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The 'imbalanced balance' and its unravelling: current accounts and bilateral financial flows in the euro area

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Alexandr Hobza, Stefan Zeugner

Abstract

Based on a new database of bilateral financial flows among euro area countries and their major world partners, this paper explores the role of financial links in the accumulation and then adjustment of current account imbalances in the euro area. The data show that the geography of financial flows can differ quite markedly from trade flow patterns and suggest that the nexus between surpluses in the 'core' with deficits in the periphery went along financial rather than trade interlinkages. In particular, the data document the dominant role of 'core' countries in financing the euro area periphery's current account deficits before the financial crisis. In addition to direct financing, France and the UK acted as important intermediaries of financial flows from elsewhere, particularly outside of the euro area. Most of this financing took the form of debt instruments and increased the vulnerability of the recipient countries. In 2009/10, gross flows in the euro area contracted, while the net flows remained broadly unchanged. France became the periphery's main financier in 2009 and substituted the withdrawn flows from surplus countries, mainly Germany. Only when France reduced its exposure in a hasty asset withdrawal during 2011, the periphery had to rely on large ECB-mediated liabilities in order to refinance its liabilities.

JEL Classification: F32, F34, F36, F41.

Keywords: international financial flows, external imbalances, current account, euro area.

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The "imbalanced balance" and its unravelling: current accounts and financial flows in the euro area

1. INTRODUCTION

Large external imbalances became a salient feature of the economic landscape in the euro area in the run up to the crisis of 2007-8. Some of its members accumulated increasingly large and persistent current account deficits, while others posted high and equally persistent surpluses. At the onset of the crisis, the collective deficit of Greece, Ireland, Italy, Portugal and Spain was almost 7% of their GDP. The surplus group, comprising Germany and the Netherlands among others, recorded a surplus of around 6% of their GDP. At the same time, the euro area as a whole, despite its economic weight and intensive participation in cross-border trade and finance, had a broadly balanced current account and stayed largely aside of the discussions on how to address the growing global imbalances. Over this period, the current account of the euro area largely stayed moderately positive, never exceeding 1% of GDP. The euro area current account position during its first decade thus could be called an "imbalanced balance".

This implies that the deficits were almost exclusively financed from the surpluses in other euro area countries. ⁽¹⁾ Such 'downhill' capital flows from the capital-abundant 'core' to the catching-up periphery are a feature in line with theoretical predictions of inter-temporal approaches to the current account but hardly ever observed in reality (Lucas, 1990).

The arrival of the crisis brought a 'sudden stop' to these flows (Merler and Pisani-Ferry, 2012). While the ECB-mediated flows softened the impact, external net borrowing of the deficit countries started to adjust quickly and, by the end of 2012, their current account positions were roughly balanced. On the other hand, current account surpluses have not substantially changed. As a result, the external position of the euro area has shifted into a surplus, which is expected to approach 3% of GDP if the current trends prevail (European Commission, 2014).

These developments highlight the role of financial flows and their geographical pattern both in the pre-crisis accumulation of imbalances and their post-crisis adjustment. The strength of financial linkages among the euro area countries has increased considerably in the pre-crisis period, riding on the wave of the global surge in gross financial flows and enjoying an additional boost from the establishment of the euro and, inter alia, the related convergence in capital costs (Lane, 2013). The euro has thus resulted in the emergence of the 'euro bias' in the cross-border holdings of different classes of financial assets. For example, German banks were the main investors – directly and indirectly – in the Spanish construction sector. France, on the other hand, "specialised" in intermediating financial flows from non-euro area investors to the Mediterranean economies such as Italy and Greece.

We, therefore, investigate external positions of euro area countries in view of the boom in cross-border financial flows, both worldwide and in particular in the euro area. For this purpose, we build a new dataset of bilateral gross and net financial flows. We combine data on (mostly stocks of) different classes of foreign financial assets and derive the underlying flows by accounting for valuation changes. We then document the specific patterns of financial flows in the euro area and with main financial partners and analyse the way they contributed to the build-up and the ensuing adjustment of current account imbalances.

Several recent papers focused on bilateral financial linkages at the global level (see, e.g., Kubelec and Sá, 2010, Milesi-Ferreti, Strobbe and Tamirisa, 2010, Gourinchas, Rey and Trümpfer, 2012), while evidence on intra-euro area developments is rather scarce (see Waysand, Ross and de Guzman et al., 2012, Chen, Milesi-Ferretti and Tressel, 2013, or Hale and Obstfeld, 2014). Our work extends the existing literature in several aspects: first, the key conceptual contribution of this paper is to propose an approach to derive financial flows from the available data on stocks by estimating bilateral valuation effects on holdings of foreign assets. Such consistent data on cross-border financial flows has so far been missing and can be used for numerous analytical purposes. Most existing studies use bilateral stocks of foreign assets as reported in the original data sources, i.e., with

⁽¹⁾ This applies to the net financing needs, which does not rule out important gross financial flows with the rest of the world, as will be documented in our paper.

mismatches between the reported bilateral liabilities from one country and the reported matching asset holdings from its partners. Second, the analysis zooms in on the situation in the euro area, which the bulk of existing research considers as a single entity. This often makes sense given the global perspective of much of this work. But it arguably hides important developments that are behind the accumulation of imbalances in the euro area and which are also shaping their adjustment and increasingly affecting the euro area's external position. Finally, we extend the time span of the data to cover the period 2001-12, which provides first insights into the behavior of financial flows in the period following the initial impact of the crisis. To our knowledge, none of the existing contributions goes beyond 2010. This does not allow them to analyse the effects of the euro area sovereign crisis on financial flows, which started in 2010, following the Greek public debt crisis and the launch of the EU- and IMF-sponsored adjustment programme.

Our dataset documents several stylized findings: first, there has been an important degree of 'euro' bias in the gross as well as net financial flows. The current account deficits in the euro area periphery were almost exclusively financed from within the rest of the area, mostly by countries with current account surpluses but also through flows intermediated via France and the UK. Second, a large part of this financing took the form of debt in the pre-crisis period. Third, the intensity and direction of financial flows with the non-EU countries differ between surplus and deficit economies. While the deficit countries depended on their euro area partners to cover their net financing needs, they were only one among the many important financial partners of the surplus countries. Fourth, after the start of the crisis, gross flows reverted their direction and contracted in size. However, the net flows initially remained broadly unchanged. France became the periphery's main financier and substituted the withdrawn flows from surplus countries, mainly Germany. Once France reduced its exposure in a hasty asset withdrawal during 2011, the periphery had to rely on quickly increasing ECB-mediated liabilities and official assistance in order to refinance its liabilities. This helped to roll over debt and make the correction of deficits in the periphery smoother.

