The paper examines the extent to which intra euro area current account imbalances are related to intra-euro area factors and to external shocks. We argue that the traditional explanations for the rising imbalances (financial integration, and overheating and competitiveness losses within the euro area) 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.

JEL codes: E2, F14, F3, F41, F43, O52
Keywords: current account imbalances, financial integration, competitiveness

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INTRODUCTION

After 10 years of existence, the euro area has come under pressure. Triggered by adjustments in the fiscal accounts of Greece, the crisis spread to Ireland in the Fall of 2010, and concerns about the sustainability of the external debt of Portugal and Spain have remained. While concerns about intertwined public debt and banking sector fragilities, and weak growth prospects were central to the crisis, the “external dimension” played an important role as well: as of end-2009, net external liabilities of Greece, Ireland, Portugal, and Spain were around 100 percent of GDP.

In this paper we focus specifically on this “external dimension,” and investigate the factors that contributed to the growing external imbalances in the euro area. We focus in particular on the 5 largest “net debtors” in the euro area: Greece, Ireland, Italy, Portugal, and Spain, while acknowledging that there are significant differences between these countries. For example, Italy’s external imbalances are much more modest than those of the other four countries in our sample.

In broad terms, two explanations have been put forward for the rising external deficits of “net debtors”, particularly those—like Greece, Portugal, and Spain—that had income below the euro area average. The first is the acceleration of neoclassical convergence as a result of financial integration with the rest of the world as financial markets were harmonized in the EU.2 The second, less benign interpretation emphasizes the loss in intra-euro area competitiveness because of domestic prices and unit labor costs rising more rapidly than in Germany, reflecting a combination of credit and asset price booms, real wage rigidities, and generally “excessive optimism” of domestic consumers and foreign investors about future economic prospects.

We contribute to this literature along two dimensions. First, we emphasize the role of trade linkages and relative price dynamics between the euro area and the rest of the world. Specifically, we show how trade balances vis-à-vis the rest of the world contributed significantly to the widening of intra-euro area imbalances, and we present evidence on the asymmetric effects of external shocks on different euro area countries consistent with this stylized fact. We also show that the large appreciation of the euro since 2000 is quantitatively more important than inflation differentials in explaining real exchange rate appreciation in euro area deficit countries. Second, we show that the financing of euro area current account deficits originated primarily within the euro area, with investors from the rest of the world holding primarily financial instruments issued by countries such as Germany or France. This suggests a sharper increase in substitutability between financial assets issued by different euro area countries for “inside” investors relative to “outside” investors—and arguably a special role for intra-euro area financial integration in explaining these imbalances.

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2 Beyond elimination of capital controls, financial integration was enhanced by the EU “single passport” legislation of 1993 that liberalized cross-border activities of financial firms, and the Financial Services Action Plan (FSAP) that further harmonized financial services in the EU between 1998 and 2003.
Several authors have stressed that the accumulation of net external liabilities in debtor countries of the euro area was a natural outcome of the process of economic integration and convergence, and that rising current account deficits could be interpreted as byproducts of a healthy convergence process as countries integrate financially. However, patterns of saving and investment are only partially consistent with the convergence explanation for the rising deficits. A decline in saving and an increase in investment (in Spain, and to some extent in Ireland) are the main macroeconomic counterparts to rising current account deficits of these countries. But Greece and Portugal experienced declines in corporate saving at the same time as declines in domestic investment, a trend harder to reconcile with convergence and differences in the marginal product of capital. The convergence explanation also does not explain the rising surplus of Germany, which was mainly accounted for by an increase in corporate savings and a decline in domestic investment.

A parallel literature has instead emphasized that domestic price and wage developments in deficit countries reflected a combination of unsustainable credit booms and product market and labor market rigidities, and were generally inconsistent with productivity growth differentials. This resulted in severe competitiveness losses vis-à-vis more ‘virtuous’ euro area countries, such as Germany, and large current account deficits, mirrored by large surpluses in Germany and other central and northern European countries belonging to the euro area.

We emphasize that, while relative price movements within the euro area have led to a real effective exchange rate appreciation in Greece, Ireland, Spain, and Portugal (and to a lesser extent Italy), the lion share of the appreciation between 2000 and 2009 is accounted for by the nominal appreciation of the euro vis-à-vis other currencies. Also, Greece and Portugal had high current account deficits and a real exchange rate above historical average at the inception of the euro, and may therefore have been particularly vulnerable to an appreciation against their trading partners inside and outside the euro area.

We also uncover a significant contribution of asymmetric trade developments to the growing divergence of current accounts within the euro area. Among the topics discussed in the run-up to EMU, the effects of asymmetric shocks or asymmetric effects of common shocks occupied a central role. A concern was that divergent patterns of macroeconomic performance could have harmful consequences in a monetary union in which some conditions of an optimum currency area (such as a free mobility of labor, a flexibility of prices and wages, and the

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3 See for instance the early contribution of Blanchard and Giavazzi (2002).

4 See for instance, Berger and Nitsch (2010), Two recent papers argue that the current account deficits are symptoms of unsustainable trends and overvalued real effective exchange rates (Giavazzi and Spaventa, 2010 and Jaumotte and Sodsriwiboon, 2010). Jaumotte and Sodsriwiboon (2010) show that a euro effect and a financial liberalization effect explain the worsening of current accounts.

5 The Stability and Growth Pact emphasized the importance of harmonizing fiscal policies, but other factors may also contribute to a divergence of macroeconomic performance (Lane, 2006).
existence of a system of risk sharing) are not satisfied. We explore the extent to which three main trade developments may have contributed to asymmetric shocks in the EMU: (i) the growing penetration of world markets by China; (ii) the integration of Central and Eastern European countries with the rest of Europe; and (iii) rising oil prices.

A look at the data reveals that most of the decline in the overall trade balance in goods of Southern European countries is the result of trade developments with non-euro area countries. A rapid increase in imports from emerging Asia (in particular from China) explains a large share of the rising trade deficits of these countries. Furthermore, imports from Central and Eastern European (CEE) countries, and oil imports also contributed to rising trade deficits. In contrast, Germany’s trade balance benefited from rising exports to CEE countries, to emerging Asia, and to oil exporters.

To complement and potentially explain these stylized facts, we estimate simple bilateral export and import regressions, to assess whether potential differences in export and import demand elasticities may explain the divergence of trade developments. We find that elasticities of export demand by China and CEE countries are lower than the euro area average for some of the euro area debtor countries, causing asymmetries in trade developments relative to other euro area countries. Furthermore, import demand elasticities are higher than the average for goods exported by China and Central and Eastern European countries, suggesting that the initial structure of demand or production of euro area countries may result in persistent trade deficits vis-à-vis these countries. Finally, we find evidence that exports of Greece, Italy and Portugal may have been be displaced by Chinese exports—thus adding to the previous asymmetric trade shocks. Overall, our estimates suggest that Greece and Italy in particular experienced substantial cumulative losses from asymmetric trade developments with countries outside of the euro area.

