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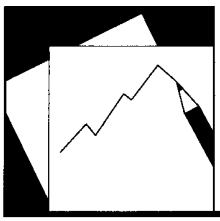

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External Imbalances in the Euro Area

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External Imbalances in the Euro Area

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Abstract

The paper examines the extent to which current account imbalances of euro area countries are related to intra-euro area factors and to external trade shocks. We argue that the traditional explanations for the rising imbalances are correct, but are incomplete. We uncover a large impact of declines in export competitiveness and asymmetric trade developments vis-à-vis the rest of the world –in particular vis-à-vis China, Central and Eastern Europe, and oil exporters— on the external balance of euro area debtor countries. While current account imbalances of euro area deficit countries vis-à-vis the rest of the world increased, they were financed mostly by intra-euro area capital inflows (in particular by the purchase of government and financial institutions' securities, and cross-border interbank lending) which permitted external imbalances to grow over time.

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I. INTRODUCTION

After its first decade of existence, the euro area has come under severe pressure. Triggered by adjustments in the fiscal accounts of Greece, the crisis initially spread to Ireland and Portugal, before become a threat to the eurozone's existence after Italy and Spain's sovereigns began to experience funding pressures. The crisis reflects intertwined public debt and banking sector fragilities made worse by weak growth prospects, but also substantial gross and net external liabilities—for example, net external liabilities of close to 100 percent of GDP in Greece, Ireland, Portugal, and Spain. This paper focuses on the external dimension of the euro area crisis and aims at characterizing the factors that contributed to the growing balance of payments imbalances in the euro area. We focus on the 5 largest "net debtors" in the euro area (Greece, Ireland, Italy, Portugal, and Spain) while acknowledging the significant differences between these countries.[2]

We argue that the large current account imbalances of individual euro area countries reflected to an important extent the asymmetric impact of trade shocks originating outside the euro area, as well as sustained cheap financing from core euro area countries to the largest net debtors. In particular, the rise of China generated strong demand for machinery and equipment goods exported by Germany while exports from euro area debtor countries were displaced from their foreign markets by Chinese exports. In addition, the term of trade shock associated with higher oil prices contributed to rising trade deficits but higher income in oil producing countries also generated strong demand for machinery and equipment exported by Germany. Finally, German firms continued their outwards integration by setting up production platforms in emerging Europe to take advantage of a higher return on capital and lower wage costs which boosted competitiveness and exports of emerging Europe to the euro area debtor countries. The continued easy financing (until the crisis erupted) allowed deficit countries to sustain appreciating real effective exchange rates, which were also driven by the nominal appreciation of the euro, and delayed the adjustment needed to end the growing divergence of trade performance within the monetary union.

We differ from the existing literature along two main dimensions. First, we emphasize the role of trade linkages and relative price dynamics between euro area countries and the rest of the world. We document that, while relative price movements within the euro area contributed to the debtor countries' real exchange rate appreciations, the lion share of the appreciation between 2000 and 2009 was accounted for by the nominal appreciation of the euro vis-à-vis other currencies, even for the countries such as Greece and Portugal that entered the euro at a potentially overvalued real exchange rate. We present econometric evidence that this appreciation adversely affected the export performance of the debtor countries, over and above the average impact on euro area exports. We also show that trade shocks originating outside the euro area contributed to the widening of euro area imbalances. We document the contribution of bilateral trade vis-à-vis China, oil exporters, and emerging Europe to the growing surplus of Germany and the growing deficits of the debtor countries. We also present econometric evidence suggesting that the asymmetric effects of these trade shocks on euro area countries had

[2] For example, Italy's external imbalances are a much more modest share of GDP than those of the other four countries.

a causal impact on trade performance, and were related to differences in the elasticities of exports to specific markets (emerging Europe, China, and oil exporting countries) within the euro area, and to displacement effects by China's exports affecting several debtor countries in their foreign export markets. In particular, we present sectoral export regressions that control for all unobserved home country factors that may have affected export performance.

Second, we show that the external deficits of euro area debtor countries (vis-à-vis euro area and non-euro area countries) were financed by capital inflows from within the euro area, in particular from France and Germany, while investors from the rest of the world purchased primarily financial instruments issued by other euro area countries, in particular French and German debt securities. These intra-euro area capital flows financed government debt (in Greece), financial sector borrowing (in Spain or Ireland), or a combination of both (in Portugal or Italy). This pattern of capital flows suggests, inter alia, that euro area investors viewed securities issued by 'peripheral' European countries as closer substitutes for securities issued by the euro area core to a larger extent than investors from outside the euro area.

Our analysis of current account deficits and external positions of the debtor countries also helps clarify the link between public debt and external liabilities. In particular, we document how the rise in current account deficits and external liabilities between the inception of the euro and the global crisis primarily reflected a worsening of private-sector balance sheets, with households' net debt rising significantly. This worsening of private sector balance sheets was financed directly or indirectly (and to a varying extent, depending on the country) by foreign purchases of domestic government debt, previously held by the domestic private sector, as well as by increased recourse of debtor countries' banks to external finance. As a result, foreign ownership of government debt increases substantially, particularly in Greece, even though there was no increase in many debtor countries' government debt in percent of GDP during the period 2000–2008.[3]

Overall, the observed combinations of external terms of trade shocks and financing patterns suggest that, following monetary union, key adjustment mechanisms of the external balance of debtor countries were not operating.[4] Indeed, while trade shocks would have required real effective exchange rate depreciations in debtor countries to restore external sustainability in the long-run, intra-euro area capital inflows and the trend in the euro nominal exchange rate contributed instead to further real appreciation, which further affected export performance.

The rest of the paper is organized as follows. Section II presents known stylized facts on the evolution of current accounts, real effective exchange rates and saving-investment balances since the start of the euro, and reviews the main explanations for euro area imbalances. Section III presents an ancillary set of stylized facts which emphasize trade and financial linkages between the euro area and the rest of the world and suggests their importance in explaining intra-euro area imbalances. Section IV presents econometric evidence on the

[3] However, in Greece, the general government's gross debt increased by 7 percent of GDP between 2000 and 2008.

[4] The existing literature often focused on the differential inflation performances in a monetary union, and the reinforcing mechanisms of common monetary policy on demand booms (for instance Mongelli and Wyplosz, 2008). Lane (2006a, b) reviews the effects of heterogeneity in a monetary union.

asymmetric impact of world trade shocks on different euro area countries. Section V characterizes the structure of external financing by sectors, instruments and destination/source for the countries in our sample. Section VI concludes and discusses policy implications.

II. Stylized Facts on Euro Area Imbalances and Their Interpretation

A. Stylized Facts

At the time of euro accession, Greece and Portugal's current account deficits were already large, and these two countries had a real effective exchange rate (REER) above historical average (Table 1). Spain had a moderate current account deficit, while Italy and Ireland had a balanced current account. All three countries' REER were close to their historical average.

Current account balances in Greece, Ireland, Italy, and Spain worsened significantly during the first decade of European Monetary Union, while Portugal's deficit remained at the very high levels it had reached early in the decade (Table 2). As a result of the increasing recourse to external financing, net external liabilities of these countries rose sharply, reaching levels close to or above 100 percent of GDP by the end of 2010 in Greece, Ireland, Portugal, and Spain (Figure 1). During this period, Germany and a number of other smaller countries in Northern Europe progressively built large current account surpluses, with the current account for the euro area as a whole remaining in broad balance throughout the period.

While current account trends were broadly similar across debtor countries, there were significant differences in the underlying evolution of saving and investment (see IMF, 2011). In Ireland and Spain, investment rates were boosted by construction booms, and growth rates were considerably above the average for the euro area, also thanks to rising labor forces. In Greece, growth was also stronger than in the rest of the euro area, with the widening current account deficit mostly explained by a large decline in saving. In contrast, growth was very modest in Portugal, with declines of both investment and household saving. Italy also experienced relatively weak growth and some decline in saving, although the current account deficit in percent of GDP remained much more contained than in other countries.[5]

These current account trends were accompanied by significant real effective exchange rate appreciations in Greece, Ireland, Portugal, and Spain, and to a lesser extent in Italy (Figure 3). Shifts in relative prices between different euro area countries were sizable, with consumer prices and unit labor costs rising very significantly in the euro area periphery relative to the euro area core, and particularly vis-à-vis Germany (Table A4).

The most striking evidence of the extent of financial integration of debtor countries with the rest of the euro area is the well-known convergence in bond yields that occurred between the mid-1990s and the onset of the global financial crisis. Figure 2 shows the spreads between 10-year government bonds and German bunds, illustrating the process of financial integration and convergence of interest rates that started in the mid-1990s. With the exception of Greece, most of the reduction of bond spreads in Southern Europe took place in the run-up to EMU, and

[5] Table A2 reports growth performance for the whole market economy and by industries.

spreads remained stable and low until the onset of the crisis, suggesting that government bonds of euro area debtor countries became close substitutes to German bunds for marginal investors.

B. Traditional Explanations for the Rise of Euro Area Imbalances

The two traditional (and complementary) explanations for rising external imbalances of euro area debtor countries relate to (i) financial integration and expectations of convergence within the euro area, and (ii) "over-optimism" and wage/price rigidities in borrowing countries resulting in strong growth in domestic demand with domestic prices and labor costs rising faster than in other euro area countries (the so-called "intra-euro area competitiveness" problem). We discuss these explanations in turn, and argue that they fit the stylized facts on current account and real exchange rate developments described in the previous section.

Intra-euro area financial integration and expected growth

Rising financial integration among euro area countries has been well documented in the literature (see Lane, 2006a, b, and Coeurdacier and Martin, 2009 on bond markets; Lane and Milesi-Ferretti, 2008; Coeurdacier and Martin, 2009; and De Santis and Gerard, 2006 on equity markets; and Blank and Buch, 2007, Kalemli-Ozcan et al., 2010, and Spiegel, 2004 and 2009 on cross-border bank flows and financial flows more generally).

The growing consensus is that the European Monetary Union stimulated capital flows by eliminating currency risk, while institutional reforms harmonizing financial sector policies and the integration of good markets among EU countries reduced transaction costs and led to the integration of European bond markets and banking systems (Kalemli-Ozcan et al., 2010). According to neoclassical theory, removing transaction costs on international financial transactions—resulting from financial integration within the EU or from the elimination of country-specific currency risk—should result in net capital inflows from richer to poorer countries, as observed among EMU countries (Schmitz and von Hagen, 2009). Countries at a less advanced stage of development should experience net capital inflows and therefore be expected to run current account deficits—the consequence of a healthy convergence process (Blanchard and Giavazzi, 2002; Schmitz and von Hagen, 2009). These deficits should be associated with rising domestic investment—to the extent that the marginal product of capital is higher than in richer countries—and/or by a decrease in savings—that would be the consequence of stronger growth prospects and declining borrowing constraints for firms and households following financial liberalization (see for instance, Jappelli and Pagano, 1994). As income or productivity in tradable sectors increase, higher consumption of non-tradable goods would result in an equilibrium appreciation of the real exchange rate (the standard Balassa-Samuelson effect).

The impact of financial integration and optimism about borrowing countries on the external balance of richer countries of the currency union is, however, less clear-cut. Since the euro area is financially integrated with the rest of the world, the rising current account deficits and appreciating real exchange rates of relatively poorer countries of the union should not, in principle, be matched by offsetting changes in the current accounts of the relatively richer countries of the currency union. Moreover, the evolution of saving-investment balances were not entirely consistent with neoclassical convergence, especially in Greece and Portugal which experienced declines in corporate saving at the same time as declines in domestic investment, an

observation difficult to reconcile with differences in the marginal product of capital. During the same period the rising surplus of Germany reflected mainly a rise in corporate savings and a decline in domestic investment.

"Over-Optimism" and excessive real appreciation

The process of international financial integration, the decline in credit constraints and real interest rates, and over-optimistic expectations of convergence can also lead to increases in domestic prices and unit labor costs that are inconsistent with underlying productivity gains and with the external budget constraint. For example, foreign-financed real estate booms may result in unsustainable growth of non-tradable sectors (Giavazzi and Spaventa, 2010, IMF, 2011). Empirical work on the drivers of current account balances by Jaumotte and Sodsriwiboon (2010) finds that a large part of the current account deficits are not explained by medium-term fundamentals (such as demographic trends, the level of development relative to trading partners, relative fiscal positions etc), with deficits in excess of fitted values related to a "euro effect" and to financial reforms of the 1990s.[6] For example, Greece, Ireland, Portugal, and Spain experienced rising prices and unit labor costs relative to Germany and other "Northern" euro area countries, sustained in some cases by asset price booms.

The resulting real exchange rate appreciation contributed to crowding out manufacturing and export activities.[7] Portugal experienced a decade of low productivity gains and stagnant economic growth, as the competitiveness of tradable goods declined (Blanchard, 2007). In Greece and Spain growth was sustained by very strong domestic demand, and led to a very significant deterioration of current accounts. Since EMU, bilateral trade imbalances among euro area countries became more persistent, and more so in countries with more rigid labor markets, suggesting growing competitiveness differentials among eurozone countries (Berger and Nitsch, 2010).

III. Euro Area Imbalances and the Rest of the World: New Stylized Facts

The explanations for euro area imbalances discussed so far rely primarily on intra-euro area factors. The popularity of such explanations for the current account deficits and surpluses reflects both the fact that the euro area as a whole ran a broadly balanced current account throughout the period and the importance of trade and financial ties between euro area economies. However, the euro area as a whole is a very open economy, with sizable trade and financial flows vis-à-vis the rest of the world. We now provide a number of stylized facts that suggest that trade and financial linkages between the euro area and the rest of world also played an important role in explaining external imbalances of individual euro area countries.