We also analyse the relative role of bilateral financial and trade flows in shaping the pattern of intra-euro area imbalances. We argue that financial flows have been key in driving the specific pattern of intra-euro area imbalances, overriding the traditional role of trade flows in determining external balances of countries. Bilateral net trade does not provide a good indication of net bilateral financial flows. In the euro area, the surplus countries financed the periphery by more than their bilateral trade balances, and effectively intermediated flows coming from the rest of the world. Using spatial econometric analysis, we then assess the relative importance of financial spillovers and interlinkages between surplus and deficit countries. We find that financial interlinkages are significant and negative: a country is more likely to run a deficit if its major financial partners run surpluses, and vice versa. In contrast, trade spillovers tend to have a different pattern and countries are more likely to run a current account surplus if their trade partners run a surplus. These findings are highly relevant for empirical analyses of cross-border spillovers. Weights based on trade flows are usually used in this type of analysis as a measure of interlinkages. However, this may not be fully appropriate.

The rest of the paper is organized as follows: the next section briefly reviews the recent literature exploring the bilateral financial flows. Section 3 then presents the conceptual approach to building the dataset of bilateral financial flows, documents the data sources and explains some empirical issues related to the construction of the data. Section 4 uses the data to provide a picture of financial flows in the euro area and with the rest of the world before and after the onset of the crisis in 2007-8. Section 5 concludes.

2. LITERATURE REVIEW

The fast progress in global financial integration over the past two decades and the associated surge in international financial flows have underlined the importance of understanding the developments in cross-border financial linkages. This has given an impetus to the construction and exploration of datasets on external asset and liabilities positions of countries. In their seminal work, Lane and Milesi-Ferretti (2001 and 2007b) compiled data on international investment positions (IIP) for over

140 countries, covering a period between 1970 and 2004 and distinguishing between the debt and equity components of external asset and liabilities. Their dataset as well as much of the ensuing work concentrated on the aggregate external positions of countries, without considering the geographical composition of foreign assets and liabilities. Information on bilateral cross-border holdings of financial instruments and their flows is, nevertheless, crucial to understand the developments in the modern financial world. For example, in order to study effects of exchange rate movements on the valuation of international portfolios, Lane and Shambaugh (2010) built a cross-country dataset of currency exposures of external positions.

Recently, several contributions explored the bilateral financial linkages among countries. In doing so, they typically have to tackle important constraints related to data availability and reliability as well as numerous conceptual issues. Kubelec and Sá (2010) constructed a dataset of financial flows covering 18 world economies and spanning a period from 1980 until 2005. The long time span of their dataset required that much of the data had to be estimated using VAR models. They document the rapid strengthening of financial linkages over the past two decades and their concentration around several major financial centers. Some other papers exploited newly available data sources such as the IMF's Coordinated Portfolio Investment Survey (CPIS) or the BIS data on cross-border banking exposures and explored the geographical composition of countries' IIPs. Milesi-Ferreti et al. (2010) provide a comprehensive map of bilateral holdings of asset and liabilities in several classes of instruments for around 70 countries (some presented as groups). They took advantage of the improved availability of data on bilateral holdings, which however limits their dataset to a cross-section for a single year (2007). This view of international financial linkages just before the start of the financial crisis is, nonetheless, very useful in documenting many stylized facts about the strength and nature of cross-border exposures, which consequently had a key impact on the spreading of the effects of the crisis and distribution of capital gains and losses. With a view to studying the geographical distribution of valuation effects on cross-border asset holdings at the height of the financial crisis in 2007-8, Gourinchas et al. (2012) compiled a

dataset of bilateral net and gross external asset and liabilities positions for a number of world economies and country groupings and estimated the financial flows over this period.

All these datasets have a rather limited coverage of European economies, which impairs their use for studying developments within the euro area or the EU in a greater detail. For example, Milesi-Ferreti et al. (2010) or Gourinchas et al. (2012) consider the euro area as a single entity, although they note the important divergences among the individual countries in terms of level and composition of their net and gross external positions. Similarly, Kubelec and Sá (2010) included only five large European economies in their analysis.

Following the introduction of the euro, several papers analysed changes in the geographical composition of holdings of specific financial assets. They generally found evidence of the "euro bias", i.e. a shift in the composition of financial portfolios in favor of other euro area countries' assets. Lane (2006) showed that the 'euro bias' was especially pronounced in the bond markets, as cross-border holdings of bonds within the euro area were twice as high as with other countries. Lane and Milesi-Ferretti (2007a) focused on equity holdings and found that this phenomenon was also present there, albeit somewhat weaker. In a similar vein, Coeurdacier and Martin (2009) then considered equity, bonds as well as bank assets.⁽²⁾ In the most comprehensive study focusing on Europe, Waysand et al. (2010) provide a database of the geographical composition of foreign asset and liabilities positions of 29 European countries with around 200 partners over the period 2001-2008. It uses the actual data from different sources and provides a split into foreign direct investment (FDI), portfolio equity, portfolio debt and 'other investment'. They present a number of salient characteristics of the pattern of financial interlinkages in the EU, in particular the increasing financial interdependency among the European economies and the intra-euro area financing of imbalances.

⁽²⁾ Schmitz and von Hagen (2009) analyze bilateral capital flows in the euro area. However, they proxy them via bilateral trade balances, which is highly problematic as is shown in our paper.

3. CONSTRUCTION OF THE DATASET: METHODOLOGY AND SOURCES

Despite the enormous progress in compiling data on aggregate external financial positions of countries, the availability of data on bilateral financial stocks and flows continues to be limited. Apart from a handful of exceptions, such data is not usually published by national statistical institutes. ⁽³⁾ Various international institutions report bilateral stocks for different financial instruments, such as the OECD on FDI, the IMF on portfolio assets, and the BIS on other investment for banks. The data on cross-border financial flows is even scarcer. An exception is the data on bilateral FDI flows (and stocks) that are reported by several international institutions such as the OECD or Eurostat (although the geographical coverage of the latter is limited to the EU membership).

We combine the available data to construct a comprehensive dataset of bilateral financial flows. For classes of financial assets, where data on flows is not directly available, we first construct the data on bilateral cross-border stocks and then proceed to estimating flows. In doing so, we face two major challenges. First, the conceptual challenge is to estimate bilateral financial flows from the available data on cross-border holdings of financial assets, accounting for the valuation effects. The second – practical – challenge relates to the fact that the estimation of bilateral flows requires consistent stock data. However, available datasets often feature important internal inconsistencies, i.e. the reported liabilities of country A vis-à-vis a country B do not always correspond with the reported holdings of country A's assets in country B. The web appendix discusses such issues relating to data treatment, while this section provides a brief overview.

