Internal and External Current Account Balances in the Euro Area

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Abstract

The dispersion in current account balances among countries in the euro area has widened markedly over the past decade-and-a-half, and especially since 1999. We decompose current account positions for euro area countries into intra-euro-area balances and extra-euro-area balances and examine the determinants of these balances. Regarding intra-euro-area balances, we present evidence that capital tends to flow from high-income euro area economies to low-income euro area economies. These flows have increased since the creation of the single currency in Europe. Regarding extra-euro-area balances, we estimate a model of the trade balance of the euro area and individual euro-area countries with the rest of the world. We find that a real appreciation of the euro against the currencies of its main trading partners appears to have a substantial effect on the euro area's net exports in the long run, though the immediate effect is small. Our estimates for individual countries suggest that the adjustment to a real appreciation of the euro would not be equally distributed across euro-area countries. In particular, Germany would bear the largest share of the adjustment, while the other large euro-area economies would be relatively unaffected. Finally, we find that the introduction of the euro seems to have changed the dynamics of trade balance adjustment in three of the larger euro-area economies.

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1. Introduction

The observation of rising and persistent global imbalances has been the focus of lively debate among policymakers and academic economists in recent years. Most of that debate has concentrated on the large U.S. current account deficit and its main counterpart, the large current account surpluses of countries in Asia. Europe has not attracted much attention in this debate, most likely because European countries and the European Union as a whole have a long tradition of keeping their current accounts relatively close to balance (see Ahearne and von Hagen, 2005). Nevertheless, current account developments in Europe deserve attention for several reasons. For starters, current account imbalances within the EU and, in particular, among the countries participating in European Monetary Union (EMU) have grown considerably in recent years. A natural question to ask is whether these imbalances can be explained by fundamental economic factors or whether they might point to a potential unsustainability of the common currency.

In addition, as argued in Ahearne and von Hagen (2005), Europe, and the euro area in particular, might be forced to run significant current account deficits in the future, if the United States takes action to close its current account deficit or the U.S. dollar depreciates sharply and the Asian countries insist on running surpluses and start accumulating euro reserves instead of dollar reserves. The question here is: What are the consequences of a significant appreciation of the euro for the euro area's current account position?

This paper explores the determinants of the current account balances of the euro area and individual member countries of the euro area. We are interested in both intra-euro-area and extra-euro-area current account balances. Below, we look at the issue from two perspectives. The first interprets current account balances as the

counterpart of capital flows and asks to what extent they can be explained by economic convergence among countries with different per-capita incomes. The second perspective interprets current accounts in the traditional way of exports and imports of goods and services and asks to what extent they can be explained by movements in aggregate real incomes and real exchange rates.

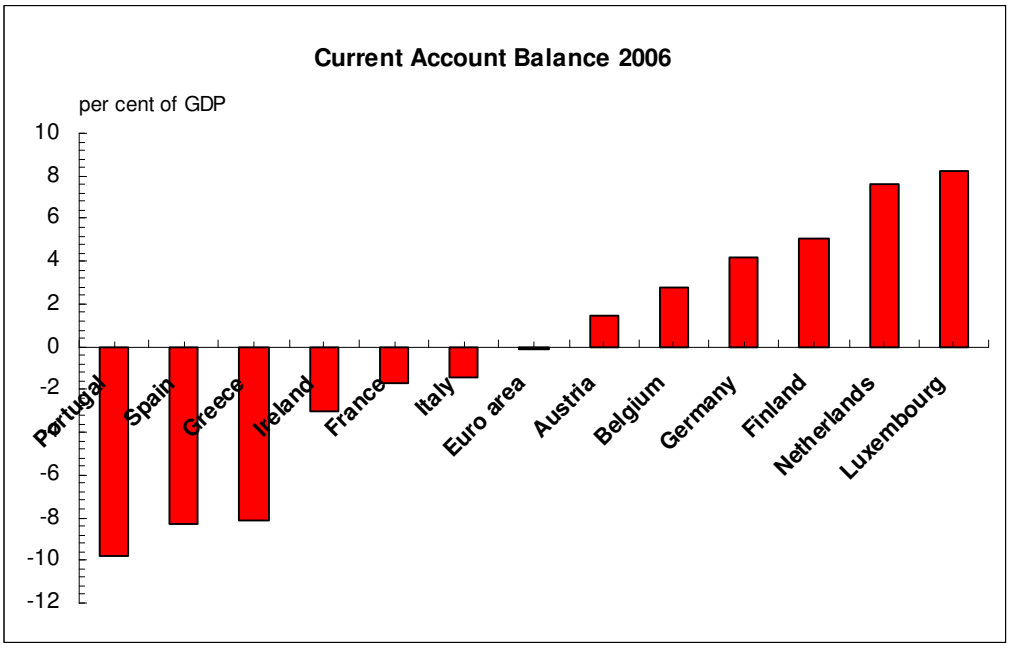
We have divided the paper into 5 sections. After this brief introduction, we present some stylised facts on current account balances in the euro area. In Section 3, we present evidence that capital tends to flow from high-income euro area economies to low-income euro area economies. These flows have increased since the creation of the single currency in Europe. In Section 4, we turn our attention to extra-EMU trade and estimate a model of the trade balance of the euro area and individual member countries of the euro area with the rest of the world. We find that a real appreciation of the euro against the currencies of its main trading partners appears to have a substantial effect on the euro area's net exports in the long run, though the immediate effect is small. Our estimates for individual countries suggest that the adjustment to a real appreciation of the euro would not be equally distributed across euro-area countries. In particular, Germany would bear the largest share of the adjustment, while the other large euro-area economies would be relatively unaffected. Finally, we find that the introduction of the euro seems to have changed the dynamics of trade balance adjustment in three of the larger euro-area economies. We close with a few concluding remarks.

2. Stylised facts

This section presents some of the main stylised facts about individual EMU member countries' current account balances. Figure 1 shows estimated current

account balances for the euro area as a whole and for individual euro area countries in 2006. As an aggregate, the euro area seems to be financially largely self-contained. This is not withstanding the fact that some euro-area countries have sizable current account imbalances. Germany, for example, has recorded annual surpluses of around $100 billion in recent years. Germany's surplus is estimated to have reached 4¼ per cent of GDP in 2006, with Finland and the Netherlands running even larger surpluses relative to GDP. In contrast, Portugal's current account deficit was nearly 10 per cent of GDP in 2006, while deficits in Greece and Spain exceeded 8 per cent of GDP.

Figure 1: Euro area current account balances (% of GDP)



Source: Estimates from IMF WEO September 2006

Figure 2 shows the evolution of current account balances under EMU. There is a group of countries consisting of Luxembourg, Finland, the Netherlands, and Germany, that consistently ran surpluses during the past five years. Germany registered small current account deficits averaging about 1 per cent of GDP during

most of the 1990s. The German balance swung into surplus in 2002 and the surplus has widened steadily over recent years as German exports have outpaced imports. Recent years have also seen a marked increase in the current account surplus in the Netherlands, while Finland's surplus has returned to roughly its level at the beginning of EMU, after widening to nearly 10 per cent in 2001.

At the other end of the spectrum, Greece, Portugal, and Spain have consistently run current account deficits in the past five years, and their deficits have widened significantly under EMU and during the period in the run-up to EMU. All three countries had current account positions close to balance around the mid-1990s. Recent years have seen an especially sharp decline in Spain's current account balance from roughly 3½ per cent of GDP in 2003 to an estimated 8¼ per cent of GDP in 2006.

Current account deficits of the magnitudes seen in Greece, Portugal, and Spain at present are unprecedented among euro area countries, with the exception of Ireland in the mid-1980s and Portugal in the 1970s (European Commission, 2006). Current account deficits of more than 8 per cent of GDP are also large compared with other non-euro-area advanced economies. Continual current account deficits accumulate to the net international investment position. Net external liabilities relative to GDP have soared to nearly 80 per cent in Greece, 60 per cent in Portugal, and 40 per cent in Spain.

One interpretation of the evolution of current account balances under EMU is that the increased dispersion of current account positions has been driven by trade flows that reflect shits in relative competitiveness within the euro area. (See, for example, Blanchard 2006, European Commission 2006, and Munchau 2006).