Next, we analyze how the current account deficits were financed. As widely documented, deficit countries were able to borrow at rates which were only marginally above those of surplus countries. We show that, even though a significant fraction of the debtor countries’ current account deficits was incurred vis-à-vis countries outside the euro area, the lion share of the financing came from within the euro area, particularly from French and German investors—a fact consistent with financial integration in the EMU. However, capital inflows from outside the euro area played instead a more limited role in financing these deficits, a fact at odds with a simple convergence story; instead, investors from outside the euro area showed a preference for securities issued by countries such as Germany and France. This suggests that the extent of substitutability between financial instruments issued by the debtor countries and those issued by other euro area countries was perceived to be higher for investors within the euro area than for outside investors. Arguably, this higher substitutability may reflect some underestimation of risk (or bailout expectations) on the part of intra-euro area investors which helped to contain the cost of external borrowing, or the fact that for euro area banks securities

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6 Lane (2006) provides a review of the effects of monetary union when member countries are heterogeneous. Feldstein (1997) presents the economic and political reasons for the creation of the EMU.
issued by different euro area countries had the same collateral value at the European Central Bank. 7

Furthermore, econometric evidence shows that rising capital inflows from French and German banks were associated with growing trade deficits vis-à-vis euro area and non-euro area countries, with declining export performance, but not with rising imports. This suggests that, in countries experiencing stronger capital inflows, tradable sectors may have been crowded out by non-tradable sectors (such as construction), maybe as a result of a growing overvaluation problem, and that intra-euro area capital flows financed the resulting increase in net imports vis-à-vis the euro area and the rest of the world.

Finally, our analysis of current account deficits and external positions of the debtor countries 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 2009 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 (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, even though there was no increase in debtor countries’ government debt in percent of GDP during the period 2000-2008. The increased exposure of foreign investors to government and domestic banks helps explain the external spillovers of the concerns about public finances and banks’ health underpinning the crisis of early 2010.

The rest of the paper is organized as follows. Section II discusses the conceptual framework and reviews the relevant literature. Section III briefly documents the evolution of current accounts and of real effective exchange rates since the start of the euro. Section IV analyses export competitiveness and asymmetric trade developments. Section V examines the structure of external finance for the countries in our sample and presents the analysis on the role of bank capital inflows in financing the build-up of trade deficits in the euro area debtor countries. Section VI concludes.

I. WHAT CAN EXPLAIN RISING EXTERNAL IMBALANCES IN THE EURO AREA?

As discussed in the introduction, the two main explanations for rising external imbalances of euro area debtor countries relate to (i) financial integration and expectations of convergence, and (ii) “over-optimism” and wage rigidities in borrowing countries resulting in strong growth in domestic demand with domestic prices and labor costs rising faster than in other

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7 Capital inflows were mostly foreign participations in domestic bond markets or loans to domestic financial institutions—not FDI or portfolio equity investments, which in principle are more responsive to differences in the marginal product of physical capital, and therefore should have increased if convergence was driving the capital inflows. The bulk of Germany’s (or France’s) outward FDI was vis-à-vis countries outside of the euro area.
euro area countries. According to these explanations, borrowing countries should experience either equilibrium long-run appreciations of the real exchange rate, or an overvaluation. In addition to these (complementary) stories we also emphasize (iii) the role of asymmetric trade shocks arising primarily from outside the euro area, and (iv) we stress an additional channel of “competitiveness losses”—namely, the very large nominal appreciation of the euro during the period 2000-2009. These complementary explanations also contribute in explaining the rising current account deficits, but they also imply a more acute overvaluation problem as negative trade shocks would require an depreciation of the long-run real exchange rate. We postpone to Section V a discussion of the role played by capital flows within the euro area in financing external imbalances in deficit countries.

A. Financial Integration and Expected Growth

The rising financial integration among euro area countries has been well documented in the literature, which has characterized the integration of bond markets (Lane, 2006 and Coeurdacier and Martin, 2009), equity markets (Lane and Milesi-Ferretti, 2008; Coeurdacier and Martin, 2009; and De Santis and Gerard, 2006), and cross-border bank flows (see for instance Spiegel, 2009 on Portugal and Greece; and Blank and Buch, 2007 and Kalemli-Ozcan et al., 2010 on more general bilateral financial linkages among euro area countries). The European Monetary Union has stimulated capital flows by eliminating currency risk, but institutional reforms harmonizing financial sector policies and trade integration among EU countries have also reduced transaction costs and led to the integration of European bond markets and banking systems (Kalemli-Ozcan et al., 2010). According to the 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. Because of a higher marginal product of capital, countries at a less advanced stage of development should experience net capital inflows and therefore be expected to run current account deficits. Hence, rising current account deficits may be the consequence of a healthy convergence process (Blanchard and Giavazzi, 2002; Schmitz and von Hagen, 2010). They should be reflected in rising domestic investment—to the extent that their marginal product of capital is higher— and/or by a decrease in savings—reflecting both stronger growth prospects and declining borrowing constraints. The latter could also be the consequence of a reduction in households’ credit constraints after financial liberalization (Jappelli and Pagano, 1994). As consumption and investment increase, the real effective exchange rate should appreciate.

Optimism about the future has similar effects on the current account and the real effective exchange rate of poorer countries. Expectations of higher future productivity growth would

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8 Spiegel (2009a) finds that EMU fosters pair-wise financial integration, and Spiegel (2009b) shows that Greece and Portugal changed their cross-border borrowing patterns in favor of financing from EMU banks.

9 To achieve a sustainable convergence of income levels through financial integration, the inter-temporal budget constraint must be satisfied. This places constraints on the type of activities that are financed by foreign capital, in particular, foreign capital should to a significant extent finance investments in tradable goods (Giavazzi and Spaventa (2010)).
also result in growing current account deficits, as savings decline in anticipation of higher future income, and may also result in higher investment as the marginal product of capital is expected to increase (see for instance Blanchard, 2007). As productivity in tradable sectors and income increase, higher consumption of non-tradable goods would result in an 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 the simple version of the model, be matched exclusively by offsetting changes in relatively richer countries of the currency union.