3.1. The conceptual approach to estimating financial flows from the stock data

The estimation of flows from the stock data requires disentangling the transactions that took place in a given period from the valuation effects

⁽³⁾ In the euro area, bilateral data on financial flows are, for instance, published by the German central bank.

on the initial holdings of foreign assets. Such valuation effects can be quite substantial, particularly in periods when asset prices are subject to significant fluctuations (see, e.g., Gourinchas, 2008, for an overview).

Our strategy to compute the bilateral financial flows is to first estimate the bilateral valuation effects and then derive the bilateral flows as a difference between them and the changes in bilateral financial stocks. Equation (1) shows that the gross acquisitions of an individual asset over some period can be derived as the change in gross bilateral stock less the valuation effects on the holdings of this asset at the beginning of the period:

$$fa_{ij,t}^l = (p_{j,t}^l a_{ij,t}^l - p_{j,t-1}^l a_{ij,t-1}^l) - (p_{j,t}^l - p_{j,t-1}^l) a_{ij,t-1}^l \quad (1)$$

where $a_{ij,t}^l$ denotes country i's holdings of asset l in country j at time t; $p_{j,t}^l$ denotes the price of asset l in country j at the end of period t; $fa_{ij,t}^l$ represents country i's acquisitions of asset l in country j during time t. ⁽⁴⁾ From the available data sources, only the bilateral holdings $p_{j,t}^l a_{ij,t}^l$ and $p_{j,t-1}^l a_{ij,t-1}^l$ are known. However, the applicable price changes for any particular asset can be inferred from the known data on gross aggregate holdings and acquisitions of this asset. Then, the individual asset acquisition $fa_{ij,t}^l$ is given by difference between the change in individual asset holdings and the asset's price growth times the initial asset holding: ⁽⁵⁾

⁽⁴⁾ This equation assumes that all asset acquisitions or disposals are made at one point in time (at the end) of period t, i.e. valuation changes apply only to the initial stock of the asset. In reality, portfolio allocation changes will occur also throughout the period t and the asset price is likely to differ with each transaction. This would lead to additional valuation effects on assets newly acquired during the period. In the actual data computation, we use a slightly more complicated version of equation (2), which is akin to a Fischer index, and assumes that acquisitions are spread evenly across the period and the price changes gradually (linearly). See the web appendix for more detail.

⁽⁵⁾ For instance, the IMF CPIS data show that Dutch holdings of Portuguese portfolio equity in 2006 were EUR 1161 mn, and EUR 1737 mn at the end of 2007. Valuation effects computed on the basis of Portuguese BoP data imply that foreign holders of Portuguese portfolio equity on average gained 6% during 2007. Assuming that also the Dutch holders experienced the same magnitude of valuation

$$fa_{ij,t}^l = \frac{(p_{j,t}^l a_{ij,t}^l - p_{j,t-1}^l a_{ij,t-1}^l) - (p_{j,t}^l A_{j,t}^l - p_{j,t-1}^l A_{j,t-1}^l - FA_{j,t}^l)}{p_{j,t-1}^l A_{j,t-1}^l} p_{j,t-1}^l a_{ij,t-1}^l \quad (2)$$

where $A_{j,t}^l$ and $FA_{j,t}^l$ denote aggregate gross holdings and acquisitions of the asset l of country j by other countries, respectively.

If data on asset holdings were available for individual assets and under high frequency, equation (2) would directly yield the asset acquisition by each investor. In the absence of such data, we apply this approach to the asset classes as reported in the available data sources. The aggregate valuation effects for different classes of assets can be retrieved from the Balance of Payments (BoP) statistics as a difference between change in their outstanding holdings and the corresponding flows.⁽⁶⁾ In practice, we compute the aggregate valuation effects on different classes of external liabilities, i.e. domestic assets held by foreign investors, in a given country. Heterogeneity of price developments, within a specific class of financial instruments, is likely to be lower for foreign liabilities than for the portfolios of foreign assets.

This approach becomes more precise the higher the disaggregation of assets. For higher levels of aggregation of different classes of assets, the reliability of this approach rests on the assumption that for a particular asset class from a given country, price changes affect all investors' portfolios by the same proportion.⁽⁷⁾ This may approximately be the case given the empirically

strong co-movements among asset prices within asset classes in a given country.⁽⁸⁾ Therefore, we use the finest level of disaggregation on which bilateral asset holdings are available.⁽⁹⁾ Computing bilateral asset holdings in such a manner yields a matrix of gross financial acquisitions between countries for each time period.

An important advantage of our estimation method is that it would be precise if stock data were available at the individual asset level. This approach is thus theoretically consistent and any empirical shortcomings are thus due to data limitations. An alternative strategy would be to derive financial flows directly from the financial stocks, again relying on some assumptions. For instance, Gourinchas et al. (2012) assume foreign asset acquisitions to be proportional to foreign asset holdings in order to determine bilateral valuation effects. Such an assumption is more arbitrary from a conceptual point of view. While it may be reasonable to assume that disposals of foreign assets are proportional to the outstanding stock of these assets in times of crisis, it is less obvious why this should be the case with acquisitions of new assets in calmer times.

3.2. The construction of bilateral stock and flow data

We build the dataset of gross and net bilateral external financial positions by combining different data sources on specific classes of financial assets in a similar way to Milesi-Ferretti et al. (2010) or Waysand et al. (2010). We follow the categories from the Balance of Payments statistics and cover portfolio investment, other investment (essentially

gains, their implied acquisitions of Portuguese equity during 2007 were therefore EUR 506 mn, i.e. EUR 1737 mn-EUR 1161 mn*1.06.

⁽⁶⁾ For the computations, we use the flows reported on the components of the financial account of the BoP. This implies that any errors and omissions that affect the financial account rather than the current account are by construction included in the estimate of the valuation effects.

⁽⁷⁾ Investment behavior of different foreign investors may differ, but there is not much reason to expect returns within asset classes to differ considerably. For instance, Gourinchas et al. (2012) show a preference of emerging markets for US short-term debt securities when compared to European investors. However, since their price is mostly determined by general money market rates, there is not much reason to expect the short-term debt held by Europeans to perform differently from the one held by, say, Chinese ones.

