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**Zooming Out: The Trade Effect of the EURO
in Historical Perspective**

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The Trade Effect of the Euro in Historical Perspective

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Abstract

In 1999, eleven European countries formed the Economic and Monetary Union (EMU); they abandoned their national currencies and adopted a new common currency, the euro. Several recent papers argue that the introduction of the euro has led (by itself) to a sizable and statistically significant increase in trade between the member countries of EMU. In this paper, we put the trade effect of the euro in historical perspective. We argue that the creation of the EMU was a continuation (or culmination) of a series of previous policy changes that have led over the last five decades to greater economic integration among the countries that now constitute EMU. Using a data set that includes 22 industrial countries from 1948 to 2003, we find strong evidence of a gradual increase in trade intensity between European countries. Once we control for this trend in trade integration, the euro's impact on trade disappears. Moreover, a significant part of the trend in European trade integration is explained by measurable policy changes.

JEL: F02, F15, F33

Keywords: monetary union, currency, euro, trade, European integration

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I. Introduction

On January 1, 1999, eleven countries formed the European Economic and Monetary Union (EMU); they formally abandoned their national currencies and adopted a new currency, the euro.¹ A number of recent papers argue that the formation of the EMU has had a sizable effect on the member countries' pattern of international trade. Micco, Stein, and Ordoñez (2003, henceforth MSO), for instance, find that for pairs of countries that have adopted the euro, trade has increased by about 4-16 percent. Other papers, including Baldwin, Skudelny, and Taglioni (2005), Barr, Breedon, and Miles (2003), Bun and Klaassen (2002), De Nardis and Vicarelli (2003), De Sousa and Lochard (2004), Faruqee (2004), and Flam and Nordström (2003), report broadly similar, and often even larger, estimates.

While much of this work should be taken with caution (given that, at this early stage, only a few years of data from the EMU period are available)², the finding that the introduction of the euro has a positive and significant effect on intra-EMU trade has attracted considerable attention for at least two reasons. For one thing, the result has important policy implications. If a common currency immediately boosts trade even among highly integrated economies, currency unions become more attractive. As a result, countries that are currently considering joining EMU may opt for an early adoption of the euro.

A more general implication is that a positive trade effect of the euro – even if initially moderate in magnitude – would appear to provide empirical support for Andrew Rose's (2000) finding that establishing a common currency significantly increases trade among union members.³ Rose's finding was met with great skepticism. Critics noted, for instance, that the conclusions were based on a sample of currency union members that mainly consists of small, poor and dependent territories and therefore might not apply to other economies.⁴ The formation of the EMU allows addressing at least some of the objections: it presents one of

¹ The countries are: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain. As twelfth member country, Greece joined EMU on January 1, 2001. All of our empirical results refer to the original eleven EMU members (with joint data for Belgium and Luxembourg); we get qualitatively similar results when we use EMU-12 instead.

² The sample period that is analyzed in these papers typically extends through the end of 2002. At that time, EMU had been in existence for four years. However, since the euro was not introduced as a physical currency before January 1, 2002, the sample period often covers only a single year of data from when the new currency was actually in circulation.

³ Previous results suggest that the trade effect of currency union entries/exits may be subject to extremely long lags. Glick and Rose (2002) estimate that it will take about three *decades* after a change in the currency regime for trade to double.

⁴ Persson (2001) even argues that Rose's empirical specification is inappropriate since countries that belong to currency unions are systematically different from the rest of the sample.

those rare “natural experiments” that permits analyzing the impact of the introduction of a common currency on trade between large and independent nations.⁵

In this paper, we take a fresh look at the evidence on the euro’s effect on trade. In particular, we argue that the potential trade-creating effects of the EMU must be viewed – and analyzed – in the proper historical perspective. Rather than focusing on the formation of a monetary union as an isolated event, we emphasize that the creation of the EMU was a continuation, or perhaps a culmination, of an integration process that started almost half a century ago.⁶ In fact, this process may go back (at least) as far as the Marshall plan of 1948, which, according to Berger and Ritschl (1995), helped to reestablish the traditional European division of labor in trade. The 1950s saw efforts to harmonize tariffs, regulations, and economic policies across European countries, leading up to the Treaty of Rome in 1957. After the removal of internal trade barriers, the integration process continued, eventually encompassing European monetary cooperation (after the end of the Bretton Woods system), a gradual increase in EU membership (in the 1970s and 1980s), and the introduction of the single market framework (in 1987). Since all this set the table for the Maastricht Treaty of 1991 and, thus, ultimately the formation of the EMU, the question of interest to us is: What has been the euro’s impact on trade above and beyond the impact of previous and ongoing steps toward economic integration in Europe?

Taking a long-run view of European integration, we find that the introduction of the euro has almost no measurable effect on trade. In particular, the incremental trade effect of the euro is reduced once elements of European economic integration, such as trade liberalization, economic harmonization, and low exchange rate volatility, are taken into account. More importantly, there is strong evidence for a gradual increase (rather than a one-time jump) in trade intensity between countries that later join the EMU over a period of more than a half century. As soon as we control for this long-term trend, the introduction of the euro has no additional effect on trade. These results are robust across a number of model specifications and alternative data sets.

The remainder of the paper is organized as follows. In section II, we briefly review the existing evidence of the euro’s effect on trade. Section III describes our estimation

⁵ Other episodes of currency union formation and entry in the post-war period are analyzed in Nitsch (2005).

⁶ Faruqee (2004, p. 4) makes a similar point, arguing that EMU is best viewed as an “ongoing process that, in many ways, preceded the euro”.

methodology and the data, followed by a presentation of our benchmark results on the evolution of trade between current EMU members over a period of more than 50 years. Section V explores some determinants of growing intra-EMU trade, and section VI provides a short conclusion.

II. Zooming In: Some Open Issues

Previous findings of a significant trade-enhancing effect of EMU, although generally consistent with Rose's (2000, 2004) observation that common currencies promote trade, invite a more detailed examination for a number of reasons. We focus here on results reported in MSO; other studies often present (qualitatively) similar results.⁷

A first notable observation from these papers is that the estimated trade effect of the euro appears to be surprisingly large relative to the trade effect of membership in the European Union (EU). According to MSO's benchmark cross-country regressions (reported in their Table 1), the point estimate of EMU membership on trade is 0.20, while the estimated coefficient of EU membership on trade is only marginally larger, at 0.27. These results imply that the adoption of the euro has almost the same impact on trade as the removal of trade barriers and the creation of a single market (i.e., further harmonization and integration) in the European Union.⁸ Given the much shorter history of EMU and the large degree of monetary integration that was already achieved before the adoption of the euro (with low exchange rate volatility between countries that later join the EMU), this is a remarkable finding inviting further study.

Another interesting empirical observation is that trade between EMU members was obviously already disproportionately large in 1998, i.e., one year *before* the formation of the monetary union (and the irrevocable fixing of exchange rates); see Table 2 in MSO.⁹ The

⁷ Gomes et al. (2004) discuss some of these points in more detail; they also provide an excellent review of the related literature.

⁸ The total impact of EU membership is obtained by adding the coefficient of EU membership, the coefficient of the EU Trend multiplied by the mean of the trend, and the coefficient of membership in a Free Trade Arrangement; see footnote 2 in MSO. The coefficients imply that trade between EMU members is estimated to be 22 percent ($=\exp[0.20]-1$) higher than the rest of the sample after 1999, while the trade-increasing effect of EU membership is estimated at 31 percent ($=\exp[0.27]-1$).

⁹ It should also be noted that, in principle, several dates could be identified as important for the introduction of the euro, each of which could be associated with a significant increase in trade. These dates include the signing of the Maastricht treaty in February 1992, the fixing of the final date for the beginning of the currency union at

decision about the final set of participating countries, however, was only made in early/mid-1998 and even then some uncertainties remained. For instance, the ultimate conversion rates were not specified until the very end of the convergence process, making a strong anticipation effect less likely.¹⁰ These difficulties in dating the exact beginning of the EMU point towards other – somewhat more continuous – dimensions of the European integration process that are often neglected.