Figure 2a: Current account balances under EMU (% of GDP)

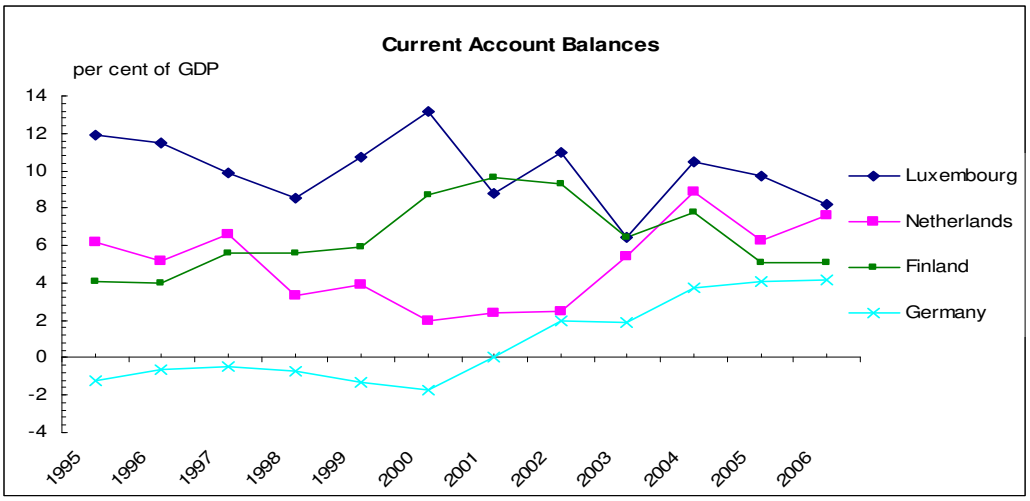


Figure 2b: Current account balances under EMU (% of GDP)

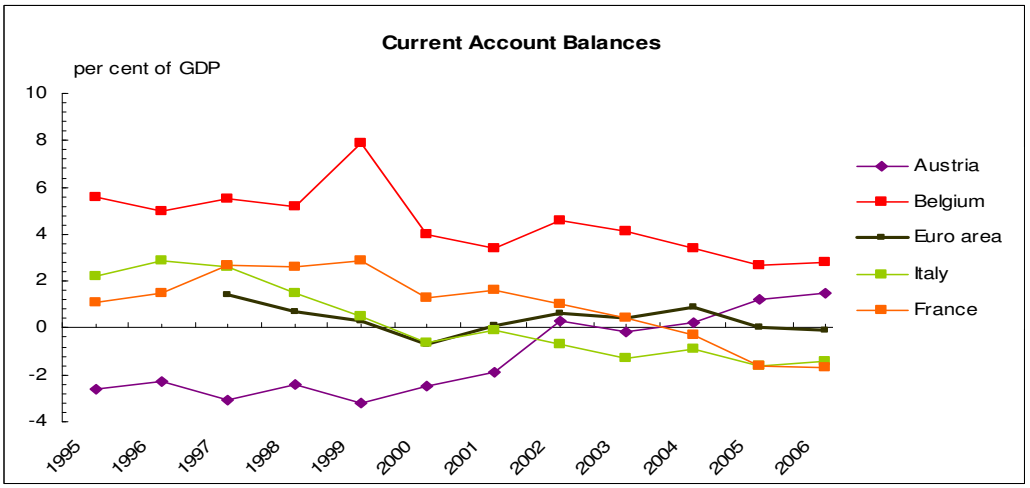
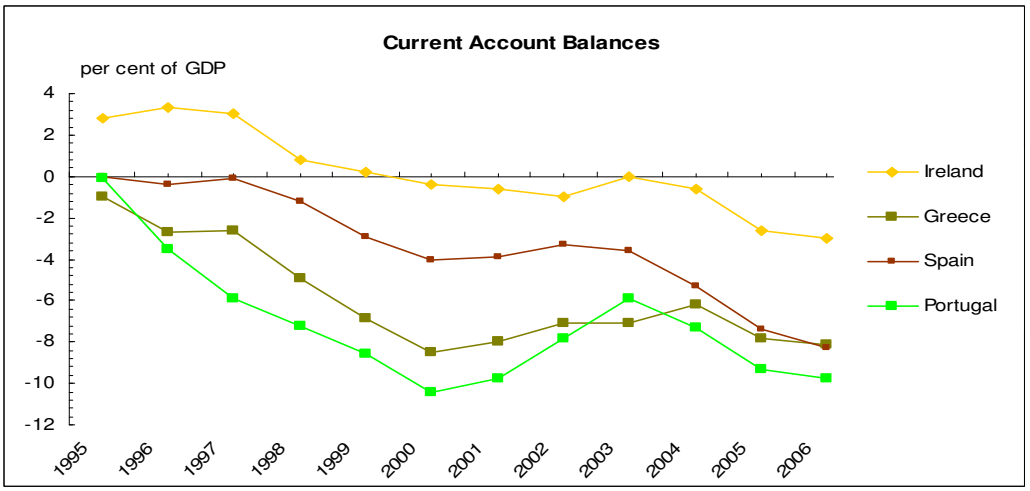


Figure 2c: Current account balances under EMU (% of GDP)



Source: IMF. Estimates for 2006 from IMF WEO September 2006.

On this account, aggregate demand was too strong in some countries and too weak in others, resulting in persistent differences in inflation rates across countries. In fact, the size and persistence of inflation differentials at the national level is one of the most widely recognized and documented facts relating to the start of EMU. As a result of persistent differences in inflation across countries, euro area economies have experienced very sizeable swings in the real exchange rates vis-à-vis their peers, as shown in Figure 3. In turn, the changes in competitiveness associated with these movements in real exchange rates may have played a role in bringing about the large swings in current account balances. The relationship between real exchange rate developments and current account balances portrayed in Figure 4 appears to confirm that countries that have gained (lost) competitiveness relative to other euro-area countries during EMU are now running large current account surpluses (deficits).

In particular, Blanchard (2006) ascribes Portugal's economic boom in the late 1990s to the sharp drop in interest rates and heightened expectations for faster convergence that resulted from participation in EMU. Rapid economic growth and a decline in unemployment lead to an increase in wage growth to a rate substantially above the growth in labour productivity. As a result, competitiveness deteriorated sharply, export growth weakened, and Portugal's trade and current account deficits widened markedly. Ahearne and Pisani-Ferry (2006) document that over the period 1999-2005, cumulative growth in Portugal's gross exports was as much as 10 percentage points below the euro area average. Greece, Italy, and Spain also experienced relatively sluggish growth in gross exports over this period.