⁽⁸⁾ In addition, the more similar investors' portfolio shares within the asset class l are, the more precise the valuation effect estimate for each individual investor will be. For aggregate figures, one might expect this to hold. For instance, the performance of German holdings on the US equity market can reasonably be expected to be close to the performance of, e.g., Italian holdings in the US stock market.

⁽⁹⁾ Note that the estimation of valuation effects as in (2) may also be influenced by the reclassification of assets (from, e.g. FDI equity to FDI 'other capital'). However, the higher the level of disaggregation, the less likely such reclassification issues will affect the estimated residual, i.e., bilateral financial flows.

loans), FDI and reserve assets. ⁽¹⁰⁾ Our dataset excludes holdings of financial derivatives because bilateral figures are hardly ever available. In order to account for most of financial flows affecting the euro area, we estimate a full bilateral matrix for a sample of 62 countries, territories and entities. ⁽¹¹⁾

The primary source for portfolio investment is the IMF CPIS, which reports bilateral holdings of assets. ⁽¹²⁾ In order to achieve a finer level of disaggregation, which is important for the reliability of the computation of financial flows, the portfolio investment is decomposed into portfolio equity and debt. ⁽¹³⁾ As regards the bilateral other investment (loans, currency and deposits) by the private sector, we use the locational banking statistics compiled by the BIS. Finally, the OECD provides both stock and flow data on bilateral FDI, thus stocks are not needed for computing FDI flows in most cases. ⁽¹⁴⁾

The cross-border assets and liabilities reported by any two countries match reasonably well in most cases, but there are some important exceptions where major inconsistencies arise: for instance, in

Waysand et al. (2010), France reports liabilities vs. Germany of USD 528 bn, whereas Germany reports assets in France of USD 418 bn. Where feasible, we attempt to obtain the most reliable estimates of bilateral exposures by using additional available information. For this purpose, we use the geographical decomposition of the BoP data provided by Eurostat, which is fully internally consistent, but offers only a limited geographical split. We also use national statistics, whenever available. To resolve the remaining cases of mismatches between data on a particular bilateral stock, we rank countries based on the absolute and relative size of such reporting residuals. We then use this ranking to build a matrix of consistent bilateral stocks iteratively: asset and liabilities from the first-ranked country, i.e., that with the smallest mismatches, are taken as given. Subsequently, for each country, we only apply its reported assets and liabilities positions with lower-ranked countries. ⁽¹⁵⁾

The most challenging issue in constructing such a bilateral matrix of financial positions is to properly account for offshore financial centers. Due to the magnitude of their exposures, reporting inaccuracies can have major implications for their financial partners. In the European context, such offshore financial centers serve as stopovers for cross-border investment: e.g., the Netherlands for FDI and eurobonds, Ireland for FDI and mutual funds, while the magnitude of Luxembourg's international assets is on par with that of Germany or France. ⁽¹⁶⁾ In addition to the above-mentioned countries, Singapore and Hong Kong, our dataset includes 17 'proper' offshore economies such as Bermuda, which allows us to cover the bulk of financial flows routed through the offshore centers.

⁽¹⁰⁾ Due to data availability, reserve assets are not accounted for with any country, but instead ascribed to a special entity of 'international organizations and non-euro central banks'. However, those reserve assets are accounted for as portfolio liabilities in the asset-originating countries (see Waysand et al., 2010, for a discussion).

⁽¹¹⁾ These countries are the EU and OECD members, as well as 17 offshore territories plus Hong Kong and Singapore, and the special aggregate of 'international organizations and non-euro central banks'. In addition, flow estimates are partially available for more countries, but not considered in the analysis.

⁽¹²⁾ Note that the countries that report further disaggregation of portfolio debt (e.g. short-term vs. long-term) are too few to be representative. Moreover, note that portfolio asset holdings tend to be much more reliable than portfolio liability statistics. This is due to the fact that national statistics providers survey investors on their portfolio allocation, but have difficulties to track who is ultimately holding their liabilities. For instance, the German central bank reports Belgium and Luxembourg to be the most important holders of German portfolio liabilities. But this stems from major clearing houses being situated in these countries, while the residence of the actual investor is frequently unknown.

⁽¹³⁾ Note that CPIS also offers assets by institutional sector. However, our approach to estimating the valuation effects would require the institutional sector of the asset (and thus the borrower), and not the sector of the asset holder.

⁽¹⁴⁾ In the few cases where missing links between non-OECD economies had to be estimated, OECD FDI data is complemented by the IMF's Coordinated Direct Investment Survey (CDIS).

⁽¹⁵⁾ Note that in some cases, other countries report more holdings in a given domestic economy than what this economy reports as its liabilities. In particular this is the case for FDI and portfolio debt in economies with an offshore financial sector (and in particular when the country is a popular choice for Eurobond origination). While several of these countries do not include the offshore sector in their external assets and liabilities reported to the IMF or Eurostat, several publish additional data that incorporates their offshore sector (see web appendix).

⁽¹⁶⁾ We therefore refrain from the assumption used in Gourinchas et al. (2012) that assets in offshore centers immediately 'round-trip' to the originating country, although this may be an important element.

The underlying sources point to severe underreporting in several instances. For example, the estimated total net financial position of Luxembourg with the 62 countries in the sample stood at around USD 1.7 tn in 2007, which is way beyond its reported position and not plausible. This, however, is a direct implication of the underlying data. In 2007, Luxembourg reported portfolio equity liabilities (mostly mutual funds) of around USD 2.8 tn. But in the CPIS data, only 60% of this amount were reported as assets held by other countries in the sample. A similar issue affects Irish portfolio equity liabilities (also mostly mutual funds), of which only a third are reported in CPIS. Similar mismatches affect most offshore centers in the sample, albeit at a much smaller scale.