Indeed, reviewing the results on the evolution of trade intensity between EMU countries in MSO's Table 2 more generally, there appears to be gradual increase in trade integration over the (full) period (from 1992 through 2002) that is analyzed by MSO; the results indicate a surprisingly steady rise in the estimated intra-EMU trade intensities. The yearly EMU coefficients increase from a low of -0.02 (with a standard error of 0.03) in 1993 to 0.04 (0.03) in 1997 and, after rising both in terms of size and significance in 1998, the coefficients continue to grow over the EMU period from 0.12 (0.03) in 1999 to 0.15 (0.04) in 2002.¹¹

Finally, MSO also present results on the trade effect of the euro disaggregated by country (and by country group). These estimates (reported in their Table 7) suggest that the EMU had the largest effect on trade for countries of the former Deutsche-Mark bloc. In fact, when the DM bloc is dropped from the sample, the estimated coefficient on EMU membership even becomes statistically insignificant. However, since the exchange rate links between the DM bloc countries (including the non-EMU member Denmark) were, as a rule, already tight before the adoption of a common currency, it is striking to find that the introduction of the euro had the strongest effect on these countries. This invites further investigation of country-specific elements in the European integration process.

In the following, we argue that many of these results, in particular the finding of a sizable increase in trade after the introduction of the euro, are very sensitive to the analyzed time period and the regression specification. Extending the length of the sample to cover the

the end of 1997, the actual start of the EMU on January 1, 1999, or the introduction of the euro as physical currency on January 1, 2002.

¹⁰ See Flam and Nordström (2003) for an alternative view.

¹¹ To illustrate, regressing MSO's EMU coefficients for the developed country sample and the period from 1993 through 2002 on a constant and a linear time trend yields a highly significant estimate of about 0.02 and an adjusted R² of 0.89.

entire post-war period and accounting for the underlying non-monetary integration dynamics within the European Union has a significant impact on estimation results.

III. Methodology and Data

We estimate variants of an augmented gravity model of the form:

$$(1) \quad \ln(T_{ijt}) = \alpha + \sum_{k=1}^n \beta_k X_{ijk} + \gamma \text{EMU}_t \{ + \phi_{ij} + \eta_t \} + \varepsilon_{ijt}$$

where T_{ijt} is the volume of trade between country i and j at time t in real US dollars; X_t is a set of n conditioning variables that are typically found to affect bilateral trade flows (such as the size of and distance between the trading partners); EMU_t is a binary variable that takes the value of one if the two countries are members of the European Monetary Union; $\{\phi_{ij}\}$ and $\{\eta_t\}$ are a comprehensive set of country pair- and time-specific fixed effects; and ε_t is a residual assumed to have standard characteristics. This set-up is standard and has been used, among others, by Rose (2000), Glick and Rose (2002) and MSO.

In early work on the common currency effect on trade, the above framework was mainly implemented in cross-section fashion; see, for instance, Rose (2000). In this specification, the data are typically pooled over time, but year dummies eliminate the time-series variation so that the currency union dummy captures the extent to which trade between members of a currency union differs from (or, more precisely, is larger than) trade between countries using separate currencies. For illustrative purposes we reproduce MSO's benchmark regression results based on this specification in the second column of Table 1.^{12, 13} The point estimate of 0.19 implies that trade between EMU members is about 21 percent ($=\exp[0.19]-1$) higher than trade between non-EMU members, holding other things constant.

¹² Countries in the developed country sample are: Australia, Austria, Belgium-Luxembourg, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States. The European sample is a subset of the above.

¹³ Note that, in replicating the results, we slightly depart from MSO's regression specification. In particular, we drop two explanatory variables for which MSO report insignificant coefficients: the log product of land areas and an EU trend integration measure. Thus, for the sake of comparison, we re-estimated the gravity model with MSO's original data (taken from the [Economic Policy](#) website) instead of simply copying their original results. As shown, this hardly influences the results.

For our purposes, however, the cross-sectional approach has a severe drawback. The estimated coefficient on EMU membership (as the one replicated above) is not necessarily an indication of the trade effect of the euro. In fact, it is quite plausible that the EMU countries shared a disproportionately large amount of trade already before the adoption of a common currency. Therefore, to identify the *change* in trade intensity *after* the formation of EMU, adding country-pair fixed effects might be a useful strategy. By allowing for country-pair specific intercepts that account for any particularly strong (or weak) bilateral tendency to trade, the estimator exploits the time series variation around country-pair averages and the EMU dummy captures the extent to which trade between EMU member countries differs before and after the adoption of the common currency (see Glick and Rose (2002), among others). MSO (p. 327) argue that the use of country-pair dummies “provides the cleanest possible benchmark against which to assess the euro effect on trade.”¹⁴

We follow MSO and others, and use the regression specification with a comprehensive set of country-pair fixed effects as our preferred specification. For the sake of completeness, we also continue reporting results on the cross-sectional set-up our preferred specification.¹⁵

Estimation results derived from the fixed effects regression are reported in the third column of Table 1; results from the preferred specification are presented in shaded columns. As expected, the coefficient on the EMU dummy falls considerably, suggesting that countries that later joined EMU had indeed strong trade relations already before the formation of the monetary union. Nonetheless, the coefficient on EMU membership remains positive and statistically highly significant. The estimate of about 0.05 implies that the adoption of the euro has increased trade between EMU members by about 5 percent ($=\exp[0.05]-1$). Restricting the sample to European countries yields broadly similar results (reported in panel b of Table 1).

In the remaining columns of Table 1, we seek to replicate MSO’s results using an updated data set that incorporates the most recent data revisions and extends the sample period to 2003. The exercise carefully follows MSO’s original approach, using the same data sources and data definitions.¹⁶

¹⁴ Klein and Shambaugh (2004) provide a more detailed discussion of the various estimation techniques.

¹⁵ Parenthetically, we note that, in principle, it is possible to combine both approaches by adding a separate dummy variable to the cross-country set-up; this variable takes the value of one for the whole sample period if the two countries are – or eventually later become – EMU members (i.e., adding a pooled EMU country-pair fixed effect).

¹⁶ The data set is described in more detail in Appendix 1.

Somewhat surprisingly, data revisions seem to have a large impact on the estimation results. In column four of Table 1 (using the same sample period as in MSO), the EMU coefficient is still positive and statistically highly significant, but the estimated magnitude of the coefficient is almost twice as large as suggested by MSO's original results; the point estimate of about 0.31 suggests that EMU members trade about 36 percent ($=\exp[0.31]-1$) more with each other than with non-members or countries with separate currencies. For the country-pair fixed effects estimates (tabulated in the fifth column of Table 1), the effect seems to be even more pronounced and continues as we extend the data set to 2003 (last column).¹⁷ While it is surprisingly hard to identify country- or period-specific data revisions that explain these changes, revisions to GDP appear to be particularly influential. Restricting the sample to European countries (reported in panel b of Table 1) leaves the picture essentially unchanged.

In summary, it seems that the finding of a surge in intra-EMU trade after the adoption of a common currency becomes even more intriguing when the original MSO set-up is applied to the revised and updated data set.

IV. Zooming Out: Putting the Euro's Effect on Trade in Perspective

After having added another year of EMU data, we now extend our data set backwards. MSO explore a sample that covers the 10-year period from 1992 to 2002; we lengthen the sample to include the entire post-war period starting in the late 1940s. Estimation results are depicted in Table 2. Turning directly to our variable of interest, the point estimates for EMU membership not only remain positive and statistically highly significant (with a t-statistic often close to 10), but also increase substantially in magnitude. The benchmark (country-pair fixed effects) estimate for the developed country sample (reported in the third column of Table 2) implies that trade between EMU members exceeds trade between countries using separate currencies by about 41 percent ($=\exp[0.34]-1$), and even larger positive effects are found when the country-pair-specific fixed effects are dropped (second column) or the sample is restricted to European economies.

¹⁷ Gomes et al. (2004) report similar findings.