Figure 3a: Real exchange rates

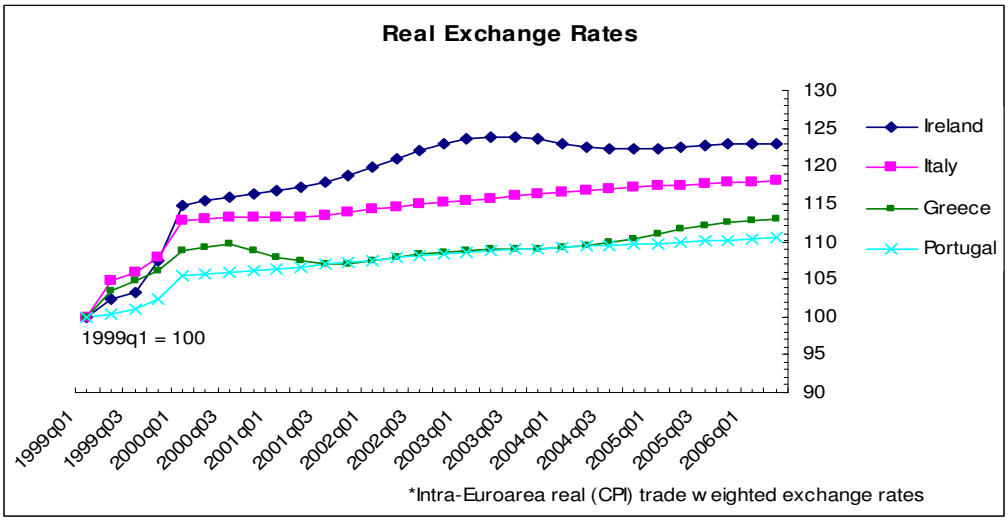


Figure 3b: Real exchange rates

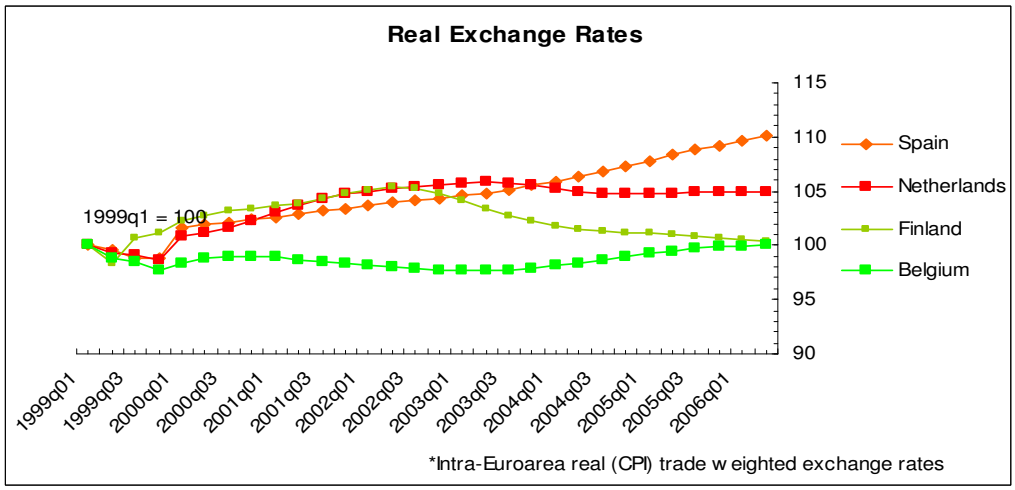
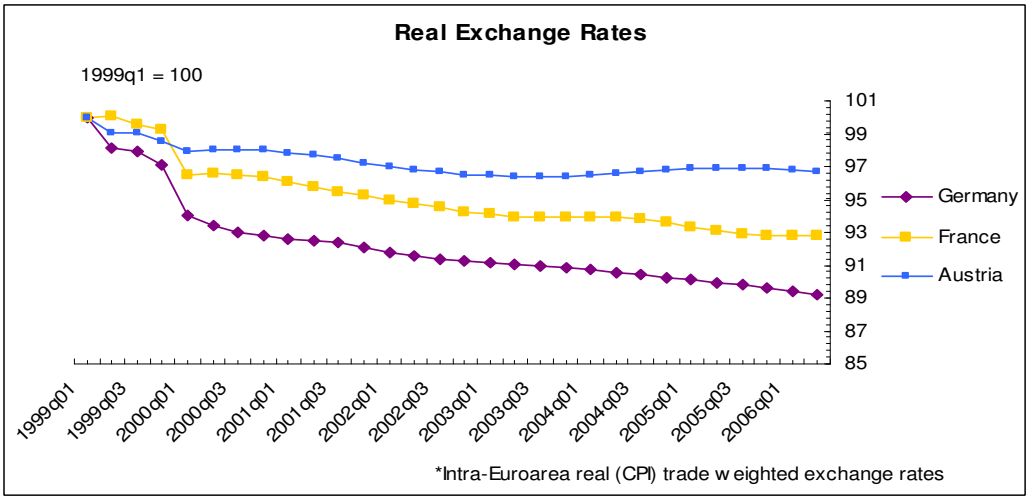
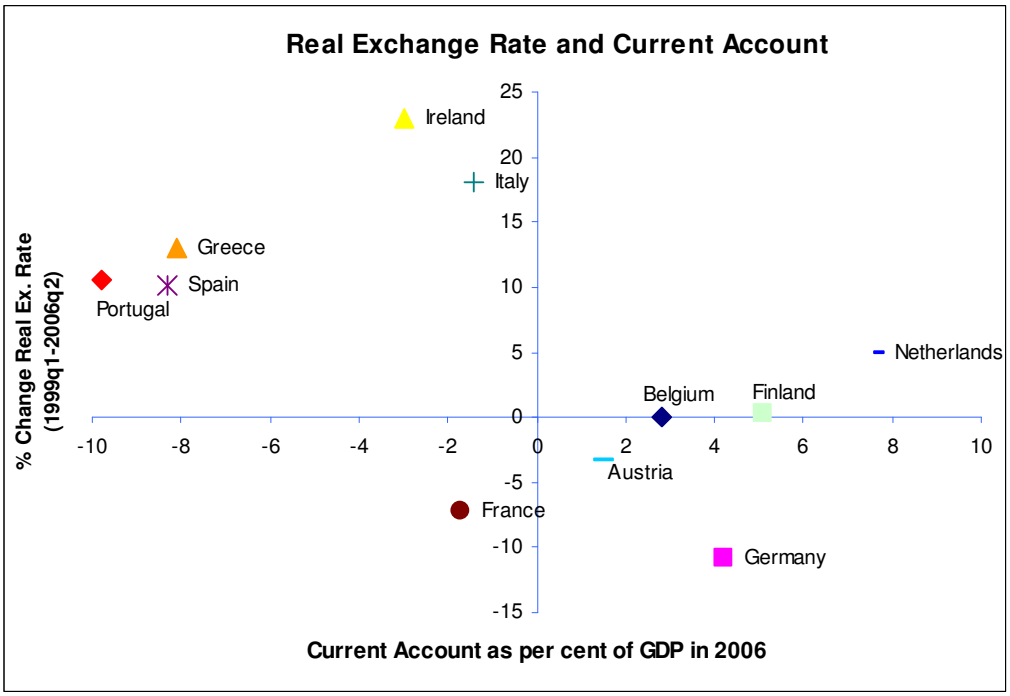


Figure 3c: Real exchange rates



Source: Eurostat.

Figure 4: Real exchange rate and current account balances



Source: Eurostat and IMF. Estimates for 2006 current account balances are from IMF WEO, September 2006.

In particular, Blanchard (2006) ascribes Portugal's economic boom in the late 1990s to the sharp drop in interest rates and heightened expectations for faster convergence that resulted from participation in EMU. Rapid economic growth and a decline in unemployment lead to an increase in wage growth to a rate substantially above the growth in labour productivity. As a result, competitiveness deteriorated sharply, export growth weakened, and Portugal's trade and current account deficits widened markedly. Ahearne and Pisani-Ferry (2006) document that over the period 1999-2005, cumulative growth in Portugal's gross exports was as much as 10 percentage points below the euro area average. Greece, Italy, and Spain also experienced relatively sluggish growth in gross exports over this period.

Some commentators have linked the strong performance of German exports over recent years to gains in competitiveness associated with a rate of inflation that has been persistently below the euro area average (see Ahearne and Pisani-Ferry,

2006, and Munchau 2006). According to this view, wage restraint, facilitated by a decline in unionization in Germany's labour market, has kept growth in unit labour costs well below the euro area average, boosting the competitiveness of German exporters. Revealingly, two-thirds of the 1.2 per cent annual average growth in German GDP over the period 1999-2005 came from net exports, with only one-third from growth in domestic demand (Ahearne and Pisani-Ferry, 2006).

The policy implication from this perspective is that, in order to achieve internal balance, deficit countries in the euro area need fiscal contractions to slow down aggregate demand and that the surplus countries ought to boost aggregate demand. One problem with this prescription, however, is that Germany and the Netherlands had troubles meeting their obligations under the Stability and Growth Pact until recently and have little room for manoeuvre with regard to fiscal policy. Most of the adjustment would thus have to come from the deficit countries.

An important question is how the large current account deficits in Greece, Portugal, and Spain are being financed. European Commission (2006) documents that a large part of the net financial inflows into these countries during EMU have taken the form of bank loans. For Greece, net portfolio inflows have also been important. Outflows of foreign direct investment have generally exceeded inflows in each of the three countries. In Germany, lending abroad by German banks exceeded foreign borrowing by German banks to the tune of about 2½ per cent of GDP annually on average over the period 1999-2005.

In contrast, in the period 1992-1998, German banks were significant net borrowers from the rest of the world. One hypothesis is that by eliminating exchange rate risk, the creation of the single currency in Europe has boosted financial flows from high-income to low-income countries in the euro area. Financial flows from

high-income countries in the euro area to low-income countries outside of the euro area have not increased. Of course, EMU has coincided with other efforts to promote increased financial integration in Europe. In the next section, we examine in more detail the pattern of net financial flows between European countries and between European and non-European countries.

3. Net financial flows and EMU

The alternative interpretation of current account imbalances is that they reflect capital flows. Neoclassical growth theory predicts that capital should flow from rich countries to poor countries. Poor countries have lower levels of capital per worker—in part, that explains why they are poor. In poor countries, the scarcity of capital relative to labour should mean that the returns to capital are high. In response, savers in rich countries should look at poor countries as profitable places in which to invest.[1]

In this section, we present some simple econometric evidence on the determinants of capital flows between countries in the EU-15 and between EU-15 countries and non-EU-15 countries. Ideally, we would use individual country data on intra-EU-15 and extra-EU-15 current account positions to measure financial flows, but these data are not readily available. As a proxy for current account balances, therefore, we use intra-EU-15 and extra-EU-15 trade balances. Our main aim is to examine whether capital tends to flow from rich to poor EU-15 countries, and whether the creation of the single currency in Europe has affected these flows.

[1] In reality, surprisingly little capital flows from rich countries to poor countries (see Lucas, 1990). Several candidate explanations have been put forward, including differences in human capital between rich and poor countries as well as failures in international capital markets that might account for the lack of flows. However, none of these candidates can come near to explaining quantitatively the observed shortage of capital flows relative to what economic theory would predict.

3.1 Data

We use annual data on exports and imports of goods over the period 1981-2005. Our sample covers the EU-15 counties, excluding Luxembourg. We have individual country data on both intra-EU-15 and extra-EU-15 exports and imports of goods. Exports and imports of services are not included because of a lack of reliable data. We consider intra-EU-15 trade balances (calculated as a country's exports to other EU-15 countries less imports from other EU-15 countries), extra-EU-15 trade balances (calculated as a country's exports to non-EU-15 countries less imports from non-EU-15 countries), and total trade balances (calculated as the sum of intra-EU-15 and extra-EU-15 trade balances). We also focus on the subset of EU-15 countries that are members of the euro area by considering intra-EMU trade balances (calculated as an EMU member country's exports to other EMU members less imports from other EMU members) and extra-EMU trade balances.

Figure 5 plots over time the dispersion across countries of each of the five different types of trade balances. The dispersion in trade balances trended upwards during the 1990s and then accelerated somewhat after 1999. The observation of widening differences among the current account balances of EU member states is also found in Blanchard (2006), who looks at the total current account of each country with the rest of the world and shows that the dispersion also increases among OECD countries. Figure 5 shows that the dispersion of intra-EU trade balances is consistently larger than the dispersion of extra-EU trade balances, and that the former has risen faster than the latter since the mid-1980s. Separating euro and non-euro countries from the EU-15 group makes no significant difference.