[6] Symmetrically, Northern euro area countries' current accounts experienced a positive "euro effect".

[7] Tables A2 and A3 present the evolution of unit labor costs and sectoral productivity in the debtor countries.

A. Real Exchange Rate Appreciation

Figure 3 decomposes the real exchange rate appreciation in individual euro area countries into two components: (i) movements in domestic prices (or unit labor costs) relative to those of trading partners; and (ii) movements of the euro nominal exchange rate. It shows that the real appreciation primarily reflected the strengthening of the euro in all five current account deficit countries. In Spain and Ireland, which experienced housing booms, domestic consumer prices (or relative unit labor costs) contributed more significantly to the appreciation of the real exchange rate than in Greece, Italy, and Portugal. In comparison, the REER appreciation reflected exclusively nominal effective exchange rate appreciation in France, while in Germany the REER remained stable throughout the decade, with the nominal appreciation offset by a decline in unit labor costs relative to trading partners.

Of course the euro appreciation could have also reflected general optimism on the part of investors outside the euro area on the economic prospects of the euro area periphery. However, as discussed more in depth in Section V, investors from outside the euro area invested primarily in core euro area countries, such as France and Germany. This suggests that at least part of the appreciation of the euro and the ensuing loss in competitiveness was an "external shock" for countries in the euro area periphery.

A simple "accounting" decomposition of the CPI-based REER provides a useful theoretical apparatus to clarify our discussion of various factors affecting the external balance.[8] In a 3-country environment (home, rest of the euro area and rest of the world), the real exchange rate is given by:

$$RER = \frac{\left(SP^{*NEA}\right)^{\alpha}\left(P^{*EA}\right)^{1-\alpha}}{P}$$

Where S is the euro exchange rate, P^{*NEA} is the price level in non-euro area trading partners, P^{*EA} is the price level in euro area trading partners, α is the share of trade with non-euro area countries and P is the domestic price level.

Assuming both at home and abroad a share γ of tradable goods in the consumption basket and rearranging yields:

$$RER = \left(\frac{SP^{*NEA\_T}}{P^{T}}\right)^{\alpha\gamma} \cdot \left(\frac{P^{*EA\_T}}{P^{T}}\right)^{\gamma(1-\alpha)} \cdot \left(\frac{\left(SW^{*NEA}\right)^{\alpha}\left(W^{*EA}\right)^{1-\alpha}}{W}\right)^{1-\gamma}$$

The first two terms represent the terms of trade vis-à-vis non-euro area and euro area countries, while the third term represents relative unit labor costs in non-tradable sectors. Hence, the real exchange rate can be affected by:

[8] We are grateful to the discussants for suggesting this decomposition.

i. *The nominal exchange rate:* A nominal appreciation tends to appreciate the real exchange rate by improving the terms of trade vis-à-vis non-euro area countries (first term), but worsens relative wage competitiveness (third term);
ii. *The relative price of tradable goods:* an increase in the price of foreign imported goods (a negative terms of trade shock) tends to depreciate the real exchange rate;
iii. *Relative wages:* an increase in domestic wages relative to foreign wages tends to appreciate the real exchange rate.

Our previous empirical decomposition suggests that nominal exchange rate factors dominate price effects due to relative tradable prices and relative wages. In the next section, we estimate empirically the impact of the nominal appreciation on export performance and show also that trade shocks (including from oil prices) and non-price shocks to trade played an important role in explaining the evolution of trade balances.

B. Trade Developments with Non-Euro Area Countries

Table 3 shows the trade balance, import and export to GDP ratio vis-à-vis euro area and non-euro area countries at the inception of the euro and at the eve of the global financial crisis. The first stylized fact is that trade with the rest of the world accounts for a large share of import and exports for all debtor countries, as well as for Germany and France.[9] The trade balance in goods of Greece, Italy and Spain worsened during the decade. In Greece, Italy and Spain, the worsening trade balance was associated with a rapid increase in imports from non-euro area countries. Ireland's trade surplus grew at a slower rate than GDP, in particular vis-à-vis euro area countries. Portugal had, in contrast, a stable trade deficit to GDP ratio, but a rising trade deficit vis-à-vis non-euro area countries (driven mostly by a terms of trade deterioration). At the same time, its export to GDP ratios vis-à-vis euro area and non euro area countries were stable or declining. During the same period, Germany built a significant trade surplus mainly vis-à-vis non euro area countries driven by a rapid increase in exports.

Table 4 provides a snapshot of exports and imports of our sample of euro area countries vis-à-vis emerging Asia, oil and commodity exporters, and countries in Central and Eastern Europe. A striking stylized fact is the dramatic increase in Germany's exports to these regions. These exports were higher in relation to GDP when compared to other euro area countries already in 2000, and then doubled as a ratio of German GDP in the space of 8 years. The German trade balance vis-à-vis commodity exporters improved despite the dramatic increase in commodity prices over this period. In contrast, exports to these three regions from Greece, Spain and France increased only modestly, and their trade balance deteriorated substantially. Italy experienced an increase in exports to these regions, but imports grew faster, causing a deterioration of the trade balance. Portugal experienced similar increase of exports and imports in percent of GDP.

The shifts in external demand highlighted by Table 4 were also reflected in the terms of trade: Figure 4 documents that Italy, Portugal, and Greece experienced very significant decline in their terms of trade during the period 1999–2008. Figure 4 also shows that a large component of the

[9] Note that our analysis, because of data restrictions, considers only trade in goods as directional breakdowns of trade in services are typically not available. Exports of services can be important in some countries, for example for Greece or Spain (e.g., from tourism) where they accounted for 14 and 9 percent of GDP in 2007.

terms of trade shock came from the steady and substantial increase of real crude oil prices (over 400 percent between 1999 and 2008). The lower panel of the figure depicts the evolution of export prices relative to unit labor costs (ULC). It shows that until 2006, ULC grew as fast as export prices with the exception of Germany and Spain. After 2006, Italy and Ireland had ULC rising faster than export prices.[10]

C. Capital Flows

Discussions of external imbalances in individual euro area countries have typically emphasized the role of capital flows and financial integration among euro area countries, also in light of the fact that the current account and the financial account of the euro area as a whole have remained broadly balanced since the inception of the euro. However, it is important to point out that financial integration between the euro area as a whole and the rest of the world was high from the inception of the euro, and has increased substantially over the past decade. Figure 5 presents the net and gross international investment position of the euro area as a whole vis-à-vis the rest of the world. While the net position has been fairly stable between the beginning of the decade and the onset of the global financial crisis, gross external assets and liabilities have risen substantially in percent of euro area GDP, reflecting buoyant inward and outward financial flows.

In light of the larger deficits incurred by euro area debtor countries vis-à-vis the rest of the world documented in the previous sub-section, one could conjecture that investors from the rest of the world provided significant external financing to euro area debtor countries. However, Figure 6 provides suggestive evidence against this conjecture: on the eve of the global financial crisis investors from outside the euro area held their portfolio debt claims primarily in "core" euro area countries, rather than in deficit countries. This suggests a more in-depth investigation of how the financing of euro area imbalances took place, which we undertake in Section V.

IV. Econometric Evidence of the Asymmetric Impact of Trade Shocks on Export Competitiveness

This section explores further the extent to which trade shocks originating from outside the euro area contributed to the build-up in current account imbalances for euro area countries, in particular through an asymmetric impact on Germany and euro area debtor countries. Various microeconomic studies have found that some Southern European countries' exports lost competitiveness vis-à-vis their trading partners over the past decade on the basis of a range of structural indicators (see ECB, 2005; Baumann and di Mauro, 2007; di Mauro and Foster, 2008; Bennett et al., 2008; IMF, 2010).However, the trade literature has often focused on explaining the evolution of intra-euro area trade (Rose, 2000; Micco et al., 2003; Schmitz and von Hagen, 2009; Baldwin et al., 2005; Flam and Nordstrom, 2006b).

[10] In the case of Greece, the ratio of export price to ULC is likely biased upwards by the inclusion of refined oil products in the export price index.

A. Hypothesis

Our hypothesis is that three important external shocks during the past decade may have affected euro area exports differentially:

- *The rise of China (and more generally of emerging Asia)* may have displaced southern European countries exporting goods from some of their foreign markets (see also Di Mauro et al. 2010). Also, rapid growth in China may have boosted the demand for goods, such as machinery and equipment, exported by Germany, but may have had more limited benefits for Southern European countries exporters.

- *Higher oil prices* may also have affected euro area countries' trade balance asymmetrically. While the oil trade balance worsened in all countries as a result of higher oil import prices, fast income growth in commodity-exporting countries may have benefited countries such as Germany exporting goods in high demand by oil producers.

- *The integration of Central and Eastern European countries* with the production chain of the euro area may have benefited exporters in countries such as Germany which undertook large direct foreign investment to take advantage of a higher return on capital and lower wage costs (Marin, 2010), but may have resulted in higher imports of countries in Southern Europe.

Before turning to the regression analysis, Table 5 presents some descriptive statistics of bilateral exports at a disaggregated level where exports at the 5-digit sectoral classification have been grouped into five categories (High Technology, Medium-High, Medium-Low, and Low Technology goods, as well as goods not classified, which include raw and processed agricultural goods as well as mining). The table shows that Germany and Italy are the two countries with a significant specialization in medium high-tech goods at the beginning of the period. It also shows that, to a large extent, the very strong performance of Germany's exports throughout the period was accounted for by the rapid increase in exports of Medium-High Technology goods, with almost 1/3 of such increase reflecting exports to emerging Asia, oil exporters and CEE countries. Among other countries in our sample, only Italy experienced a strong performance of exports of medium-high tech goods. This evidence is indicative that the three regions might have been a significant pull factor for exports of medium-high tech goods.

B. Econometric Analysis: Asymmetric Effects of Trade Shocks and of the Nominal Exchange Rate on Euro Area Countries

In this section, we investigate quantitatively the importance of several channels through which the asymmetric trade shocks identified in the previous section affected the trade performance of euro area debtor countries during the last 10 years. Specifically, we estimate bilateral export and import-displacement effect regressions for the period 1990–2009 and for a set of reporter countries and their trading partners—listed in the appendix. We make use of estimated coefficients to quantify the implied contributions to the cumulative trade deficits of each type of shock. We also estimate the impact of the nominal exchange rate on exports and displacement effect, allowing for a different effect for the debtor countries. The approach of the trade regression analysis follows the literature, in particular Goldstein and Khan (1985), where export

and import volumes are explained by domestic and foreign real economic activity and relative prices. [11]

Export regressions

Empirical specifications

Export regressions have the following specification:

$$\log\left(Exports_{ijt}\right) = \alpha + \beta \cdot \log\left(RER_{ijt}\right) + \delta \cdot \log\left(DomDemand_{jt}\right) + F_{ij} + T_t + \varepsilon_{ijt}$$

where $Export_{ijt}$ is total bilateral exports of reporting country *i* to trading partner *j* during year *t*, RER_{ijt} is the bilateral real exchange rate between country *i* and country *j* during year *t*, $DomDemand_{jt}$ is total domestic demand of trading partner *j* during year *t*, F_{ij} is a fixed effect for the country pair (i, j), T_t is a time fixed effect, and ε_{ijt} is a residual.

We also estimate the regressions by replacing the bilateral real exchange rate with the bilateral nominal exchange rate and relative CPI to separate the nominal exchange rate effects (relevant vis-à-vis countries outside the euro area) from those of relative prices.[12] We also introduce a control for trade specialization of the reporting country (defined as the share of low-technology goods in total exports) interacted with domestic demand of the trading partner considered (see di Mauro et al, 2010). Finally, in (unreported) robustness tests, we also include country specific time trends T_{it} that absorb the effect of any country-specific factors (external or domestic) affecting trade in a linear fashion over time.

The coefficient of interest is the elasticity vis-à-vis the domestic demand of trading partner δ. We first estimate an average elasticity, and next allow the elasticity to vary according to the region of the trading partner (emerging Asia, CEE country or commodity exporter) and the reporting country (Germany, or euro area debtor country). We are also interested in the real or nominal exchange rate elasticity β—we estimate an average elasticity first, and then an elasticity specific to euro area debtor countries. We rely on this specification to assess whether demand elasticities vary across reporting countries and trading partners. In particular, we test whether demand elasticities of exports of the euro area debtor countries to China, CEE, or oil exporters are significantly different from the euro area average. We are also interested in testing whether exchange rate elasticities of debtor countries' exports are significantly different from the euro area average.

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[11] See also Marquez (1990), Bayoumi (1999), Flam and Nordstrom (2006a), Chinn (2006), and Bayoumi et al. (2011).

[12] Panel unit root tests (Fischer type tests based on Choi (2001)) do not reject the null hypothesis that all panels are stationary (when we consider only the top five trading partners) for all variables except the bilateral RER. We also performed panel cointegration tests developed by Westerlund (2007) on our main specification and were able to reject the null hypothesis that there is no cointegration for all individual members of the panels.

We also estimate bilateral trade regressions at the sectoral level (at the level of aggregation described in the previous paragraph). In these regressions, we control for country- and sector-specific time dummies. This allows us to control for all unobserved characteristics at the country or sectoral level that may explain our findings. In particular, this allows us to ascertain that our findings are not driven by demand conditions of the reporting country. Specifically, we estimate the following regression:

$$\log\left(Exports_{ijkt}\right) = \alpha + \beta \cdot \log\left(RER_{ijt}\right) + \delta_k \cdot \log\left(DomDemand_{jt}\right) + \varphi \cdot \log\left(DomDemand_{it}\right) + F_{ij} + T_{kt} + \varepsilon_{ijt}$$

where $k \in \{\text{High\_Tech;Medium\_High\_Tech;Medium\_Low\_Tech,Low\_Tech,Non\_Classified}\}$ $DomDemand_{it}$ is total domestic demand of reporting country *i* during year *t* and T_{kt} is a set of sectoral specific time dummies.