A possible explanation for this dramatic increase in the estimated EMU effect is that the additional inclusion of trade observations before 1992 lowers the sample average of bilateral trade flows, thereby further highlighting the above-average tendency to trade between EMU member countries. In view of this obvious dependence of the estimated EMU effect on the sample period, it appears to be even more important to put the trade-creating effects of EMU in historical perspective.¹⁸ We now turn to that task.

There are essentially two approaches to analyze the evolution of trade (or, more precisely, the development of cross-country variation in bilateral trade) over time. A first approach is to run separate regressions for every single year in the sample. The coefficient on the currency union dummy then captures, year by year, the extent to which trade between (future) EMU member countries deviates from the sample average, after controlling for other factors. Alternatively, one can estimate a pooled regression for the full sample period, adding separate annual currency union dummies. In contrast to the previous approach, this specification requires the coefficients on the control variables to be constant over time. In practice, however, it turns out that the results for both models are largely identical. Figure 1 plots the coefficient estimates on the EMU dummy for both specifications; panel a shows the results for the full country sample and panel b the coefficient estimates for the subgroup of European countries. Accompanying estimation results for 10-year periods are reported in Table 3.

The most notable observation from Figure 1 (and also Table 3) is a strong positive long-term trend in the bilateral tendency to trade between the countries that later join EMU. Trade between future EMU members was still significantly below the sample average in the wake of World War II. Since then, however, trade has increased over a span of more than five decades to levels clearly, and significantly, above average trade within the sample. Against this backdrop, the increase in intra-EMU trade that we (and others) observe after the formation of EMU is largely a continuation of a remarkable longer-term trend. Arguably, Figure 1 still hints at a euro effect, but the increase in trade is small when compared with the long-term trend driving intra-EMU trade long before the inception of a common currency at the end of the 1990s.

¹⁸ Bun and Klaassen (2004) also note a positive association between the sample period and the estimated impact of the euro on trade.

Whether the positive trend in intra-EMU trade vis-à-vis the rest of the sample is continuous over time partly depends on the country sample that is used as control group. Relative to trade between all developed countries in the sample, intra-EMU trade grew in spurts, with the 1950s and 1980s being exceptionally dynamic periods, while the late 1960s and the 1970s were periods of relative stagnation. This general pattern is still discernable when the control group is restricted to European countries. However, relative EMU trade growth appears to have been somewhat more stable in this sample.

The long-term upward trend in intra-EMU trade also remains intact after the introduction of country-pair fixed effects to control for any unobserved time-invariant determinants. Figure 2 illustrates that, with this modification, there is still clear evidence of a gradual increase in bilateral trade among future EMU economies. Note that the estimated values for the time-variant EMU dummies are consistently positive in this specification, since the country-pair fixed effects control for the average deviation of intra-EMU trade from the mean of the sample.

V. Explaining the Evolution of Intra-EMU Trade

What could explain this particular time pattern in the evolution of intra-EMU trade? The growth spurt in the immediate post-war period seems to reflect the rapid re-emergence of pre-war patterns in European trade, fostered by institutions that were established under the auspices of the Marshall plan, including the European Payments Union. These institutions helped to overcome problems of convertibility and alleviated the notorious European trade deficit with the US by re-integrating the German economy into the European network of trading partners; see, for instance, Berger and Ritschl (1995).

The reestablishment of trade patterns was accompanied by the formal harmonization of tariffs, regulation, and economic policies, efforts that finally led to the founding of the European Economic Community (EEC) in 1957 and of the European Free Trade Agreement (EFTA) in 1960; Appendix 2 provides a broad timeline of important steps towards European integration. While institutional integration slowed somewhat during the 1960s, it was rejuvenated in the late 1970s when—in the aftermath of the demise of the Bretton Woods

system—European monetary cooperation took shape.¹⁹ After another period of low activity in the early 1980s (often denoted as ‘euro-pessimism’), the integration process re-intensified again in the second half of the 1980s with the preparation and passing of the Single European Act (which set up the single market framework), a streamlining of the work of the European Commission, and the start of the political process that culminated in the Maastricht Treaty of 1991.

While there is no obvious link between the landmarks of institutional integration and the particular time pattern in the evolution of intra-EMU trade that we observe empirically, it seems likely that the two are related. In particular, it would seem that – from the institutional perspective – the establishment of the EMU in 1999 was just another step in the long-developing movement toward increased integration and greater convergence. As a result, trade relations between EMU members intensified after 1999 as they intensified over the previous several decades in response to earlier efforts to increase integration.

Continuing along this line but trying to go beyond the narrative, we further explore this issue by expanding our econometric model. Thereby, we aim to shed some light on the factors underlying the time path of intra-EMU trade

Exchange Rate Stability

We begin by examining a measure of exchange rate volatility. In the actual implementation, we use the standard deviation of the mean monthly bilateral exchange rate in the year of interest.²⁰ The data were obtained from the IMF’s International Financial Statistics and are available (only) from 1957 onwards. Figure 3 portrays the evolution of exchange rate volatility over the sample period; the graph shows that our volatility measure basically follows an inverted U-shaped pattern.

Interestingly, periods for which we observe a rapid increase in trade integration in Europe, at the beginning and at the end of our sample period (the 1950s and 1960s under the Bretton Woods system and the late 1980s and early 1990s under the European Monetary System [EMS], respectively), are typically associated with low exchange rate volatility.

¹⁹ The European Monetary System entered into force in March 1979. In the same year the European Parliament was, for the first time, elected directly by European voters.

²⁰ Note that the construction of the exchange rate variable allows for bilateral differences in exchange rate volatility. Modifications of this measure, such as using lagged or average values, have no effect on our findings. Alternative results available on request.

Table 4 reports the regression results. The coefficient on exchange rate volatility takes on the expected (negative) sign and is significant in most specifications; that is, stable exchange rates tend to promote trade. However, with the additional inclusion of this variable, the estimates for the EMU dummy fall only marginally. In the preferred model with country-pair fixed effects, the estimated EMU effect drops by about 3 percent (1 percent in the European sample). While this points in the expected direction, including exchange rate volatility largely fails to capture the long-term trend in EMU trade intensity.

Institutional Integration

In a second extension of the basic model, we add a (country-specific) measure of institutional integration in Europe. Since no comprehensive indicator is readily available, we define an (albeit crude) index of integration. The index combines information from three different sources, each summarizing important elements of the integration process in Europe over a certain period. For each of these three measures, the index is defined to vary between 0 (no liberalization) and 10 (full liberalization) index points, so that the overall index ranges from 0 to 30 (=3*10). Figure 4 graphs the sample average of the index, along with minimum and maximum values. In the regression analysis, we take the pair-wise minimum of the country-specific degree of integration; alternative specifications, including the pair-wise mean, yield basically similar results.

The index is constructed as follows. For the 1950s, we obtain information on the percentage of intra-European trade that is freed from quantitative restrictions. The data are available from the Organization for European Economic Co-operation (OEEC) on a bi-annual basis for the period from 1950 through 1961 for 17 major European countries; we take mid-year figures from the OEEC's final (1961) Annual Economic Review (Table 35) and divide these percentages by 10. At the beginning of the period, about one-half of private imports among the member countries were free of quotas. In the following years, this figure rapidly increased and often reached values significantly above 90 percent by 1956.

Beginning in the late 1950s, trade liberalization was increasingly carried out within subgroups of countries – most prominently in the EEC and the EFTA; see Appendix 2. The gradual phase-out of tariffs within, and between, these groupings is captured by an average tariff index that we take from Table 2 in Ben-David (1993). This tariff index is set to 100 in

1958 and gradually falls to 0 in 1967 (for intra-EFTA trade), 1968 (for intra-EEC trade) and 1977 (for EEC-EFTA trade). In the actual implementation of this tariff measure, we obtain our overall index of European trade integration during this period by adding the difference between 100 and the actual tariff index, divided by 10, to the starting value of 10.

The late 1970s and early 1980s were characterized by less dynamic real economic integration and liberalization efforts than previous periods, with the exception of some political progress and the rise of the EMS (which helped providing stable exchange rates). Thus, with other variables available to capture exchange rate stability (see above), our measure of European economic integration remains unchanged during this period.