B. “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. Indeed, price and wage dynamics were such that countries such as 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 “excess” real exchange rate appreciation contributed to crowding out manufacturing and export activities. Portugal experienced a decade of low productivity gains and stagnant economic growth, as the competitiveness of tradable goods declined (Blanchard, 2007). In countries such as Greece and Spain growth was sustained by very strong domestic demand, but the external accounts deteriorated very significantly. Empirical work on drivers of current account balances by Jaumotte and Sodsriwiboon (2010) finds that a large part of the current account deficits of these countries are not explained by “medium-term fundamentals,” and that the excess current account deficits are related to a "euro effect" and to financial reforms of the 1990s.10 11

C. The Dynamics of the Euro

Because individual euro area countries have significant trade linkages with countries outside the euro area, the evolution of their real effective exchange rate depends not only on price and wage patterns relative to other euro area countries (and trading partners more generally) but also on the overall value of the euro relative to their own trading partners outside the euro area. For smaller countries, with arguably a modest effect on the evolution of the euro vis-à-vis other major currencies, the real exchange rate is also subject to “exogenous” shocks related to euro fluctuations. And an appreciation of the euro can therefore result in

10 Their current account analysis does not control for trade shocks with the exception of those caused by oil prices.

11 Symmetrically, Northern euro area countries’ current accounts experienced a positive “euro effect”.

competitiveness losses and widening current account deficits unless domestic prices and wages adjust correspondingly. This is an obvious but often disregarded point—because the euro area’s overall current account has been in broad balance, the literature on euro area imbalances has often considered the euro area as a closed economy, at least implicitly.

D. Asymmetric Trade Developments

The European Monetary Union enhanced trade among EMU countries (Rose, 2000; Micco et al., 2003; Von Hagen and Schmitz, 2010; Baldwin et al., 2005), by reducing exchange rate volatility and thanks to a progressive process of trade reforms that culminated in the single market in 1992 and in the monetary union in 1999 (Berger and Nitsch, 2008). In a monetary union, adjustments to asymmetric trade developments, originating either from within or from outside the currency union could be delayed—with a common nominal exchange rate, members of the currency union can adjust only through domestic prices or wages, but because of downward price rigidities, the adjustment will be protracted, and result in persistent current account imbalances (Lane, 2006; Decressin and Stavrev, 2009). Furthermore, adjustments of individual countries with trading partners outside of the monetary union may be slowed by movements of the nominal exchange rate. 12

There is growing evidence that euro area countries have experienced asymmetric trade developments. Integration within the monetary union has been associated with a strong persistence of bilateral trade imbalances among euro area countries, suggestive of growing competitiveness differentials, as documented by Berger and Nitsch (2010), who associate these imbalances with differences in labor market institutions and policies. Moreover, at a more microeconomic level, a number of authors have documented differential developments in export performance and competitiveness for euro area countries vis-à-vis the rest of the world, even though it remains unclear how these developments could affect their macroeconomic situations (ECB, 2005; Baumann and di Mauro, 2007; di Mauro and Foster, 2008; Bennett et al., 2008).13

Before characterizing asymmetric trade developments vis-à-vis the rest of the world, as we shall do in section IV, we discuss how, in theory, trade shocks affect the external balance. A permanent loss of competitiveness (resulting from the entry of new competitors in world markets, or from an increase in their efficiency) requires a permanent depreciation of the real exchange rate to maintain external balance in the long run (see Obstfeld and Rogoff, 1999). Symmetrically, the emergence of new markets for exports, or a sudden decline in production

12 For example, a small member country could experience negative trade shocks vis-à-vis the rest of the world and at the same time an appreciating nominal exchange rate if overall demand for euro area financial assets rise. Such combination of shocks would require performing a stronger internal adjustment to re-establish external balance.

13 Some studies have found that trade integration and monetary union have generated different competitiveness and efficiency gains across EMU countries (Ottaviano et al., 2009). Such gains depend on the initial trade specialization and initial macroeconomic and institutional characteristics, including on the product and labor markets.
costs, requires a real exchange rate appreciation in the long run. By contrast, a fall in the price of imports would have ambiguous effects on the real exchange rate. The income effect would tend to increase the demand for non-tradable goods, and therefore appreciate the real exchange rate, while the substitution effect would tend to raise the demand for imported goods and therefore would depreciate the real exchange rate (Obstfeld and Rogoff, 1999).

In theory, permanent trade shocks would have no effects on the current account, but they would affect the current account if they are perceived to be temporary. For instance, if intertemporal elasticities of substitution are low, negative trade shocks would tend to worsen the current account as agents reduce their savings to smooth consumption. In contrast, with high elasticities of substitution, an increase in import prices would result in an improvement in the current account as agents increase their savings through international markets to substitute future consumption of imports for today’s consumption of imports.

In sum, theory predicts that, if intertemporal elasticities of substitution are low, negative trade developments would tend to worsen the current account and depreciate the real exchange, while positive trade developments would tend to appreciate the real exchange rate and improve the current account.

II. CURRENT ACCOUNTS AND REAL EFFECTIVE EXCHANGE RATES UNDER EMU

In this section, we characterize the evolution of euro area debtor countries since the inception of the euro. 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.

Table 1

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 saving, the net foreign asset positions of these countries deteriorated sharply, reaching levels close to or above -100 percent of GDP by the end of 2009 in Greece, Ireland, Portugal, and Spain (Figure 1). During this period, Germany and a number of other smaller countries in Northern Europe have progressively built large current account surpluses, with the current account for the euro area as a whole remaining in broad balance throughout the period.

Table 2 and Figure 1

While current account trends were broadly similar across debtor countries, there were significant differences in their macroeconomic determinants. In Ireland and Spain, there was a significant rise in investment caused 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.

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 2 decomposes the real exchange rate appreciation into two components: (i) movements in domestic prices (or unit labor costs) relative to those of trading partners; and (ii) nominal exchange rate variations, showing 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) had a more significant contribution to the appreciation of the real exchange rate than in Greece, Italy, and Portugal. In comparison, the real effective exchange rate appreciation reflected exclusively the nominal effective exchange rate appreciation in France, while in Germany the real effective exchange rate remained stable throughout the decade as the nominal appreciation was offset by a decline in unit labor costs relative to trading partners.

Figure 2

What do these stylized facts leave us? At first hand, developments of the external balance of euro area debtor countries seem consistent with the hypothesis that current account deficits were driven by financial integration and/or (over)optimism about future growth. However, with the euro appreciating by close to 30 percent during this period, these facts also show that the real effective exchange rate appreciations were at least in part exogenous to the conditions in individual debtor countries. Hence, part of the “overvaluation problem” was not related financial integration within the euro area.14

III. EXPORT COMPETITIVENESS AND ASYMMETRIC TRADE SHOCKS

In this section, we characterize the macroeconomic importance of asymmetric trade developments experienced by euro area debtor countries relative to Germany since the inception of the euro. We show that, even though there are differences across countries, the group of euro area debtor countries have experienced negative trade developments vis-à-vis the rest of the world, in particular vis-à-vis China, oil producers and emerging Europe—while Germany benefited from these developments. As discussed in section II, such trade developments are consistent with rising current account deficits, but would call for a depreciating (rather than appreciating) real effective exchange rate. We then turn to a partial

14 To be precise, the nominal exchange rate is determined by the supply and demand for euro area assets. As we shall see in section 5, most of the claims on Southern euro area debtor countries are held by residents from other euro area countries, while the rest of the world’s demand for euro area financial assets was focused on German and French securities. This suggests that the movements of the euro were to some extent driven by factors independent from the macroeconomic developments in debtor countries.
equilibrium econometric analysis to characterize some of the channels through which developments vis-à-vis the rest of the world affected trade performance.