In this specification, the coefficient of interest is the sector-specific elasticity of foreign demand δ_k. As in the aggregate bilateral regression, we first estimate an average elasticity, and next estimate a differential elasticity (from the average) by region of trading partner, and by reporting country. Since each time we control for the average elasticity, the crossed trading partner-reporting country elasticity can be read as a differential elasticity relative to the euro area average for the trading partner considered.

Regression results

Export regression results for a sample of 11 euro area reporting countries during 1990–2009 are reported in Table 6. A first noticeable finding is that bilateral price elasticities are non-negligible—for example, they suggest that the 36 percent appreciation of the euro relative to the U.S. dollar from the end of 1999 to mid-2008 implied a 12–15 percent decrease in exports of euro area countries to the U.S on average, and a 20–25 decrease in exports of the debtor countries on average.

The overall *differential* impact (relative to the euro area average) of the euro appreciation on debtor countries' exports can be derived from the appreciation of the nominal effective exchange rates of these countries and their specific coefficient reported in column (4). The estimated coefficient implies that, during 2000–10, the cumulative loss of export levels of Greece, Italy, Portugal and Spain (in difference from a euro area average effect) was respectively 2.7 percent, 2.8 percent, 1.5 percent and 1.7 percent.[13] The *total* loss of exports (obtained by adding the euro area average effect) from the nominal effective exchange rate appreciation was respectively 7 percent, 7.3 percent, 4 percent and 4.6 percent for Greece, Italy, Portugal and Spain.

[13] During 2000-10, the nominal effective exchange rate appreciation was 13 percent, 13 percent, 7 percent and 8 percent respectively for Greece, Italy, Portugal and Spain.

The elasticity of export demand is also non-negligible: a one percent increase in trading partners' domestic demand is associated with a 1¼ percent increase in exports.

Columns 5 to 12 report regressions in which the demand elasticity is allowed to vary across trading partner (CEE countries, China, oil exporters) and both trading partner and reporting country (Greece, Italy, Portugal, Spain, and Germany). First we explore whether elasticities of export demand by CEE countries differ from the average elasticities, and differ in trade specialization and across euro are reporting countries (columns 5 to 7). We find that demand elasticities of exports to CEE countries are significantly larger than average elasticities (by about 0.6). There is also significant heterogeneity across euro area reporting countries: demand elasticities of exports are significantly smaller than the euro area average for Greece and Italy, but significantly larger for Spain and Portugal. However, we do not find any compelling evidence that Germany benefits from higher export demand elasticities than other euro area countries. On the trade specialization side, countries with higher export shares in low-tech goods tend to have smaller demand elasticities from CEE countries.

Turning to exports to China (columns 8–9), we find that the average export demand elasticity from China is significantly higher (by over 0.3) from the average export demand elasticity from all trading partners of euro area countries. Moreover, the export demand elasticities of Italy vis-à-vis China is significantly lower than the euro area average's elasticity.

Results for export demand elasticities vis-à-vis oil exporters are in columns 10–12. Export demand elasticities for goods exported by Greece, Italy, Portugal and Spain are significantly below the euro area average, after accounting for elasticities specific to oil exporters (which are significantly higher than all trading partners, by about 0.2). Overall, export demand elasticities varied across euro area countries and Southern European countries experienced export demand shortfalls resulting from these differences in export demand.

Appendix Table A5 reports export regressions estimated at the sectoral level, allowing us to control for reporting countries' domestic demand, country pair dummies, and sectoral time dummies to allay reverse causality concerns and omitted variable bias. Our regression specification includes a variety of interaction terms to control for possible sources of heterogeneity. First, as in the previous set of regressions, we allow for export demand elasticities that are specific to trading partners (CEE countries, emerging Asia or oil exporters). Second, we allow these trading partners' export elasticities to vary across sectors.[14] After accounting for trading partner and sector elasticities, we then allow the sectoral elasticities to differ across euro area countries reporting countries (Germany and the debtor countries). Hence, for each trading partner (CEE, emerging Asia, and oil exporters) the coefficients on these variables can be read as differential elasticities relative to the sectoral average for the euro area.

[14] In these regressions, the omitted sector is the "un-classified" (e.g., agriculture and mining).

We find that, on average, export demand elasticities are higher for High Tech and Medium-High Tech sectors than for other sectors for each of the trading partner regions (CEE countries, China and oil exporters). For example, in the case of China (columns 5–6), export demand elasticities for Medium-High Tech goods are about 0.05 higher than average while they are about 0.09 below average for Low Tech goods. After accounting for these sectoral specific factors, we find that export demand elasticities of Medium-High Tech and Medium-Low Tech goods exported by Germany are higher than the average for euro area reporting countries. For example, export demand elasticities are about 0.17 above the sectoral average of euro area countries for goods exported to China.

By contrast, while estimated elasticities vary across countries and sectors, we find in general strong evidence that sectoral export demand elasticities are significantly below the sectoral average for many sectors and many euro area debtor countries. For example, in the case of Greece, the sectoral elasticities (excluding the "un-classified" group) are all significantly below average for all three trading partner regions. In the case of Italy, sectoral export demand elasticities are below average for trade with CEE countries or oil exporters but above average for exports of Medium-High Tech goods to China.

Import regressions – displacement effect

Empirical specifications

We estimate the following augmented import regression to test whether Chinese goods may displace other countries' exports in common market:

$$\log\left(Import_{ijt}\right) = \alpha + \beta \cdot \log\left(RER_{ijt}\right) + \delta \cdot \log\left(DomDemand_{it}\right) + \mu \cdot \log\left(Import_{iChina,t}\right) + f_{ij} + T_t + \varepsilon_{ijt}$$

where $Imports_{iChina,t}$ are total imports of country *i* from China during year *t*. A positive (resp. negative) coefficient μ means that, conditional on bilateral real exchange rates and total domestic demand, imports of country *i* from country *j* are positively (resp, negatively) correlated with its imports from China. If there is a displacement effect, we expect the coefficient μ to be negative, as higher imports from China should result in lower imports from other trading partners. To control for trade specialization, we introduce in some specification the control variable $low\_tech_j * \log(Imports_{iChina,t})$ where low_tech_j is the share of low technology goods in the exports of country *j*. We also estimate exchange rate elasticities specific to the debtor countries as a robustness test of our previous regressions.

We also estimate this specification at the sectoral level, controlling for the trading partner *j* domestic demand, sector specific dummies, and country-specific dummies to absorb the impact of any unobserved sectoral or reporting country specific shocks, and estimate the sector-specific elasticity μ_k of euro area exports to market *i* to Chinese exports to the same market.

Regression results

To explore whether exports of euro area countries may have been displaced by Chinese exports, we consider a sample of 17 major trading partners of euro area countries during 1999–2009 and estimate various versions of the regression specification reported in Table 7.

Columns 1 to 7 report regressions estimated on the complete sample of reporting countries, and columns 8 and 9 regressions estimated on the sample of euro area reporting countries. On average, bilateral imports vis-à-vis any trading partner are positively correlated with bilateral imports from China, even after controlling for total domestic demand of the trading partner. In the full sample of reporting countries, the estimated coefficient implies that a 10 percent rise in bilateral imports is associated with a rise in imports from China of about 2–2½ percent. The estimated elasticity (1.1) is however much smaller when estimated on euro area countries only. This positive coefficient is not consistent with the possibility that, on average, Chinese goods may displace other countries' exports. A possible interpretation is that imports from China proxy for demand effects not captured by total domestic demand and that would raise all imports simultaneously.[15]

To test whether Chinese exports are closer substitutes to some countries' exports, we allow for different coefficients μ across trading partners of each reporting country and after controlling for partner countries' trade specializations. In columns 4 to 6, we estimate a coefficient specific to euro area countries. Next, to test whether euro area debtor countries differ significantly from the euro area average, we estimate a coefficient specific to Greece, Italy, Spain and Portugal (columns 4, 5, and 8), and let it be country specific in columns 6, 7, 9, and 10. In columns 5–10, we control for the low-tech shares in partner countries' exports.

Interestingly, we find first that exports of euro area countries to common markets are negatively correlated with Chinese exports to these markets (columns 4–6), suggesting that euro area countries exports are more likely than average to be displaced by Chinese exports. The coefficient is even smaller for the debtor countries (columns 4, 5, and 8), suggesting that these exports are even more likely to be displaced by Chinese exports. However, find no significant displacement effects due to trade specialization in low-tech goods except for the regressions that focus on euro area reporting countries only, partially due to limited coverage on trade specialization in non-euro area countries in our dataset. Finally, we confirm in columns (2) and (10) that the exchange rate elasticity of imports from the euro area debtor countries is larger than the average exchange rate elasticity, implying a large decline in imports from these countries as a result of the effective appreciation of their nominal exchange rate.

Appendix Table A6 reports displacement effects regressions estimated at the sectoral level. In these regressions, we control for the trading partner's domestic demand and also include sector specific time dummies. Our main findings are on average robust to this sectoral specification.

[15] For example, this could capture the effect of time variation in trade openness not fully captured by the time trend.

However, we now obtain a negative and large displacement effect for Spain, and smaller displacement effects for the other three countries.[16]

Estimates of asymmetric impact of world trade shocks

How economically significant are these estimated effects of differential export demand elasticities? To quantify the impact on exports as deviation from the euro area average, we first compute an average differential elasticity defined as $elast_j = \sum_k share_k \times elast_{j,k}$, where $share_k$ is the share of exports of sector *k* in total export and $elast_{j,k}$ is the differential elasticity of sector *k* (relative to the euro area average) for exports to trading partner region *j*. The loss of exports to trading partner *j* at year *t* is then given by:

$$\left(\frac{export\_loss}{GDP}\right)_t = elast_j \cdot \%increase\_domestic\_demand_{j,(1999-t)} \cdot \left(\frac{export_j}{GDP}\right)_{1999} \cdot \left(\frac{GDP_{1999}}{GDP_t}\right)$$

The cumulative loss in percent of GDP between 2000 and 2008 is then given by the sum of the annual losses.

All in all, the total cumulative differential effects of trade developments vis-à-vis China, emerging Europe and oil exporters on the trade balance of euro area debtor countries appear to be quite large, although the estimate impact varies according to the regression specification. While export demand and displacement effects are estimated to be smaller with sectoral data in general, the displacement effect is instead larger in the case of Spain.

[16] Estimated displacement effects may be smaller when estimated with sectoral data if part of the displacement effect reflects pure sectoral patterns that are absorbed by the sector-specific time dummies. In contrast, for Spain we find a significantly larger displacement effect than with aggregate data. In that case, an aggregation bias may attenuate the estimated displacement effect (this could be the case for instance if a competitiveness loss in a third market is compensated by higher exports from another sector).

Total differential effects on the cumulative trade balance, 1999–2008 (in percent of GDP)

Differential Effect :	Greece	Italy	Portugal	Spain
Aggregate Data				
Export demand	-6.8	-7.0	-1.5	0.0
Displacement of exports	-8.8	-17.1	-29.2	2.4
Total	*-15.6*	*-24.1*	*-30.7*	*2.4*
Sectoral Data				
Export demand	-1.3	0.0	0.0	-0.5
Displacement of exports	-10.2	-7.4	5.9	-25.2
Total	*-11.5*	*-7.4*	*5.9*	*-25.7*

Source: authors' calculations

V. THE FINANCING OF EURO AREA DEBTOR COUNTRIES

A. Financial Integration and NFA Positions

In Section III we documented how investors from outside the euro area held larger shares of debt issued by "core" euro area countries as opposed to debt issued by the periphery. In Figure 7 we provide a decomposition of net foreign assets for euro area debtor countries, separating out to the extent possible the positions vis-à-vis other euro area countries from those vis-à-vis the rest of the world (see Waysand et al, 2010, for an analysis of bilateral positions of European Union countries). The figure shows that net liabilities vis-à-vis other euro area countries account for the lion share of the increase in net external financing for euro area debtor countries since the beginning of the past decade. In addition, net liabilities vis-à-vis the United Kingdom (not shown in the chart) account for a meaningful part of net liabilities vis-à-vis the rest of the world. Given the importance of cross-border financial sector activity of affiliates of core euro area banks domiciled in the U.K., part of these liabilities are also likely to reflect positions vis-à-vis the core euro area.

The mirror image of the debtor countries' net foreign liabilities are the net foreign assets of the other "core" euro area countries described in Figure 8; theses accumulated net foreign assets vis-à-vis the debtor countries, and net foreign liabilities vis-à-vis the rest of the world. We next focus on the two largest "core" euro area countries in Figure 9. During the same period, France and Germany accumulated net foreign assets within the euro area almost exclusively vis-à-vis the five debtor countries. While Germany had a growing positive net asset position vis-à-vis the rest of the world, France had a growing net liability position vis-à-vis the rest of the world. A closer look at the data shows that investors from the rest of the world held debt securities in "core" euro area countries, in particular France and Germany, but accumulated very few claims vis-à-vis the euro area debtor countries. Figure 10 also shows that France and Germany's claims on the debtor countries were mostly in the form of debt securities.