Finally, attempts to eliminate the remaining barriers to the free movement of goods, services, capital and workers within Europe re-intensified in the mid-1980s, culminating in the introduction of the single market framework in 1992. At this time, the European Commission began to track the integration policies of individual member states with the help of an Internal Market Index (among other measures). This index is a composite measure of 12 indicators, including various prices (e.g. for electricity and gas) and intra-EU trade and investment.²¹ We use this index and normalize it so that it takes the value of 20 in the base year 1992 and that a doubling in the index equals 10 index points.

Table 5 shows the results when our measure of institutional integration is added to the gravity model. The estimated coefficient on the integration index is positive and statistically significant in all specifications, indicating that trade between more liberalized European countries is indeed disproportionately large. Moreover, the economic impact of the integration measure is sizable. As shown in Figure 4, the index increases on average from 0 to about 25 over the sample period. Thus, the point estimate in the preferred fixed effects model implies an impact of European integration on trade of about 19 percent ($=\exp[0.007*25]-1$) in the all-countries sample.

To calculate the full impact of EU integration on trade, however, also the time-invariant effect of EU membership (captured by the EU and FTA dummies) has to be taken into account. Their combined trade-enhancing effect is about 33 percent in the full sample

²¹ See http://europa.eu.int/comm/internal_market/score/index_en.htm for a more detailed description.

(coefficient estimates are not reported), implying an overall integration effect of about 58 percent; the comparable figure for the smaller European sample is 81 percent.²²

The overall long-term effect of European integration by far exceeds the estimated trade effect of the euro. The inclusion of the integration measure reduces the estimated trade effect of the euro, but the impact is modest. The point estimate for the EMU dummy falls by about one-third for the pooled OLS estimation and by just one-tenth for the preferred fixed effects specification. The point estimate of 0.27 implies that trade between EMU members is estimated to be about 31 percent higher in the full sample for the preferred model.²³ This also suggests, however, that the estimated impact of EMU membership on trade remains considerably smaller than the overall effect of European trade integration (see above). Based on our crude integration measures, the integration effect seems to be almost twice as large as the common currency effect on trade.

Controlling for Trend Integration

Finally, to more fully describe the development of intra-EMU trade across time we add a time trend to our preferred specification.²⁴ While somewhat less refined than the index-based set-up discussed above, introducing a time trend adds considerable flexibility to the econometric model that should help identifying the underlying dynamics of intra-EMU trade.

Table 6 shows that the introduction of a simple linear trend completely eliminates the effect of the introduction of the euro on trade intensity (panel a). In the preferred specification with country-pair fixed effects, the point estimate on EMU membership is statistically indifferent from zero (for the full country sample) and even becomes marginally negative. Also in the smaller European sample, the coefficient is no longer significantly positive. At the same time, the trend coefficient is positive and statistically highly significant across samples. In other words, there is no trade effect from the introduction of the euro *in addition* to the post-war trend of increasing trade integration.

²² The figures for the European sample are about 33 percent for the integration effect and about 36 percent for the combined EU and FTA dummies.

²³ These results for the integration measure seem to be robust across alternative model specifications. For instance, interacting the integration index with the EMU2 dummy hardly changes the point estimate on the index itself, while the significance level of the euro effect is reduced to the 15 percent level. Results are not reported, but available on request.

²⁴ Bun and Klaassen (2004) propose a similar approach; they apply country-pair specific time trends for shorter sample periods.

These results are fairly robust.²⁵ Alternative specifications of the trend variable leave the results basically unchanged. For instance, the EMU coefficient remains statistically indifferent from zero at conventional levels when we replace the linear trend by a quadratic trend. Results are shown in panel b of Table 6. Table 7 presents the results of a first-difference specification of the gravity model, examining the annual growth of trade. Again, the estimates support our initial (non-)result: we find that neither the coefficients for entry into the euro area (Δ EMU) nor EMU membership in general (EMU) are significantly different from zero. Allowing for country-pair specific (rather than EMU-specific) linear time trends also leaves the EMU effect statistically insignificant. Finally, the same holds, when we add a time-invariant constant to the linear trend variable for the EMU countries.

Summary

Figure 5 summarizes the estimation results the standard regression approach and our key extensions discussed above. We conclude that the euro effect on trade, while more than a figment of the data, is perhaps best interpreted as the extension of a longer-term trend in European economic integration. There are indications that this trend, in part, reflects a number of measurable policy changes (at both the European and the unilateral level) aimed at fostering economic integration within Europe.

VI. Concluding Remarks

Recent research suggests that the introduction of the euro has a sizable and statistically significant effect on trade among EMU members. Some estimates imply that EMU has increased trade by about 10 percent in its first four years of existence. This finding, if robust, has important policy implications for countries that are considering joining EMU.

In this paper, we put the adoption of the euro by EMU members in historical perspective. We argue that the creation of the EMU is best interpreted as a continuation, or culmination, of a series of policy changes that have led over the last five decades to greater economic integration among the countries that now constitute the EMU. Using a data set that includes 22 industrial countries from 1948 to 2003, we find strong evidence of a gradual increase in trade intensity between European countries. Once we control for this trend in trade

²⁵ All additional results not reported here are available on request.

integration, the effect of the formation of the EMU disappears. A significant part of this trend can be explained by measures of economic integration preceding the introduction of the euro.

These results caution against an unqualified application of the Rose (2000) result that establishing a common currency significantly increases trade among union members to the case of the EMU. While it might well be true that – as some have argued – the advent of the euro was as necessary condition for the European integration process to continue beyond the “single market” agenda in the early 1990s, the euro’s repercussions on trade are difficult to understand without taking proper account of the dynamics of the underlying European institutions. An obvious policy implication is that countries considering joining the euro area (or, for that matter, any currency union) should be wary regarding promises of an imminent acceleration of intra-area trade.

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Table 1: The trade effect of the euro – the short run view

a) Developed countries

Data	MSO	MSO	Updated	Updated	Updated	Updated
Period	1992-2002	1992-2002	1992-2002	1992-2002	1992-2003	1992-2003
EMU2	0.188** (0.038)	0.045** (0.014)	0.306** (0.049)	0.139** (0.015)	0.305** (0.044)	0.143** (0.015)
Real GDP	0.788** (0.008)	1.220** (0.045)	0.799** (0.007)	0.568** (0.025)	0.801** (0.007)	0.562** (0.023)
Real GDP per capita	0.224** (0.033)		0.268** (0.030)		0.273** (0.029)	
Distance	-0.763** (0.021)		-0.789** (0.021)		-0.789** (0.021)	
Common Language	0.800** (0.042)		0.718** (0.037)		0.715** (0.036)	
Common Border	0.243** (0.043)		0.154** (0.050)		0.159** (0.048)	
Free Trade Agreement	0.092# (0.050)	-0.015 (0.019)	0.148** (0.043)	0.019 (0.019)	0.142** (0.042)	0.021 (0.019)
European Union	0.189** (0.044)	0.033 (0.020)	0.214** (0.042)	0.014 (0.021)	0.220** (0.040)	0.015 (0.021)
Landlocked	-0.481** (0.030)		-0.453** (0.031)		-0.448** (0.030)	
Island	0.146** (0.043)		0.215** (0.031)		0.221** (0.030)	
Country pair effects?	No	Yes	No	Yes	No	Yes
Year effects?	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	2,541	2,541	2,541	2,541	2,772	2,772
R ²	0.93	0.45	0.93	0.42	0.93	0.44

Notes:

Dependent variable is the log of bilateral trade in real US dollars.

Robust standard errors are recorded in parentheses.