The following forces may have contributed to divergent trade developments:

- *The rise of China (and more generally of emerging Asia)* as a key player in world markets may have affected euro area countries differentially. *On the export side*, southern European countries exporting goods close substitutes to Chinese exports may have been displaced from some of their foreign markets, causing a loss of export competitiveness of euro area debtor countries. Second, rapid growth in China may have boosted the demand for specific goods, such as machinery and equipment exported by countries such as Germany, but may have had more limited benefits for Southern European countries exporters (see also Bennett et al., 2008; IMF, 2010). *On the import side*, the rise in the supply of goods produced in China may have had stronger and significant effects on imports of some euro area countries because of high demand elasticities of imports from China and differences in the strength of domestic demand.15

- *Higher oil prices* may also have affected euro area countries’ trade balance asymmetrically. While the oil trade balance may have worsened in all countries as a result of higher oil import prices, fast income growth in oil exporting countries may have benefited some countries (such as Germany), because of increased import demand for capital and consumption goods produced by these countries.

- *The integration of Central and Eastern European countries* with the European Union may have benefited exporters of countries such as Germany, but may have resulted in higher imports of countries in Southern Europe. Moreover, the integration of CEE countries was accompanied by large direct foreign investments of German firms setting up production platforms to take advantage of a higher return on capital and lower wage costs, thus boosting productivity of German firms (Marin, 2010).

The remainder of this section presents stylized facts supporting the macroeconomic relevance of these conjectures, showing that part of these asymmetric trade developments can be explained by differences in trade elasticities across countries.

**A. Trade Performance under EMU: Stylized Facts**

**Export Competitiveness**

Various studies have found that some Southern European countries’ exports lost competitiveness over the past decade on the basis of a range of structural indicators (see Bennett et al., 2008 and di Mauro and Forster, 2008). In particular, unit labor costs rose

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15 For example, differences in consumer tastes or in the structure of the demand for intermediate inputs could result in different price and demand elasticity for Chinese products.
significantly, particularly in Ireland, Spain, and to some extent Italy (Table 3), suggesting that wage increases dented the profit margins of exporters. The possibility of declining profit margins is consistent with declining corporate savings documented earlier.

**Table 3**

With the exception of Italy, aggregate labor productivity in the debtor countries expanded faster than in the euro area average, while Greece and Ireland had faster labor productivity growth than even Germany. However, aggregate figures can be misleading, as for instance productivity in the services sector is strongly influenced by high turnover during an economic boom. A better indicator of productivity performance and competitiveness of tradable goods is arguably labor productivity in the manufacturing sector. According to this metric, all countries—with the exception of Ireland—experienced a decline of productivity growth relative to the euro area average. The discrepancy between aggregate and sectoral figures is particularly striking in the case of Greece where labor productivity growth in traditional manufacturing industries declined by almost 3 percentage points relative to the euro area average. In market services, Italy, Spain and Portugal also experienced slower labor productivity growth than the euro area average.

**Table 4**

**Evolution of trade balances**

The trade balance in goods of Greece, Italy and Spain worsened during the decade (Table 5). In Greece, Italy and Spain, the worsening trade balance was the consequence of 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 in percent of nominal GDP, but a rising trade deficit vis-à-vis non-euro area countries (driven mostly by higher import values). During the same period, Germany built a significant trade surplus mainly vis-à-vis non euro area countries (3 ½ percent of GDP).

**Table 5**

**Asymmetric Trade Developments**

A closer look at bilateral trade balances suggests that euro area debtor countries experienced asymmetric trade developments, in particular relative to Germany, and that these developments contributed to the rise of current account deficits of debtor countries, while at the same time contributing to the improved trade performance of Germany. These asymmetric tendencies are related to the 3 main factors discussed earlier: (i) the rise of China and more generally of emerging Asia, (ii) rising oil prices and income of oil exporters, and (iii) the growing integration of Central and Eastern European countries with EMU countries.

To identify potential structural trade deficits or surplus by region of trading partner, we first look at the cumulative bilateral trade balances during the period 2000-09 (Figure 3). Greece, Spain and Portugal have maintained large trade deficits vis-à-vis euro area countries. In contrast, Italy had balanced trade and Ireland maintained a trade surplus during the period.
Next, to assess how the structure of bilateral regional trade evolved during the decade, we look at the change in bilateral trade balances between 1999-2000 and 2008-09 and the contribution of these changes to the overall trade balance (Figure 4). Even if the euro area remained the main source of deficit for the debtor countries (and for France), and the main source of surplus for Ireland and Germany, trade developments with the rest of the world were far from being negligible. As already noticed, trade with the rest of the world had a large impact on the rising trade deficit of Greece, Spain or Italy; and a large contribution to the rising trade surplus of Germany.

Figure 4

Emerging Asia

Trade with emerging Asia accounts for a large proportion of the cumulative trade deficits of Greece and Portugal—over 20 percent of GDP and 15 percent of GDP, respectively. But it accounts for smaller share in other countries, mainly because of the relatively small share of trade taking place with emerging Asia at the beginning of the decade.16 However, bilateral trade balances with emerging Asia, and in particular with China, were contributors to the change in the trade balances during the past 10 years. In spite of low initial bilateral trade deficits, worsening trade balances with emerging Asia explain respectively 20 percent, 84 percent and 25 percent of the increase in the trade deficits of Greece, Italy and Spain between 1999-2000 and 2008-09. The widening bilateral trade deficits were driven primarily by a rapid rise in imports from China. Imports from emerging Asia account for respectively 15 percent, 13 percent and 11 percent of the total increase in imports of Greece, Italy and Spain. The contribution of emerging Asia to the increase in exports has been much smaller for these 3 countries.

In contrast, exports of Germany to emerging Asia grew rapidly, and more than offset the impact of the rapid growth of imports on the trade balance. Overall, Germany and Ireland benefited from the rise of China and other Asian countries. In France and Portugal the trade deficit with emerging Asia contributed moderately in the rising trade deficit in goods.

Emerging Europe

Trade with emerging Europe contributed to worsening trade deficits in Greece, Ireland, Portugal, Spain and France. But it explains almost 40 percent of the rising trade surplus of Germany, and almost offset the rising deficits of Italy with emerging Asia. What could explain the trade surplus of Germany (and the trade deficits of the debtor countries) vis-à-vis

16 Emerging Asia accounted for at most 9 percent of goods imports (for Germany) at the time of creation of the euro, and an even smaller share in other countries. The share of emerging Asia in total exports was even lower.
emerging Europe? Looking at sectoral bilateral data, we simultaneously observed a take-off of Germany’s exports of capital goods and intermediate inputs (machinery and transport equipment) to emerging Europe, and a take-off of emerging Europe’s exports of the same goods to the debtor countries. This suggests that a significant share of the observed trade could be associated with processing trade whereby assembly is performed in Central and Eastern European countries for re-exports to Germany's trading partners.