Figure 6 shows the behaviour of the (unweighted) average of trade balances over the past 25 years. It indicates that the average EU-15 country had a trade surplus

against its EU partners since the mid-1990s, and a slight deficit against non-EU countries since the start of EMU. We also counted the number of years in which a country's trade balance against its EU partners had the same or the opposite sign from its trade balance against the rest of the world. Greece had the same sign on both balances in all 25 years, Portugal in 23 years and Spain in 21 years. In contrast, Germany and the Netherlands had opposite signs on the two balances in all 25 years. Thus, countries running deficits against their EU partners consistently in past years tended to borrow from those and from the rest of the world. In contrast, Germany and the Netherlands tended to borrow from the rest of the world and lend to other EU countries, thus positioning themselves as financial intermediaries in Europe.

Figure 5: Dispersion of Trade Balances
(Standard deviation, % of GDP)

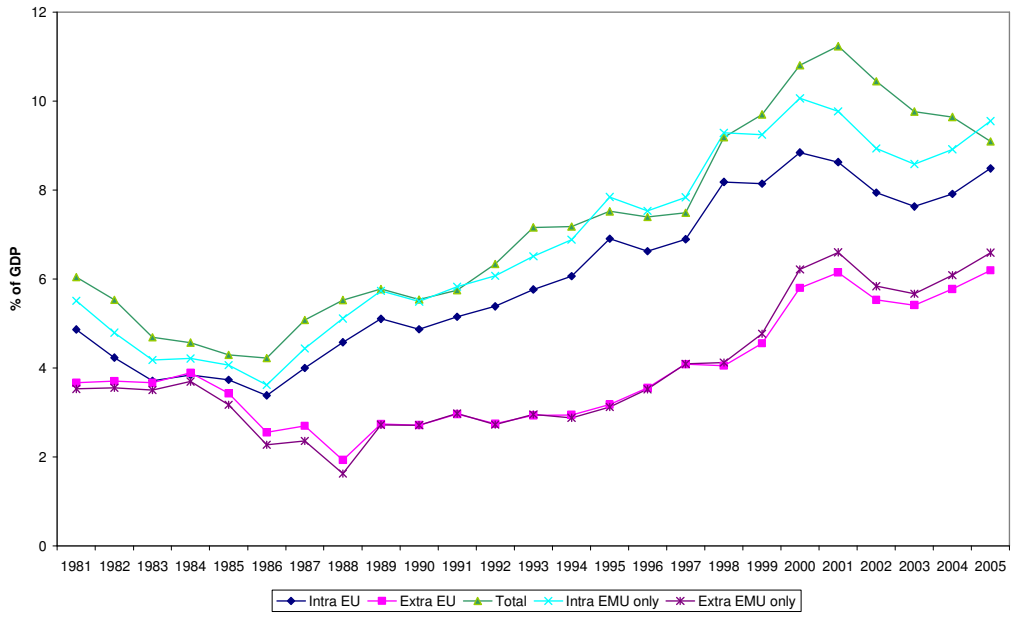
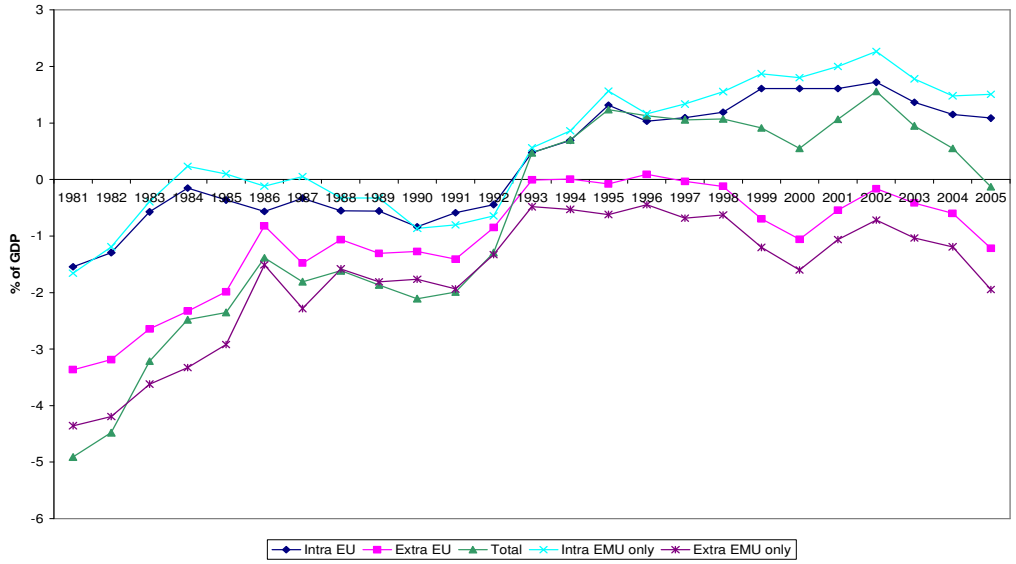


Figure 6: Average Trade Balances
(% of GDP)



3.2 Trade balances and income per capita: Some econometric evidence

We run some simple OLS regressions to examine the determinants of trade balances in individual European countries. We are particularly interested in any possible relationship between trade balances (and therefore financial flows) and income per capita. The dependent variable in our regressions is the ratio of the trade balance to GDP. We consider three variations of the dependent variable, corresponding to the different measures of the trade balance for EU-15 countries discussed above: total trade balance to GDP, intra-EU-15 trade balance to GDP, and extra-EU-15 trade balance to GDP.

The main explanatory variable is real per-capita GDP. We also include this variable interacted with a dummy variable for the start of EMU in 1999. We include dummy variables for Ireland and the Netherlands because these two countries consistently had very large trade intra-EU surpluses.[2] We also include a dummy

[2] Ireland's persistently large intra-EU surplus in large part reflects its position as an export platform in Europe for U.S. multinational companies.

variable for German unification and a dummy variable for all countries that had trade deficits consistently throughout the entire period: Austria Greece, Portugal, Spain, and the United Kingdom.

Our results are presented in Table 1. The first part of the table uses the set of dummies and real GDP per capita as regressors. We find that trade surpluses are a positive function of per-capita income in the EU-15 and that the relationship is strongly statistically significant. Generally, countries with larger per-capita GDPs have larger trade balances. Before the start of EMU, the effect of a rising GDP per capita on a country's total trade balance is 0.50, 0.19 of which goes to the intra-EU trade balance and 0.31 to the extra-EU trade balance. The positive coefficient becomes a notably stronger after the beginning of EMU, and only for EMU countries. Thus, the effect of rising per-capita GDP on a country's total trade balance doubles for EMU member countries, and this is almost entirely due to a strong rise in the effect on the intra-EMU dummy. In contrast, the effect of rising per-capita GDP on the trade account remains unaffected for the three countries in the sample that did not join the euro, Denmark, Sweden, and the UK. Thus, effect we observe is not merely a general effect for all EU countries. Instead, the estimates indicate that EMU has changed the direction of capital flows within the euro area significantly.

These results suggest that EMU has increased capital market integration in Europe with the result that capital flows are now more in line with what neoclassical growth theory predicts. As capital flows from high-per capita GDP to low-per capita GDP countries, they can be expected to promote economic convergence among the euro-area countries. This means that the allocation of capital is becoming more efficient in Europe, and that the observed current account imbalances indicate that the monetary union works well. By implication, a fiscal expansion in the surplus

countries would tend to absorb more of their domestic savings and slow down capital flows to poorer countries, thus rendering EMU less efficient.

The lower part of table 1 shows the results of adding some control variables to the above regression. Importantly, the central message of the simpler regressions remains the same: The income elasticity of the trade balance with regard to per capita real GDP increases with the start of EMU, but only for the EMU member countries. After the beginning of EMU, there is also a positive reaction to the real exchange rate with regard to the EU countries, and the coefficient on real GDP per capita in the EU aggregate becomes significantly negative for the EMU member countries.