**, * and # denote significant at the 1, 5 and 10 percent levels, respectively.

Shaded columns and bolded EMU2 results mark the preferred specification with country-pair fixed effects.

b) European countries

Data	MSO	MSO	Updated	Updated	Updated	Updated
Period	1992-2002	1992-2002	1992-2002	1992-2002	1992-2003	1992-2003
EMU2	0.229** (0.041)	0.052** (0.014)	0.359** (0.042)	0.138** (0.015)	0.362** (0.038)	0.143** (0.015)
Real GDP	0.742** (0.009)	1.081** (0.050)	0.721** (0.009)	0.524** (0.031)	0.723** (0.009)	0.515** (0.030)
Real GDP per capita	0.150** (0.036)		0.279** (0.032)		0.282** (0.031)	
Distance	-0.905** (0.028)		-1.035** (0.031)		-1.040** (0.030)	
Common Language	0.423** (0.068)		0.392** (0.060)		0.391** (0.057)	
Common Border	0.297** (0.041)		0.005 (0.050)		0.003 (0.048)	
Free Trade Agreement	-0.158** (0.052)	-0.006 (0.018)	-0.156** (0.046)	0.025 (0.019)	-0.174** (0.045)	0.028 (0.019)
European Union	0.119* (0.047)	0.026 (0.019)	0.131** (0.041)	0.021 (0.021)	0.142** (0.040)	0.022 (0.020)
Landlocked	-0.676** (0.033)		-0.737** (0.032)		-0.734** (0.030)	
Island	-0.152* (0.069)		-0.379** (0.052)		-0.352** (0.050)	
Country pair effects?	No	Yes	No	Yes	No	Yes
Year effects?	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	1,496	1,496	1,496	1,496	1,632	1,632
R ²	0.94	0.51	0.95	0.46	0.95	0.49

Notes:

Dependent variable is the log of bilateral trade in real US dollars.

Robust standard errors are recorded in parentheses.

**, * and # denote significant at the 1, 5 and 10 percent levels, respectively.

Shaded columns and bolded EMU2 results mark the preferred specification with country-pair fixed effects.

Table 2: The trade effect of the euro – the long run view

Sample	Developed	Developed	Europe	Europe
Period	1948-2003	1948-2003	1948-2003	1948-2003
EMU2	0.376** (0.053)	0.343** (0.032)	0.462** (0.049)	0.437** (0.032)
Real GDP	0.824** (0.004)	0.899** (0.013)	0.746** (0.006)	0.815** (0.022)
Real GDP per capita	0.187** (0.010)		0.316** (0.013)	
Distance	-0.817** (0.010)		-0.921** (0.019)	
Common Language	0.763** (0.021)		0.724** (0.037)	
Common Border	0.009 (0.028)		-0.099** (0.031)	
Free Trade Agreement	0.543** (0.024)	0.194** (0.017)	0.462** (0.022)	0.182** (0.017)
European Union	-0.167** (0.029)	0.203** (0.022)	-0.198** (0.028)	0.240** (0.021)
Landlocked	-0.399** (0.017)		-0.600** (0.018)	
Island	0.313** (0.017)		-0.327** (0.032)	
Country pair effects?	No	Yes	No	Yes
Year effects?	Yes	Yes	Yes	Yes
# Obs.	12,150	12,157	7,124	7,128
R ²	0.91	0.85	0.93	0.88

Notes:

Dependent variable is the log of bilateral trade in real US dollars.

Robust standard errors are recorded in parentheses.

**, * and # denote significant at the 1, 5 and 10 percent levels, respectively.

Shaded columns and bolded EMU2 results mark the preferred specification with country-pair fixed effects.

Table 3: Trade intensities between EMU members over time

Sample	Developed EMU11	# Obs.	R2
Period			
1950-59	-0.220** (0.057)	1,933	0.80
1960-69	0.030 (0.045)	2,298	0.88
1970-79	0.000 (0.030)	2,310	0.91
1980-89	0.103** (0.025)	2,310	0.93
1990-98	0.248** (0.024)	2,079	0.93
1999-2003	0.324** (0.038)	1,155	0.93
Country pair effects?	No		
Year effects?	Yes		

Sample	European EMU11	# Obs.	R2
Period			
1950-59	-0.348** (0.060)	1,120	0.85
1960-69	-0.045 (0.046)	1,360	0.91
1970-79	-0.012 (0.029)	1,360	0.93
1980-89	0.089** (0.024)	1,360	0.94
1990-98	0.243** (0.023)	1,224	0.95
1999-2003	0.400** (0.036)	680	0.95
Country pair effects?	No		
Year effects?	Yes		

Notes:

Dependent variable is the log of bilateral trade in real US dollars.

Robust standard errors are recorded in parentheses.

**, * and # denote significant at the 1, 5 and 10 percent levels, respectively.

The following variables are included in the regressions, but coefficients are not reported: real GDP, real GDP per capita, distance, common language, common border, free trade agreement, European Union dummy, landlocked, and island.

Shaded columns mark the preferred specification with country-pair fixed effects.

Table 4: Controlling for exchange rate volatility

Sample	Developed	Developed	Developed	Developed
Period	1957-2003	1957-2003	1957-2003	1957-2003
EMU2	0.375** (0.050)	0.329** (0.029)	0.338** (0.050)	0.319** (0.036)
Exchange rate volatility			-2.580** (0.238)	-0.705** (0.138)
Country pair effects?	No	Yes	No	Yes
Year effects?	Yes	Yes	Yes	Yes
# Obs.	10,835	10,835	10,835	10,835
R ²	0.91	0.85	0.91	0.85

Sample	Europe	Europe	Europe	Europe
Period	1957-2003	1957-2003	1957-2003	1957-2003
EMU2	0.461** (0.046)	0.406** (0.029)	0.460** (0.046)	0.400** (0.035)
Exchange rate volatility			-0.054 (0.273)	-0.608** (0.168)
Country pair effects?	No	Yes	No	Yes
Year effects?	Yes	Yes	Yes	Yes
# Obs.	6,389	6,389	6,389	6,389
R ²	0.93	0.88	0.93	0.88

Notes:

Dependent variable is the log of bilateral trade in real US dollars.

Robust standard errors are recorded in parentheses.

**, * and # denote significant at the 1, 5 and 10 percent levels, respectively.

The following variables are included in the regressions, but coefficients are not reported: real GDP, real GDP per capita, distance, common language, common border, free trade agreement, European Union dummy, landlocked, and island.

Shaded columns and bolded EMU2 results mark the preferred specification with country-pair fixed effects.

Table 5: Controlling for European integration

Sample	Developed	Developed	Developed	Developed
Period	1950-2002	1950-2002	1950-2002	1950-2002
EMU2	0.392** (0.059)	0.295** (0.033)	0.280** (0.059)	0.275** (0.034)
Index of European integration			0.025** (0.002)	0.007** (0.002)
Country pair effects?	No	Yes	No	Yes
Year effects?	Yes	Yes	Yes	Yes
# Obs.	10,365	10,365	10,365	10,323
R ²	0.90	0.86	0.91	0.86

Sample	Europe	Europe	Europe	Europe
Period	1950-2002	1950-2002	1950-2002	1950-2002
EMU2	0.501** (0.053)	0.390** (0.030)	0.443** (0.053)	0.369** (0.031)
Index of European integration			0.034** (0.005)	0.011** (0.003)
Country pair effects?	No	Yes	No	Yes
Year effects?	Yes	Yes	Yes	Yes
# Obs.	5,479	5,479	5,479	5,479
R ²	0.93	0.91	0.93	0.91

Notes:

Dependent variable is the log of bilateral trade in real US dollars.

Robust standard errors are recorded in parentheses.

**, * and # denote significant at the 1, 5 and 10 percent levels, respectively.

The following variables are included in the regressions, but coefficients are not reported: real GDP, real GDP per capita, distance, common language, common border, free trade agreement, European Union dummy, landlocked, and island.

Shaded columns and bolded EMU2 results mark the preferred specification with country-pair fixed effects.

Table 6: Controlling for the long-term trend in EMU trade intensities

a) Linear trend

Sample	Developed	Developed	Europe	Europe
Period	1948-2003	1948-2003	1948-2003	1948-2003
EMU2	0.209** (0.059)	-0.001 (0.036)	0.327** (0.055)	0.019 (0.035)
Common time trend for EMU11 countries	0.004** (0.001)	0.015** (0.001)	0.003** (0.001)	0.017** (0.001)
Country pair effects?	No	Yes	No	Yes
Year effects?	Yes	Yes	Yes	Yes
# Obs.	12,150	12,157	7,124	7,128
R ²	0.91	0.86	0.93	0.89

Notes:

Dependent variable is the log of bilateral trade in real US dollars.

