

The Euro's Impact on France's Trade with Adopting and Non-adopting Countries

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January 1st 2004

Economics Honors Thesis

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ABSTRACT

A major economic reason for the introduction of the euro was the conviction that, by eliminating the exchange risks within the European Union (EU), a common currency would intensify the commercial relations between member countries. Whether the EU's outlook is affected by, or just coincides with, the introduction of the euro is a fascinating question. Consequently, this paper studies the impact of the euro on France's trade with adopting and non-adopting countries. Using a model à la Rose, I calculate the Euro's impact on French trade with 20 OECD countries. I find that there is a strong impact of sharing the European common currency on bilateral trade flows, and this effect grows with the time span over which the common currency has been shared. I estimate that French trade increased by 33% with Euro countries due to the introduction of the Euro. These results are not only encouraging for the future of the EU as a whole but are also interesting for future adopting countries.

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I-Introduction

Introduction to the Euro

In 1999, eleven member countries of the European Union abandoned their independent currencies to adopt the Euro and the rigid institutional commitments attached to a currency union. Greece joined them two years later. The first five years of the unique European currency have been generally smooth. There have been some minor miscues and crossed wires as new officials operating in new institutional settings made uncoordinated and sometimes contradictory actions and comments.¹ Markets have been briefly unsettled by this confusion, but no serious instabilities have emerged. For the most part, businesses, governments, and financial markets have adapted to operations in the new currency fairly well.² In both symbolic and practical ways, monetary union has been an important addition to the collection of institutions and arrangements that contribute to the creation of a unified, cooperating and democratic Europe.

In economic terms, the monetary union promised some real advantages. Within Europe, cross border transactions have become simpler and less risky. In the longer run, this may result in a more efficient economy. For now, impassioned debates about the pros and cons of the common currency have been replaced by discussions of the currency's impacts on the European economy, and especially its impact on trade and investment in adopting and non adopting countries. This focus stems from the conjecture that a major economic reason for the introduction of the euro was its predicted positive effect on intra-EMU and intra-EU trade. As Hartmann and Issing (2002) and Kene (2002) note, the question of the impact of the European Monetary Union on international trade has been a main focus of political and economic

¹ See, for example, Coenen & Wieland, ECB(2000)

² Refer to Rinkinen and Seristö (2000), Johansson (2000) and Verdin and Van Heck (1999)

debates for the past several years.³ Member countries expected an increase of trade but how great has it been? This paper is aimed at addressing this question.

Survey of Empirical Literature

In the early 1960s, fixed exchange rates predominated. In 1961, Mundell was the first to ask when it is advantageous for a number of regions to relinquish their monetary sovereignty in favor of a common currency. From there, he developed the concept of an Optimum Currency Area, or OCA. From a theoretical standpoint, the relationship between trade and variability of exchange is ambiguous. According to the classical theory of trade, the negative effect of the variability of exchange rates on commercial trade is based upon aversion to risk. Indeed, an exporter's production costs occur in his own money, while his future income will be in a foreign currency. The smallest variation in exchange rates before the payment is made may provoke a significant loss or gain for the exporter. More recently, the development of derivatives, futures and forward markets allow agents to protect themselves against potential exchange rate fluctuations. However, it is impossible to protect one's self against all risks.

On the other end, De Grauwe's (1988) and Sercu and Vanhulle (1992) argue that the variability of the exchange rate can be beneficial for trade. De Grauwe(1988) notes that the growth rate of international trade among industrial countries has declined by more than half since the inception of floating rates.. Sercu and Vanhulle (1992) suggest that trade can be considered as an option held by the firms, arguing that the value of this option increases with the rise in the exchange rate volatility. Using a gravity model and panel data, Flam and Nordstrom (2003) found that the introduction of the Euro has increased Euro-zone trade by an average of 15 percent between 1998 and 2002, and that trade between Euro-zone countries

³ See Kenen (2002) and Hartmann and Issing (2002)

increased twice as much as between Euro and non-Euro countries. They propose trade costs and tariffs reduction as the most likely reasons. However, they use unilateral trade rather than bilateral trade in their model, which, they admit, may lead to greater inaccuracies in their estimates.