Our major focus is the computation of financial flows. Since these reporting mismatches are relatively stable, they do not induce undue volatility in the estimated flows. If, however, the mismatches in Luxembourg and Irish data are due to underreporting by European partners, this will lead to 'under-reporting' in the estimates of European financial flows towards these offshore centers. Any such residual will, therefore, be picked up by the rest-of-the-world component in the data set. Therefore, CPIS data mismatches for Luxembourg and Ireland may tentatively lead to an over-estimation of flows between the EU and the rest of the world.⁽¹⁷⁾ In general, the volatility of such reporting mismatches has most implications for financial flows, which we address by adjusting several estimated flows from these centers through visual inspection and scaling.⁽¹⁸⁾

Another major issue is to account for euro area countries' net asset holdings with the ECB (mainly

TARGET2 balances), which are part of the 'other investment' component. Technically, net asset holdings with the ECB are a claim on or a liability to the euro area, not its individual members. For the purpose of our dataset, we distribute bilateral TARGET2 exposures between the individual euro area countries. We assign these to the implied bilateral balances among Eurosystem members as if the ECB's balances were an exchange-traded fund.⁽¹⁹⁾ European financial assistance to Greece, Portugal, Ireland, and Spain during the crisis is also accounted for in the form of inter-governmental loans. For those countries, the ECB's quantitative easing measures during 2011-12 also matter, whose exposures are again allocated to individual member states.⁽²⁰⁾

The dataset of bilateral financial asset and liability positions constructed in this way is similar to the ones used in Lane and Milesi-Ferretti (2007b) and Waysand et al. (2010). As emphasized above, the major difference is that we strive for consistency of asset and liability data, in order to be able to construct financial flows. For portfolio and 'other' investment, these are obtained straightforward, in principle, according to equation (2).⁽²¹⁾ Overall, the resulting financial flow estimates match the little available bilateral financial data relatively well. We then refine the resulting estimated flows further by appropriately scaling the flows between EU countries and regional aggregates according to available Eurostat information. By definition, the resulting estimates provide a consistent matrix of bilateral financial flows for portfolio and other investment between the 62 countries and territories in the sample (see Table 2 in the annex). Reported FDI flows are added from OECD statistics. In order to resolve cases of mismatches between reported bilateral FDI asset and liability flows, we apply the ranking methodology used for the stocks.

⁽¹⁷⁾ As a robustness test we considered attributing more of Luxembourg's financial inflows to its European partners, but the result did not alter the findings of this paper.

⁽¹⁸⁾ In general, we estimate flows to offshore centers in the same way as for the other economies, by relying on valuation effects from the balance of payments. Due to the large magnitudes involved, such valuation effects can sometimes induce aggregate inflows that are too large, which requires manual adjustment to render the valuation effects on the offshore center's liabilities more similar to those on its underlying liabilities. Only in the few cases where the BoP is not available (in particular for the Cayman and Channel Islands) we compute inflows by assuming zero valuation effects in the sender country's currency.

⁽¹⁹⁾ The ECB is modelled like an exchange-traded fund (ETF) that allows for short positions. Intuitively, all the countries with net liabilities are treated as the securities underlying the ETF. Each country with net claims on ECB thus holds a 'share' of this fund, with proportional exposure to the underlying liabilities from other countries.

⁽²⁰⁾ Financial assistance refers to funding under ESM, EFSM, GLF, EFSM, IMF, and bilateral assistance loans. For more detailed information, see the web appendix at <http://www.zeugner.eu/studies/finflows/>.

⁽²¹⁾ Note that in each case, valuation effects are computed in local currency. The resulting financial flow estimates are converted into EUR / USD with the period average exchange rate.

For each economy in the sample, the estimated total gross financial flows with 61 partners are closely correlated with the gross flows reported in the BoP. ⁽²²⁾ In order to obtain a complete matrix, we construct the financial flows with the rest of the world as a residual from reported total flows. The full dataset is available at: <http://www.zeugner.eu/studies/finflows/>.

4. FINANCIAL LINKS WITHIN AND OUTSIDE THE EURO AREA

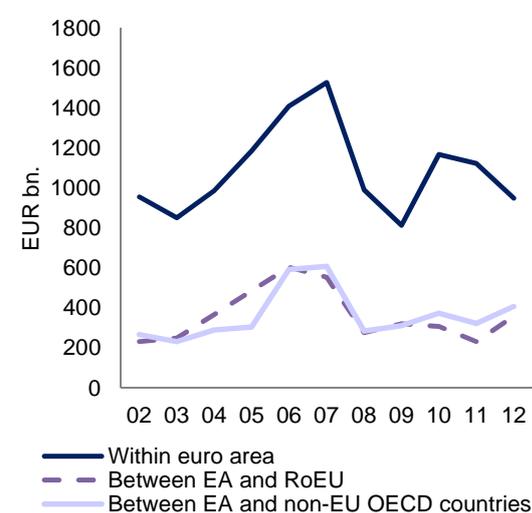
We use this new dataset to analyse the nature and strength of financial interlinkages within the euro area, with the rest of the EU and major global financial partners. However, it should be kept in mind that the economic interpretation of financial flows between two countries is not always straightforward. Such flows may be part of more complex financial intermediation chains. ⁽²³⁾ As the bilateral financial data are usually reported on the basis of the residence principle, it is, moreover, not possible to disentangle the underlying transactions (Lane, 2013).

4.1. The concentration of financial flows in the euro area before and after the crisis

The period following the establishment of the monetary union saw increases in cross-border capital flows among the euro area (and EU) countries. While the expansion in cross-border financial transactions has been a global phenomenon, the increase of flows within the euro area has been even more remarkable (Lane, 2013). Graph 1 shows the developments in the intensity of bilateral gross financial flows within the euro area and between the euro area and other groupings of countries. It shows the average of bilateral outflows and inflows of the euro area members with the other euro area countries, the rest of the

EU (RoEU) and non-EU members of the OECD. It documents the fast expansion in gross financial flows within the euro area prior to the financial crisis, which even outstripped the dynamic growth in financial flows with other partners, particularly in the boom up to 2007. The reduction in transaction costs and increased substitutability between different financial assets were possibly among the main drivers, although these effects varied across classes of assets (Coeurdacier and Martin, 2009; and Jappelli and Pagano, 2010; Kalemli-Ozcan et al., 2010; and Spiegel, 2009).

Graph 1: Gross financial flows aggregated by partner



The graph covers direct, portfolio and other investment. It shows the average of absolute value of financial outflows and inflows of the euro area (EA) countries with different partners (other EA countries; rest of the EU (RoEU); and non-EU OECD countries). Note that it is based on matrices of flows as shown in the tables in the annex, i.e. with some countries aggregated into groups. This also applies to the remaining graphs in this section.

Source: Authors' calculations.