Robust standard errors are recorded in parentheses.

**, * and # denote significant at the 1, 5 and 10 percent levels, respectively.

The following variables are included in the regressions, but coefficients are not reported: real GDP, real GDP per capita, distance, common language, common border, free trade agreement, European Union dummy, landlocked, and island.

Shaded columns and bolded EMU2 results mark the preferred specification with country-pair fixed effects.

b) Quadratic trend

Sample	Developed	Developed	Europe	Europe
Period	1948-2003	1948-2003	1948-2003	1948-2003
EMU2	-0.070 (0.073)	0.087# (0.045)	-0.104 (0.068)	0.053 (0.044)
Common time trend for EMU11 countries	-0.010** (0.002)	0.025** (0.003)	-0.018** (0.002)	0.021** (0.003)
(Common time trend for EMU11 countries) ²	0.035** (0.006)	-0.018** (0.006)	0.054** (0.005)	-0.007 (0.006)
Country pair effects?	No	Yes	No	Yes
Year effects?	Yes	Yes	Yes	Yes
# Obs.	12,150	12,157	7,124	7,128
R ²	0.91	0.86	0.93	0.89

Notes:

Dependent variable is the log of bilateral trade in real US dollars.

Robust standard errors are recorded in parentheses.

**, * and # denote significant at the 1, 5 and 10 percent levels, respectively.

The following variables are included in the regressions, but coefficients are not reported: real GDP, real GDP per capita, distance, common language, common border, free trade agreement, European Union dummy, landlocked, and island.

Coefficients and standard errors for the quadratic time trend are multiplied by 100. A Wald test shows that the coefficients on the linear trend and the quadratic trend are jointly significant.

Shaded columns and bolded EMU2 results mark the preferred specification with country-pair fixed effects.

Table 7: First differences

a) Developed countries

Sample	Developed	Developed	Developed	Developed	Developed	Developed
Period	1948-2003	1948-2003	1948-2003	1948-2003	1948-2003	1948-2003
Δ EMU2	0.052 (0.032)			0.034 (0.033)		
EMU2		0.020 (0.014)	0.010 (0.015)		0.003 (0.015)	-0.003 (0.016)
Δ Real GDP	-0.075 (0.184)	-0.069 (0.184)	0.001 (0.188)	0.035 (0.228)	0.038 (0.228)	-0.014 (0.228)
Δ Real GDP per capita	0.554** (0.183)	0.547** (0.183)	0.476* (0.187)	0.430# (0.227)	0.426# (0.227)	0.475* (0.227)
Δ Free Trade Agreement	0.062** (0.018)	0.062** (0.018)		0.063** (0.018)	0.063** (0.018)	
Free Trade Agreement			0.004 (0.006)			0.019* (0.009)
Δ European Union	0.001 (0.024)	0.001 (0.024)		-0.004 (0.024)	-0.004 (0.024)	
European Union			0.011 (0.008)			-0.002 (0.011)
Country pair effects?	No	No	No	Yes	Yes	Yes
Year effects?	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	11,898	11,898	11,898	11,898	11,898	11,898
R ²	0.24	0.24	0.24	0.24	0.24	0.44

Notes:

Dependent variable is the change in the log of bilateral trade in real US dollars.

Robust standard errors are recorded in parentheses.

**, * and # denote significant at the 1, 5 and 10 percent levels, respectively.

b) European countries

Sample	Europe	Europe	Europe	Europe	Europe	Europe
Period	1948-2003	1948-2003	1948-2003	1948-2003	1948-2003	1948-2003
Δ EMU2	0.048 (0.030)			0.027 (0.030)		
EMU2		0.020 (0.013)	0.013 (0.014)		-0.001 (0.014)	-0.003 (0.014)
Δ Real GDP	0.260 (0.213)	0.268 (0.213)	0.332 (0.215)	0.322 (0.234)	0.326 (0.234)	0.305 (0.234)
Δ Real GDP per capita	0.163 (0.211)	0.155 (0.211)	0.091 (0.213)	0.090 (0.232)	0.085 (0.232)	0.103 (0.232)
Δ Free Trade Agreement	0.068** (0.016)	0.062** (0.016)		0.070** (0.016)	0.070** (0.016)	
Free Trade Agreement			0.006 (0.006)			0.021** (0.008)
Δ European Union	0.003 (0.022)	0.003 (0.022)		-0.004 (0.022)	-0.004 (0.022)	
European Union			0.014* (0.006)			0.000 (0.009)
Country pair effects?	No	No	No	Yes	Yes	Yes
Year effects?	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	6,974	6,974	6,974	6,974	6,974	6,974
R ²	0.31	0.31	0.31	0.32	0.32	0.32

Notes:

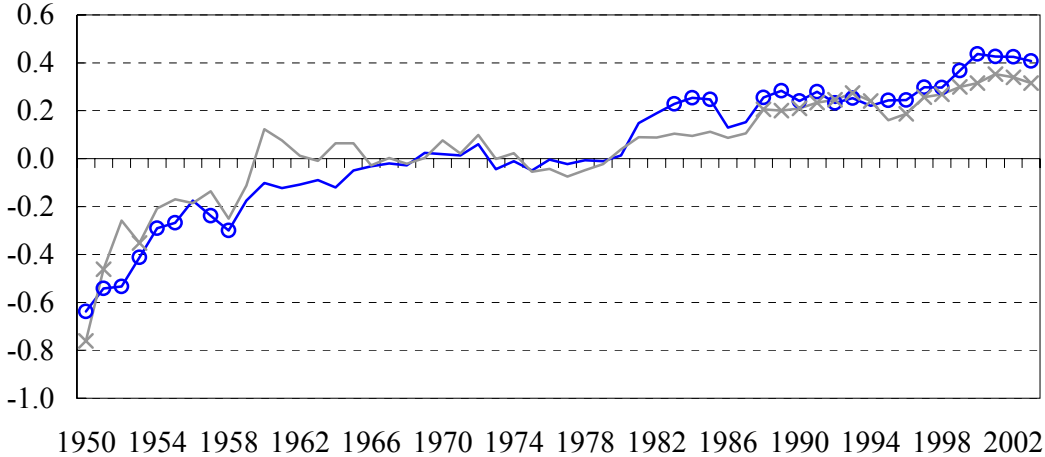
Dependent variable is the change in the log of bilateral trade in real US dollars.

Robust standard errors are recorded in parentheses.

**, * and # denote significant at the 1, 5 and 10 percent levels, respectively.

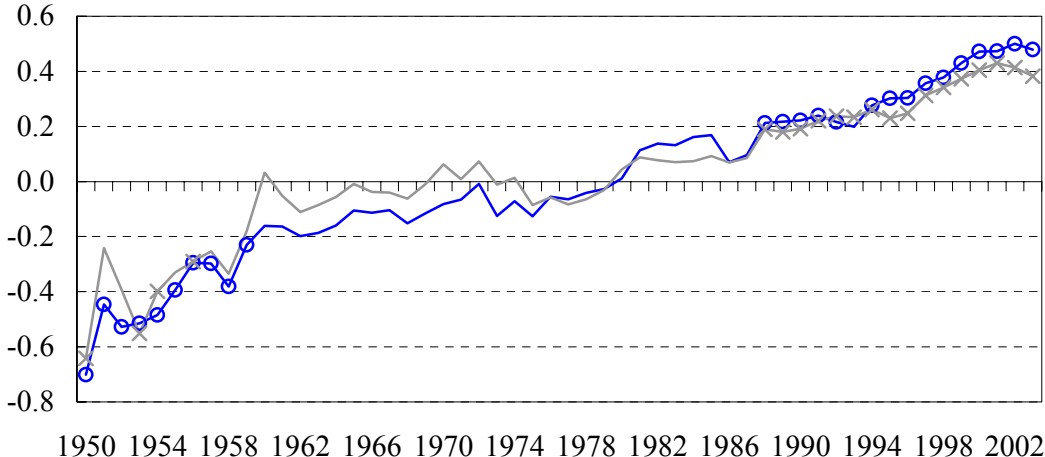
Figure 1: Evolution of trade intensity between EMU11 countries over time

a) Developed countries



Notes: Line with circles (crosses) reports estimated coefficients derived from pooled (yearly) regressions. A circle/cross indicates that the coefficient is significant at the 5% level.