While the early theoretical literature, including Clark (1974), Baron (1976) and Gosh et al(1997), found that an increase in exchange rate volatility leads to a decrease in the level of international trade, Gotur (1985) found there is little support for a relation between exchange rate volatility and trade. Thom and Walsh (2002) studied the importance of the exchange rate regime in Anglo-Irish trade and found no evidence (from time series or panel data) that the change in the exchange rate had any effect on Anglo-Irish trade.

Lately, many economists have addressed the issue of the impact of a common currency on trade. Rose (1999) estimated the impact using panel data. He found a highly positive effect, as bilateral trade tripled when the two countries use the same currency. The major benefits economists sought were the elimination of the nominal exchange rate, the reduction of foreign exchange transactions costs, and the increase in trade by risk averse traders as making profits became less risky. Micco et al. (2003) propose to measure the potential impact of the currency union effect on trade using a panel data of 22 countries for a ten-year period ending in 2002. They found that the effect of the introduction of the Euro on bilateral trade between Euro-zone countries ranges between an 8 and 16% increase when compared to trade among non-Euro-zone countries.

Glick and Rose (2001) used a large sample panel data set which included 217 countries over a 50 year period. As they used many data on developing countries, they specify that their model may not be applicable to the EMU, as the sample ends in 1997. Thus, these results are relevant mostly for the case of very small and poor countries.

These findings by Rose and his co-authors were followed by a large number of studies seeking to “shrink” the currency union effect, my favorite being Nitsch’s (2002) “Honey, I just shrunk the currency union effect”. Nitsch re-examined Rose’s analysis (2000) of the currency union’s effect on trade. Using the same data set, he reduced the estimated currency union effect by manipulating the data, finding a common currency factor of 2, suggesting that the common currency doubles rather than triples trade. Persson (2001) argues that some of Rose’s variables are nonlinear and may bias the results, while Tenreyro (2001) emphasizes the problem of omitted variables that may at the same time affect trade and the propensity to join currency unions.

The basis of each one of Rose’s models is a common currency dummy added to a simple gravity model, defining common currency as currencies exchanging one for one. Since the euro has existed for almost five years, it is now possible to test specifically for the euro-zone trade data. Indeed, I extended Rose’s model by adding a time variable, i.e., measuring the cumulative yearly effect of the Euro on French trade. Therefore, the question I examine in this paper is: did the Euro have a positive impact on France’s trade with adopting countries?

I measure the impact of the elimination of exchange rate variability within the Euro-zone on trade between France and each EMU member. The structure of the paper is as follows. The next section provides the methodology used to assess the effects of the currency union on trade. Section three presents evidence from panel data on France’s trade. The final section discusses the main findings and their implications.

II- Methodology

Model Specifications:

The gravity model has been used in a number of empirical studies on international trade, mostly because of its simplicity, its empirical significance and its match with international trade theories. In its initial form, it explains a country i 's external trade with another country j by its GDP and geographical distance. Following Rose, I add two other variables to the model: the first one is related to the Regional Trading Union, the second one to the monetary union. The effect created by a membership in the European Union is treated fairly simply by introducing a dummy variable, assigning a unitary value to member countries. But I extended Rose's work by measuring the Euro's impact both with a dummy variable indicating whether it applies to trading countries and by the number of years that it has applied to trade between them. By introducing a "time" variable, I measure the cumulative effect of the Euro from its introduction in 1999 until 2002. The time variable thus considers the span of time the countries have shared the currency. The variable specifications are described later in this section. Although this is a measure of Euro's short term effect, it is important for future estimates.

