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The Single Currency's Effects on Eurozone Sectoral Trade: Winners and Losers?

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Abstract:

In this paper we study the effect of the single currency across industries for euro area members. This analysis may help to shed light on the main factors influencing the euro effect on trade flows. We intend to verify whether these factors are specific to individual sectors and/or countries or common to the entire euro area. We use a dynamic specification of an augmented gravity equation. Following the most recent econometric literature, we apply a "System GMM" dynamic panel data estimator (Blundell and Bond, 1998) to avoid inconsistency and biases in the estimates, and introduce controls for heterogeneity.
Our preliminary results indicate some heterogeneity at country level. Despite statistically pro-trade effects in the majority of the EMU members, at sectoral level there are some countries in which the impact of the euro has been negative. The pro-trade effects are mainly concentrated in scale intensive industries. Industrial specialization and location of these industries, together with other factors (i.e. differences in factor endowments, product regulations across countries), may have determined "the winners and the losers" in the monetary integration process.
These preliminary findings are in line with those of the few other studies on this issue. In particular, this recent literature seems consistent with Baldwin's (2006) "new good" hypothesis. However, in our estimates the magnitude of these effects are lower, probably because of our empirical strategy. Moreover, the sector/country analysis points out that other specific factors have been in place in shaping differently the euro effect on trade.

JEL: F14, F15, F4, F33, C33

Keywords: International trade, currency unions, gravity models, dynamic panel data, Blundell−Bond estimates

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1 INTRODUCTION

Empirical analysis on the first few years of existence of the euro has generally reported a modest, although statistically significant, effect. This evidence does not completely fit with the assumption that important reductions in transaction costs would ensue from the replacement of many currencies with one single money. The limited impact may depend, inter alia, on the fact that the euro came at the very end of a long-term path of European integration, adding (maybe) little to a process that has had its main drivers in several former economic policy decisions (e.g. the common market, the EMS, the Single Market). Yet other factors, working below the surface of aggregate behavior and affecting the pervasiveness of the influence of the single currency across products and industries, may have contributed to shape the modest pro-trade impact.

Analysis of sectoral variation of the euro effect may hence help shed some light on factors conditioning the single currency influence on trade flows. Despite its relevance, this issue has received scant attention to date. In this paper, we address this rather uninvestigated area, studying the trade-consequences of the single currency across industries of Euro Area members. In line with a consolidated tradition in the analysis of the euro's trade impact, the aim of the study is mainly empirical: we intend to verify whether the euro effect is much differentiated across industries and economies, or whether some common features are detectable for the entire Euro area. Empirical findings at sector/country level may hint at the mechanisms driving trade put in place by the single currency inception.

The paper is organized as follows. The first and the second sections conduct a critical survey of the most recent empirical literature and provide a description of the empirical strategy. The third section describes the data. The fourth and fifth sections presents the estimation results at sector and country level. Conclusions follow.

2 RECENT EMPIRICAL LITERATURE ON THE EURO'S SECTORAL TRADE EFFECTS

Analysis on the euro effect on trade has been largely performed at aggregate level. Empirical studies that estimate the euro effect at sector level are still very scarce. However, in both approaches (aggregated and sectoral) the main empirical findings highlight a positive and statistically significant effects of euro adoption on bilateral trade in EMU countries. All the empirical studies use panel data methodology, instead of pooled cross sectional data, to emphasize the time dimension in the estimation of trade flow determinants in gravity models[1].

[1] The gravity model has been used extensively in the empirical and theoretical literature to explain bilateral trade. See Anderson (1979), Deardorff (1998) and Helpman and Krugman (1985), Evenet and Keller (2002) and Baldwin (2006).

In this section we focus on the studies using sectoral data. Existing studies on sectoral euro effect usually use static models: to best of our knowledge, only one work uses dynamic models[2] (see table 1) .

Tab 1 **Euro's effect on trade, sectoral data**

	Authors	Empirical Strategy	Main findings-sample period
Static models	Flam and Nordstrom (2003)	Fixed effect panel data estimator, 1 digit ISIC rev.3 sectors. Gravity model Dep variable: bilateral exports, 1 digit ISIC rev.3 sectors Exchange rate as regressor in the gravity equation. 14 EU countries (excluding Greece)	Sample period 1995-2002. Intra area euro effect aggregate 15%, increase of trade with non members of 7%; euro effect not widespread across sectors, ranging between 7-50%.
	Baldwin et al. (2005)	Fixed effect panel data. Gravity model Dep variable: bilateral imports, ISIC 2 and 3 digit 18 OECD countries	Sample period 1988-2003. Intra area euro effect aggregate 70-112%, euro effect not widespread across sectors, ranging between 40-177%.
	Flam and Nordstrom (2006)	Fixed effect panel data estimator Gravity model Dep variable: bilateral exports. 6 digit level HS product categories 20 OECD countries	Sample period 1999-2005. euro increased intra area trade by 26% and trade between the eurozone and outsiders by 12% in 2002-2005 compared to 1995-1998. The effects are concentrated in semi-finished and finished products, industries with highly processed products
Dynamic models	Fernandes (2006)	A dynamic panel data System GMM estimator , Gravity model. for 25 two digit ISIC rev.3 sectors Dep variable: bilateral exports. 23 OECD countries.	Sample period 1988-2003 Intra area euro effect aggregate 2.8%, euro effect not widespread across sectors, ranging between 7-23%.