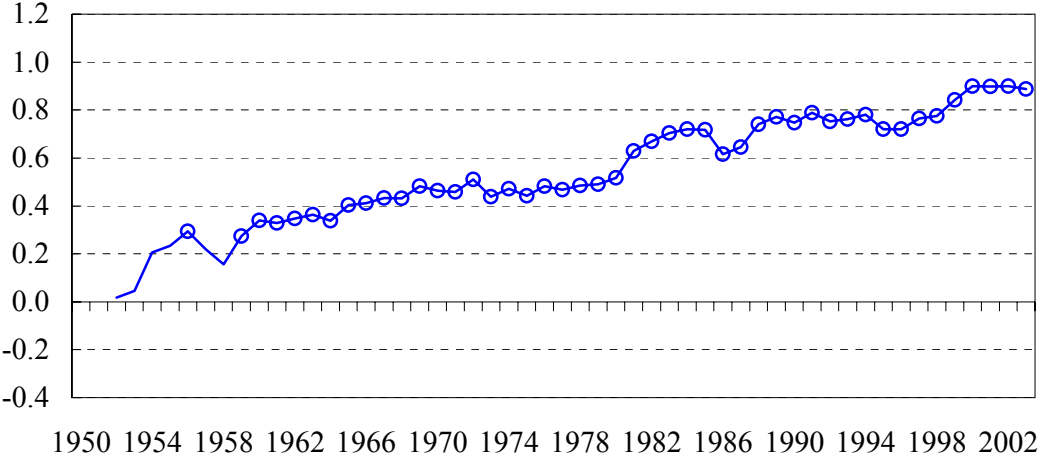
b) European countries



Notes: Line with circles (crosses) reports estimated coefficients derived from pooled (yearly) regressions. A circle/cross indicates that the coefficient is significant at the 5% level.

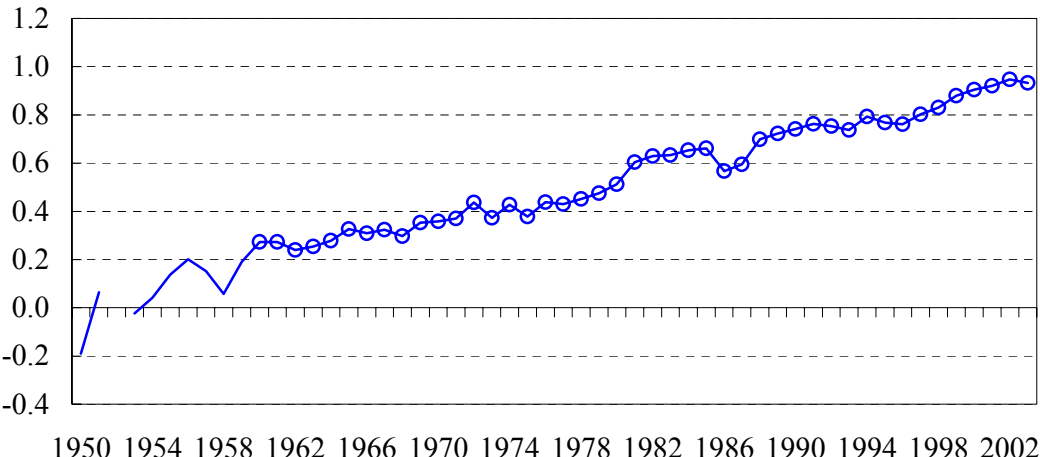
Figure 2: Evolution of trade intensity between EMU11 countries over time (with country-pair fixed effects)

a) Developed countries



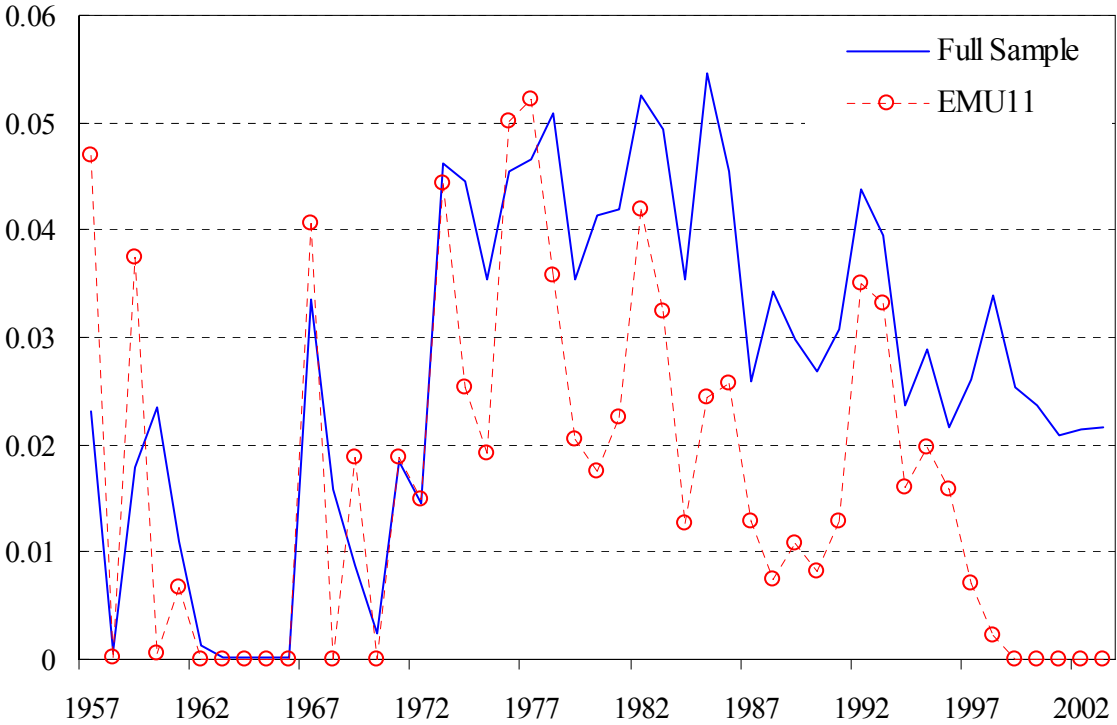
Notes: Line reports estimated coefficients derived from pooled regressions. A circle indicates that the coefficient is significant at the 5% level.

b) European countries



Notes: Line reports estimated coefficients derived from pooled regressions. A circle indicates that the coefficient is significant at the 5% level.

Figure 3: Exchange rate volatility



Notes: The graph shows the average yearly standard deviation in bilateral exchange rates.

