Figure 1: Intra-EU Trade Growth minus Intra-Core Trade Growth Due to Enlargements and Third-Order Polynomial Projection

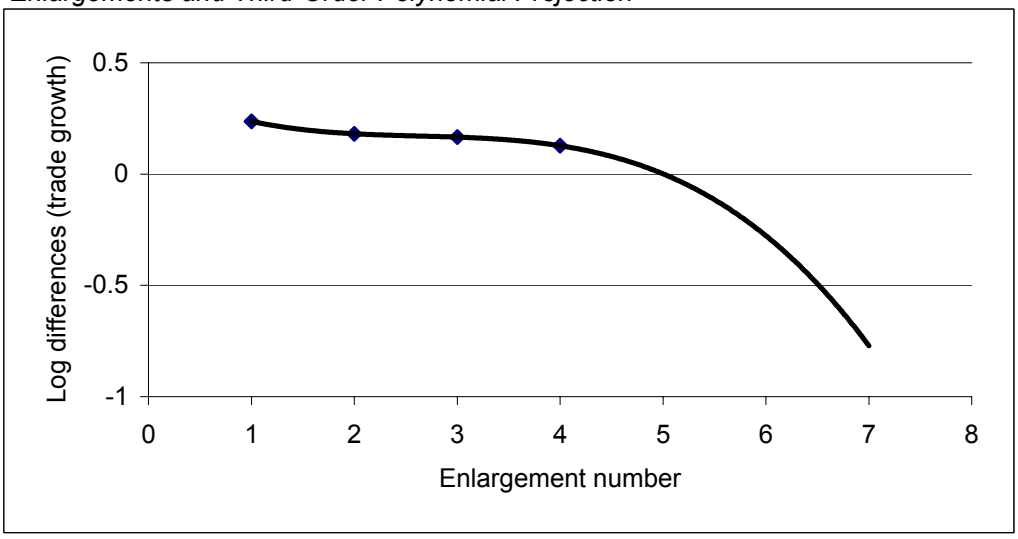


Figure 2: Core-Periphery Trade Growth minus Intra-Core Trade Growth Due to Enlargements and Third-Order Polynomial Projection

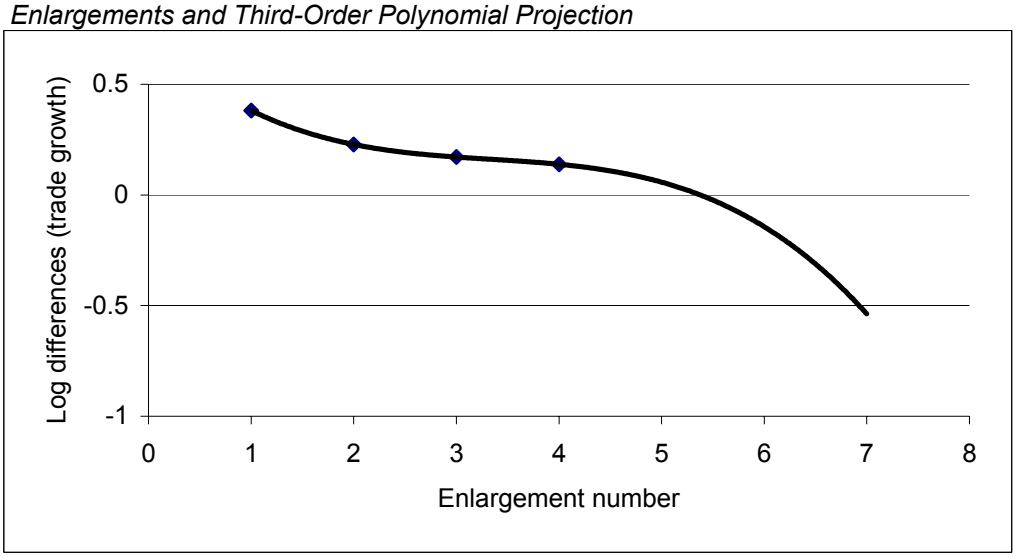
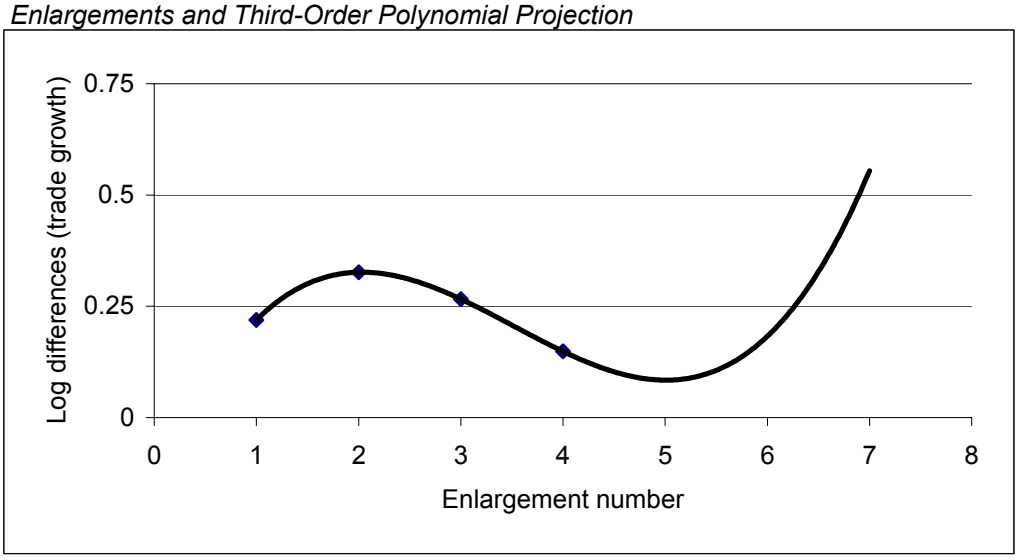


Figure 3: Intra-Periphery Trade Growth minus Intra-Core Trade Growth Due to Enlargements and Third-Order Polynomial Projection



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