All such studies (in spite of different time spans, countries samples and empirical strategies) report that the euro effect is not widespread among sectors and among country/sectors. Baldwin et al. (2005) show a correlation between the size of the "Rose Effect" (the adoption of a common currency) and the presence of what they call ICIR sectors (Imperfect Competition and Increasing Return Sectors). Ranking the sectors analyzed in a decreasing order, at the bottom of the list (lower "Rose Effect") they find agriculture, as well mining and quarrying; at the top, (higher "Rose Effect") various types of machinery and highly differentiated consumer goods (such as food products, beverages and tobacco). This result

[2] Theory and a large body of empirical work support the hypothesis that trade is a dynamic process and that estimating static equations may produce upward biased estimates (see de Nardis at al. (2007). The rationale for considering dynamics in trade is the existence of sunk costs borne by exporters to set up distribution and service networks in the partner country. This sticky behavior seems all the more important in the EMU case, where trade relationships between countries are affected not only by past investments in export-oriented infrastructure, but also by the accumulation of invisible assets such as political, cultural and geographical factors characterizing the area and influencing the commercial transactions taking place within it.

suggests that these sector characteristics may be related to the size of the effects on trade due to the adoption of a common currency. The rationale behind this heterogeneous euro effect among sectors is explained by Baldwin (2006) in light of two elements of the "new-new trade theory": the fixed costs of entering a new market and differences in firms' marginal production costs[3].

In line with these findings, also Flam and Nordstrom underline that sectors without a "Rose effect" tend to be those marked by fairly homogeneous products. The results set out in their 2003 paper, which are obtained from quite aggregate dataset (1 digit ISIC rev.3 sectors), are confirmed also at a highly disaggregated level (6 digit level HS product categories: Flam and Nordstrom 2006). In this latter work, the authors estimate currency union effects at different stages of processing and for different industries, finding evidence of a positive effect for semi-finished and finished products and for industries characterised by highly processed products, which are those that require relatively high fixed costs for distribution and marketing.

3 EMPIRICAL STRATEGY AND EQUATION

In our apporoach, in accordance with the recent findings in the empirical literature, we introduce dynamics into a panel data model. This raises well known econometric problems: if trade is a static process, the fixed-effect estimator is consistent for a finite time dimension T and a infinite number of country-pairs N; but if trade is a dynamic process, the transformation needed to eliminate the country-pair fixed effects produces a correlation between the lagged dependent variable and the transformed error term that renders the least square estimator biased and not consistent.

To avoid the inconsistency problem, Arellano and Bond (1991) suggested transforming the model into first differences and run it using the Hansen two-step GMM estimator[4].

However, the first-differenced GMM estimator performs poorly in terms of precision if it is applied to short panels (along the T dimension) including highly persistent time series. Lagged levels of time series with near unit root properties are in fact weak instruments for subsequent

[3] According to Baldwin, only firms with low marginal costs will be able to sell in foreign markets, since they must be able to afford also the fixed foreign market entry costs (exporting costs). Once these exporting costs decrease (after the introduction of a common currency), also smaller firms may be able to afford these costs and still make profits. Therefore goods that were previously produced and sold only on domestic markets can now be traded on international ones (in this sense, they are considered "new varieties of goods" for international trade).

[4] They show that the two key properties of the first differencing transformation – eliminating the time-invariant individual effects while not introducing disturbances for periods earlier than period t-1 into the transformed error term – can be obtained using any alternative transformation (i.e. forward orthogonal deviations).

first-differences[5]. Since bilateral exports between industrialized countries are expected to be persistent, due to sunk exports costs, one may expect this to affect the estimates[6].

Arellano and Bover (1995), describe how, if the original equations in levels are added to the system of first-differenced equations, additional moment conditions may increase efficiency ("System GMM" estimator). This estimator has been refined by Blundell and Bond (1998).

The System GMM estimator has several advantages with respect to Arellano and Bond's estimator. First differencing the equation removes fixed effects but also the time invariant regressors in the specification. If these regressors are of interest, the resulting loss of information may be a serious inconvenience.