Table 1: Trade Balances and Per Capita Real GDP

	Dependent variable: Trade balance		
Exogenous variables:	Total	Intra-EU	Extra-EU
constant	-9.85***	-3.82***	-6.04***
EMU dummy	-12.47***	-8.82***	-3.65**
German unification dummy	0.39	-0.32	0.71
Real GDP per capita	0.50***	0.19***	0.31***
Real GDP per capita*EMU dummy	0.55***	0.43***	0.12*
Real GDP per capita * non-euro dummy	-0.05	-0.02	-0.03
Deficit county dummy	-4.48***	-3.27***	-1.21**
Surplus country dummy	6.94***	10.18***	-3.24***
R^2 (adjusted)	0.72	0.75	0.36
Constant	-18.4**	-0.15	-18.3*
Real GDP per capita	0.47**	0.29**	0.17**
EMU dummy	16.1	1.14	14.9
Real GDP per capita*EMU dummy	0.58**	0.30**	0.28**
German unification	0.05	-0.36**	0.42
Deficit county dummy	-5.28**	-4.12**	-1.16*
Surplus country dummy	6.26**	9.96	-3.69**
Denmark/Sweden/UK dummy	15.61**	6.49*	9.11**
DK/SE/UK dummy*Real GDP per cap.	-0.38	-0.17	-0.21
Avg. EU real GDP per capita	0.40**	0.12	0.29*
Avg. EU real GDP per cap*EMU dummy	-2.44**	-1.23*	-1.21
Intra-EU REER	0.02	-0.07**	0.08**
Intra-EU REER*EMU dummy	0.25	0.19*	0.06
Intra-EU REER* DK/SE/UK dummy	-0.07	-0.05	-0.03
R^2 (adjusted)	0.74	0.77	0.39

No. of observations = 350
indicates statistically significant at 10% level; ** indicates significance at 5% level,
*** indicates significance at 1% level

Given the simplicity of our estimated equations, these results are suggestive rather than definitive. Nonetheless, our reading of the results is that monetary union seems to have made a difference in that high-income countries have become lenders to low-income countries within EMU much more than on a global scale.

4. Estimating trade balance models

The emphasis in the previous section was on capital flows within the euro area. In this section, we present empirical estimates of a model explaining the trade balance of the euro area and individual member countries of the euro area with the rest of the world. We use quarterly data for the period from 1980:Q1 to 2005:Q2. Exports and imports for the euro area are computed for the ten most important trade partners outside the euro area. This covers approximately 60 per cent of the total trade with the rest of the world. For the member countries, we use total exports (imports) and subtract exports (imports) to other euro-area countries. We use data from the IMF's Direction of Trade statistics, and focus on exports and imports of goods since, as mentioned earlier, data for trade in services are not readily available, nor are current account data with regard to non-euro area countries. Exports and imports are measured in U.S. dollars for all countries. We normalize the trade balance by dividing by domestic GDP in U.S. dollars.

Our baseline model seeks to explain the trade balance using domestic and foreign real GDP and the effective real exchange rate. For each country and the euro area, we calculate "foreign" GDP by taking the nominal GDP of the ten most important trade partners outside the euro area and deflating it by the US CPI. Our regressions use the ratio of domestic real GDP to foreign real GDP as an explanatory variable. Note that domestic real GDP is computed in terms of the relevant country's or the euro area's own currency, while "foreign" real GDP is calculated in terms of

real US dollars. Converting the former into real dollars - or the latter into real euros – would result in a series which is entirely dominated by real exchange rate movements such that the information about real GDP is wiped out. Both real GDP series are computed as indexes with the first quarter of 1999 as base period and are converted into logs.

Figures 7-13 show the trade balances relative to GDP together with the real exchange rates and the relative GDP variables. For the euro area, Figure 7 gives three measures of the trade account. The line CA gives the trade balance of the aggregate euro area according to EU statistics. "Extra CA" gives the sum of all of euro area-countries net exports to the rest of the world less the same countries' net exports to other euro-area countries. The figure shows that there are some data discrepancies that are due to the statistical separation of Belgium and Luxembourg in the late 1990s. The figure also shows the euro-area's net exports to its ten most important trade partners. This line tracks the total trade balance very closely except for a period in the mid-1990s.

Figure 7 shows that for the euro area as a whole the trade balance has remained within a band of plus/minus 2 per cent of GDP in all but two years in the past 25 years, and the two exceptions are in the early part of the sample. In the past 10 years, it has hovered between zero and 2 per cent of GDP. There are larger discrepancies across the four largest euro-area economies, Germany, France, Italy, and Spain, as shown in Figure 9. Individual trade balances range between plus and minus five per cent of individual country GDP. While Spain consistently experienced trade deficits throughout the period, the other three large economies consistently had trade surpluses, and Germany had the largest of these.