In sum, this evidence shows that the financing of debtor countries' trade deficits vis-à-vis the rest of the world was mostly indirect and intermediated by the large countries of the euro area. The fact that most capital inflows in the euro area debtor countries originated from other euro area countries suggests that the substitutability between financial instruments issued by different euro area countries was higher within the euro area than for outside investors. While it is straightforward to explain why monetary union and financial harmonization increased the substitutability of bonds issued by different euro area countries for a local investor, it is more difficult to explain why investors outside the euro area would perceive bonds from the euro area periphery as less substitutable with those from the euro area core. One possibility is that core euro area investors perceived deficit countries' bonds as less risky because of bailout expectations (that would somehow favor euro area holders). Another is that these bonds had the same collateral value at the European Central Bank for euro area financial institutions accessing ECB financing while attracting the same zero weight across all euro area sovereigns in their capital requirements. Outside investors did not enjoy such benefits.[17]

B. Sectoral and Instrument Composition of the NFA Position

The sectoral destination of capital inflows reflected a combination of purchases of government bonds (in all countries, but particularly in Greece and Portugal) and purchases of bank bonds and lending to domestic banks (particularly in Spain, Portugal, and Ireland) with Italy standing out as having the largest accumulation of assets overseas, reflecting capital outflows by the non-bank private sector (Figure 11). In sum, the net position of the general government and the financial sector account for the lion share of the increase in net external liabilities for the debtor countries. This helps explain why concerns about government finances and the health of bank balance sheets took center stage during the crisis starting in early 2010.

However, a parallel analysis of domestic financial balance sheets reveals a more complex picture: the worsening external position of debtor countries is to a significant extent associated with a worsening in the financial balance sheet of the private sector—specifically, households (Table 8). In turn, this worsening of the financial balance sheet of households is mostly explained by an increase in purchases of nonfinancial assets (primarily housing). The net position of the general government (as of end-2008) was still stronger than early in the decade (the exception being Portugal) but the domestic private sector reduced substantially its holdings of domestic government debt and increased its indebtedness vis-à-vis the domestic financial system, which in turn increased its reliance on external funding. What changed therefore was the pattern of ownership of domestic public debt, rather than its overall size—worsening private sector balance sheets were the driving force behind increased external imbalances.

[17] Another possible explanation for the fact that investors from the rest of the world favored bonds from core euro area countries such as France and Germany is that these countries attract much bigger weights in global bond indices, and that investment management guidelines prevent many institutional investors from deviating significantly from these index weights.

VI. Concluding Remarks

In this paper we have documented the evolution of external imbalances among euro area countries, and explored the role of various factors in rising net foreign liabilities. The asymmetric impact of trade developments with countries outside the euro area are important but often overlooked factors contributing to the growing external imbalances. The rise of China, the integration of Central and Eastern European countries with the rest of Europe, and rising oil prices contributed to the divergence of external balances in the euro area. In particular, exports of several Southern European countries were negatively affected by Chinese competition, while Chinese import demand provided little benefits to the trade balance of these countries. At the same time, the very sharp nominal appreciation of the euro compounded the well-documented losses in competitiveness of deficit countries within the euro area due to domestic prices and costs.

We also show that the current account deficits of euro area countries were mostly financed by euro area surplus countries, despite significant trade imbalances vis-à-vis the rest of the world. That is, in deficit countries trade imbalances vis-à-vis the rest of the world were financed by net lending from the core euro area. In turn, investors from outside the euro area increased their claims on countries such as Germany and France. This suggests a special role for intra-euro area financial integration in allowing for persistent current account imbalances. Why investors from the rest of the world displayed different portfolio preferences for euro area investment is an important subject for future research.

While external imbalances in debtor countries reflected to an important extent an increase in claims by nonresidents on the public sector (as well as financial institutions) these increased claims reflected sales of public debt by the domestic private sector. Indeed, between 2000 and 2008 the entire deterioration in the net financial position of deficit countries vis-à-vis nonresidents reflects a worsening of private sector financial balance sheets, with the effect on household balance sheets masked by asset price booms.

These results suggest that the build-up in external liabilities in several euro area countries reflected a variety of factors, including external shocks, with the ease of external financing coming from core euro area countries playing an important role in allowing these imbalances to persist. Given the persistence of the external shocks we discussed—the rise of China, the integration of Central and Eastern Europe with the euro area, high commodity prices—and especially the dramatic change in the willingness of nonresidents to finance large current account deficits—the need for external adjustment in debtor countries is particularly pressing. Domestic demand-side policies (such as fiscal consolidation and internal devaluation) and supply-side policies boosting productivity and export competitiveness (such as product and labor market reforms) are likely to be important elements of rebalancing in a monetary union. But our evidence of asymmetric shocks calls for mechanisms to develop centralized risk sharing and transfers across euro area countries to ease adjustment to country-specific shocks. Having

fiscal transfers in place, conditional on strong governance, would be particularly important given limited mobility of labor and existing labor market rigidities in the euro area.[18] The adjustment would be greatly facilitated by an easing of external factors. These include stronger external demand, less onerous financing conditions as well as a depreciation of the euro.

[18] See for instance, Bordo et al. (2011) for a related discussion.

Table 1. Real Effective Exchange Rate and Current Account Balances at the Start of EMU

	REER in 1999 relative to 1980-99 average	Current account balance inclusive of capital transfers, 1999
Greece	9.4%	-3.7%
Ireland	-5.7%	0.9%
Italy	-3.4%	0.9%
Portugal	12.3%	-6.2%
Spain	-1.0%	-1.8%
France	-3.6%	3.2%
Germany	-2.4%	-1.3%

Source: IMF staff calculations based on IFS data.

Table 2. Saving-Investment Balance (In percent of GDP)

		1999-2001	2007-2008	Change 1999-01 to 2007-08
Greece [1/]	**Current Account**	**-6.8%**	**-14.5%**	**-7.7%**
	Investment	22.9%	21.6%	-1.4%
	Savings	16.2%	7.1%	-9.1%
	Public Savings	-0.7%	-3.0%	-2.3%
	Private Savings	16.9%	10.1%	-6.7%
	Household Savings	2.0%	0.3%	-1.7%
	Corporate Savings	13.8%	9.8%	-4.0%
Ireland	**Current Account**	**-0.3%**	**-5.3%**	**-5.0%**
	Investment	23.4%	23.9%	0.5%
	Savings	23.2%	18.7%	-4.5%
	Public Savings	8.3%	-0.8%	-9.1%
	Private Savings	14.8%	19.4%	4.6%
	Household Savings	…	…	…
	Corporate Savings	…	…	…
Italy	**Current Account**	**0.0%**	**-2.9%**	**-3.0%**
	Investment	20.4%	21.5%	1.0%
	Savings	20.5%	18.5%	-1.9%
	Public Savings	1.3%	1.5%	0.2%
	Private Savings	19.2%	17.0%	-2.2%
	Household Savings	10.8%	10.2%	-0.5%
	Corporate Savings	8.4%	6.8%	-1.6%
Portugal	**Current Account**	**-9.5%**	**-10.8%**	**-1.2%**
	Investment	27.5%	22.3%	-5.3%
	Savings	18.0%	11.5%	-6.5%
	Public Savings	0.9%	-0.5%	-1.3%
	Private Savings	17.1%	11.9%	-5.2%
	Household Savings	7.3%	4.4%	-2.9%
	Corporate Savings	9.8%	7.5%	-2.2%
Spain [1/]	**Current Account**	**-3.6%**	**-9.8%**	**-6.2%**
	Investment	25.9%	30.1%	4.2%
	Savings	22.3%	20.3%	-2.0%
	Public Savings	2.3%	2.9%	0.6%
	Private Savings	20.1%	17.5%	-2.6%
	Household Savings	7.4%	7.7%	0.2%
	Corporate Savings	12.5%	9.8%	-2.7%
France	**Current Account**	**2.2%**	**-1.6%**	**-3.9%**
	Investment	19.9%	22.2%	2.3%
	Savings	22.0%	20.6%	-1.5%
	Public Savings	2.1%	5.1%	3.0%
	Private Savings	19.9%	15.4%	-4.5%
	Household Savings	10.0%	10.2%	0.3%
	Corporate Savings	9.9%	5.2%	-4.8%
Germany	**Current Account**	**-1.0%**	**7.2%**	**8.1%**
	Investment	20.9%	18.8%	-2.2%
	Savings	19.9%	25.9%	6.0%
	Public Savings	0.9%	2.5%	1.5%
	Private Savings	19.0%	23.5%	4.4%
	Household Savings	10.6%	11.6%	1.0%
	Corporate Savings	8.4%	11.8%	3.4%

Sources: Eurostat, IFS, and Staff Calculations

1/: households and corporate savings data start in 2000.

Table 3. Trade Balance, Goods, in Percent of GDP (By Region)

		Trade Balance		Imports		Exports	
		1999-2000	2008-2009	1999-2000	2008-2009	1999-2000	2008-2009
Greece	World	-13.2%	-15.1%	21.3%	21.9%	8.1%	6.7%
	Euro Area	-7.8%	-7.7%	11.4%	10.6%	3.6%	2.9%
	Non-Euro Area	-5.3%	-7.5%	9.8%	11.3%	4.5%	3.8%
Ireland	World	25.7%	19.8%	50.7%	29.9%	76.5%	49.7%
	Euro Area	19.9%	13.1%	10.0%	7.5%	29.9%	20.6%
	Non-Euro Area	5.8%	6.7%	40.7%	22.4%	46.6%	29.1%
Italy	World	0.7%	-0.5%	19.8%	21.8%	20.5%	21.3%
	Euro Area	-0.2%	-0.4%	10.3%	9.8%	10.1%	9.4%
	Non-Euro Area	0.9%	-0.1%	9.6%	12.0%	10.4%	11.9%
Portugal	World	-12.4%	-12.4%	32.1%	32.8%	19.6%	20.4%
	Euro Area	-8.6%	-9.0%	21.8%	21.6%	13.2%	12.7%
	Non-Euro Area	-3.8%	-3.5%	10.3%	11.2%	6.5%	7.7%
Spain	World	-5.7%	-6.8%	23.3%	23.0%	17.7%	16.2%
	Euro Area	-2.6%	-2.5%	13.3%	11.6%	10.7%	9.2%
	Non-Euro Area	-3.0%	-4.4%	10.0%	11.4%	7.0%	7.0%
France	World	0.0%	-3.2%	23.2%	23.0%	23.2%	19.9%
	Euro Area	-1.2%	-3.5%	12.9%	13.3%	11.7%	9.8%
	Non-Euro Area	1.2%	0.3%	10.3%	9.8%	11.6%	10.1%
Germany	World	2.9%	6.5%	23.9%	30.2%	26.9%	36.7%
	Euro Area	1.8%	1.9%	10.4%	13.8%	12.2%	15.7%
	Non-Euro Area	1.1%	4.6%	13.6%	16.4%	14.7%	21.0%

Source: Direction of Trade Statistics, IMF

Table 4. Exports and Imports of Euro Area Countries vis-à-vis Emerging Asia, Commodity Exporters and CEE Countries

		Imports (ratio of GDP)		Exports (ratio of GDP)	
		1999-2000	2007-08	1999-2000	2007-08
Greece	Emerging Asia	1.4%	2.6%	0.2%	0.1%
	Commodity exporters	2.2%	4.3%	0.6%	0.5%
	CEE	0.9%	1.5%	1.4%	1.6%
	Total	4.5%	8.3%	2.1%	2.3%
Ireland	Emerging Asia	4.5%	2.3%	3.5%	2.7%
	Commodity exporters	1.3%	1.0%	2.7%	1.7%
	CEE	0.6%	0.5%	1.0%	0.9%
	Total	6.4%	3.8%	7.2%	5.3%
Italy	Emerging Asia	1.1%	2.2%	0.9%	1.2%
	Commodity exporters	1.9%	3.2%	1.3%	2.4%
	CEE	1.0%	1.8%	1.4%	2.4%
	Total	4.0%	7.2%	3.5%	6.0%
Portugal	Emerging Asia	1.1%	1.4%	0.2%	0.9%
	Commodity exporters	2.3%	3.6%	0.8%	1.8%
	CEE	0.4%	0.7%	0.2%	0.6%
	Total	3.7%	5.7%	1.2%	3.3%
Spain	Emerging Asia	1.4%	2.4%	0.4%	0.5%
	Commodity exporters	1.9%	3.4%	0.8%	1.1%
	CEE	0.3%	0.9%	0.5%	0.8%
	Total	3.7%	6.6%	1.6%	2.4%
France	Emerging Asia	1.2%	1.6%	0.9%	1.3%
	Commodity exporters	1.6%	2.4%	1.4%	1.7%
	CEE	0.4%	1.1%	0.7%	1.1%
	Total	3.2%	5.1%	3.0%	4.1%
Germany	Emerging Asia	1.9%	3.1%	1.3%	2.7%
	Commodity exporters	1.5%	2.7%	1.4%	3.2%
	CEE	2.1%	3.7%	2.3%	4.7%
	Total	5.5%	9.6%	5.0%	10.6%

Source: International Monetary Fund, Direction of Trade Statistics, and World Economic Outlook

Table 5. Bilateral Exports, Goods, by Sectors
(In percent of GDP)