Owing to the relatively short time-span data available and the relevance of "persistence" effects in bilateral trade relationships, the "System GMM" estimator seemed to be the right choice for our purposes. The application of this methodology in a gravity context is quite new:[7] as far as we know , only one study has applied it to investigate the euro effect on trade.[8]

We introduced into the dynamic gravity equation three sets of variables: i) gravity variables, ii) controls for heterogeneity, iii) controls for other factors affecting bilateral trade.

i) ***Standard gravity variables***. Bilateral distance, as a proxy of transport costs, and the sum of importer and exporter's value added as proxies of the "mass".

ii) ***Controls for heterogeneity and bias***. Following Baltagi, Egger and Pfaffermayr (2003) we introduce fixed effects for importing and exporting countries and time. Differently from these authors, we did not control for country-pair effects (i.e. the interaction effect between they exporting and importing country picking up unobserved characteristics of country-pairs) because this kind of variable would have included the impact of the euro effect that we wanted to control by a specific dummy. As suggested by Rose and van Wincoop (2003), controlling for exporter and importer effects enabled us to proxy the multilateral "trade resistance index" (see Anderson and van Wincoop (2003)), obtaining a specification of a gravity equation that can be interpreted as a reduced form of a model of trade with micro foundations.

5 More in general, a IV approach is a way to solve the endogeneity problem. See Anderson and Van Wincoop (2004).

6 For an exhaustive survey of GMM estimators, see Roodman(2006).

7 See De Benedictis and Vicarelli (2005); De Benedictis, De Santis and Vicarelli (2005).

8 See Fernandes (2006).

iii) ***Controls for other factors affecting bilateral trade in EMU***. In the specific case of EMU, there are political, institutional and monetary factors that may have affected bilateral trade flows. After 1992, thanks to the European Monetary System and the convergence process leading to the adoption of the single currency, volatility of the exchange rate among European countries diminished. We controlled for this by introducing a measure of volatility into our equation. It seemed important to distinguish this aspect from a "Currency Union" effect that should capture a structural change (i.e. ERM crisis in 1992-1993) in the markets expectations, due to the fact that a common currency is an irrevocably fixed commitment on exchange rate regime. The introduction of the euro has been the last step of this integration process; we controlled for "EU membership"[9] in order to "isolate" this effect on exports by introducing a specific dummy .

The equation was as follows:

$$Ln\ Expsect_{ijt} = b1\ ln(\ Expsect_{ijt\text{-}n}) + b2\ ln(\ SumVAsect_{ijt}\ ) + b3\ lnDist_{ij} + b4\ vol_{ijt} + b5\ dueuro_{ijt} + b6\ duEU_{ijt} + +b7Trend + b8\ \alpha_j + b9\beta_j + b10\tau \quad (1)$$

where:

ln = the natural logarithm, i is the exporting country, j is the importing country and t is the year, n is a lag structure for the dependent variable;

$Expsect$ = exports in volume from country i to country j for 25 sectors ISIC two digit rev. 3;

$SumVAsect$ = the sum of value added at constant term for 25 sectors ISIC two digit rev. 3 of the exporting and importing countries, a proxy of the "mass" in gravity models;

$Dist_{ij}$ = bilateral distance between capital cities, expressed in kilometers;

$dueuro_{ijt}$ = Dummy euro: assumes value 1 for bilateral trade among Eurozone countries from 1999, 0 otherwise, in the case of Greece the dummy assumes value 1 starting from 2001;

$duEU_{ijt}$ = Dummy European Union membership: assumes value 1 for bilateral trade among European Union countries, taking into account the enlargement process of EU (Austria, Finland and Sweden entered in 1995), 0 otherwise[10];

vol_{ijt} =is the nominal exchange rate volatility;

$Trend$ = linear trend;

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9 From the late 1950s to the mid-1990s, the European trade integration process were mainly related to the abolition of internal tariffs with a view to the completion and widening of the Single European Market.

10 We consider EU membership instead of other "institutional" variables (i.e. Single Market 1993) because EU membership implies the obligation of a Member State to transpose into national law directives (for example to implement the Single Market) issued by the EU Commission.

α_j = exporting country dummy: assumes value 1 if export flows are from exporter country i to each one of the importing country j, 0 otherwise;

β_j = importing country dummy: assumes value 1 if export flows are from each one of the exporter countries i to the importing country j, 0 otherwise;

τ = annual dummies: assumes value 1 for time t, 0 otherwise.

We expected bilateral export flows to be positively influenced by:

i) The lagged endogenous variable. Countries trading heavily with each other were expected to continue to trade, thus reflecting the effects of entrance and exit barriers due to sunk costs;

ii) The "mass". In gravity models trade flows are positively influenced by the "mass" proxied by the sum of GDP or value added;

iii) The introduction of euro. This dummy proxied the "pure trade effects" and was expected to have had a positive impact on Eurozone trade flows, in line with recent literature;

iv) The "EU membership" effect. Countries joining EU should have benefited from European trade integration process;

We expected bilateral export flows to be negatively influenced by:

i) Distance. According to the standard gravity model, bilateral distance is a proxy for transport costs and cultural proximity between two countries;

ii) Exchange rate volatility. Reducing exchange rate volatility should promote bilateral trade reducing risks and uncertainty.

4 DATA DESCRIPTION

The pool of the economies that we considered in the estimates consisted of 23 developed countries: 13 EU members (Ireland and Luxembourg were not included in the pool due to the lack of homogeneous data)[11], and 10 OECD countries: Korea, Czech Republic, Australia, Canada, Japan, New Zealand, Norway, Mexico, Switzerland and United States. The sample period was 1988-2004 according to data availability.