Financial flows within the euro area and particularly towards the periphery countries were dominated by debt instruments (Graph 2). ⁽²⁴⁾ For example, debt flows accounted for over $\frac{3}{4}$ of the total gross financial flows in the euro area in 2004-6. In Spain, the share of cross-border loans and

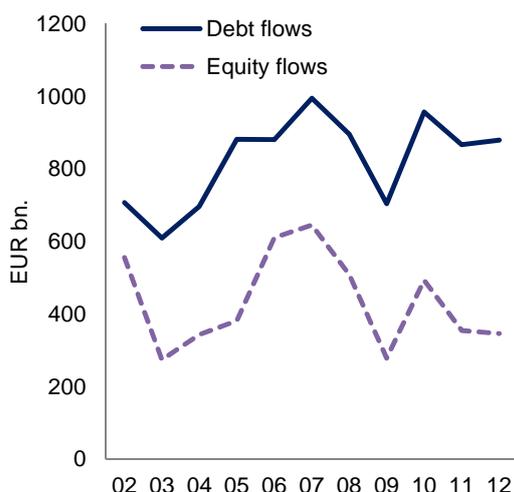
⁽²²⁾ Note, however, that in several cases flows were scaled with respect to reported financial flows with regional aggregates. This is particularly relevant for economies with a large offshore sector, such as the Netherlands, Luxembourg, Ireland, Hungary, or Cyprus.

⁽²³⁾ This is particularly complicated in view of the existence of offshore financial centers and large financial intermediaries, both outside and inside the euro area. For example, the large financial flows with Luxembourg and the UK demonstrate the importance of international financial centers in intermediating capital.

⁽²⁴⁾ From an economist's viewpoint, it is important to distinguish between fixed-income instruments (like bonds and loans) and equity instruments, the remuneration of which is contingent on economic developments. Therefore, the discussion will largely use this split: portfolio debt and other investment will be treated together as debt, while portfolio equity and FDI form the equity category.

portfolio debt exceeded 95%. A significant part of this was short-term inter-bank lending and investment of banks and other financial institutions into sovereign debt of the periphery countries (Lane, 2013). The accumulation of debt liabilities increased the vulnerability of the periphery countries' financial systems. This is because an adverse macroeconomic shock that lowers income growth and suppresses inflation, can make the debt burden excessive and economic agents can start facing liquidity or solvency problems. The vulnerability was further accentuated by the declining share of equity liabilities, which reduced the scope for cross-border risk-sharing (adverse shocks affect domestic equity valuations and the burden is thus partially shared by the foreign holders of such equity).

Graph 2: Gross debt and equity Flows within euro area

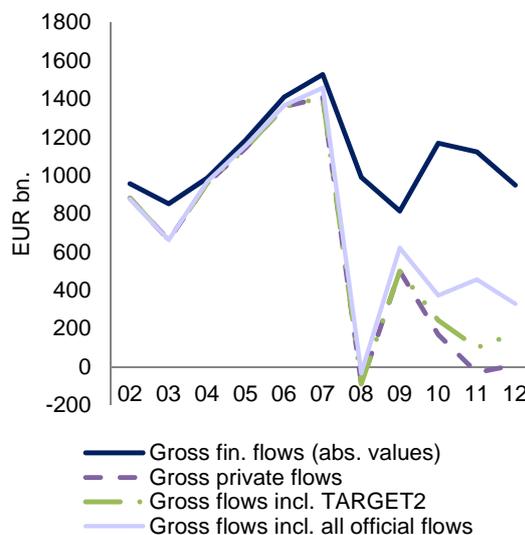


Debt flows cover portfolio debt and other investment; equity flows cover portfolio equity and direct investment. The graph shows the sum of absolute value of bilateral gross debt/equity flows within the euro area. Source: Authors' calculations.

The eruption of the crisis in 2007 then resulted in a collapse of financial flows both within the euro area and with the rest of the world. Graph 3 shows that the volume of cross-border flows within the euro area declined substantially (the full dark line). The contraction particularly affected debt flows, although equity flows also declined. 'Home bias' reemerged on private and sovereign debt markets, particularly in the periphery countries badly affected by the crisis (Battistini et al., 2013). Inter-bank markets effectively dried up and banks

reduced their cross-border exposures in favor of domestic assets, increasingly sovereign debt (Reichlin, 2013). The full light line in Graph 3 shows that much of the flows during this turbulent period actually were withdrawals (negative entries in the underlying matrix of gross flows) of funds from other euro area countries. The situation further worsened during the euro area 'sovereign crisis' from 2010 onwards, and, in particular, the periphery countries effectively faced a 'sudden stop' of private financial flows. A complete shutdown of financing was, however, prevented through a substitution of private flows by the ECB-mediated funding, which was reflected in increasing TARGET2 balances, liquidity injections to banks through the ECB's Securities Market Programme and the financial assistance from EU- and IMF-sponsored programmes.

Graph 3: Gross financial flows within the euro area: private vs. official flows



The graph shows the sum of (absolute value of) bilateral gross financial flows within the euro area. Source: Authors' calculations.

4.2. Bilateral financial flows and external imbalances in the euro area

The surge in gross financial flows before the financial crisis coincided with the emergence of large net external imbalances. Graphs 4 and 5 show this pattern of financial flows from the euro area 'core' to the high-deficit countries in

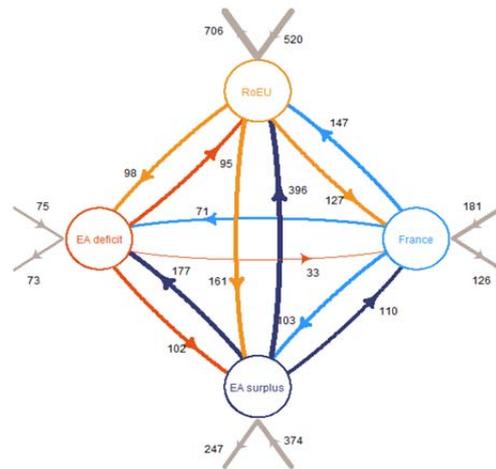
2004-06. ⁽²⁵⁾ The euro area surplus countries were the main financial partner of the deficits countries in terms of both gross as well as net financial flows. The flows into the periphery predominantly took the form of debt, mostly inter-bank loans or bonds, while deficit countries recorded modest net outflows of equity investment to surplus countries. The surplus countries' net financial flows to the group of deficit countries amounted to around EUR 80 bn annually, corresponding to two-thirds of the latter's current account balance. The most important bilateral financial relationship in the euro area, in the years preceding the crisis, was that between Germany and Spain, the two countries with the largest surplus and deficit in nominal terms respectively (Table A.2 in the annex). ⁽²⁶⁾

Deficits in the euro area's periphery were thus almost entirely financed from the rest of the euro area. Net inflows from the rest of the EU financed a rather small share of the euro area periphery's deficits, while the deficit countries actually were net investors in non-EU countries. The euro area core countries financed the periphery deficits with their own savings, but also intermediated financial flows from the rest of the world. This is particularly apparent for France, whose financial system received net inflows from the rest of the world and non-euro area Member States and channeled them to the deficit countries. The net flows from France to the euro area periphery amounted to roughly EUR 40 bn annually.