The bilateral trade equation associated with the gravity model is estimated using a data panel covering the 20 OECD countries (Australia, Austria, Belgium-Luxembourg, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States) during a six year period from 1997 to 2002. I selected the aforementioned countries not only because they are OECD countries, but also because they are France's major trading partners.⁴

It is important to differentiate the currency union effect on trade for Euro-zone countries from the pre-existent geo-political effects specific to Europe and the Euro-zone. These later effects take the form of such things as the free-trade area, tariffs, or the variability of exchange rates. The initial expectation is that countries that entered the European currency

⁴ For example, despite of the fact that they are OECD countries, Iceland and New Zealand are left out as trade between these two countries and France is little, thus the results would not be relevant to this study.

union since 1999 profited from sharing the same currency and the elimination of exchange rate volatility. This is the expected currency union effect. Since the Maastricht treaty was adopted in 1992, the EMS sought to reduce the exchange rate volatility between Euro-zone countries. Ultimately, the adoption of the Euro by eleven countries in 1999, followed by Greece two years later, eliminated exchange rate volatility for intra-Euro-zone countries. Thus a distinction should be made between the two distinct effects.

Consequently, the estimated equation is:

$$\ln(\text{Trade}_{ijt}) = \beta_0 + \beta_1 \ln(Y_i Y_j)_t + \beta_2 (\text{IncomeDifference}_{ijt}) + \beta_3 \ln(\text{Distance}_{ijt}) + \beta_4 \text{EUMembership}_{ijt} + \beta_5 \text{CurrencyYears}_{ijt} + \beta_6 \text{Border}_{ijt} + \gamma \text{CommonCurrency}_{ijt} \quad (1)$$

where i and j denote countries, t denotes time, and the other variables being defined below:

- Trade_{ijt} denotes the real value of bilateral trade between i and j at time t , where real quantities are nominal quantities divided by the U.S. CPI.
- Y is real GDP
- IncomeDifference is the economic distance between the country i (France) and the country j , computed as the natural log of the absolute value of the ratio of the per capita GDPs of the trading countries: $\text{IncomeDifference} = \ln | \text{GDP}(i) / \text{GDP}(j) |$. As a Taylor's series approximation shows, it is roughly equal to the absolute value of the proportional difference between the two GDPs.
- "Distance" is the distance between the countries' economic centers in kilometers
- EUMembership is a binary variable, which is unity if a country is member of the European Union. It thus takes a value 0 if j (considering i is France) is not a member of EU, and 1 if i trades with a EU country.
- Border is a binary variable, which is unity if countries share a border
- CurrencyYears is the number of years i and j have been sharing the common currency.

- CommonCurrency is a binary variable which is unity if i and j use the same currency at time t. It thus takes a value 0 if j (considering i is France) is not a member of EMU, and 1 if i trades with a Euro-zone country.

The critical coefficient is γ , the effect of a common currency on trade.

As Rose did, I used ordinary least squares. The results are presented in Table 1 and discussed in the next section.

Expected Outcome:

I expect the Euro to stimulate France's trade with Euro-zone countries, the variables considered in the gravity equation are expected to have the following signs:

- "Y": the GDP variable is expected to have a positive sign as an increase in French or foreign GDP stimulates the bilateral trade between the two countries.
- The "IncomeDifference" variable is used to measure the economic distance between the two trading countries. Behind it is the Linder hypothesis, which states that trade is greater between countries that have similar standards of living: as their respective populations gravitate towards consuming goods of the same quality (here, "Western Culture"), implying that the goods produced in one country will appeal to the consumers in the other country, and vice versa. This implies that a greater economic difference between trading countries reduces trade. Thus, the predicted sign for the "IncomeDifference" variable is negative.
- The "Distance" variable represents the distance between the economic centers of the countries, its presumed sign is negative as greater the distance, smaller the trade.
- The "EUMembership" variable is expected to have a positive sign as joint membership affects trade positively.

- The variable “Border” is predicted to have a positive sign as countries sharing a common land border trade more with one another.
- The longer countries share a common currency, the more effective the currency’s impact on trade will be (i.e., the greater trade will be). Thus the CurrencyYears variable is believed to have a positive sign
- Countries sharing a common currency (Euro here) are expected to trade more thus “CommonCurrency” has a positive sign.