[11] In this paper we deflate nominal bilateral export by value added implicit deflators taken from OECD STAN BTD, a more accurate measure than US CPI commonly used in empirical literature. However, this data bank does not provide value added implicit deflators for Ireland. Data for Belgium and Luxembourg are aggregated.

We considered 13 exporting European countries and 23 importing industrialized countries (13 EU + 10 OECD). Bilateral exports data in dollars terms, current prices, were taken from OECD STAN-BTD, and value added from the STAN- Industry data base; both variables were deflated by value added implicit deflators.

We tested five different measures of Exchange rate volatility; the variable we used was measured by the standard deviation of the first difference of monthly natural logarithms of the bilateral nominal exchange rate at the current year t . Data were taken by monthly average exchange rates from IMF-IFS.

Tab. 2 **Data source**

Variable	Source	Sample
Bilateral exports in current terms	OECD STAN-BTD	1988-2004
Value Added	STAN industry	1988-2004
Bilateral nominal exchange rate	IMF-IFS	1988-2004
CPI, PPI	IMF-IFS, OECD- MEI	1988-2004
Distance	P. Brenton and F. Di Mauro http://www.ceps.be	1988-2004
Free Trade Agreement	European Commission and WTO	1988-2004

5 A SECTORAL ANALYSIS IN A DYNAMIC SETTING

Owing to the large number of regressions made, here we do not report the estimate results of equation (1) for each of the 25 ISIC 2 digit sectors[12]. However, both the specification of the model and the econometric strategy seemed to fit well.

Estimates were robust to the standard tests. AR(1) and AR(2) tests showed the consistency of the GMM estimator and the inconsistency of the OLS. Hence, by introducing dynamics, the proper estimation method was the former one. The Hansen test of over-identifying restrictions showed that the hypothesis that all moment restrictions would be satisfied for the dynamic specification was not rejected[13].

In general, gravity standard variables showed high statistical significance and the expected sign: there was a positive correlation with the mass and a negative one with distance. We also found a high statistical significance of the 1 period lagged dependent variable coefficient; the magnitude of the " persistence effect" seemed in line with the results in the literature. A

[12] Detailed estimates results are available on request.

[13] Arellano and Bond (1991) propose a test of the hypothesis of no second-order serial correlation in the disturbances of the first differenced equation. This is a necessary condition for the valid instrumentation. A test for the hypothesis of no first order–order serial correlation is also reported: the rejection of the null hypothesis (i.e. the presence of first-order serial correlation) indicates the inconsistency of the OLS estimator.

decrease in exchange rate volatility promotes bilateral trade; the "EU membership" effect has had a positive impact on trade flows among EU15 countries.

In this section and in the next we focus on the impact of the euro on sectoral exports, looking at the sign and magnitude of the Euro dummy coefficient. The euro trade effect was estimated for each sector considering the EU members as a group of exporting countries. In this case, the coefficient of dummy euro quantified the (average) sectoral effect of euro adoption with respect to EU partners that did not joint the common currency.

The estimates results (table 3) highlight that the euro effect is not uniformly distributed among sectors. Only in 11 industrial sectors out of 25 is there a positive and significant impact of the euro on exports flows (at least at 10% significance level).

On the basis of a classification à la Pavitt, a positive effect was detected in four sectors characterised by scale economies (transport, telecommunications, pulp-paper and printing, metal products), one sector characterised by high technology (medical precision and optical instruments), one specialised supply sector (machinery and equipment) and two traditional sectors (food products and metal).

Tab. 3 **Sectoral estimates results**

ISIC 2 digits	Industry description	Dummy euro	t	p
01_05	Agriculture, hunting, forestry and fishing	-0.009	-0.2	0.839
10_14	Mining and quarrying	-0.12	-1.62	0.106
15_16	**Food products beverages and tobacco**	**0.04**	**1.83**	0.069
17_19	Textiles, textile products, leather and footwear	-0.038	-1.49	0.138
20	Wood and wood and cork products	0.05	0.77	0.441
21_22	**Pulp, paper, paper products, printing and publishing**	**0.09**	**2.65**	0.009
23_25	Chemical, rubber, plastics and fuel products	0.029	0.96	0.339
23	Coke, refined petroleum products and nuclear fuel	0.12	0.86	0.393
24	Chemical and chemical products	0	0.34	0.734
25	Rubber and plastic products	-0.01	-0.48	0.632
26	Other non metallic mineral products	-0.005	-0.2	0.842
27_28	**Basic metals and fabricated metal products**	**0.1**	**4.07**	0
27	**Basic metals**	**0.09**	**2.99**	0.003
28	Fabricated metal products except machinery and equipment	0.01	0.3	0.764
29_33	Machinery and equipment	**0.06**	**2.75**	0.009
29	Machinery and equipment n.e.c.	0.064	2.91	0.004
30_33	**Electrical and optical equipment**	**0.056**	**1.78**	0.076
30	Office accounting and computing machinery	0.05	0.64	0.525
31	Electrical machinery and apparatus nec	0.01	0.05	0.963
32	**Radio tv and comunnication equipment**	**0.13**	**2.21**	0.028
33	**Medical precision and optical instruments**	**0.107**	**3.12**	0.002
34_35	**Transport equipment**	**0.145**	**2.41**	0.017
34	**Motor vehicles**	**0.097**	**2.26**	0.025
35	Other transport equipment	0.03	0.3	0.761
36_37	Manufacturing nec	-0.02	-0.85	0.394

* Sectors in bold are those with a euro effect positive and significant for the entire set of EU countries

In general, even if a two-digit classification is still very aggregate, it is possible to point out that the most of the sectors exhibiting a positive euro effect are characterised by increasing returns to scale, imperfect competition and product differentiation (horizontal and vertical).