Figure 4: Index of European integration

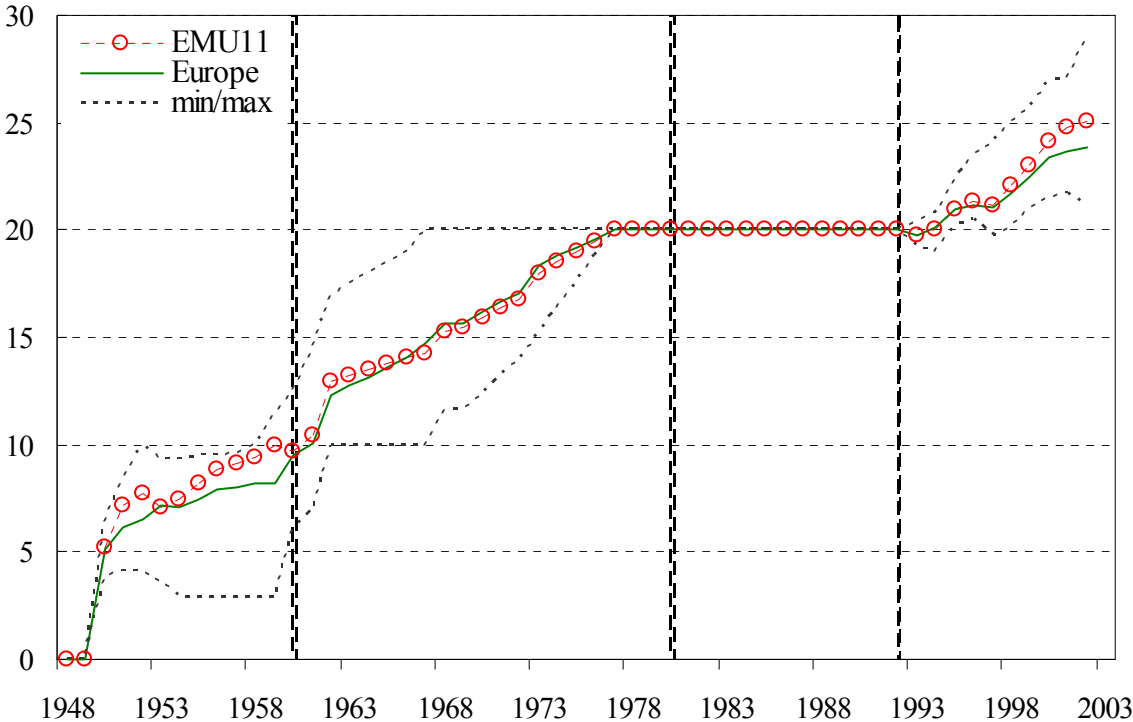
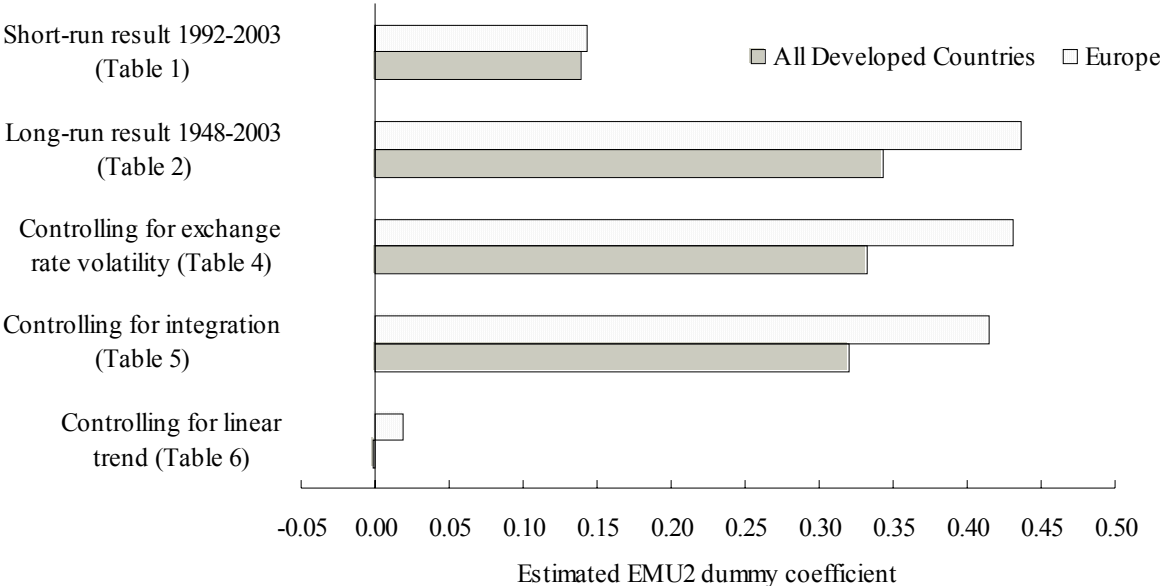


Figure 5: Estimated EMU effects under different specifications – an overview



Notes: See the tables mentioned above. The EMU2 coefficients taken from Tables 4 and 5 have been re-scaled to match the long-run result of Table 2.

Appendix

A1. Data

a) Sources

When compiling the data set, we aim to follow MSO as closely as possible. However, since we employ historical data reaching back to 1948, we sometimes had to use other sources. For instance, we often replace World Bank data (which are typically only available beginning in 1960) with IMF data. To make sure that data issues do not affect our results, we reestimated all our regressions with data from MSO's original sources (for shorter sample periods).

Our data set consists of annual observations for 22 industrialized countries between 1948 and 2003.

Trade. The trade data are taken in current US dollars from the International Monetary Fund's Direction of Trade Statistics. The nominal values are deflated by the US CPI.

GDP. GDP figures are derived in current local currency from the IMF's International Financial Statistics and converted into US dollars using current exchange rates (year averages). The nominal values are deflated by the US CPI.

Population. Population data are taken from the IMF's International Financial Statistics.

Distance. The distances are calculated as the Great Circle distance between the countries' geographic centers; the geographic coordinates are taken from the CIA World Factbook. Information for other gravity variables (common land border, common language) is also obtained from the CIA World Factbook.

FTA. The FTA dummy takes the value of one when the two countries in the pair belong to the same free trade area (FTA). The following FTAs are covered: Canada-US, ANZCER, EC, EFTA.

Exchange rates. The exchange rates are taken from the IMF's International Financial Statistics.

b) Descriptive statistics

	Non-EMU countries	EMU members
Observations	10,416	2,520
Trade	1.071 (2.241)	1.853 (2.209)
Real GDP	14.601 (2.637)	14.723 (2.135)
Real GDP per capita	9.606 (1.292)	9.169 (1.400)
Distance	8.241 (1.112)	7.052 (0.620)
Common Language	0.124 (0.329)	0.067 (0.249)
Common Border	0.054 (0.226)	0.222 (0.416)
Free Trade Agreement	0.188 (0.390)	0.442 (0.497)
European Union	0.083 (0.276)	0.402 (0.490)
Landlocked	0.177 (0.356)	0.200 (0.400)
Island	0.452 (0.559)	0.000 (0.000)
Exchange rate volatility	0.030 (0.032)	0.017 (0.026)
Index of European integration	6.719 (8.924)	17.726 (5.150)

The table reports means with standard deviations in parentheses.

A2. Integration timeline

<i>Year</i>	<i>Major European Events</i>
1951	Marshall plan institutions (i.e., the European Payments Union) help solve the German balance of payments crisis and, thus allow restitution of European division of labor; Treaty of Paris signed; European High Authority set up (to become EU Commission later).
1954	European Community of Coal and Steel comes into force (France, Germany, Italy, Belgium, Luxembourg, The Netherlands).
1957	Treaty of Rome establishes, among other things, the European Economic Community (EEC).
1960	European Free Trade Agreement (EFTA) is established (Austria, Denmark, Norway, Portugal, Sweden, Switzerland, UK).
1961	EFTA expansion: Finland
1962	Common Agricultural Policy is launched.
1965	European Community (EC): Merger of the three European “unions” (EEC, Coal & steel, and Atomic Energy) in a treaty; single Council of Ministers and European Commission established to head the new institution.
1973	EC expansion: Denmark, Ireland, UK.
1974	EFTA expansion: Iceland
1979	First direct Europe-wide election to European Parliament ; European Monetary System established.
1981	EC expansion: Greece
1986	EC expansion: Spain, Portugal.
1987	Single European Act comes into force, setting up "Single Market" framework and streamlines Commission’s work.
1991	Maastricht Treaty establishes European Union (EU), sets up timetable for the Economic and Monetary Union (EMU), defines European citizenship, and initiates EU enlargement process.
1993	Single Market takes effect.
1995	EU expansion: Austria, Finland, Sweden; Schengen treaty takes effect (some countries).
1997	The Treaty of Amsterdam , among other things, updates Maastricht and further prepares eastward expansion.
1999	Euro introduced (physically in 2002).