The Data Set:

Rather than using large multi-country data sets, I considered twenty OECD countries: Australia, Austria, Belgium-Luxembourg, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States. These comprise the twelve European countries that have adopted the Euro (note that Belgium and Luxembourg are taken together), three European countries who are members of the European Union but *not* members of the Monetary Union and five other members of the OECD. A distinctive feature of this data compared to other studies is that it covers data for the Euro period, from 1997 to 2002. I thus obtained a group of 19 “countries” that trade with France, observed over a six year period, so that there are 114 bilateral flows (and observations). These countries were selected as they are the major trading countries. This structure allows me not only to measure how the introduction of the Euro impacts the Euro-zone trade, but to also show how it limits trade with outside EMU countries.

I chose to restrict this study to the European Union, France in particular, to measure the effect of currency union, as the EU technically is one of the first currency unions spanning many developed countries. Further, the test group of countries is comprised of the European countries and the major trading countries.

The bilateral trade data are from the International Monetary Fund *Direction of Trade Quarterly*. The data are quarterly, and were added to obtain annual data, covering 21 industrial countries from 1997 to 2002. Further, to find the common currency effect on trade, seven additional variables are considered: the first pair taken from the International Monetary Fund's *International Financial Statistics*, the following three from the EUROSTATS, and the last two from the Online World Atlas. Specifically, I use:

- real GDP (GDP in National Currency, thus translated into U.S. dollars and divided by the U.S. CPI);

- population (to find GDP per capita);

- common currency adoption; E.U. membership;

- years since adoption of the Euro;

- distance between economic centers of the trading countries;

- common border between trading countries.

Further details on the data can be found in the appendix.

III- Empirical Analysis & Results

As aforementioned, I used a modified gravity model. The gravity model appears to be successful at measuring the impact of the currency union. Results show the independent effect of the common currency on bilateral trade, keeping everything else constant.

Many economists and politicians believe(d) that exchange rate volatility abates trade, but proofs have been hard to come.⁵ Our results are not only economically important, but also statistically significant: not only does each variable have the “right” sign, but, in addition, the t-statistic is significant almost all across the line.

⁵ Brada and Mendez (1988) found the “wrong” sign for the relationship, while Belanger (1992) obtained insignificant results. See De Nardis and Vicarelli (2003).

Considering single variables, the independent effect of the EU Membership on trade is an additional increase in trade of 19% over the 1997-2002 period (from Table 1). The associated t-statistic is significant at 1.56. Further, an increase of French or foreign GDP by 1% increases French trade by 0.6%.

As the levels of and the similarity in the 20 trading partners' per capita incomes increase, so does the volume of bilateral trade flows, as conjectured in the Linder hypothesis. The results found here reinforce this hypothesis: despite a t-statistic of -0.63 , the "income difference" between trading countries still proves to be somewhat economically important as its coefficient is equal to -0.03 ("right" sign). Each one percent increase in economic difference reduces trade by 3 hundredths of a percent.

Each additional year two countries share the Euro brings them 5% more trade, with a strong t-statistic of 1.8411.⁶ Hypothetically, this could create a 100% increase within the next 20 years, thus defending Rose's initial claim of a doubling of trade for EMU countries in the long-run.

The data set used contains data over the EMU period, which allows me to estimate the Euro's effect on French trade. Moreover my analysis can be used to evaluate the effect of several important variables on France's trade, the common currency being only one example.

The sharing of a common currency has an impact on trade, but this is in addition to the EU Membership (as countries sharing the Euro automatically are members of the European Union). The Euro stimulated French trade with those countries who adopted the Euro five years ago by a cumulative 33% in 2002.

⁶ This result may be capturing part of the common currency effect.

IV- Comparing results with earlier studies

Relating my results to other studies, I find a contrast with the results of Thom and Walsh (2002). They found no apparent effect of a currency union between Ireland and UK, studying through 1979. On the other hand, the results for the effect of a currency union on trade match the ones reported by Rose and Glick (2002) as trade increased, However, they predicted a tripling of trade, which has not (yet) taken place.

Between these two extremes stand more reasonable results.

Micco et al. (2003) found that the effect of the introduction of the Euro on bilateral trade between Euro-zone countries ranges between an 8 and 16% increase when compared to trade among non-Euro-zone countries. Further, they found no evidence of trade diversion from non-Euro countries. Although these estimates seem reasonable, the time variable is not taken in consideration.