These results seem to reflect both the theoretical explanations and the empirical findings reported in section 2. Particularly possible explanation of the positive effect of euro introduction in these sectors is provided by Baldwin (2006): abatement of the fixed costs of entry into new markets thanks to substitution of multiple currencies with the euro and firms heterogeneity in marginal costs of production. Positive effect on the export volumes in these sectors may have hence been due to the entry of new firms, and thus of new varieties of goods previously restricted to the domestic market by high exporting costs.

The differences in our estimate results are, on one hand that the magnitudes of our coefficients are lower than those reported by previous studies, probably because of the dynamic specification of our model correcting for some bias, and on the other hand, that the magnitudes of the coefficients signalling a trade-reinforcing effect seem to be more homogeneous across sectors than in other studies. According to our estimates, the introduction of the euro increased the intra-EMU trade on average with a coefficient included in a range between 4% (food products) and 15% (transport[14]). In Flam and Nordstrom (2006), for instance, the magnitude of the Euro effect varied from 16% for wood products to 62% for other transport equipment[15].

6 A COUNTRY/SECTOR ANALYSIS

Moving from sector to sector/country analysis the picture becomes more blurred. Table A1 in the Appendix presents the coefficients of the euro dummy for each country/sector.

Table 4 reports the same industrial sectors as table 3 in order to compare them with the evidence found at sector/country level. The last two columns of the table show countries for which a statistically significant euro effect has been found in those sectors.

The first point to stress is that, despite statistically pro-trade effects in the majority of the EMU members, there are also some countries in which some sectoral impacts have been

[14] Since, for instance, the coefficient of the dummy euro in the transport equipment sector is 0.145, the variation of exports induced by euro adoption (Dueuro=1) with respect to the case of non-adoption (Dueuro=0), is given, other things being equal, by [(exp0.145*1/ exp0.145*0) –1]*100=15.6%.

[15] Flam and Nordtrom (2006), introduce two different dummies: a dummy for exports within the eurozone in 1999-2001 and a dummy for exports in 2002-2005. We report results of this second dummy (see table A6 in Flam and Nordstrom (2006)). To be noted is that these authors consider a wider group of exporting countries (20 OECD countries), while we consider 13 EU countries only. Furthermore, we would point out that, in our estimates, different sectors show a positive and statistical significance euro effect with respect to those in Flam and Nordstrom. In particular, we find no statistically significant effects in chemicals, rubber and plastics.

negative. Among these countries, it seems that France and Finland have suffered more than others: they exhibit a negative impact in many manufacturing sectors. Interestingly, in the case of some sectors for which there was no euro effect at an aggregate level of exporters, the country analysis evidences the existence of significant effects, both negative and positive. In some cases these exceptions are quite relevant, given the importance of these sectors in the trade structures of those countries (i.e. textiles and clothing for Italy, chemicals for France and Germany, office accounting and computing machinery in Germany).

Tab. 4 **The country/sector euro effect**

ISIC 2 digits	Industry description	Dummy euro positive and significant	Dummy euro negative and significant
01_05	Agriculture, hunting, forestry and fishing	France, Spain	Finland, Germany, The Netherlands
10_14	Mining and quarrying		Spain
15_16	**Food products beverages and tobacco***	Germany, The Netherlands	
17_19	Textiles, textile products, leather and footwear		Finland, Italy
20	Wood and wood and cork products	The Netherlands	
21_22	**Pulp, paper, paper products, printing and publishing**	The Netherlands	
23_25	Chemicals, rubber, plastics and fuel products	Spain, Portugal	France, Germany
23	Coke, refined petroleum products and nuclear fuel	Austria, The Nertherlands	
24	Chemical and chemical products	Belgium, Spain	
25	Rubber and plastic products		Belgium, France
26	Other non metallic mineral products		
27_28	**Basic metals and fabricated metals products**	Greece and Portugal,	
27	**Basic metals**	Austria, the Netherlands, Spain	France, Finland
28	Fabricated metal products except machinery and equipment		Belgium
29_33	machinery and equipment		Finland
29	machinery and equipment n.e.c.	Belgium	
30_33	**Electrical and optical equipment**	Belgium, the Netherlands, Spain	France, Finland
30	Office accounting and computing machinery	Austria, Germany	France
31	Electrical machinery and apparatus nec	Greeece	Finland
32	**Radio tv and comunnication equipment**	Austria, Germany, Spain	France
33	**Medical precision and optical instruments**	Greeece	
34_35	**Transport equipment**	Spain	
34	**Motor vehicles**	Italy, France, Greece, Spain	Finland
35	Other transport equipment	Italy	
36_37	Manufacturing nec		Italy

* Sectors in bold are those with a euro effect positive and significant for the entire set of EU countries.