		High		Medium-High		Medium-Low		Low		Not Classified	
		1999	2008	1999	2008	1999	2008	1999	2008	1999	2008
Greece	**Total**	**0.4%**	**0.6%**	**0.8%**	**0.9%**	**1.5%**	**1.6%**	**2.2%**	**1.4%**	**0.6%**	**1.1%**
	1. Emerging Asia	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
	2. CEE	0.2%	0.0%	0.1%	0.2%	0.2%	0.4%	0.2%	0.3%	0.1%	0.1%
	3. Commodity exporters	0.0%	0.0%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.0%	0.1%
	1+2+3	0.2%	0.1%	0.2%	0.3%	0.3%	0.6%	0.4%	0.5%	0.1%	0.2%
Italy	**Total**	**1.7%**	**1.7%**	**6.1%**	**7.5%**	**2.9%**	**4.2%**	**4.9%**	**4.5%**	**0.3%**	**0.3%**
	1. Emerging Asia	0.1%	0.1%	0.3%	0.5%	0.1%	0.2%	0.2%	0.3%	0.0%	0.0%
	2. CEE	0.1%	0.1%	0.4%	0.8%	0.2%	0.4%	0.3%	0.4%	0.0%	0.0%
	3. Commodity exporters	0.1%	0.1%	0.5%	1.0%	0.2%	0.4%	0.3%	0.5%	0.0%	0.0%
	1+2+3	0.3%	0.3%	1.1%	2.3%	0.4%	1.0%	0.8%	1.2%	0.0%	0.1%
Portugal	**Total**	**1.6%**	**1.2%**	**3.8%**	**4.3%**	**1.9%**	**3.3%**	**7.0%**	**5.0%**	**0.2%**	**0.4%**
	1. Emerging Asia	0.0%	0.1%	0.1%	0.0%	0.01%	0.03%	0.1%	0.05%	0.00%	0.02%
	2. CEE	0.0%	0.0%	0.1%	0.2%	0.0%	0.1%	0.0%	0.1%	0.00%	0.00%
	3. Commodity exporters	0.0%	0.1%	0.1%	0.6%	0.1%	0.4%	0.3%	0.5%	0.01%	0.01%
	1+2+3	0.1%	0.3%	0.3%	0.8%	0.1%	0.5%	0.4%	0.6%	0.01%	0.02%
Spain	**Total**	**1.2%**	**1.2%**	**4.6%**	**4.2%**	**2.5%**	**2.6%**	**3.4%**	**2.8%**	**1.1%**	**0.9%**
	1. Emerging Asia	0.1%	0.0%	0.6%	0.1%	0.1%	0.2%	0.1%	0.1%	0.01%	0.01%
	2. CEE	0.0%	0.1%	0.1%	0.2%	0.0%	0.1%	0.1%	0.1%	0.03%	0.05%
	3. Commodity exporters	0.1%	0.08%	0.2%	0.3%	0.2%	0.3%	0.2%	0.2%	0.0%	0.0%
	1+2+3	0.1%	0.2%	0.9%	0.6%	0.4%	0.6%	0.3%	0.3%	0.06%	0.09%
Germany	**Total**	**3.0%**	**4.2%**	**8.0%**	**12.6%**	**2.7%**	**4.9%**	**2.5%**	**3.1%**	**0.1%**	**0.2%**
	1. Emerging Asia	0.2%	0.3%	0.5%	1.2%	0.1%	0.3%	0.1%	0.1%	0.0%	0.0%
	2. CEE	0.2%	0.4%	0.7%	1.6%	0.3%	0.7%	0.3%	0.3%	0.0%	0.0%
	3. Commodity exporters	0.2%	0.3%	0.4%	1.2%	0.1%	0.1%	0.1%	0.2%	0.0%	0.0%
	1+2+3	0.6%	1.0%	1.6%	4.0%	0.5%	1.1%	0.5%	0.6%	0.02%	0.04%
France	**Total**	**3.0%**	**2.7%**	**5.1%**	**5.1%**	**2.3%**	**2.8%**	**3.4%**	**3.0%**	**0.4%**	**0.3%**
	1. Emerging Asia	0.2%	0.2%	0.2%	0.3%	0.1%	0.1%	0.1%	0.2%	0.0%	0.0%
	2. CEE	0.1%	0.1%	0.2%	0.4%	0.1%	0.2%	0.1%	0.1%	0.0%	0.0%
	3. Commodity exporters	0.2%	0.3%	0.3%	0.5%	0.1%	0.2%	0.2%	0.2%	0.0%	0.0%
	1+2+3	0.5%	0.6%	0.6%	1.1%	0.2%	0.5%	0.4%	0.5%	0.03%	0.03%

sources: IMF staff calculations based on UN COMTRADE data; sectoral trade classification from OECD (2005)

Table 6. Export Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(9)	(10)	(11)	(12)
					P=CEE	P=CEE	P=CEE	P=China	P=China	P=China	P=Oil	P=Oil	P=Oil
Nominal Exchange Rate			0.404***	0.304***	0.343***	0.204***	0.348***	0.406***	0.310***	0.412***	0.385***	0.325***	0.404***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Relative CPI			-0.437***	-0.405***	-0.378***	-0.294***	-0.381***	-0.442***	-0.414***	-0.447***	-0.428***	-0.408***	-0.441***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Nominal Exchange Rate				0.211***		0.306***			0.203***			0.134*	
X (R=GIPS)				(0.000)		(0.000)			(0.000)			(0.019)	
Relative CPI				-0.0852		-0.200**			-0.0761			-0.0549	
X (R=GIPS)				(0.162)		(0.002)			(0.216)			(0.368)	
Real Exchange Rate	0.425***	0.366***											
	(0.000)	(0.000)											
Real Exchange Rate		0.141**											
X (R=GIPS)		(0.009)											
PartnerDemand	1.294***	1.296***	1.268***	1.261***	1.209***	1.203***	1.219***	1.228***	1.220***	1.232***	1.295***	1.290***	1.286***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PartnerDemand X LowTechShare(r)							-0.0132*			-0.00967			-0.00855
							(0.028)			(0.119)			(0.143)
PartnerDemand X P					0.594***	0.632***	0.603***	0.372***	0.370***	0.356**	0.169*	0.113	0.171**
					(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.010)	(0.069)	(0.009)
PartnerDemand X R(R=Deu) X P					-0.0845	-0.0868	-0.0833	0.0678	0.0747	0.0700	0.227*	0.231**	0.231**
					(0.414)	(0.413)	(0.424)	(0.628)	(0.580)	(0.622)	(0.011)	(0.008)	(0.010)
PartnerDemand X R(R=GIPS) X P					-0.664***	-0.740***		-0.483**	-0.458*		-0.679***	-0.537***	
					(0.000)	(0.000)		(0.007)	(0.011)		(0.000)	(0.000)	
PartnerDemand X R(R=Grc) X P							-1.572***			-0.0160			-2.208***
							(0.000)			(0.965)			(0.000)
PartnerDemand X R(R=Its) X P							-0.778***			-0.858***			-0.353*
							(0.000)			(0.000)			(0.016)
PartnerDemand X R(R=Prt) X P							0.754***			-0.144			-0.657**
							(0.000)			(0.753)			(0.008)
PartnerDemand X R(R=Esp) X P							0.948***			-0.336			-0.323**
							(0.000)			(0.159)			(0.007)
Observations	5802	5802	5802	5802	5802	5802	5802	5802	5802	5802	5802	5802	5802
R-squared	0.981	0.981	0.981	0.981	0.982	0.982	0.982	0.981	0.982	0.981	0.982	0.982	0.982

Robust pval in parentheses, *** p<0.01, ** p<0.05, * p<0.1. All Regressions include a full set of country fixed effects and time fixed effects.

Notes: The dependent variable is annual bilateral export volume of 11 euro countries with their top 50 trading partners from 1990 to 2009. The 11 euro countries are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain. The independent variables include the nominal exchange rate, relative CPI (reporter CPI/Partner CPI), real exchange rate, partner demand (trading partner's domestic demand), reporter's export shares in low-tech goods, and interactions of trading partner's domestic demand with various country pair dummies. R is the dummy for reporter country, and P is the dummy for partner country (definition for P is listed in the column header). For example, the coefficient of -1.572 for "PartnerDemand X R(R=Grc) X P" in column (7) indicates the marginal difference in demand elasticity for exports from Greece to CEE countries.

Table 7. Displacement Effect

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) only Euro	(9) only Euro	(10) only Euro
Nominal Exchange Rate			0.318***	0.341***	0.342***	0.333***	0.352***	-0.247***	-0.272***	
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
Relative CPI			-0.354***	-0.399***	-0.400***	-0.392***	-0.413***	0.168**	0.193***	
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.000)	
Real Exchange Rate	0.341***	0.423***								-0.134*
	(0.000)	(0.000)								(0.041)
Real Exchange Rate X GIPS		-0.622***								-0.264**
		(0.000)								(0.003)
ReporterDemand	1.803***	1.763***	1.853***	1.436***	1.437***	1.436***	1.458***	1.125***	1.119***	1.044***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Import from China				0.241***	0.240***	0.239***	0.214***	0.137***	0.134***	0.116***
				(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Import from China X LowTechShare(p)					0.00227	0.00116	0.000948	-0.0160*	-0.0189**	-0.0183**
					(0.717)	(0.853)	(0.880)	(0.021)	(0.006)	(0.007)
Import from China X P(P=Euro)				-0.0512***	-0.0513***	-0.0515***				
				(0.000)	(0.000)	(0.000)				
Import from China X P(P=GIPS)				-0.0418**	-0.0421**			-0.0201		
				(0.004)	(0.004)			(0.143)		
Import from China X P(P=Grc)						-0.129***	-0.151***		-0.126***	-0.148***
						(0.000)	(0.000)		(0.000)	(0.000)
Import from China X P(P=Ita)						-0.0657***	-0.0881***		-0.0462**	-0.0531***
						(0.000)	(0.000)		(0.002)	(0.000)
Import from China X P(P=Prt)						-0.151***	-0.173***		-0.116***	-0.109***
						(0.000)	(0.000)		(0.000)	(0.000)
Import from China X P(P=Esp)						0.0759***	0.0535*		0.107***	0.103***
						(0.001)	(0.017)		(0.000)	(0.000)
Observations	3751	3751	3751	3751	3751	3751	3751	2270	2270	2270
R-squared	0.982	0.982	0.982	0.983	0.983	0.983	0.983	0.987	0.988	0.988

Robust pval in parentheses, *** p<0.01, ** p<0.05, * p<0.1. All Regressions include a full set of country fixed effects and time fixed effects.

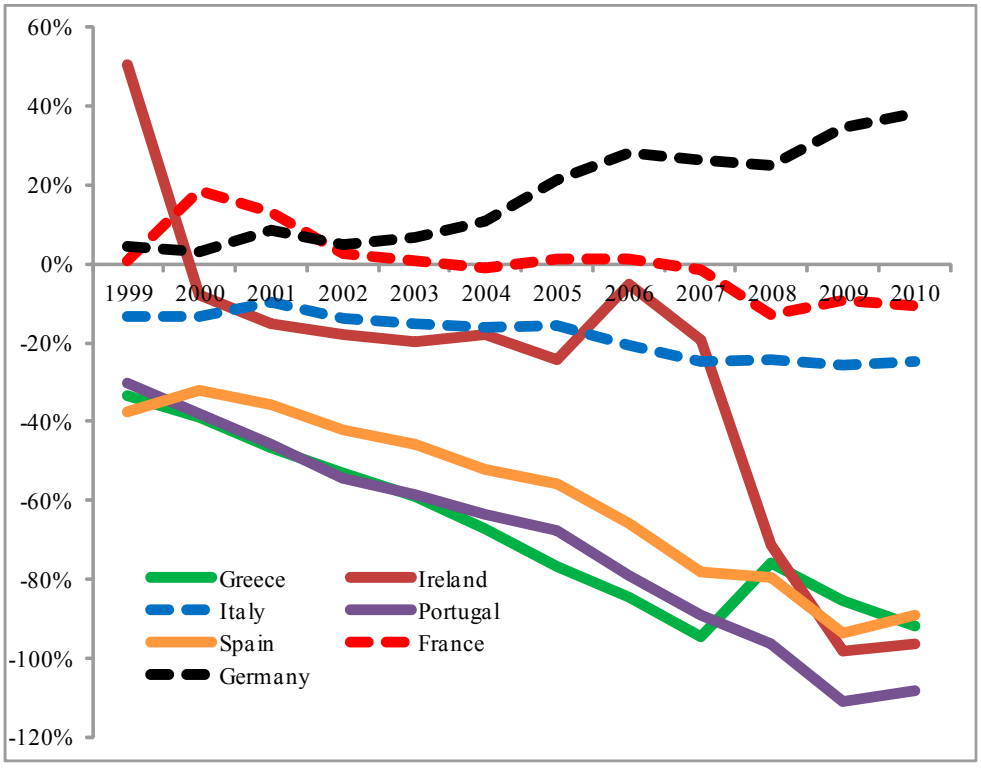
Notes: The dependent variable is the annual bilateral import volume of 17 countries with their top 50 trading partners from 1990 to 2009. The 17 countries are United States, United Kingdom, Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Sweden, Switzerland, Japan, Spain, Turkey, Russian Federation, Czech Republic, and Poland, which are major countries import from euro area. The independent variable "Import from China" is the reporter country's import from China. Other specifications are consistent with table 6. For example, -0.0512 for "Import from China X P(P=Euro)" in column (3) means the marginal effect of imports from China on the reporter country's imports from euro countries. Column (7) and (8) use the sub-sample where trading partners are only euro countries.