⁽²⁵⁾ The flowcharts in the paper show the financial flows among several regions in the EU, and with the rest of the world (the outside arrows). The direction of arrows shows the direction of the gross flows or the net balance. The regions cover the euro area surplus countries (EA surplus), i.e., Belgium, Germany, Luxembourg, the Netherlands, Austria and Finland; the euro area peripheral countries except for Ireland (EA deficit), i.e., Greece, Italy, Portugal and Spain; the remaining EU countries (RoEU), i.e., Denmark, Sweden, the UK, Ireland and countries which joined the EU since 2004; and France, which is considered separately because it is an important intermediary of financial flows to the periphery and has been both a surplus and deficit country during the last decade. Note that for the purpose of these flowcharts, Ireland is assigned to the non-euro area countries, as its important role for offshore transactions with the UK and several surplus countries alter the aggregate relationship with 'deficit countries' significantly.

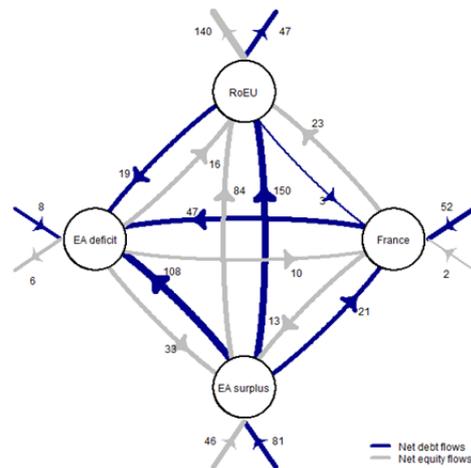
⁽²⁶⁾ This abstracts from financial flows with Luxembourg, which is very specific as a financial centre.

Graph 4: Gross financial flows (average 2004-06, EUR bn)



Financial flows cover direct investment, portfolio investment and other investment.
 Source: Authors' calculations.

Graph 5: Net debt and net equity Flows (average 2004-06, EUR bn)



Debt flows include portfolio debt and other investment; equity flows include portfolio equity and direct investment.
 Source: Authors' calculations.

Some of the surplus countries, in particular Germany, played a similar role. Chen et al. (2012) see this as a manifestation of the fact that while euro area investors considered financial assets of different euro area countries as close substitutes, external investors did not. In a similar vein, Hale and Obstfeld (2014) conjecture that banks in the

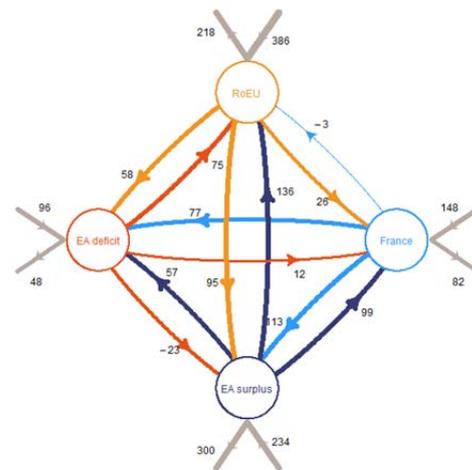
euro area core had a comparative advantage in investing in the periphery compared to banks from outside of the euro area. Liquidity considerations, regulatory requirements (in terms of rating, currency, and liquidity of investment instruments) for both euro area and non-euro area investors, and the ECB's collateral rules might provide part of the explanation why this was the case.

The surplus countries as a group also provided strong net financial outflows to non-euro countries. Inside the EU, these flows were clearly dominated by net investments going to the UK, mainly in debt instruments. Flows to the Eastern EU members were large too, but predominantly took the form of FDI. This was particularly the case for financial flows out of Germany. The surplus countries also maintained close financial relations with non-EU countries. Portfolio equity accounted for a somewhat larger portion of the inflows from the non-EU countries. This stems from the scale of stock markets in the surplus countries and the attractiveness of their companies to foreign investors. An important share of foreign capital likely came from foreign central banks buying highly rated sovereign bonds of the core euro area countries. Within the euro area, the 2004-06 period shows gross outflows from Germany and the Benelux that exceed their inflows by a wide margin and are mainly directed towards the euro area and the UK. France was the largest euro area recipient of inflows from the UK, Benelux, and the rest of the world, while it was one of the largest financiers of the Southern euro area countries.

The crisis radically changed the pattern of bilateral financial flows, with regard to both their intensity and direction. It led to a dramatic collapse in cross-border financial flows worldwide. The impact was particularly strong at the nadir of the crisis in 2008/09. The euro area countries with developed and highly integrated financial markets, relying mostly on banking flows, were among the hardest hit (Milesi-Ferretti and Tille, 2011). This can be seen in Graphs 6 and 7, which show total gross investment flows in the periods 2007-9 and 2010-12. In fact, many of the bilateral gross flows reverted, i.e. countries were selling foreign assets they had previously acquired as means to generate

liquidity.⁽²⁷⁾ This naturally affected mostly those periphery countries with high levels of indebtedness, whose sustainability or solvency was questioned by the markets during the euro area 'sovereign' crisis. However, also the surplus countries experienced significant retrenchments in international financial inflows.

Graph 6: Gross financial flows (average 2007-09, EUR bn)

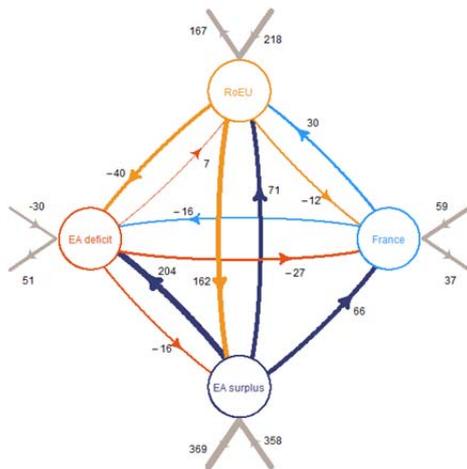


Financial flows include direct investment, portfolio investment and other investment.

Source: Authors' calculations.

⁽²⁷⁾ Here, negative gross investment flows denote flows that lead to a decrease in an outstanding aggregate position. Technically, this can reflect the sale of foreign assets, but also their non-rollover.

Graph 7: Gross financial flows (average 2010-2012, EUR bn)



(1) Financial flows include direct investment, portfolio investment and other investment.
 Source: Authors' calculations.