Figure 7

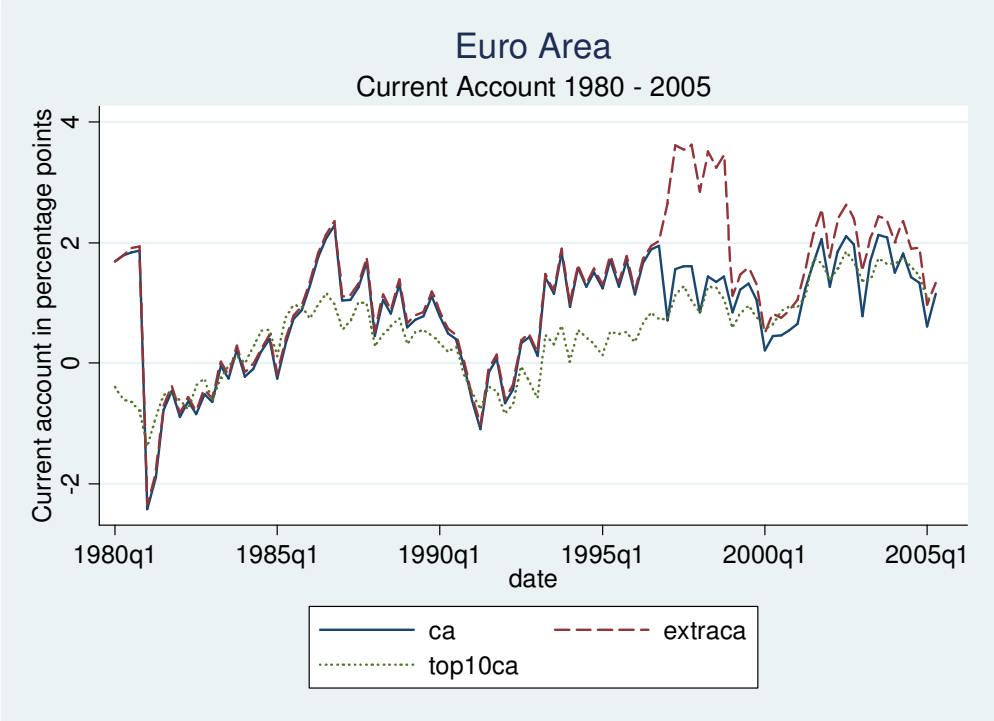


Figure 8

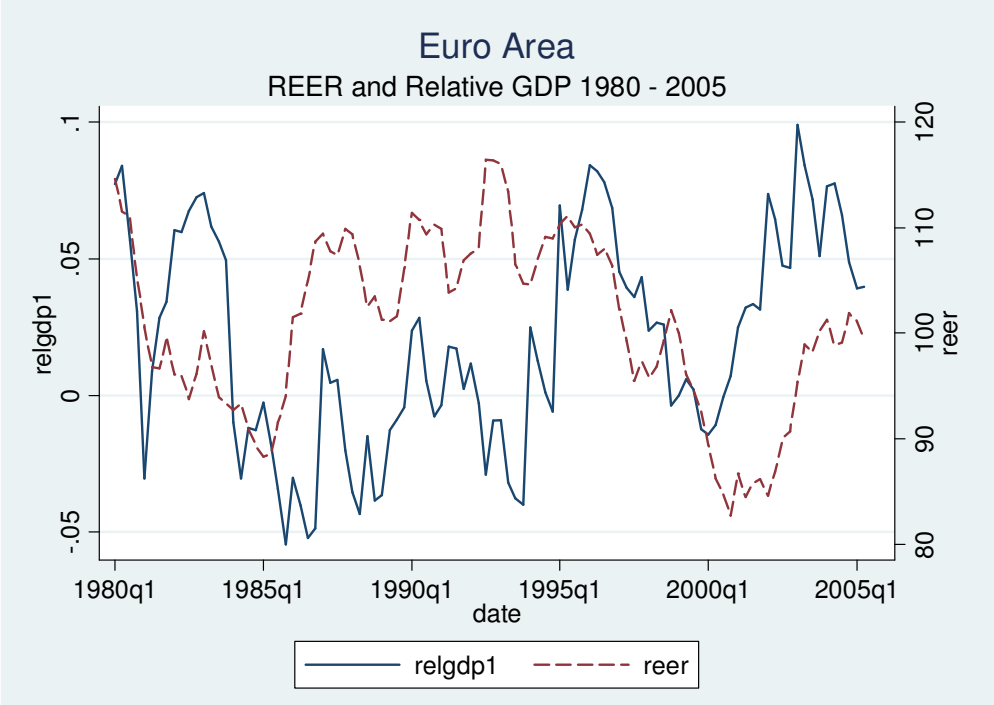


Figure 9

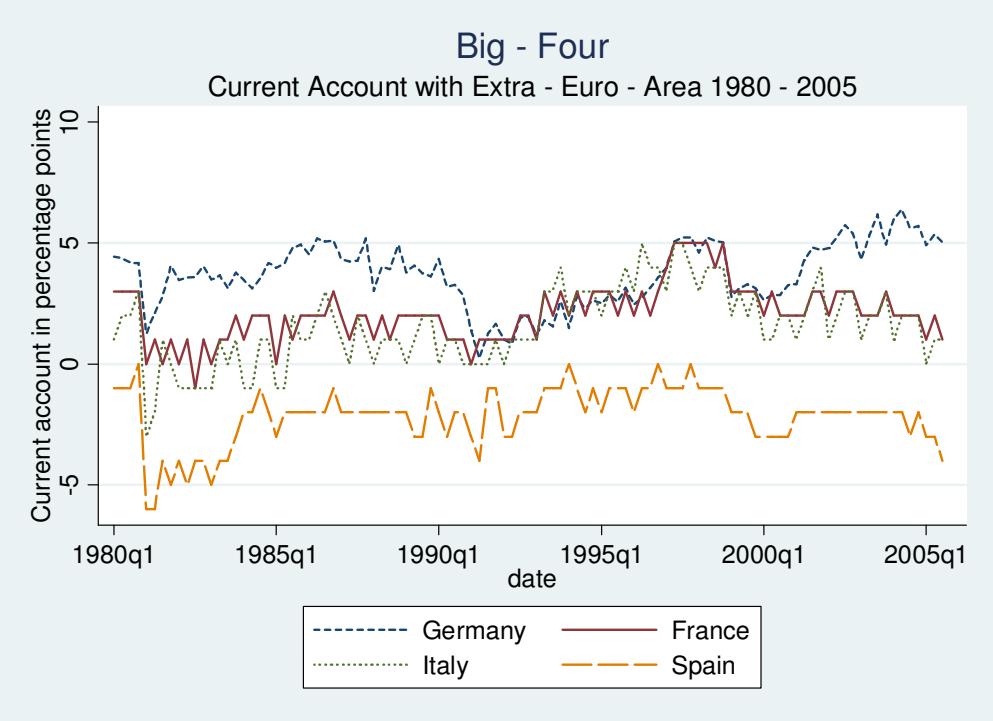


Figure 8 shows the relative GDP of the euro area against its ten largest trade partners (in logs, as explained above). The series oscillates between -0.05 and 0.1 with a slight upward trend since the mid-1980s. The figure also shows the real exchange rate of the euro area against its ten largest trade partners. Following a large real depreciation of the euro in the first half of the 1980s, we observe a real appreciation in the subsequent decade, and especially in the years 1992-1995. This was followed by a rapid depreciation which ended in an appreciation after 2001 that brought the real value of the euro back to its long-run average. Figures 10-13 show that individual country experiences exhibit similar patterns, although with swings of larger amplitudes. On aggregate, therefore, the euro area is less volatile against outside countries than its individual member countries. A notable exception to the general impression is the relative GDP series for Spain, which exhibits a continuous upward trend throughout the period.