Table 8. Net Financial Assets by Sector (In percent of GDP, 2001–09)

	Sector	2001	2009	Change
Greece	Households	131	59	-71
	Government	-93	-87	6
	Financial Sector	-9	-6	4
	Non-financial Sector	-71	-69	2
	Total	-42	-102	-60
Ireland	Households	103	65	-38
	Government	-13	-28	-15
	Financial Sector	-2	1	3
	Non-financial Sector	-103	-105	-2
	Total	-15	-67	-52
Italy	Households	202	186	-16
	Government	-96	-103	-7
	Financial Sector	2	19	17
	Non-financial Sector	-99	-117	-18
	Total	9	-16	-25
Portugal	Households	140	127	-13
	Government	-30	-57	-27
	Financial Sector	-10	-1	9
	Non-financial Sector	-148	-174	-26
	Total	-48	-106	-58
Spain	Households	107	76	-31
	Government	-42	-34	7
	Financial Sector	3	11	7
	Non-financial Sector	-103	-143	-40
	Total	-34	-90	-56
France	Households	118	131	14
	Government	-37	-51	-14
	Financial Sector	11	19	8
	Non-financial Sector	-77	-102	-25
	Total	15	-2	-17
Germany	Households	98	130	32
	Government	-36	-48	-12
	Financial Sector	0	7	7
	Non-financial Sector	-58	-59	-1
	Total	4	30	26

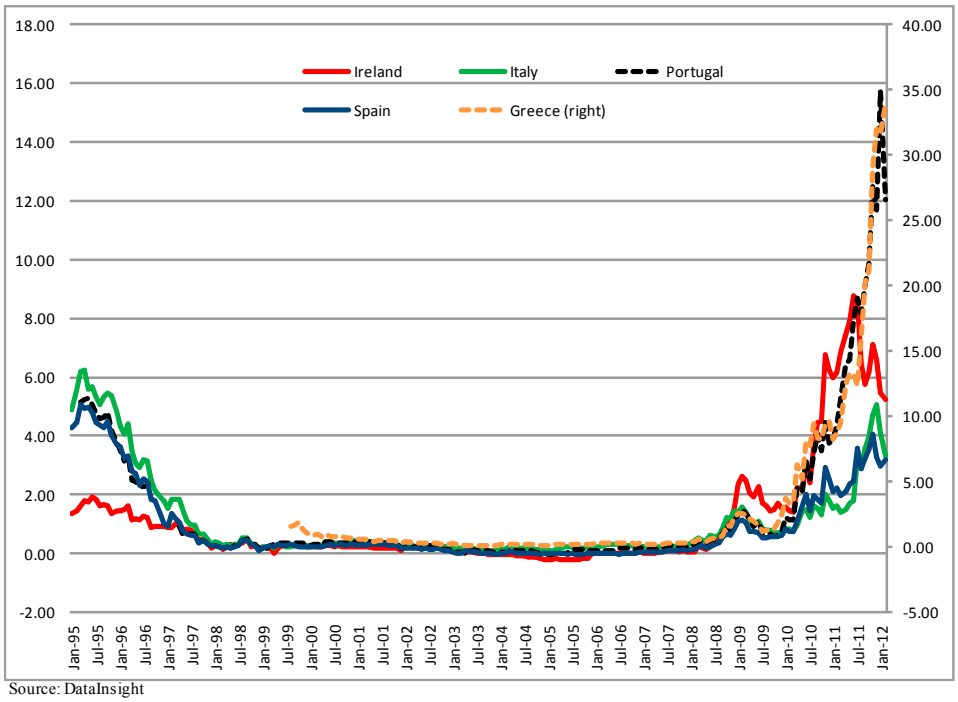
Source: Eurostat statistics, OECD statistics

Figure 1. Net Foreign Asset Positions 1999–2010, in Percent of GDP



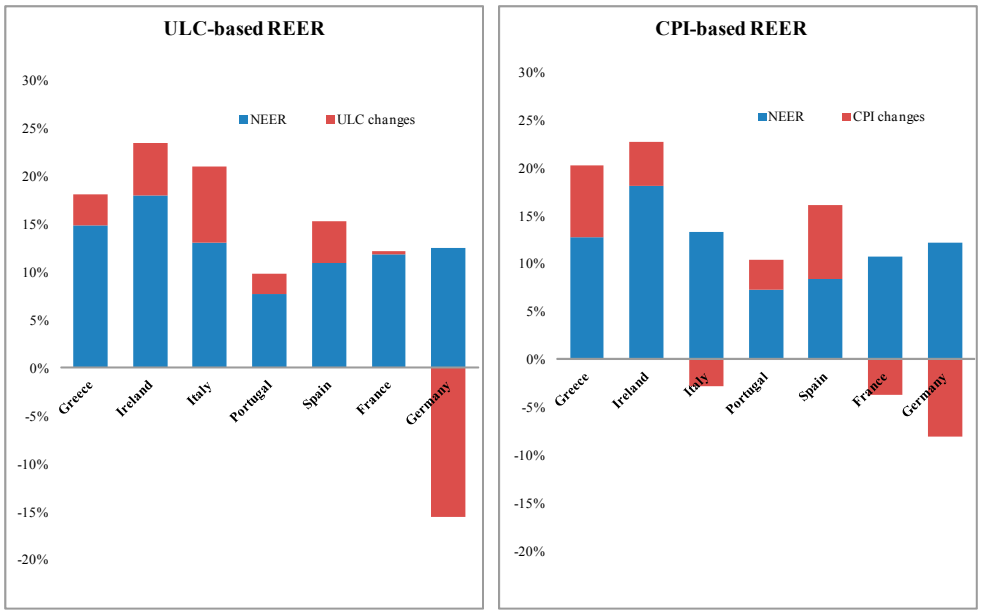
Source: IFS data

Figure 2. Ten-Year Government Bond Spreads Against German Bunds



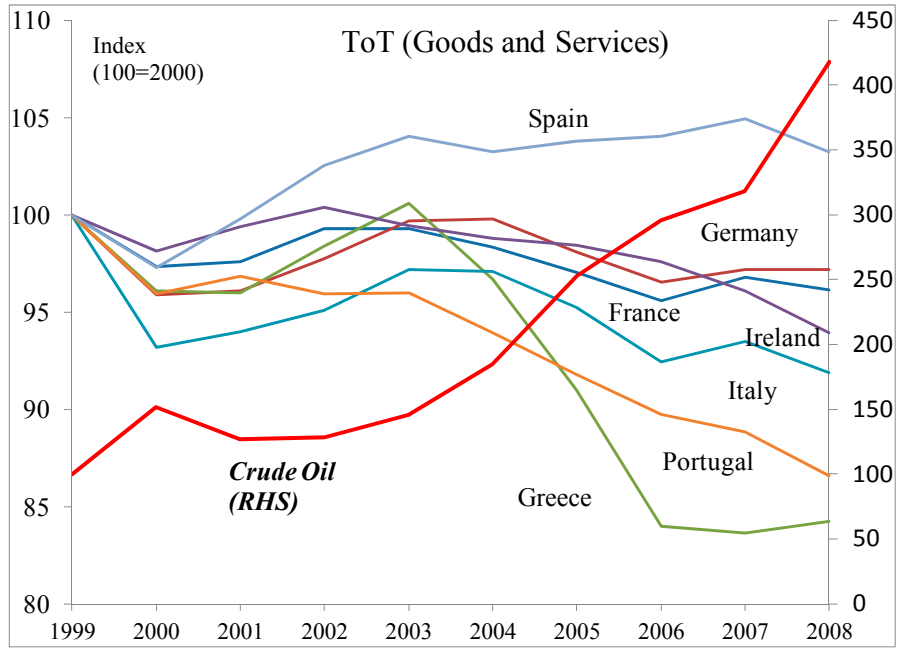
Source: DataInsight

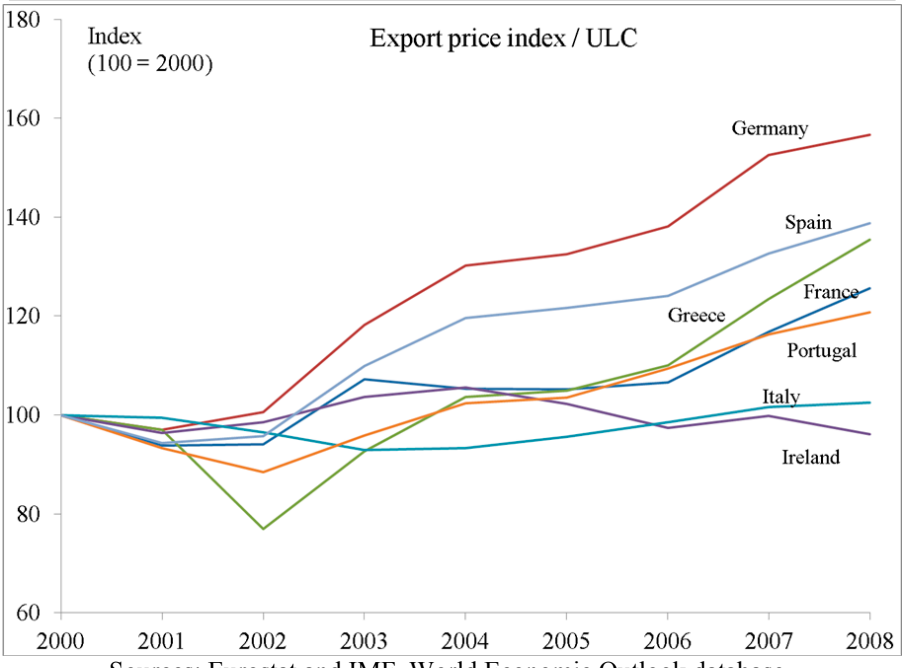
Figure 3. Decomposition of Real Effective Exchange Rates, Percentage Change from 2000 to 2010.



Source: ULC-based REER is from Eurostat, 36 trading partners; CPI-based REER is from INS.

Figure 4. Terms of Trade and Unit Labor Costs





Sources: Eurostat and IMF, World Economic Outlook database.

Figure 5. The International Investment Position of the Euro Area 2001–08
(In percent of Euro Area GDP)

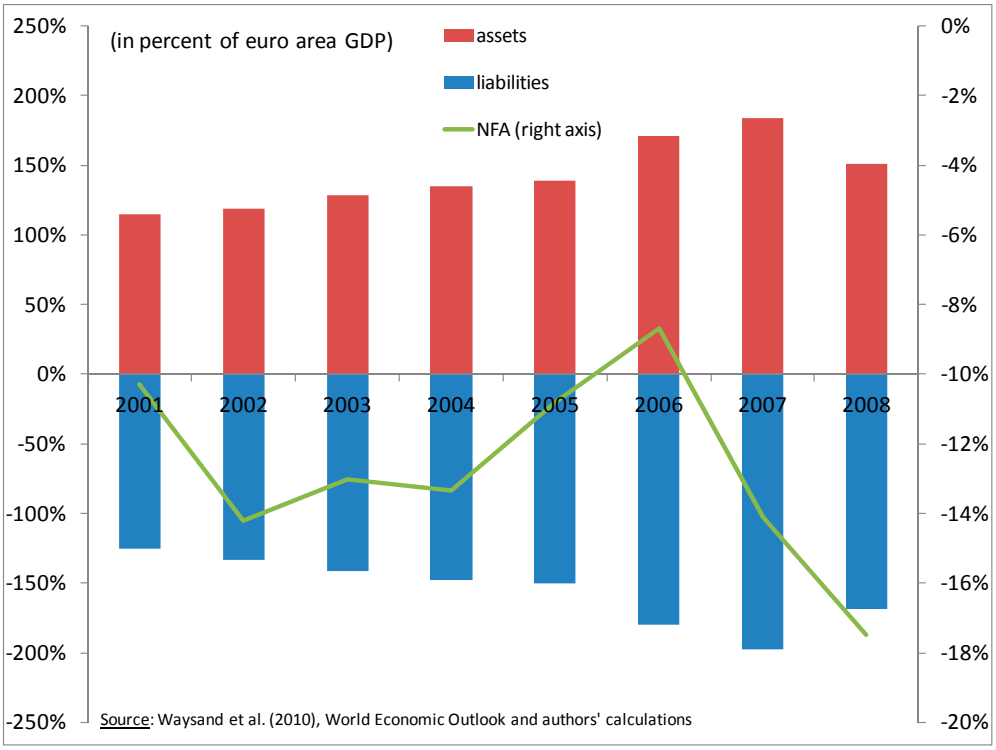
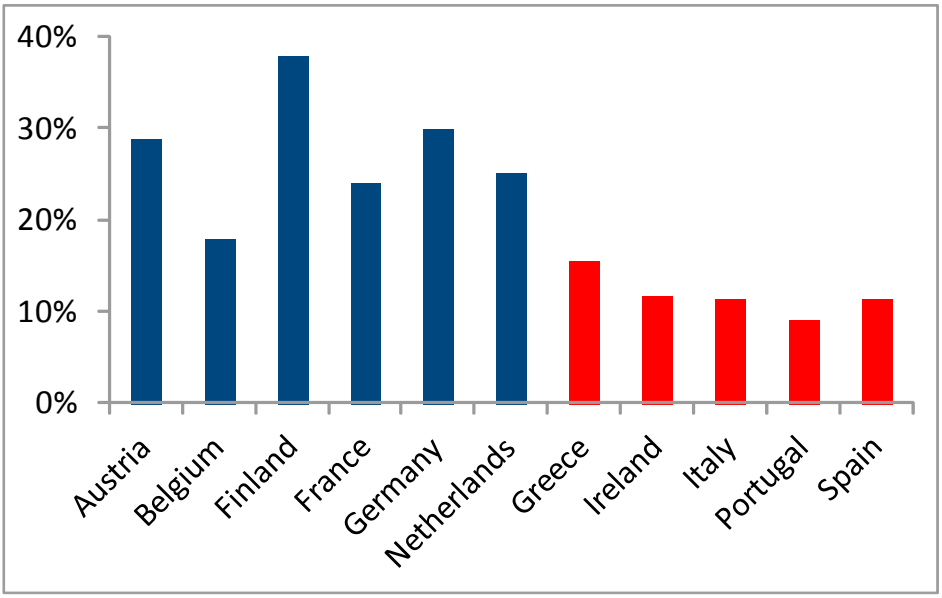


Figure 6. Share of Outstanding Debt Securities Held Outside the Euro Area (2008)



Source: Authors' calculations based on IMF, Balance of Payments Statistics and Coordinated Portfolio Investment Survey.