Oil exporters

Rising oil prices had significant contributions to the increase in trade deficits of Italy (over 40 percent of the increase in the trade deficit is explained by the oil trade balance), Spain (over 30 percent), Greece (15 percent), and Portugal (9 percent). In contrast, because of rising demand for exports of machinery and equipments, Germany and Ireland also experienced strong growth of exports to oil exporters, and therefore did not experience rising trade deficits with oil exporters.

B. Econometric Analysis: Determinants of Trade Performance

In this section, we turn to a partial equilibrium analysis to investigate quantitatively the importance of several channels through which asymmetric trade developments affected the overall trade performance of euro area debtor countries during the last 10 years. Specifically, we estimate bilateral export and import regressions for the period 1990-2009 and for a set of reporter countries and their trading partners, as described in the appendix, and make use of estimated coefficients to quantify the implied contributions to the cumulative trade deficits.

Empirical specifications

We begin by running export regressions according to the following specification:17

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\text{(3)}
\]

Where \( \text{X}_{ijt} \) is total bilateral exports of reporting country \( i \) to trading partner \( j \) during year \( t \), \( \text{E}_{ijt} \) is the bilateral real exchange rate between country \( i \) and country \( j \) during year \( t \), and \( \text{DD}_{jt} \) is total domestic demand of trading partner \( j \) during year \( t \). \( \alpha \) is a fixed effect for the country pair \( ij \), \( \gamma \) is a time fixed effect, and \( \epsilon_{ijt} \) is a residual.

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, Central and Eastern Europe or oil exporters are significantly different from the euro area average.

17 For analysis of export and import regressions, see for instance Bayoumi (1999), Marquez (1990), and Flam and Hakan Nordstrom (2003).
Next, we perform an analysis of imports of euro area countries to assess potential differences in demand elasticities of imports across euro area countries. Our regression takes the general form:

\[
(4)
\]

Where \( is total bilateral imports of reporting country \( from trading partner \( during year \( \), \( is the bilateral real exchange rate between country \( and country \( during year \( , and \( is total domestic demand of reporting country \( during year \( .

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

\[
(5)
\]

Where \( is: total imports of country \( from China during year \( . A positive (resp. negative) coefficient \( means that, conditional on bilateral real exchange rates and total domestic demand, imports of country \( from country \( are positively (resp. negatively) correlated with its imports from China. If there is a displacement effect, we expect the coefficient \( to be negative, as higher imports from China should result in lower imports from other trading partners.

Regression results

Export demand elasticity

Export regressions are reported in Table 6. The sample includes 11 euro area reporting countries during the period 1990-2009.\(^{18}\) A first noticeable finding is that bilateral price elasticities are not negligible. The coefficients estimated in column (1) imply that a one percent appreciation of the bilateral nominal exchange rate is associated with a 0.45 percent decline in export volumes, and that a one percent increase in relative CPI is associated with a 0.51 percent decrease in export volumes. For example, the euro appreciated by around 36 percent relative to the U.S. dollar from the end of 1999 to mid 2008, implying a 16 percent decrease in exports of euro area countries to the U.S. according to these estimates. The elasticity of export demand is also non-negligible: a one percent increase in trading partners’ total domestic demand is associated with a 1.36 percent increase in exports.

Table 6

Columns 3 to 8 report regressions in which the demand elasticity is allowed to vary across trading partner (CEE countries, China, oil exporters) and reporting country (Greece, Italy, Portugal, Spain and Germany). First we explore whether elasticities of export demand by

\(^{18}\) Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Spain and Portugal.
Central and Eastern European countries differ from the average elasticities, and differ across euro are reporting countries (columns 3 and 4). We find that demand elasticities of exports to CEE countries are significantly larger than average elasticities. There is also significant heterogeneity across euro area reporting countries: demand elasticities of exports are significantly smaller than 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—if anything it is even smaller than average.

To estimate the relative loss (gain) in export resulting from lower (higher) demand elasticities, we compute the effect on total exports over the period 1999-2008 given the beginning of period share of exports to CEE countries in total exports, and the average growth of total demand by CEE countries during that period.\footnote{For example, the export loss for Greece in year t is computed as follows: coefficient\_demand\_elast\_Greece * \% increase in CEE domestic demand (1999-year t) * Greece exports to CEE (1999)/GDP(1999) * [GDP(1999)/GDP(t)]. The cumulative loss is the sum of each year loss between 2000 and 2008.} The cumulative export loss (in deviation from the euro area average) during 1999-2008 resulting from a lower demand elasticity reaches respectively 3.84 and 1.52 percent of GDP for Greece and Italy, and the cumulative gain reaches 0.42 and 1.47 percent of GDP for Portugal and Spain.

Turning to exports to China (columns 5-6), we find that the average export demand elasticity from China is not significantly different from the average export demand elasticity from all trading partners of euro area countries. However, the export demand elasticities of Greece, Italy, and Spain vis-à-vis China are significantly lower than the euro area average, implying a cumulative export loss (in deviation from the euro area average export performance) of respectively 0.6 percent of GDP, 3.8 percent of GDP, and 1 percent of GDP.

Results for export demand elasticities vis-à-vis oil exporters are in columns (7) and (8). We find that export demand elasticities of Greece, Italy and Spain are below the euro area average, implying cumulative losses of respectively 2.3, 1.1, and 0.5 percent of GDP. Overall, export demand elasticities varied across euro area countries and Southern European countries experienced export demand shortfalls resulting from these differences in export demand. The cumulative losses implied by the lower elasticities of demand are noticeable for Greece and Italy, reaching 6.8 percent of GDP and 6.5 percent of GDP, respectively.

**Determinants of import demand**

In table 7, we report import regressions. Two main factors may have affected import demand differently across euro are countries: differences in total demand growth and differences in import demand elasticities. To gauge the relative importance of these two factors in explaining imports from China, CEE countries and oil exporters, we estimate an average import demand elasticity vis-à-vis China, CEE countries and oil exporters, as well as country specific elasticities of demand vis-à-vis each of these trading partners.
Table 7

How does domestic demand explain imports from each of the region considered? On the one hand, Germany, Italy and Portugal had low growth of domestic demand during 1999-2008, either because growth was pulled by exports (as in Germany) or because the economies were stagnating (as in Italy, or Portugal). On the other hand, Spain, Ireland and Greece were experienced rapid growth of total domestic demand. By relying on the regression coefficients, we quantify the predicted effect of domestic demand growth on import volume growth for each of these trading partners of the debtor countries and Germany. According to the regression model, high domestic demand growth in Spain and Greece has a strong effect on imports from China and CEE countries, which rise by respectively about 95 percent and 65 percent in these two countries. The predicted impact on the volume of oil imports is of a smaller order of magnitude.