Figure 10

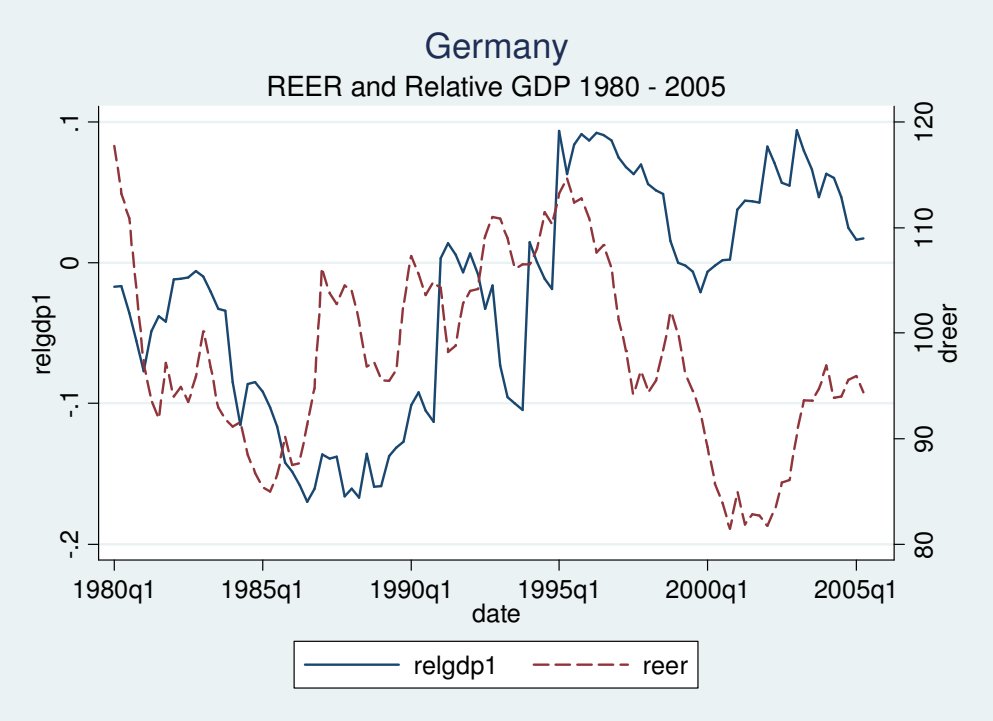


Figure 11

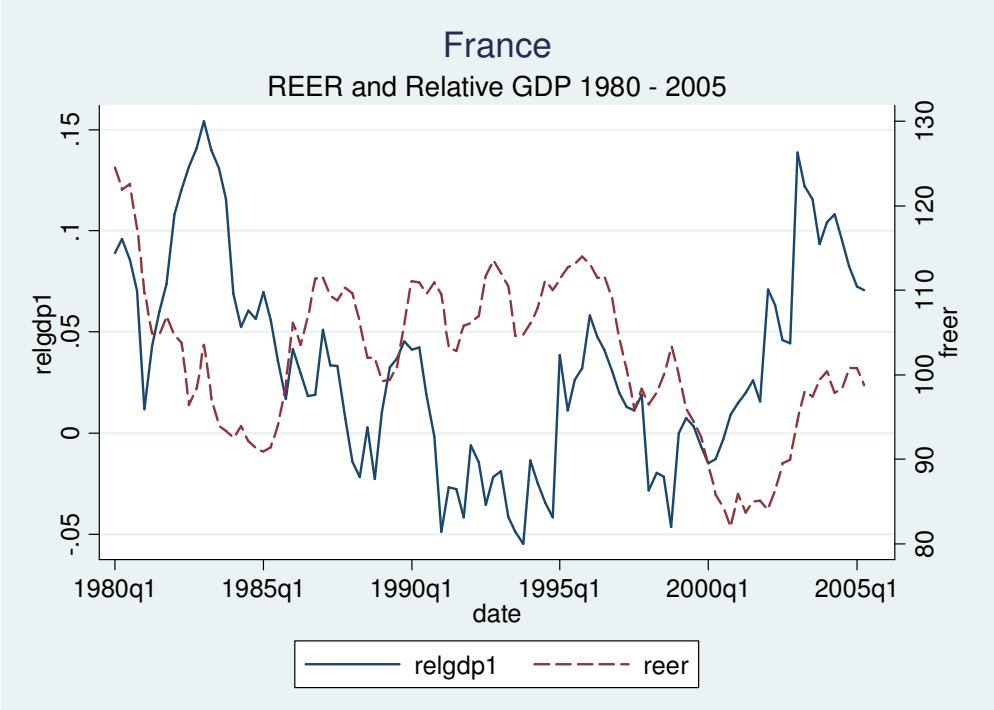


Figure 12

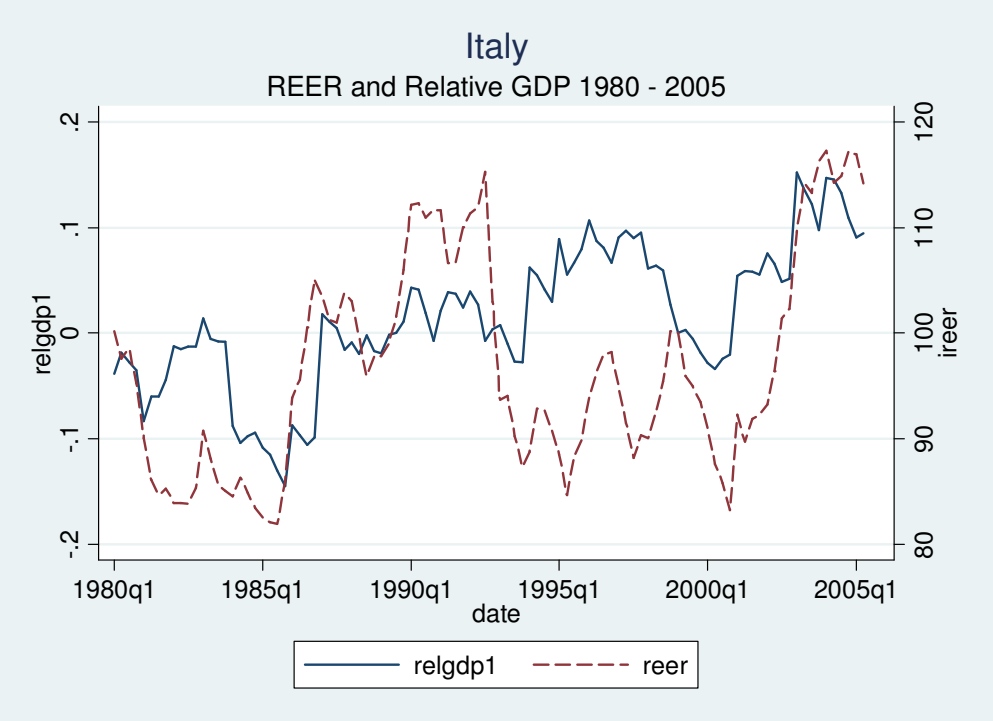


Figure 13

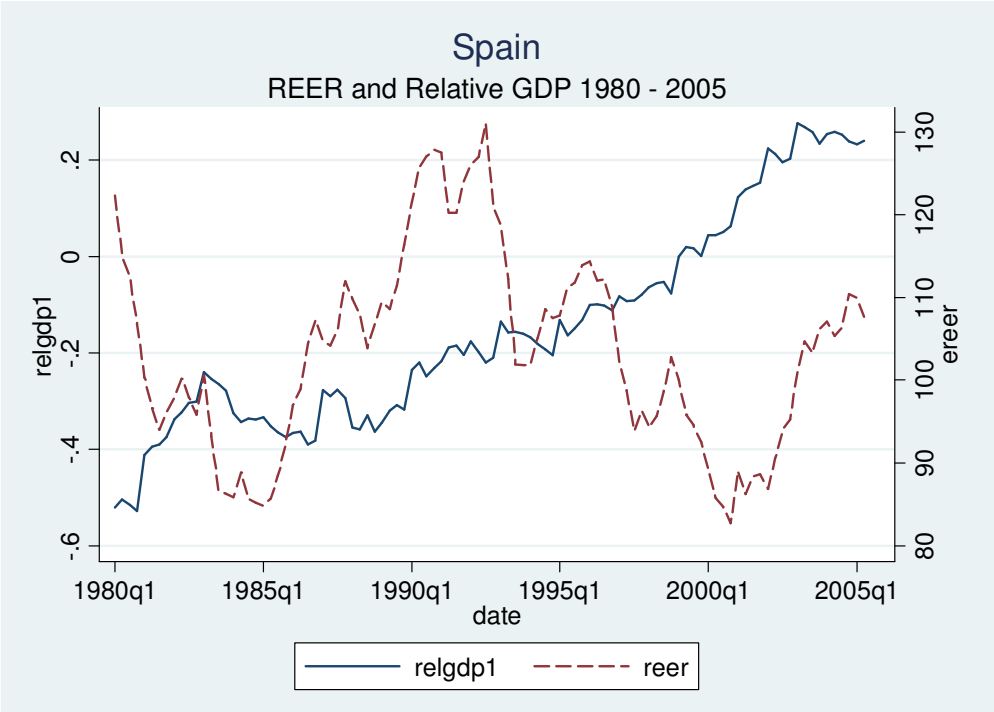


Table 2 presents estimates of a simple model of dynamic adjustment of the trade balance. The dependent variable is the trade balance of the euro area and its four largest constituent economies with regard to non-euro area economies. The explanatory variables are a lagged dependent variable, the growth rate of domestic real GDP less the growth rate of the real GDP of the ten largest (non-euro area) trade partners, and the effective real exchange rate against the ten largest non-euro area trade partners. The effective real exchange rate is measured in logs. The estimates are based on quarterly data. Preliminary estimates using more elaborate lag structures did not yield qualitatively different results.

The estimates show that trade balances are very persistent. The first-order auto-regression coefficients range between 0.7 and 0.8 for the individual countries and the coefficient for the euro-area aggregate is 0.89. For the euro area, the coefficients on the relative real-income variable and the real exchange rate are both statistically significant and correctly signed. An increase in the domestic real growth rate by one percent above the foreign growth rate leads to a fall in the trade balance by 0.024 per cent of GDP on impact, and 0.22 per cent in the long run. A rise in the real exchange rate by 10 per cent lowers the trade balance by 0.084 per cent on impact, and by 7.6 per cent in the long run. Thus, a real appreciation of the euro against its main trade partners seems to have a substantial effect on net exports in the long run, although the immediate effect is small.

Table 2: Estimated trade balance models

	Variable	Coefficient	Standard dev.	t-ratio	Long-run effect
Euro Area	Constant	3.93	1.66	2.37	
	Lag 1	0.89	0.04	21.89	
	ΔRGDP	-0.024	1.31	1.83	-0.22
	Real ex. R.	-0.84	0.36	2.34	-7.6
	R-square	0.85			
Germany	Constant	9.97	3.94	2.53	
	Lag 1	.78	0.06	13.6	
	ΔRGDP	-0.055	2.66	2.06	-0.25
	Real ex. R.	-2.00	0.84	2.37	-9.1
	R-square	0.73			
France	Constant	2.71	3.57	0.76	
	Lag 1	0.79	0.06	13.01	
	ΔRGDP	-0.052	2.96	1.74	-0.25
	Real ex. R.	3.56	2.41	1.51	
	Real ex. R. Lag 1	-4.14	2.36	1.76	-2.8
	R-square	0.65			
Italy	Constant	2.06	4.82	0.43	
	Lag 1	0.74	.069	10.67	
	ΔRGDP	-0.047	3.89	1.22	-0.18
	Real ex. R.	-0.36	1.06	0.34	-1.4
	R-square	0.54			
Spain	Constant	-2.07	3.10	0.67	
	Lag 1	0.71	0.67	10.63	
	ΔRGDP	-0.13	2.46	5.59	-0.46
	Real ex. R.	0.33	0.66	0.50	1.1
	R-square	0.59			

Turning to the individual countries, the performance of the model estimates is considerably weaker. Germany is the only euro-area country whose trade balance with respect to non-euro area countries responds significantly to changes in both the relative real GDP growth rate and the real exchange rate. For Germany, a rise in the relative growth rate by 1 per cent leads to a fall in the trade balance by 0.055 per cent

on impact and 0.25 per cent in the long run. A real appreciation by 10 per cent against the ten most important non-euro-area countries leads to a fall in the trade balance by 0.2 per cent of GDP on impact and 0.9 per cent in the long run. While the other countries show similar responses to changes in the relative GDP growth rate, the responses of the Italian and Spanish trade balances to changes in the real exchange rate are much weaker and not statistically significant. For France, we use the real exchange rate and its first lag in the model. While the current real exchange rate has a positive coefficient, the lagged real exchange rate has a negative coefficient and the total effect has the expected negative sign. These estimates indicate that the adjustment to a real appreciation of the euro against third countries would not be equally distributed across euro-area countries. Germany would bear the largest part of the adjustment, while the other large economies would seem relatively unaffected.

Next, we augment these models by a dummy variable which is zero until the fourth quarter of 1998 and one from the first quarter of 1999 onwards. This dummy allows us to test for and estimate the size of structural breaks in the model coefficients at the start of EMU. We interact the dummy with all explanatory variables in the model. For the euro-area aggregate and for Germany, all terms with this dummy are statistically insignificant. We do not report them below. For France, Italy, and Spain, in contrast, we find evidence for structural breaks around the start of EMU. Table 3 shows the results.

For France and Italy, we find that the persistence of the trade balance is significantly weaker after the start of EMU. The combined first-order autoregressive coefficient is 0.28 for France and 0.09 for Italy after the start of EMU. For Spain, the persistence of the trade balance remains unchanged, but we find that the responsiveness of the trade balance to changes in the relative real growth rate

vanishes after 1999. In contrast, the Spanish trade balance becomes responsive to changes in the real exchange rate, although the effect remains small. In sum, the introduction of the euro seems to have changed the dynamics of trade balance adjustment in three of the larger euro-area economies.

Table 3: Trade balance models and EMU

	Variable	Coefficient	Standard dev.	t-ratio	Long-run effect
France	Constant	1.77	5.40	0.74	
	EMU dummy	1.37	0.56	2.46	
	Lag dependent var.	0.86	0.07	13.13	
	*EMU effect	-0.58	0.21	2.77	
	ΔRGDP	-0.031	2.97	1.05	
	Real exchange rate	2.67	2.40	1.11	
	Real exchange rate Lag 1	-3.50	2.31	1.52	
	R-Square = 0.67				
Italy	Constant	2.48	4.86	0.51	
	EMU dummy	1.45	0.60	2.41	
	Lag dependent var.	0.78	0.07	11.05	
	*EMU effect	-0.69	0.27	2.55	
	ΔRGDP	-0.041	3.81	-1.11	
	Real exchange rate	-0.47	1.06	0.44	
	R-square = 0.57				
Spain	Constant	-4.64	3.48	1.33	
	Lag dependent var.	0.71	0.063	11.25	
	ΔRGDP	-0.181	2.72	6.67	
	*EMU effect	0.19	5.67	3.29	
	Real exchange rate	-0.38	2.33	-0.16	
Spain	*EMU effect	6.86	4.99	1.37	
	Real ex. rate Lag 1	1.27	2.31	0.55	
	*EMU effect	-8.97	5.07	1.77	
	R-square = 0.65				

The persistence of the trade balances reported in our results is closely in line with VAR results for Germany, France, and Italy by Lee and Chinn (2006). These authors also find a very weak and statistically insignificant response of the French and Italian current accounts to the real exchange rate, while the German current account responds negatively and significantly to changes in the German real exchange rate.