Figure 7. Net Foreign Assets of Euro Area Debtor Countries
(In percent of Euro Area GDP)

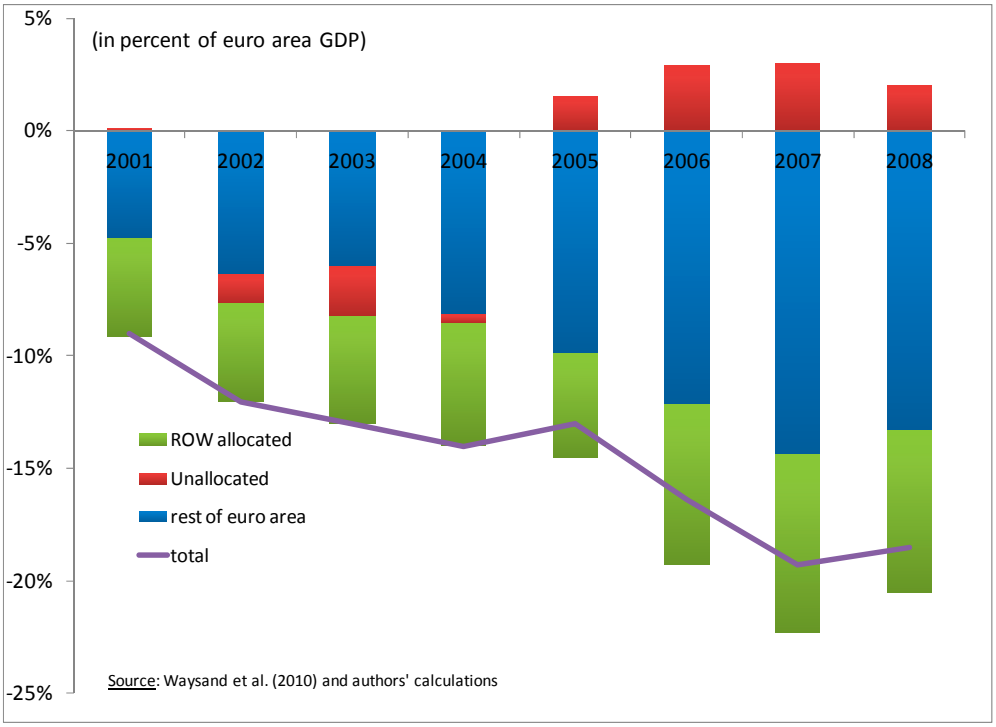


Figure 8. Net Foreign Assets of "Core" Euro Area Countries
(In percent of Euro Area GDP)

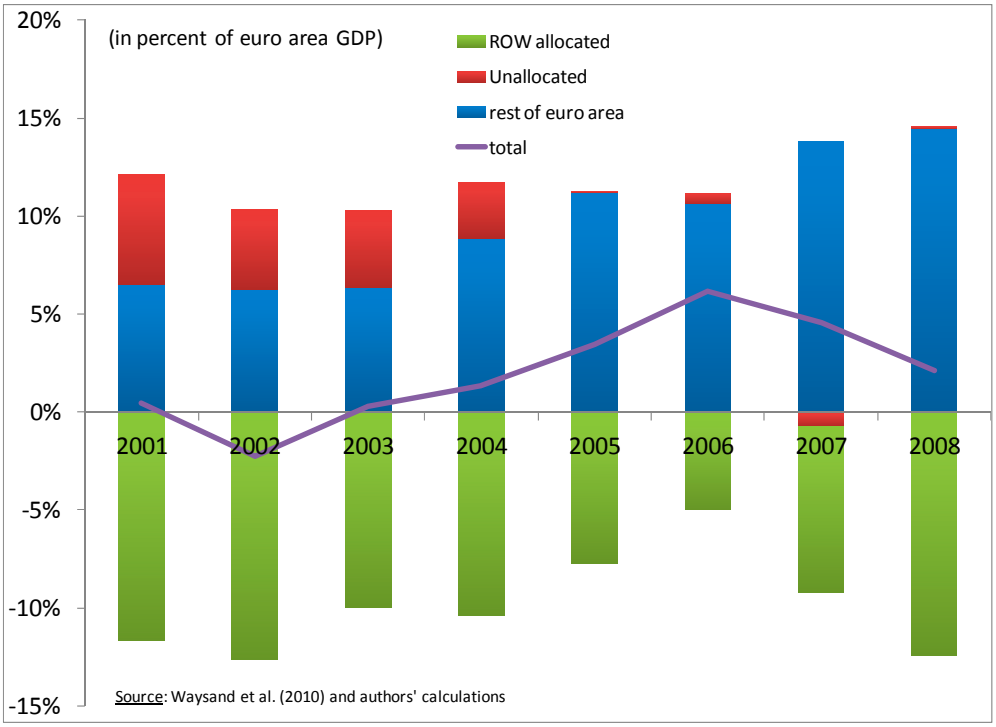
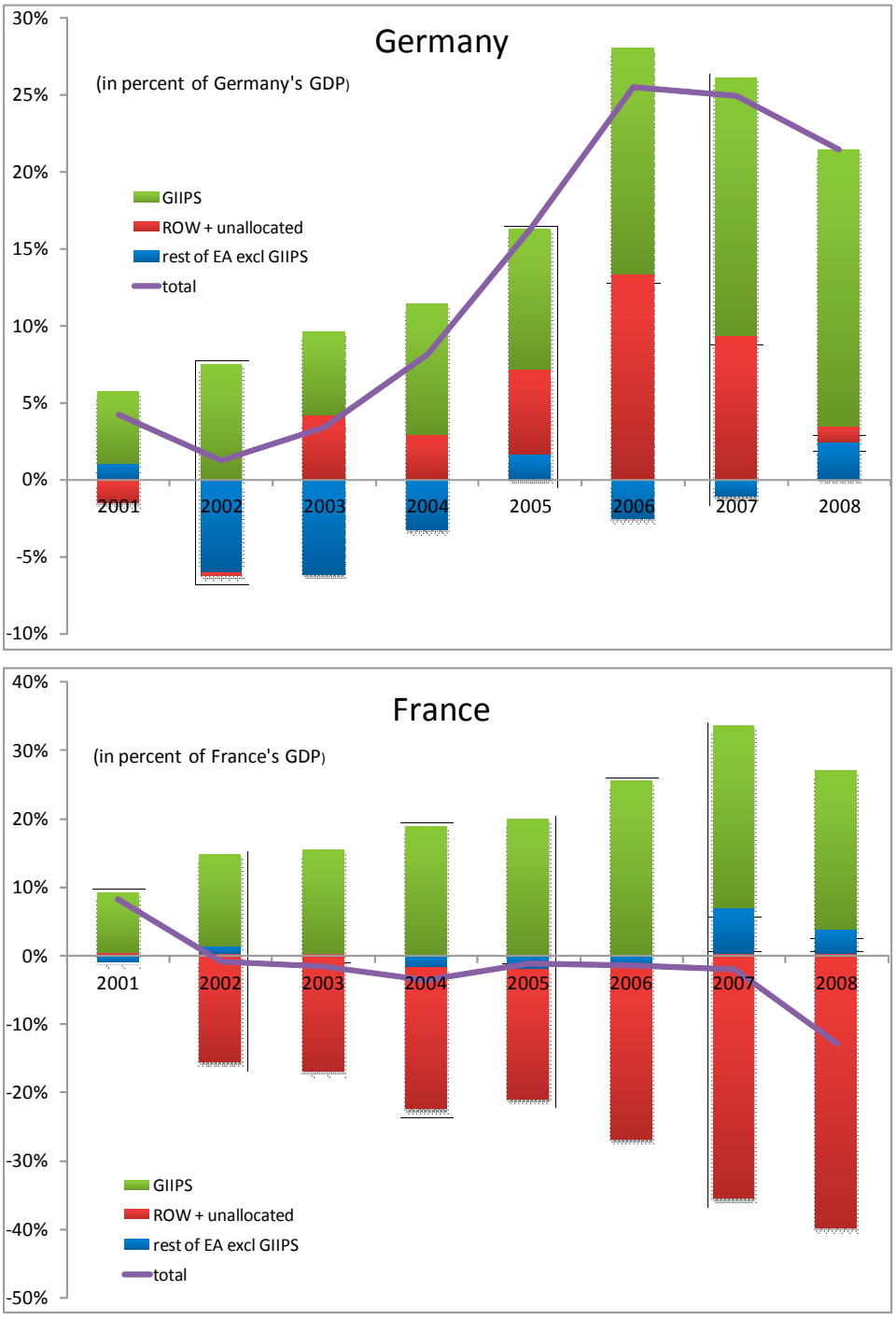


Figure 9. Bilateral Net Foreign Assets of Germany and France



Source: Waysand et al. (2010) and authors' calculations

Figure 10. Bilateral Net Foreign Assets of Germany and France vis-à-vis Euro Area Debtor Countries (By instrument)

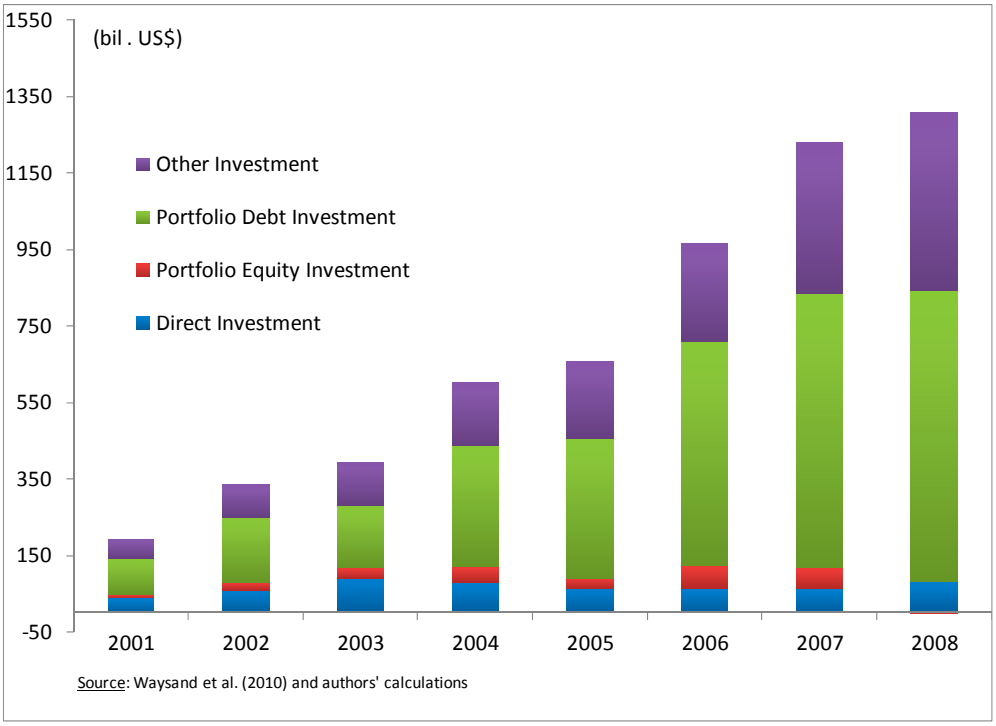
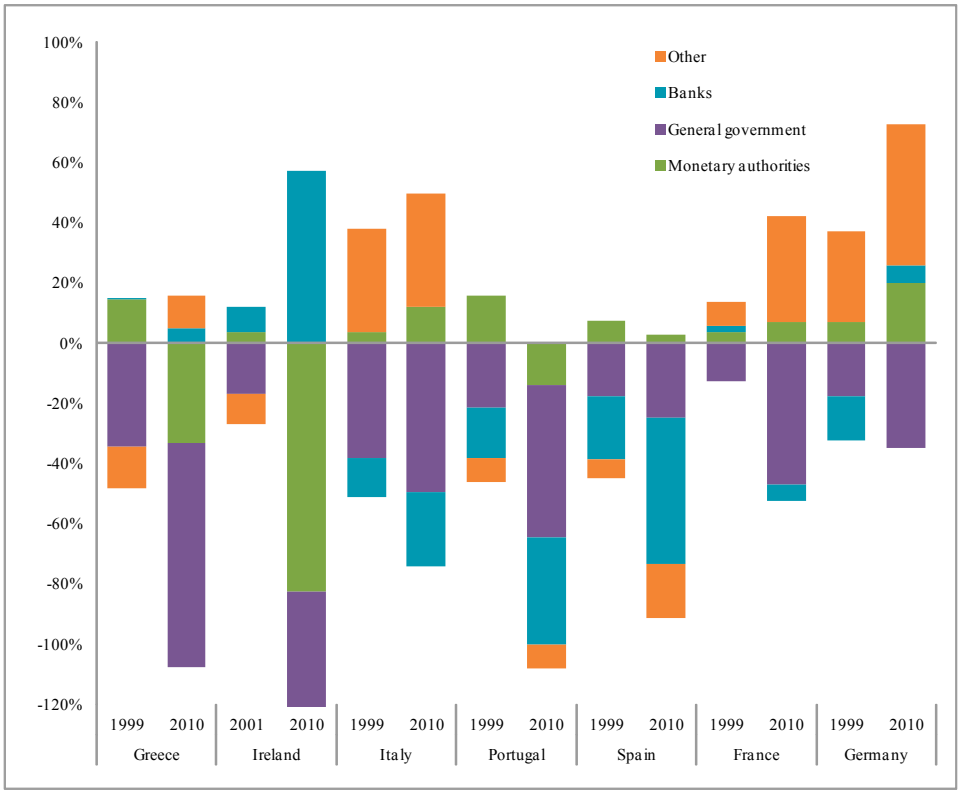


Figure 11. Sectoral Net Foreign Asset Positions (In percent of GDP)



Sources: IFS data

Notes: Data available only from 2001 for Ireland.