Import demand elasticities also differ across euro area countries, but the debtor countries do not, as a group, have larger elasticities of import demand than the euro area average. Indeed, while Spain and Portugal have larger than average elasticities for imports from CEE countries, or Italy for imports from China or oil exporters, Greece appears to have lower elasticities for imports from CEE countries or China. The differential effect of the higher import elasticities for emerging Asia, CEE countries and oil exporters have generally relatively small effects on the imports of the euro area debtor countries. The cumulative impact for Greece, Italy, Portugal and Spain reaches respectively 1.49 percent of GDP, 0.36 percent of GDP, 0.68 percent of GDP and 1.88 percent of GDP.20

Does China displace exports of euro area countries?

Another channel through which euro area countries may experience asymmetric trade development is through the competition by Chinese goods in common export markets. To explore whether exports of euro area countries may have been displaced by Chinese exports, we estimate various versions of regression specification reported in Table 8.

Table 8

Columns (1) to (5) report regressions estimated on the complete sample of reporting countries, and columns (6) and (7) 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 controlling for total domestic demand. In the complete 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 1 percent. The estimated elasticity (0.09) is however much smaller when estimated on euro area countries 20 It is estimated as follows: (coefficient_demand_elast_j+ coefficient_demand_elast_ij) * % increase in country I total final domestic demand(1999-year t) * country i’s imports (1999)/GDP(1999) * [GDP(1999)/GDP(t)], where j=(CEE, emerging Asia, oil exporters), and i=(Greece, Italy, Portugal, Spain). The cumulative loss is the sum of each year loss between 2000 and 2008.
only. This positive coefficient is not consistent with the possibility that, on average, Chinese
goods may displace other countries' exports. A possible interpretation for this positive
coefficient is that imports from China proxy for demand effects not captured by total domestic
demand.

To test whether Chinese exports are closer substitutes to some countries exports, we allow for
different coefficients across trading partners of each reporting countries. In columns (3) and
(4), 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 (3) and (6)), and let it be country
specific in columns (4), (5) and (7).

Interestingly, we find first that exports of euro area countries to common markets are
negatively correlated with Chinese exports to these markets (columns (3) and (4)), suggesting
that euro area countries exports are more likely than average to be displaced by Chinese
exports. Furthermore, the coefficient is even smaller for the GIPS, suggesting that these
exports are even more likely to be displaced by Chinese exports than other euro area
countries’ exports (columns (3) and (6)). The estimated effect is large, and is particularly
marked for Italian, Portuguese, and to some extent Greek exports. Taken at face value, the
estimates imply that the cumulative loss of exports to GDP resulting from a displacement
effect reach 14.6 percent of GDP, 31.4 percent of GDP, 27.3 percent of GDP and 3.8 percent
of GDP respectively for Greece, Italy, Portugal, and Spain. These negative effects on export
market are, thus, one additional element contributing in differential external performance of
these countries relative to other euro area countries.

All in all, the total cumulative differential effects of trade developments vis-à-vis emerging
Asia, emerging Europe and oil exporters on the trade balance of euro area debtor countries
appear quite large.

\[
\text{Total differential effects on the cumulative trade balance, 1999-2008 (in percent of GDP)}
\]

\[
\]

IV. financial integration and the financing of Euro Area deficits

The most striking evidence on the extent of financial integration of debtor countries is the
convergence in bond yields that occurred between the mid-1990s and the onset of the global

21 For example, the loss of exports for Greece during year t is computed as: coefficient(Greece) * average growth
imports from China for all reporting countries (between t and 1999) * [exports(1999) / GDP(1999)] *
[GDP(1999) / GDP(t)]. The cumulative loss of the sum is calculated over all years considered.

22 Such shocks would typically require relative price and wage adjustments and reallocation of labor across
sectors, but those may be hampered by labor market rigidities. See Artuç et al., 2010, for a structural model of
labor adjustment following trade shocks.
financial crisis. Figure 5 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 these spreads remained stable and low until the onset of the crisis.\textsuperscript{23} In Greece, which joined the euro on January 1 2001, the compression in bond yields started after 2000; spreads over German bonds remained as low as 30 bps even at the end of 2007. This decline in spreads suggests that the government bonds of the euro area debtor countries became close substitutes to German bunds for the marginal investor.

Figure 5

A. Stylized facts: Intra-euro Area Financing of Current Account Deficits

Financial Integration and NFA positions

In figure 6 we provide a decomposition of the net foreign asset position for each country in our sample by partner country or region. In particular, we highlight positions vis-à-vis other euro area countries, vis-à-vis the United Kingdom (through which many euro area financial institutions conduct their cross-border activities) and vis-à-vis the rest of the world. The figure shows that, since the creation of the euro, most of the capital inflows to euro area debtor countries originated from within the euro area—in particular from Germany and France. In Greece and Spain, virtually all foreign financing originated from within the euro area or from the United Kingdom, and about two thirds of it in Portugal. Italy, in contrast, had a larger proportion of net foreign liabilities to non-euro area banks including from the U.K. Ireland also built large net liabilities vis-à-vis euro area or U.K. based financial institutions, but these liabilities were partly offset by a positive net portfolio asset position with non-European countries, reflecting the role of Ireland’s mutual fund industry as conduit for euro area portfolio investment.

Figure 6

We now look at the bilateral net foreign assets of France and Germany.\textsuperscript{24} The mirror image of the debtor countries' net foreign liabilities are the net foreign assets accumulated by Germany and France vis-à-vis the debtor countries (and the euro area in general) and vis-à-vis the United Kingdom. However, during the same period, France and Germany accumulated net foreign liabilities vis-à-vis countries other than euro area members or the United Kingdom. Figure 7 provides supporting evidence that investors from outside the euro area held their financial claims primarily in “core” euro area countries, rather than in deficit countries.

Figure 7

\textsuperscript{23} Schuknecht et al. (2010) analyze the determinants of bond spreads before and after the crisis.

\textsuperscript{24} A closer look at bilateral data shows that a large chunk of claims on the euro area debtor countries were held by German and French financial institutions.
In sum, this evidence shows that the financing of the 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 outside. This could reflect various factors, from the removal of currency risk (Kalemli-Ozcan et al. (2010), intra-euro area financial harmonization, to the collateral policy of the European Central Bank.25

Sectoral and Instrument composition of the NFA position

A decomposition of NFA positions by sectors and instruments adds additional insights to our analysis. 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 8).

Figure 8

In sum, the net position of the general government sector 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 in early 2010.