In 2002, Nitsch re-examined Rose's analysis (2000) of the currency union's effect on trade. While he used the same data, he reduced the estimated currency union effect by manipulating the data, finding a common currency factor of 2, suggesting that the common currency doubles rather than triples trade. By isolating further specific variables such as languages, trade arrangements and colonies' history, he reduced this effect to null. Although these results are important, it proves that the selection of variables affects results rather than that the currency union is ineffective.

Persson (2001) found the currency union effect on trade to be 65% under one variant and 13% under another. However, his methodology was based on matching techniques borrowed from the labour literature and the discrepancy of 52% in the results leads me to believe that they may be unreliable.

In a recent study, De Nardis and Vicarelli (2003) found that the Euro adoption has had a positive impact on bilateral trade of European countries, the percentage increase varying

across countries between 2.6 and 6.3%. These results refer to short-run impacts and do not consider the importance of time, i.e., the cumulative effect of years using the Euro.

V- Conclusion

The purpose of this paper was to measure the effect of the introduction of EMU in 1999 on France's trade with members and non members of the EU. The data set used includes observations starting in 1997 and covering the EMU period up through 2002. The implementation of a common currency improved France's trade with the 11 European countries by an accumulated 33%⁷ over the sixth-year. A distinctive aspect of this study is that it considered a time variable, a cumulative effect. This specification of the impact of the euro is important, as the EMU is still a young phenomenon. I believe that over a longer period of time, Rose's result of the trebling of trade may well be accurate for Europe too.

Trade with non-Euro countries grew 33 percent less than trade with Euro countries did, and the Euro may have diverted trade from non-Euro countries. However, there is no certainty that, had the Euro not existed, trade with Euro countries would not have grown more rapidly⁸.

By reducing the existing uncertainty and risk within the Euro-zone, it is possible that the stimulus to trade created by the adoption of the Euro affected negatively the performance of non-members. Still, the cumulative time effect of the Euro is higher than previously measured and should be acknowledged when other countries ponder whether or not to adopt the Euro. Given the short term effect of the Euro, a 33% increase in French trade, the long term effect is promising but still uncertain. Rose found that currency unions have a 14% higher overall openness to trade when compared with countries that did not join a currency

⁷ Computed as follow: 4 years of common currency with a 0.05 coefficient, added to a 0.129 Common Currency coefficient: $0.05 \times 4 + 0.13 = 33\%$

⁸ One could argue that trade with the Euro countries makes GNP grow more rapidly and in fact indirectly benefits trade with non-Euro countries.

union. Because of the economic size of the EMU area, this estimate seems plausible for the EMU. The results found in this study will thus be further extended to the entire Euro zone in the spring of 2004.

Table 1- Estimation results

Dependent Variable: Natural Log of France's bilateral trade with test countries

Time Period: 1997-2002

Variable	Coefficients	Standard Error	t Stat	P-value
	-21.0794226	2.17638	-9.68556	3.11E-16
ln YiYj	0.630206974	0.04072	15.4782	7.46E-29
ln IncomeDifference	-0.03356372	0.05315	-0.63144	0.529127
CommonCurrency	0.129420095	0.09327	1.38756	0.168208
EUMembership	0.193116504	0.12379	1.56006	0.121754
Distance	-0.588804231	0.04684	-12.5719	1.14E-22
Border	0.613839951	0.09418	6.51792	2.54E-09
CurrencyYears	0.050026348	0.02717	1.84117	0.06842

Table 2-Data Sources

Variables-All

Time Period: 1997-2002

Variables	Sources	Available Years
GDP	International Monetary Fund, International Financial Statistics Database	1997- 2002
Common Currency	European Central Bank, European Central Bank Database	1997-2002
EU Membership	European Central Bank, European Central Bank Database	1997-2002
Distance	World Atlas, World Atlas Online	1997-2002
Border	World Atlas, World Atlas Online	1997-2002
Years/Currency	European Central Bank, European Central Bank Database	1997-2002

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