One weakness of the data used so far is that the trade weights employed to calculate the real effective exchange rates and the real GDP of the ten largest trade partners are based on trade data in 2005. The group of the 10 largest trade partners therefore includes countries that did not exist as sovereign countries or did not participate in world trade as market economies in the 1980s. Furthermore, the opening of Central and Eastern Europe to international trade and the rise of China as a trading nation have changed the trade weights significantly over the past 15 years.

To avoid potential biases resulting from these changes, we calculate the shares of the euro area with non-euro area countries for each year since 1981 and recomputed the real GDP of the 10 largest trade partners and the effective real exchange rate on that basis. Figures 14 and 15 show the difference these recalculations make for the explanatory variables of our model. Figure 14 indicates that the new relative real GDP series lies above the original one for all years during the 1980s. This suggests that the trade weights from 2005 give too much weight to countries with relatively low GDP in the 1980s. The two series converge in the mid-1990s, suggesting that there are no large changes in the trade structure of the euro area thereafter. Figure 15 shows that the new effective real exchange rate series lies below the original one during the 1980s, suggesting that the 2005 trade weights give too much weight to countries with relatively strong currencies in the 1980s. The series exhibits a noticeable jump in 1990, the year when China first appears among the top

10 trade partners of the euro area, while other countries like the former Soviet Union disappear from that group.

Figure 14

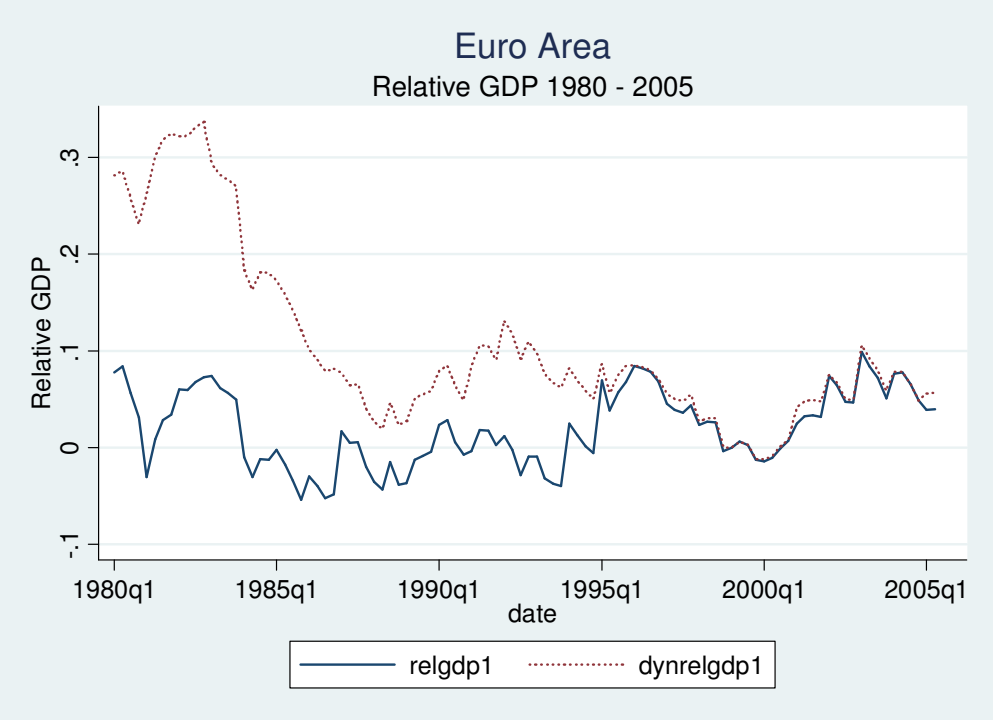


Figure 15

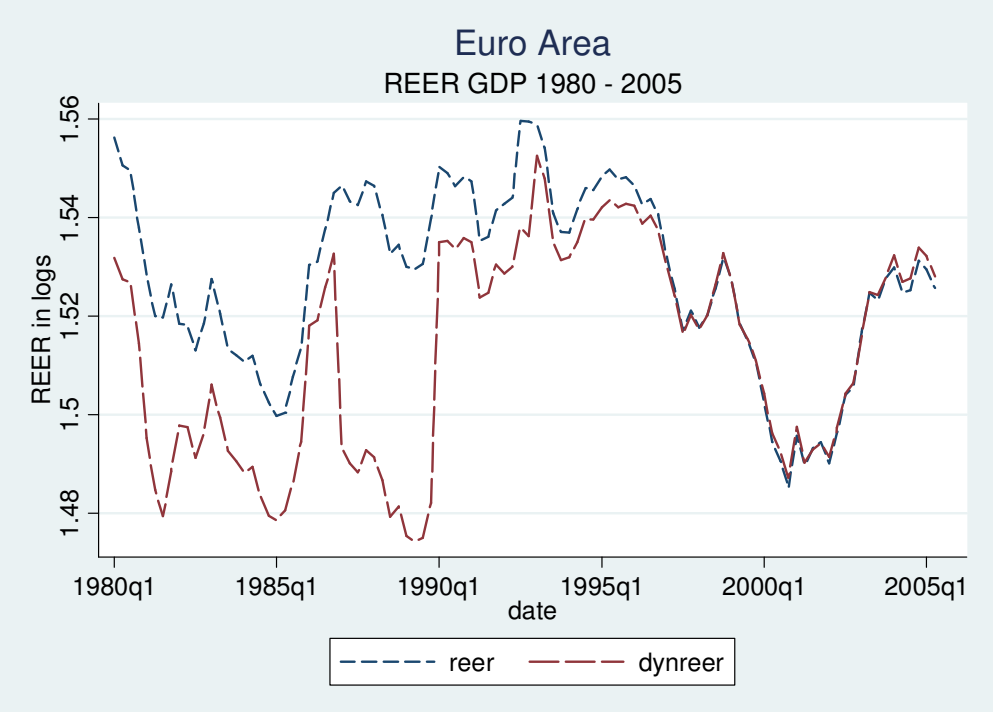


Table 4 reports the results of estimating our trade balance model with the new data series. The upper part of the table uses the full data set again. It shows that the persistence of the trade balance remains very large, while the coefficient on the relative real GDP growth rates has is somewhat smaller and the coefficient on the real exchange rate is considerably smaller in numerical value than in Table 2. Nevertheless, the long-run effects of changes in relative real GDP growth and the real exchange rate are similar to those estimated in Table 2.

Table 4: Trade balance models with dynamic trade shares

	Variable	Coefficient	Standard dev.	t-ratio	Long-run effect
Euro Area	Constant	2.23	1.36	1.66	
	Lag dep. var.	0.93	0.031	29.46	
	ΔRGDP	-0.016	0.015	1.08	-0.22
	Real Ex Rate	-0.50	0.30	1.66	-6.84
	R-square	0.90			
Euro Area 1991-2005	Constant	4.60	2.27	2.02	
	Lag dep. var.	0.82	0.065	12.62	
	ΔRGDP	--0.04	0.02	2.09	-0.22
	Real ex. R.	-1.00	0.50	2.02	-5.52
	R-square	0.80			

The lower part of Table 4 uses data only starting in 1991. We do this in view of the break in the real exchange rate series in 1990. Here, we note a considerable decline in the persistence of the trade account. At the same time, the coefficient on the relative real GDP growth rate more than doubles, and the coefficient on the effective real exchange rate is twice the coefficient from the upper part. Compared to the estimates using fixed trade weights, the short-run reaction of the trade balance to changes in relative real GDP growth is much stronger, and the short-run reaction to changes in the effective real exchange rate is moderately stronger. Nevertheless, the long-run effects of changes in relative real GDP growth remain unchanged, while the

long-run effect of the effective real exchange rate is smaller than those based on the estimates with fixed trade weights. A permanent appreciation of the real exchange rate of the euro by one percent lowers the trade account by 5.5 percent of euro-area GDP in the long run.

5. Conclusions

We have documented a growing dispersion in current account balances among countries in the euro area since the early 1990s. The differences in current account positions widened significantly following the creation of EMU. We have shown, first, that EMU has changed the pattern of capital flows within Europe. Specifically, it has increased the tendency of capital flows to go from relatively rich to relatively poor countries within the euro area. This suggests that the observed current account imbalances are sign of the proper functioning of the euro area rather than a sign of improper macro economic management.

Furthermore, we have presented some preliminary estimates of current account adjustment of the euro area and its constituent economies. Our estimates indicate that the long-run effect of a real appreciation of the euro against the currencies of its main trade partners is sizeable. Thus, in a scenario in which the dollar devalues against Asian currencies, the US current account closes, but Asian countries stubbornly continue to run current account surpluses, the euro area would experience a large deterioration of its trade balance. Furthermore, this deterioration would be distributed unevenly across its member economies, at least in the short run. Such a development could indeed pose a serious challenge to the sustainability of the common currency. More empirical work, currently under way, is needed to obtain more precise estimates of the outcomes of such a scenario.

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