However, a parallel analysis of domestic financial balance sheets reveals a more complex picture: the worsening external position of the debtor countries is to a significant extent associated with a worsening in the financial balance sheet of households (Table 9). 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.

Table 9

B. Empirical Analysis: Capital Inflows and the Trade Balance

To examine the potential effect of intra-euro area capital inflows on the trade balance of euro area countries, we perform an empirical analysis of the determinants of trade balances, of exports and imports. We seek to understand the relationship between the surge of capital

---

25 Further evidence in this respect is provided by the pattern of euro area bond holdings by non-euro area countries, which is concentrated in countries such as France and Germany.
inflows in euro area debtor countries—originating to a large extent from German and French banks—and the trade performance of these countries vis-à-vis other euro area countries, and vis-à-vis non-euro area countries.

For this purpose, we construct a database of bilateral exports and imports of goods for a sample of nine euro area countries – other than France and Germany – and covering the period 1990-2009. We aggregate bilateral trade data in two groups of trading partners: euro area countries and non-euro area countries.

We relate the annual bilateral trade balances, exports and imports to a set of standard determinants of external performance, and to net capital inflows by French and German banks. Formally, our main specification is the following:

\[
(1)
\]

where the dependent variable is one of the following variables: the trade balance, exports, or imports, all scaled by GDP, for country during year. For each of these dependent variables, we consider successively its total value, the value vis-à-vis euro area countries and the value vis-à-vis non-euro area countries. Our main explanatory variable, defined below, is a vector of control variables, is a country fixed effect, and is a residual. The inclusion of country fixed effects implies that we are identifying the association between capital inflows relative to the long-term country average and trade performance relative to the long-term country average.

We also consider a specification in which the coefficient of the variable is allowed to differ for euro area debtor countries ("GIIPS": Greece, Ireland, Italy, Spain and Portugal), and for other euro area countries ("NGIIPS": Austria, Belgium, the Netherlands, and Finland):

\[
(2)
\]

The explanatory variable of interest, is defined as total net flows of cross-border claims by French and German banks on country during year, in percent of country’s GDP. This variable is a proxy for the impact of financial integration on capital flows in euro area countries. It is constructed from the Bank for International Settlements Locational Banking Statistics (see appendix for details).

We consider a set of control variables to capture fundamental determinants of the external balance of countries. Following the existing literature (Chinn and Prasad, 2003; Lee and al., 2008; Christiansen and al., 2009), we focus on the following factors that may affect the savings and investment balance (see appendix for a precise definition and motivation for these variables): the fiscal balance, demographic factors (the old age dependency ratio, population

\[26\] Countries included in the regression analysis are Austria, Belgium, Finland, Greece, Ireland, Italy, the Netherlands, Spain and Portugal.
growth), the oil trade balance, the initial net foreign asset position, real GDP growth, and the initial PPP real per capital GDP relative to the US. Exports may also respond to external demand factors. To control for such effects, we include as an additional control variable real GDP growth of trading partners, weighted by export shares. To ensure that our main variable does not capture other unobserved common factors of rising external deficits in debtor countries, we include a time trend specific to the euro area debtor countries, and a dummy variable taking the value one after 1999 for these countries.

Regression results are summarized in Tables 10a. For each dependent variable, we report the coefficient of the variable and its p value. When imposing a common coefficient to all countries in the sample as in specification (1), we find, that, after controlling for standard determinants of the external balance, net bank capital inflows appear to be negatively correlated with the trade balance and with exports vis-à-vis non-euro area countries. In contrast, there is no systematic association between this variable and total trade or trade vis-à-vis euro-area countries. These findings suggest that, on average, bank capital inflows from within the euro area contributed in financing trade deficits vis-à-vis the rest of the world.

Table 10a

Next, we split the coefficient as in specification (2). In euro area debtor countries, bank capital inflows are negatively and significantly associated with the trade balance vis-à-vis euro area countries. There is also a negative association with the trade balance vis-à-vis non-euro area countries, but it is not significantly different from zero. The size of the effect is large: a one percent of GDP increase in net bank capital inflows is associated with a decrease in the overall trade balance by 0.48 percent of GDP. In contrast, there is no evidence of a systematic correlation between net bank capital inflows and the trade balance in other euro area countries.

Turning to exports, we find that, for euro area debtor countries, net bank capital inflows are negatively associated with exports to other euro area countries, and with exports to the rest of the world. There is no such association for other euro area countries. Again, the coefficient is large: it implies that a one percent of GDP increase in net bank capital inflows is associated with a 0.44 percent of GDP reduction in exports to other euro area countries, and a 0.48 percent of GDP reduction in exports to the rest of the world. This finding is consistent with a credit boom financed by capital inflows and simultaneous of a decline in export competitiveness. This could occur if capital inflows finance investment in non-tradable sectors (construction) and results in a real exchange rate appreciation that damages tradable sectors.

Surprisingly, we find that, in euro area debtor countries, net bank capital inflows are associated with a decrease in imports, mainly vis-à-vis non euro area trading partners. This

27 The fiscal balance, demographic variables, and real GDP growth are expressed in deviation from trading partners weighted average.
finding seems inconsistent with a overheating financed by capital inflows, as imports should increase when foreign capital flows in the country.

In Table 10b, we further investigate this finding by splitting imports into two components: imports of machinery and equipment, and other imports. Machinery and equipment are more likely to be used as intermediate inputs in domestic production, or for re-exporting. Hence, they may be less likely to increase as a result of domestic demand pressures, and may instead be more likely to be positively correlated to export performance. In contrast, other imports are more likely to be used for final domestic demand. In most regressions, imports are not systematically correlated with bank capital inflows. However, imports of machinery and equipment from non-euro area countries are strongly and negatively associated with bank capital inflows, suggesting that the negative correlation between imports and net bank capital inflows may be related to tradable sectors’ intermediate consumption.

Table 10b

How can these results be interpreted? Overall, our findings provide supporting evidence to the view that financial integration in the euro area permitted external imbalances to be sustained by financing growing trade deficits. They suggest that bank capital inflows helped close a financing gap resulting from declining exports – but were not associated with rising imports, as a standard overheating story would predict.28 Another possibility for the negative correlation between exports and capital inflows is that the inflow of capital associated with credit and asset market booms adversely affected manufacturing industries as in a Dutch disease mechanism, and caused a decline in export performance. Our results, however, are inconsistent with the interpretation that bank capital inflows were inflating public or private demand, thereby causing a rise in imports.

V. 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. Asymmetric trade developments are important 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 contributed to a significant real exchange rate appreciation in all euro area countries. These external shocks compounded the well-documented loss in competitiveness of deficit countries within the euro area, driven by price and wage dynamics.