If a country's euro positive effect on total exports emerges, it can be interpreted as the "net sum" of sectoral impacts[16]. For the Netherlands, Spain, and Belgium the joint effect of all the above factors seems to have had a positive "net effect" in terms of export performance.

Peculiar is the case of Italy, where the introduction of the euro has negatively affected the exports of two important sectors: textiles and manufacturing nec (inclusive of furniture production and other relevant productions for the specialization of the country). The euro effect was positive for chemicals, metals and transport equipment, in the latter case both motor vehicles and transport nec.

The Italian sector that has benefited most from the single currency in terms of exports is motor vehicles. Given its distinctive features (scale economies, large size of firms, and varieties of goods) this sector proves to be the one with the greatest advantages among eurozone countries. This phenomenon may have helped the recovery of the sector after the restructuring process of recent years. However, the magnitude of the euro positive effect for Italy is lower than for those of the main European partners, Spain and France, in the same sector (see table A1 in appendix).

When we reshuffle our results presented in table 4 on the basis of a manufacturing sectors classification "*à la* Pavitt", the general picture regains some more clearness (table 5). The pro trade effects for the majority of the countries seems to be mainly concentrated in scale intensive industries. The weight of these sectors in the industrial specialization of countries together with other factors (differences in factor endowments, product regulations across countries), may have contributed to determine "the winners and the losers" in the monetary integration process.

As for the sectoral distribution of positive euro effects among countries, motor vehicles is relatively widespread (France, Greece, Italy and the Netherlands), followed by machinery and equipment (positive for Austria, the Netherlands and Spain). Traditional sectors are those in which the negative effects are more widespread (Finland, Germany, The Netherlands Spain Italy Belgium).

In particular, the euro effect in the sectors of food products, basic metals and metal products, machinery and equipment, medical precision and optical instruments is widespread, while a heterogeneous distribution of the effect across countries is apparent in the sectors of motor vehicles and medical precision and optical instruments (see table A1).

What emerges from the results presented in this section is that trade specialisation, firm size, sensitiveness to exchange rate movements, and the number of firms in the sector are all factors that may have contributed to determine advantages and disadvantages of individual countries with respect to the euro introduction.

[16] Micco et al. (2003) report the euro effect for each eurozone country. For a survey of euro effects on total exports see also de Nardis et al. (2007).

Tab. 5 The euro effect in a classification "*à la* Pavitt"

SITC 2 digits	Industry description	Dummy euro positive and significant	Dummy euro negative and significant
	Traditional sectors		
01_05	Agriculture, hunting, forestry and fishing	France, Spain	Finland, Germany, The Netherlands
10_14	Mining and quarrying		Spain
15_16	**Food products beverages and tobacco***	Germany, The Netherlands	
17_19	Textiles, textile products, leather and footwear		Finland, Italy
25	Rubber and plastic products		Belgium, France
27	**Basic metals**	Austria, the Netherlands, Spain	France, Finland
36_37	Manufacturing nec		Italy
	Scale intensive sectors		
20	Wood and wood and cork products	The Netherlands	
21_22	**Pulp, paper, paper products, printing and publishing**	The Netherlands	
23	Coke, refined petroleum products and nuclear fuel	Austria, The Nertherlands	
26	Other non metallic mineral products		
27_28	**Basic metals and fabricated metals products**	Greece and Portugal,	
28	Fabricated metal products except machinery and equipment		Belgium
31	Electrical machinery and apparatus nec	Greeece	Finland
32	**Radio tv and comunnication equipment**	Austria, Germany, Spain	France
34_35	**Transport equipment**	Spain	
34	**Motor vehicles**	Italy, France, Greece, Spain	Finland
	Specialised suppliers		
29_33	machinery and equipment		Finland
29	machinery and equipment n.e.c.	Belgium	
35	Other transport equipment	Italy	
	Science Based		
23_25	Chemical, rubber, plastics and fuel products	Spain, Portugal	France, Germany
24	Chemicals and chemical products	Belgium, Spain	
30_33	**Electrical and optical equipment**	Belgium, the Netherlands, Spain	France, Finland
30	Office accounting and computing machinery	Austria, Germany	France
33	**Medical precision and optical instruments**	Greeece	

* Sectors in bold are those with a euro effect positive and significant for the entire set of EU countries

7 CONCLUSIONS

The empirical literature has reported a modest pro trade effect deriving from the euro introduction in 1999. Analysis has been usually conducted at the aggregate level, with respect to both trade flows (total exports and/or imports flows) and country aggregates (Eurozone as a whole).To gain better understanding of the main factors influencing the single currency effect on trade flows, it is of some help to use a sectoral analysis. We performed it in a dynamic analysis to take account of the persistence phenomena that characterize bilateral trade relations between industrialized countries. The estimates results show that the euro effect is not uniformly distributed among sectors: only in 11 industrial sectors out of 25 there is a positive and significant impact of the euro on export flows. Particularly, most of these sectors are those characterized by increasing returns to scale and/or by a capacity to produce (horizontally and vertically) differentiated goods.