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Appendix

The bilateral export data are from the IMF's Direction of Trade Statistics. For export regressions we collect annual bilateral exports of 11 euro countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) to their top 50 trading partners.[19] For displacement effect regressions, we focus on countries that choose to import from either the euro area or China. From the first dataset, we select countries that are in the top 20 export trading partners for at least 6 euro countries (U.S., U.K., Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Sweden, Switzerland, Japan, Spain, Turkey, Russia, Czech Republic, and Poland). We collect bilateral nominal exports and imports for those 17 counties with their top 50 trading partners. Because bilateral price deflators are not available, nominal bilateral exports (imports) are converted into real values using the reporter country's export (import) price deflators.

The bilateral sectoral export and import data are from the U.N. Commodity Trade Statistics database (UN COMTRADE). We aggregate different product types into four categories according to technology intensity using the ISIC Rev. 3 breakdown of activity: high, medium-high, medium-low, and low technology. All other non-manufacturing products are grouped as "not classified". Table A1 describes the technology classification.

We construct two datasets using sectoral trade data for export regressions and displacement effect regressions respectively. The lists of reporter countries and their top 50 trading partners are the same as those in the bilateral trade datasets for export and displacement effect regressions. To convert the sectoral trade data from values to volumes, we use the reporter country's export (import) prices as export (import) price deflators. To address the bias on sectors, we include sectoral time trends in our regressions.

The bilateral real exchange rate is the bilateral nominal exchange rate divided by the relative CPI, with higher values denoting real depreciation of the reporter country's currency. Export and import price deflators, exchange rates, CPI, and total domestic demand are from the IMF's International Financial Statistics and World Economic Outlook (April 2010).Our datasets cover the period from 1990 to 2009.

[19] We rank trading partners based on bilateral trade values (exports + imports) in 2009.

Table A1. Classification Industries Based on Technology

Technology classification	ISIC Rev.3
High-technology industries	
Aircraft and spacecraft	353
Pharmaceuticals	2423
Office, accounting and computing machinery	30
Radio, TV and communications equipment	32
Medical, precision and optical instruments	33
Medium-high-technology industries	
Electrical machinery and apparatus, n.e.c.	31
Motor vehicles, trailers and semi-trailers	34
Chemicals excluding pharmaceuticals	24 excl. 2423
Railroad equipment and transport equipment, n.e.c.	352 + 359
Machinery and equipment, n.e.c.	29
Medium-low-technology industries	
Building and repairing of ships and boats	351
Rubber and plastics products	25
Coke, refined petroleum products and nuclear fuel	23
Other non-metallic mineral products	26
Basic metals and fabricated metal products	27-28
Low-technology industries	
Manufacturing, n.e.c.; Recycling	36-37
Wood, pulp, paper, paper products, printing and publishing	20-22
Food products, beverages and tobacco	15-16
Textiles, textile products, leather and footwear	17-19

Source: the OECD's Science, Technology and Industry Scoreboard (2005)

Table A2. Summary Statistics for Variables, 1990–2009

	Mean	Standard Deviation	Number of Obs
Growth in Bilateral Export	0.068	0.286	9416
Growth in Bilateral Imports	0.062	0.383	9416
Growth in Domestic Demand in Reporter Countries	0.019	0.03	9416
Growth in Domestic Demand in Partner Countries	0.031	0.06	9326
Nominal Bilateral Exchange Rate	-1.817	2.539	9967
Real Bilateral Exchange Rate	-1.948	2.367	9967
Relative CPI	0.131	0.939	9967

Notes: All variables are measured in logarithms. Bilateral exports and imports are deflated using reporter country's aggregate export and import prices.

Table A3. Unit Labor Cost, percent change between 2000 and 2009

	Greece	Ireland	Italy	Portugal	Spain	Germany	France
ULC	37.6%	34.0%	32.2%	27.0%	31.4%	6.9%	21.1%
relative to Germany	28.7%	25.4%	23.7%	18.8%	22.9%	0.0%	13.3%
relative to Euro 12	14.9%	11.9%	10.4%	6.0%	9.7%	-10.8%	1.1%
relative to Euro 12 excl Germany	8.4%	5.6%	4.1%	0.0%	3.5%	-15.8%	-4.6%

Source: Eurostat

Table A4. Average Annual Real Labor Productivity Growth (2000–2007)
(Relative to Euro Area Average)

	Greece	Italy	Ireland	Portugal	Spain
Market Economy	2.1%	-0.8%	2.8%	0.1%	0.2%
Total Manufacturing excl electrical	-2.9%	-3.9%	1.4%	-2.6%	-2.6%
ICT (Electrical & telecommunication)	1.7%	0.0%	1.9%	2.5%	-1.2%
Construction	1.4%	-1.4%	-1.8%	-1.4%	-0.8%
Market services	1.1%	-1.8%	2.5%	-1.5%	-0.5%
Distribution	1.7%	-1.6%	0.1%	-2.6%	-0.9%
Finance	3.7%	0.8%	4.7%	4.3%	5.8%
Personal services	-0.5%	-3.5%	1.9%	-2.9%	-2.6%

Source: EU-KLEMS database

Table A5. Sectoral Export Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			P=CEE	P=CEE	P=China	P=China	P=Oil	P=Oil
Nominal Exchange Rate	0.526***		0.447***	0.444***	0.532***	0.533***	0.501***	0.500***
Relative CPI	-0.605***		-0.519***	-0.516***	-0.613***	-0.615***	-0.585***	-0.584***
Real Exchange Rate		0.564***						
ReporterDemand	0.392***	0.368***	0.370***	0.383***	0.391***	0.388***	0.403***	0.406***
PartnerDemand	1.302***	1.318***	1.243***	1.253***	1.182***	1.181***	1.401***	1.402***
PartnerDemand X P			0.435***	0.439***	0.350***	0.350***	-0.492***	-0.493***
X Low			0.0416***	0.0415***	-0.0877***	-0.0877***	0.0751***	0.0753***
X Medium-Low			0.0290**	0.0290**	-0.0404*	-0.0404*	0.0494***	0.0495***
X Medium-High			0.0407***	0.0406***	0.0411*	0.0411*	0.0989***	0.0990***
X High			0.114***	0.114***	0.0523**	0.0523**	0.132***	0.132***
PartnerDemand X R(R=Deu) X P			0.139	0.145	-0.0540	-0.0546	0.458***	0.458***
X Low			-0.0108	-0.0109	0.00651	0.00651	-0.0635***	-0.0635***
X Medium-Low			0.0483***	0.0483***	0.174***	0.174***	0.0864***	0.0864***
X Medium-High			0.0606***	0.0605***	0.169***	0.169***	0.0731***	0.0731***
X High			-0.0745***	-0.0745***	0.0906*	0.0906*	0.0126	0.0126
PartnerDemand X R(R=GIPS) X P			0.704***		0.364*		0.297**	
X Low			-0.156***		-0.154***		-0.0607***	
X Medium-Low			-0.133***		-0.0947**		0.0216	
X Medium-High			-0.196***		-0.160***		-0.116***	
X High			-0.374***		-0.287***		-0.246***	
PartnerDemand X R(R=Grc) X P				-0.376*		0.952**		-0.170
X Low				-0.442***		-0.380***		-0.165***
X Medium-Low				-0.407***		-0.122*		-0.0601*
X Medium-High				-0.618***		-0.277***		-0.268***
X High				-0.760***		-0.597***		-0.360***
PartnerDemand X R(R=Ita) X P				0.0643		-0.251		0.385**
X Low				-0.0775***		0.0731*		-0.0763***
X Medium-Low				-0.0387**		0.0785*		0.0400**
X Medium-High				-0.0761***		0.110***		-0.0122
X High				-0.296***		-0.0207		-0.171***
PartnerDemand X R(R=Prt) X P				2.635***		1.013***		0.224
X Low				0.407***		-0.185***		0.0826**
X Medium-Low				0.345***		-0.310***		0.0787**
X Medium-High				0.365***		-0.370***		-0.0625*
X High				0.176***		-0.398***		-0.201***
PartnerDemand X R(R=Esp) X P				1.842***		-0.316		0.644***
X Low				-0.388***		-0.138***		-0.0958***
X Medium-Low				-0.316***		-0.0398		0.0273
X Medium-High				-0.309***		-0.116**		-0.125***
X High				-0.474***		-0.146**		-0.251***
Observations	47396	47396	47396	47396	47396	47396	47396	47396
R-squared	0.837	0.837	0.840	0.846	0.839	0.839	0.842	0.843

*** p<0.01, ** p<0.05, * p<0.1. All Regressions include a full set of country fixed effects and sectoral time trends.

Notes: The dependent variable is annual bilateral sectoral export volume of 11 euro countries with their top 50 trading partners from 1990 to 2009. The 11 euro countries are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain. The independent variables include the nominal exchange rate, relative CPI (reporter CPI/Partner CPI), real exchange rate, reporter demand (reporter's domestic demand), partner demand (trading partner's domestic demand), and interactions of trading partner's domestic demand with various country pair dummies and sectoral dummies. R is the dummy for reporter country, and P is the dummy for partner country (definition for P is listed in the column header). For example, the coefficient of -0.442 for "PartnerDemand X R(R=Grc) X P X Low" in column (4) indicates the marginal difference in demand elasticity for exports of low technology goods from Greece to CEE countries.

Table A6. Sectoral Displacement Effect Regressions

	(1)	(2)	(3)	(4)	(5)	(6) only Euro	(7) only Euro
Nominal Exchange Rate	0.144*		0.153**	0.154**	0.149*	0.391*	0.438**
Relative CPI	-0.285***		-0.290***	-0.291***	-0.291***	-0.211	-0.255
Real Exchange Rate		0.208***					
ReporterDemand	0.933***	0.963***	0.880***	0.876***	0.914***	0.450**	0.317*
PartnerDemand	1.114***	1.099***	0.795***	0.806***	0.791***	0.933***	1.003***
Import from China			0.335***	0.332***	0.332***	0.0862*	0.0762**
Import from China X P(P=Euro)			-0.179***	-0.179***			
X Low			0.111***	0.111***			
X Medium-Low			0.0941***	0.0941***			
X Medium-High			0.134***	0.134***			
X High			0.194***	0.194***			
Import from China X P(P=GIPS)			0.134***			0.155***	
X Low			-0.0988***			-0.100***	
X Medium-Low			-0.117***			-0.118***	
X Medium-High			-0.174***			-0.176***	
X High			-0.218***			-0.219***	
Import from China X P(P=Grc)				0.199***	0.0476		0.265***
X Low				-0.193***	-0.0990***		-0.195***
X Medium-Low				-0.191***	-0.111***		-0.191***
X Medium-High				-0.389***	-0.275***		-0.391***
X High				-0.374***	-0.209***		-0.375***
Import from China X P(P=Ita)				0.0276	-0.119***		0.00150
X Low				-0.0502***	0.0442***		-0.0515***
X Medium-Low				-0.0218**	0.0581***		-0.0221***
X Medium-High				-0.0506***	0.0634***		-0.0517***
X High				-0.119***	0.0461***		-0.119***
Import from China X P(P=Prt)				0.0377	-0.111***		0.0377
X Low				0.0985***	0.193***		0.0973***
X Medium-Low				-0.0223	0.0577***		-0.0229
X Medium-High				-0.00616	0.108***		-0.00791
X High				-0.0624***	0.103***		-0.0641***
Import from China X P(P=Esp)				0.278***	0.126***		0.326***
X Low				-0.266***	-0.171***		-0.267***
X Medium-Low				-0.235***	-0.155***		-0.236***
X Medium-High				-0.241***	-0.127***		-0.242***
X High				-0.314***	-0.149***		-0.315***
Observations	29605	29605	29605	29605	29605	6495	6495
R-squared	0.747	0.746	0.755	0.759	0.753	0.873	0.900

*** p<0.01, ** p<0.05, * p<0.1. All Regressions include a full set of country fixed effects and sectoral time trends.
Notes: The dependent variable is the annual bilateral sectoral import volume of 17 countries with their top 50 trading partners from 1990 to 2009. The 17 countries are United States, United Kingdom, Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Sweden, Switzerland, Japan, Spain, Turkey, Russian Federation, Czech Republic, and Poland, which are major countries import from euro area. The independent variable "Import from China" is the reporter country's import from China. Other specifications are consistent with table 6. For example, 0.111 for "Import from China X P(P=Euro) X Low" in column (3) means the marginal effect of imports of low technology goods from China on the reporter country's imports from euro countries. Column (7) and (8) use the sub-sample where trading partners are only euro countries.