28 A possibility is that some of the control variables may absorb the effects of capital inflows on domestic demand and on imports. However, we checked that dropping some control variables (real GDP growth, the fiscal balance) that may capture aggregate demand effects does not modify the partial correlation of capital inflows with imports.
We also show that the current account deficits of euro area countries were mostly financed with capital inflows from euro area surplus countries, despite significant trade imbalances vis-à-vis the rest of the world. In turn, investors from outside the euro area increased their claims on other euro area countries, such as Germany and France. This in turn suggests a special role for intra-euro area financial integration in allowing for the persistence of current account imbalances, with investors from the rest of the world displaying different portfolio preferences for investment in the euro area.

Where do these results leave us? Demand-side policies (such as fiscal consolidation and internal devaluation) and supply-side policies boosting productivity and competitiveness (such as labor market reforms) are likely to be essential elements of a rebalancing in a monetary union. Clearly, the needed process of expenditure switching in euro area countries with large external liabilities would be made much more difficult by a prolonged period of a strong euro exchange rate.
Table 1. Real effective exchange rate and current account balances at the start of EMU

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Table 2. Saving-Investment Balance (in percent of GDP)
Table 3. Unit Labor Cost, percent change between 2000 and 2009

Table 4. Average annual real labor productivity growth (2000-2007) (relative to Euro area)

Table 5. Trade balance, goods, in percent of GDP

Table 6. Export regressions
Table 7. Import regressions
Table 8. Displacement effect

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<table>
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In percent of GDP
Table 10a. Capital flows and the trade balance:
Summary of regression results
Table 10b. Capital flows and the trade balance: Imports of machinery and equipment and other imports

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Figure 1. Net foreign asset positions 1999-2009, in percent of GDP
Figure 2. Decomposition of real effective exchange rates, percentage change from 2000 to 2009
Figure 3. Cumulative bilateral trade balances, by trading partner (percent of GDP)
Figure 4. Change in bilateral trade balances, 1999-00 to 2008-09
Figure 5. 10-Year Government Bond Spreads against German Bunds
Figure 6. Bilateral Net Foreign Assets (in percent of GDP)
Figure 7. Share of outstanding debt securities held outside the euro area (2008)
Figure 8. Sectoral NFA positions (in percent of GDP)
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Appendix: data and variables

The bilateral export and import data are from the IMF’s Direction of Trade Statistics. For regression (3) and (4) we collected 11 euro countries’ bilateral exports and imports with their top 50 trading partners\(^{29}\) on an annual basis. The 11 euro countries are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain. For regression (5), we need to focus on the countries that choose to import either from euro area countries or from China. We construct another dataset for this purpose. From the first dataset, we select countries that are in the top 20 export trading partners for at least 6 euro counties. They are United States, United Kingdom, Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Sweden, Switzerland, Japan, Spain, Turkey, Russian Federation, Czech Republic, and Poland. We drop China from the list since our purpose is to check how the selected countries’ bilateral imports can be affected by changes of their imports from China. We collect the bilateral import data for those 17 counties with their top 50 trading partners.

The bilateral export and import data are nominal. To get the bilateral export and import volumes, we need bilateral price deflators which are not available. Accordingly, nominal bilateral exports (imports) are converted into real values using the reporter country’s export (import) price deflators.

The bilateral real exchange rate is calculated as the bilateral nominal exchange rate divided by the relative CPI. Higher value of real exchange rate means real depreciation of reporter country’s currency. The export and import price deflators, bilateral nominal exchange rate, country’s CPI and total domestic demand are collected from the IMF’s International Financial Statistics and World Economic Outlook (latest version: Apr 2010). Our dataset covers the period from 1990 to 2009.

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\(^{29}\) For each euro country, we rank trading partners based on bilateral trade values (exports + imports) in 2009.
Table A1 reports the mean and standard deviation of the growth in bilateral exports, bilateral imports, total domestic demand of reporter countries, and total domestic demand of trading partners, nominal bilateral exchange rate, real bilateral exchange rates, and relative CPI. All measures are in logarithms over 1990-2009. The bilateral export and import grow at around 6 to 7 percent per year, which is about 3 times of the growth in domestic demand in reporter countries and about 2 times of the growth in domestic demand in partner counties. During this period, euro country’s domestic demand grows at a slower rate than that in their major trading partners. Both nominal and real exchange rates of euro countries are appreciating relative their trading partners. Domestic price level also grows more than their trading partners. The standard deviations of the growth in bilateral export and import are higher than the standard deviations of the growth in domestic demand. But the bilateral trades are much less volatile than both nominal and real exchange rates and relative price levels.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Number of Obs</th>
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<tbody>
<tr>
<td>Growth in Bilateral Export</td>
<td>0.068</td>
<td>0.286</td>
<td>9416</td>
</tr>
<tr>
<td>Growth in Bilateral Imports</td>
<td>0.062</td>
<td>0.383</td>
<td>9416</td>
</tr>
<tr>
<td>Growth in Domestic Demand in Reporter Countries</td>
<td>0.019</td>
<td>0.030</td>
<td>9416</td>
</tr>
<tr>
<td>Growth in Domestic Demand in Partner Countries</td>
<td>0.031</td>
<td>0.060</td>
<td>9326</td>
</tr>
<tr>
<td>Nominal Bilateral Exchange Rate</td>
<td>-1.817</td>
<td>2.539</td>
<td>9967</td>
</tr>
<tr>
<td>Real Bilateral Exchange Rate</td>
<td>-1.948</td>
<td>2.367</td>
<td>9967</td>
</tr>
<tr>
<td>Relative CPI</td>
<td>0.131</td>
<td>0.939</td>
<td>9967</td>
</tr>
</tbody>
</table>

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

Explanatory variables in trade and finance regressions:

**Bank capital flows to GDP:** Exchange rate adjusted net flows of claims on the resident country i by French and Germany banks to GDP of country i. The bilateral flow data are from the BIS Locational Banking Statistics.

**Relative GDP per capita:** Relative Income per capita is PPP income per capita relative to the U.S, both in constant 2005 international Dollars. The index has a value of 100 for the U.S. The data are from PWT 6.3.

**Old-age dependency ratio:** The old-age dependency ratio captures the share of people older than 64, relative to the working age population, defined as the age group 15-64. The data are based on UN data, annualized by the World Bank.

**Population growth:** The population growth data are computed from World Bank data, extended with UN projections.

**Net foreign assets/GDP:** Net foreign assets (NFA) are from Lane and Milesi-Ferretti (2007). If there is no NFA data for a given country we use the cumulative current account.
Oil trade balance/GDP: The oil trade balance to GDP ratio is from WEO.

General Government Balance (GGB)/GDP: The general government balance relative to GDP, using the central government balance for countries where the general balance is not available. The data are from WEO.

Real per capita GDP growth: The growth rate of GDP per capita (in PPP) is taken from PWT 6.3.

Real GDP growth of trading partners: the data are from the Global Economic Environment of the World Economic Outlook.