These results seem consistent with Baldwin's "new good" hypothesis and with other findings in the empirical literature which contend the traditional view relating trade impacts of the single currency to diminishing transaction costs. What differs with respect to earlier sectoral studies is the magnitude of the positive euro effect, which is lower and less widespread among industries. We believe that our dynamic specification fitted this phenomenon better.

But even if the general sectoral findings seem in accordance with the new-good hypothesis, this view is unable to explain all. When the analysis moves from sector to sector/country level the picture blurs considerably. Firstly, there are some countries in which the sectoral impact of euro adoption on exports has been negative, despite the fact that, in the same sector, the result for the area as a whole (Eurozone countries) was positive. Analogously in some sectors for which there was no euro effect (not statistically significant) at an aggregate level of exporters, the country analysis shows the existence of negative or positive effects. In some cases, these exceptions are quite relevant, given the importance of these sectors in the trade structure of those countries (i.e. textiles and clothing for Italy, chemicals for France and Germany, office accounting and computing machinery in Germany). All this points to the possible working of nation/sector specificities affecting differently the euro effect: a realm of heterogeneity that cannot be easily tractable with macro-econometric instruments.

Bottom line of our analysis is that, since pro trade effects is mainly concentrated in increasing-returns-to-scale industries, industrial specialization of countries (relative weight of the advantaged and disadvantaged activities in the economies) contributed to determine, at a first stage, "the winners and the losers" in the monetary integration process. Yet, there is a second-stage concerning the influence of other factors, which are mainly nation/sector specific (firm size, sensitiveness to exchange rate movements, institutions and market structures and many others) and which have played a role in further differentiating country-by-country the responsiveness of industries and in differently affecting the net result for the various economies. This hints that the field of investigation of the trade effect of the euro is still far from being completely explored.

APPENDIX

Table A1 .Estimates sector/country

		Austria		Belgio		Finlandia		Francia		Germania		Grecia	
	Industry description	Coeff.	t	Coeff.	t	Coeff.	t	Coeff.	t	Coeff.	t	Coeff.	t
01_05	Agriculture, hunting, forestry and fishing	0.13	1.01	-0.08	0.66	**-0.35**	**-2.65**	**0.16**	**1.87**	**-0.16**	**-1.88**	0.08	0.58
10_14	Mining and quarrying	-0.07	0.42	-0.04	0.21	0.02	0.14			-0.1	0.68	-0.07	0.68
15_16	**Food products beverages and tobacco**	0.06	0.75	0.05	0.94	**-0.15**	**1.76**	-0.03	0.88	**0.11**	**2.31**	-0.04	0.57
17_19	Textiles, textile products, leather and footwear	-0.03	0.69	0.01	0.25	**-0.11**	**2.03**	-0.01	1.55	0	0.11	**0.13**	**1.69**
20	Wood and wood and cork products	0.04	0.26	0	0.06	0.04	0.25	-0.1	0.88	0.02	0.24	-0.13	0.34
21_22	**Pulp, paper, paper products, printing and publishing**	0.13	1.41	0.02	0.37	0	0.09	-0.06	1.08	0.1	1.61	0.08	0.49
23_25	Chemicals, rubber, plastics and fuel products	-0.04	0.82	0.19	1.39	-0.09	0.95	**-0.11**	**-1.89**	**-0.15**	**-1.92**	-0.12	1.16
23	Coke, refined petroleum products and nuclear fuel	**1.03**	**3.81**	0.34	1.27	-0.2	0.35	-0.23	0.97	-0.21	0.69	-1.29	1.46
24	Chemical and chemical products	0	0.1	**0.06**	**2.06**	-0.07	1.41	**-0.04**	**-1.73**	0	0.1	-0.9	0.87
25	Rubber and plastic products	-0.01	0.39	**-0.1**	**-2.18**	0.06	1.16	**-0.11**	**-2.86**	-0.05	1.35	0.11	0.97
26	Other non metallic mineral products	0	0.05	0.06	1.23	0.12	1.54	-0.03	0.7	-0.04	0.88	**-0.23**	**1.67**
27_28	**Basic metals and fabricated metals products**	0.02	0.42	-0.04	0.82	-0.01	0.19	0.01	0.16	-0.04	0.83	**0.24**	**2.37**
27	**Basic metals**	0.11	1.54	-0.05	-1.26	0.06	0.07	0.04	0.7	-0.04	-0.75	**0.2**	**1.74**
28	Fabricated metal products except machinery and equipment	0.01	0.19	**-0.09**	**-1.83**	-0.03	-0.5	-0.03	-0.45	0	0	0.04	0.3
29_33	machinery and equipment	**0.08**	**1.85**	0.04	1.4	**-0.07**	**-1.84**	**-0.09**	**-2.64**	0.02	0.5	0.1	1
29	machinery and equipment n.e.c.	0.06	1.26	**0.24**	**3.72**	**-0.09**	**-1.65**	-0.04	-0.98	-0.05	-1.24	0.12	0.9
30_33	**Electrical and optical equipment**	0.06	1.2	**0.19**	**3.65**	**-0.13**	**-3.45**	**-0.13**	**-3.14**	0.04	0.8	-0.08	-0.5
30	Office accounting and computing machinery	**0.48**	**4.33**	-	-	-0.02	-1.1	**-0.32**	**-3.21**	**0.3**	**3.08**	-0.02	-0.6
31	Electrical machinery and apparatus nec	0.04	0.8	**-0.09**	**-1.7**	**-0.3**	**-5.1**	0	0.2	0.04	0.6	**0.26**	**1.96**
32	**Radio tv and comunnication equipment**	**0.27**	**2**	-	-	0.19	1.55	**-0.25**	**-2.8**	**0.23**	**2.9**	-0.37	-1.28
33	**Medical precision and optical instruments**	0.02	0.3	-0.07	-1.4	-0.01	-0.26	0.03	0.7	0.01	0.23	**0.39**	**2.22**
34_35	**Transport equipment**	0.07	0.6	-	-	-0.23	-1.31	0.15	1.5	0.05	0.43	0.21	1.1
34	**Motor vehicles**	-0.015	-0.19			**-0.3**	**-2.87**	**0.2**	**2.76**	-0.03	-0.05	**0.46**	**3.02**
35	Other transport equipment	0.17	0.99	-0.28	-1.64	-0.33	-0.94	0.14	0.72	0.02	0.1	-0.42	-1
36_37	Manufacturing nec	0.07	0.98	-	-	-0.03	-0.4	-0.09	-1.1	0.07	1.25	-0.11	-0.95

(continued)

		Italia		Olanda		Portogallo		Spagna	
	Industry description	Coeff.	t	Coeff.	t	Coeff.	t	Coeff.	t
01_05	Agriculture, hunting, forestry and fishing	0.06	0.87	**-0.19**	**2.57**	0.06	0.39	**0.3**	**2.76**
10_14	Mining and quarrying	-0.19	1.25	0.08	0.47			**-0.3**	**2.37**
15_16	**Food products beverages and tobacco**	0	0.11	**0.1**	**2.47**	0.09	1.26	0.06	1.55
17_19	Textiles, textile products, leather and footwear	**-0.14**	**2.76**	**0.06**	**1.71**	0.03	0.4	-0.01	0.34
20	Wood and wood and cork products			**0.24**	**2.41**			0.01	0.12
21_22	**Pulp, paper, paper products, printing and publishing**			**0.12**	**1.92**			0.07	0.5
23_25	Chemicals, rubber, plastics and fuel products	0.06	0.93	0	0.13	**0.19**	**2.01**	**0.16**	**2.62**
23	Coke, refined petroleum products and nuclear fuel	-0.1	0.23	0.4	1.95			0.33	1.28
24	Chemical and chemical products	**0.06**	**1.69**	0.02	0.88			**0.08**	**2.03**
25	Rubber and plastic products	0.02	0.1	0.02	0.61			0.05	1.07
26	Other non metallic mineral products	-0.04	0.87	0.05	0.94	0	0.04	0.02	0.3
27_28	**Basic metals and fabricated metals products**	0.08	1.57	0.03	0.67	**0.27**	**2.68**	0.09	1.62
27	**Basic metals**	**0.1**	**1.65**	**0.09**	**1.93**	-0.05	-1.26	0.08	1.14
28	Fabricated metal products except machinery and equipment	0.06	1.1	**-0.1**	**-1.76**	**-0.09**	**-1.83**	0.05	0.55
29_33	machinery and equipment	0.001	0.2	**0.13**	**3.2**	0.05	0.6	**0.14**	**2.95**
29	machinery and equipment n.e.c.	0.06	0.9	0	0	0.035	1.04	0.07	1
30_33	**Electrical and optical equipment**	-0.07	-1.3	**0.12**	**3.76**	-0.01	-0.13	**0.15**	**2.73**
30	Office accounting and computing machinery	-0.01	-0.6	-	-	-	-	0.03	1.2
31	Electrical machinery and apparatus nec	-	-	-	-	-	-	0.12	1.4
32	**Radio tv and comunnication equipment**	-	-	-	-	-	-	**0.42**	**3.5**
33	Medical precision and optical instruments	0.037	0.4	-	-	-	-	0.18	1.56
34_35	Transport equipment	0.29	3.17	-0.01	-0.2	-	-	**0.31**	**1.9**
34	Motor vehicles	0.11	1.94	-	-	-	-	**0.19**	**1.82**
35	Other transport equipment	0.23	1.93	-	-	-	-	0.29	1.54
36_37	Manufacturing nec	-0.11	-1.95	-	-	-	-	0.05	0.7

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