The net flows to the deficit countries did not substantially change their overall size in the early years after the onset of the crisis, i.e., the current/financial account deficits initially remained in place. However, their geographical composition changed rather significantly. The net inflows in the periphery were to a higher extent routed through France, particularly after 2009, which thus compensated for the drop in funding coming from the surplus countries, most notably Germany (Graph 6). This could possibly reflect the differences between these countries' financial exposures at the beginning of the crisis. The German banks had comparatively larger exposures to the U.S. mortgage-backed securities market, where they suffered substantial losses in 2007/8. On the other hand, the high exposure of the French banking system in the euro area periphery provided incentives to continue refinancing these loans so as to help prevent collapse of these economies, which would lead to considerably higher losses. For example, just before the start of the euro area sovereign crisis, among all countries, France had the highest exposures in Italy, Spain and Greece and the second highest in Portugal. However, following the escalation of the euro area sovereign debt crisis, French banks came under renewed pressure because of their exposure to, particularly, Italian sovereign debt. To ensure their short-run funding needs, they had to reduce quite

hastily their exposure in the euro area periphery (Graph 7). Consequently, net flows of private capital reverted as a result of capital flight and risk aversion. On the other hand, the withdrawal of funds from abroad by the deficit countries and later on the replacement of private flows by intra-Eurosystem claims helped to mitigate the shock and make the external adjustment less abrupt. ⁽²⁸⁾

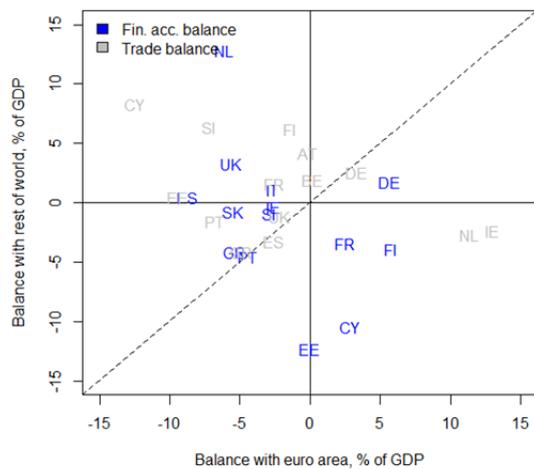
4.3. Trade, financial flows and current accounts

The previous sections documented that deficits of some of the euro area members were almost exclusively financed from surpluses in others. This raises a question whether the pattern of bilateral financial flows in the euro area contributed to the accumulation of imbalances. A priori, it is not possible to establish a direct link between bilateral financial flows and the total external financial balance (and thus the current account balance). Under efficiently working financial markets, any savings-investment gap in a deficit country can be financed under the same conditions irrespective of the source of financing. However, the presence of a financial 'euro bias' could make the total balances of its members depend more on credit supply and demand within the euro area than outside. A competing but not necessarily exclusive interpretation of the emergence of external imbalances in the euro area emphasizes the impact of excessive real appreciations on trade performance. Behind this stand the (overly optimistic) expectations of income convergence in the periphery countries, further stimulated by the reductions in financing costs, which resulted in domestic credit booms, reallocation of resources towards non-tradable sectors (e.g. housing and construction), and increased price and cost pressures (see Chen et al., 2013, for a discussion). An examination of the bilateral trade and financial balances may provide some initial hints as to the relative role of financial and trade interlinkages in shaping the imbalances in the euro area. In this respect, Chen et al. (2013) point out that, in addition to the intra-euro area factors, external

⁽²⁸⁾ This stands in a rather stark contrast with financial flows to other EU deficit countries, which were not members of the euro area. Most prominently, the Baltics experienced a true sudden stop which initiated drastic adjustment as a result of which the current account deficits of these countries sharply narrowed.

trade shocks had a differentiated impact on euro area economies and their external trade positions. This contrasted with the pattern of financial flows dominated by the core-periphery nexus.

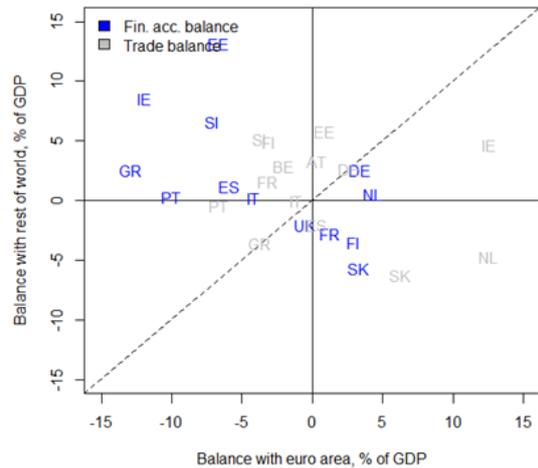
Graph 8: Balances with the euro area and RoW as % of GDP, average 2005-07



Source: Authors' calculations, and Eurostat.

Graphs 8 and 9 decompose the total financial account balance and the trade balance as % of GDP into bilateral balances with the euro area (horizontal axis) and the rest of the world (vertical axis) for a number of countries before and during the crisis. For each country, the blue label represents the financial account balance with the euro area (horizontal axis) and the rest of the world (vertical axis). The grey label shows the same for trade balances. Adding up the coordinates on the vertical and on the horizontal axis therefore yields the total financial account balance (and thus the current account balance) for each country as % of GDP. The upward sloping 45 degree line shows the locus of points where the bilateral balance with the euro area is equal to that with the rest of the world.

Graph 9: Balances with the euro area and RoW as % of GDP, average 2009-10



Source: Authors' calculations, and Eurostat.

They show that the geographical patterns of trade and financial balances of euro area countries indeed differ significantly and in many cases individual countries are not even located in the same quadrant. For instance, before the crisis (Graph 8) France recorded a trade deficit with the euro area and a mild surplus with the rest of the world. But the financial account balances showed an opposite pattern: it was a net capital exporter to the euro area and a net importer from the rest of the world. In contrast, Germany recorded trade and financial surpluses with both the euro area as well as the rest of the world, but its net financial exports were considerably higher with the euro area, particularly the periphery. On the other hand, the Netherlands and the UK were net borrowers from the euro area but net lenders to the outside world (mainly via offshore centers). Among the deficit countries, the net financing of Spain and Italy almost exclusively came from the euro area, while they ran trade deficits of similar size both with the euro area and the rest of the world.

The lack of overlap between financial and trade balances held also after the onset of the crisis (Graph 9). The geographical pattern of trade balances did not change fundamentally in comparison to the pre-crisis period particularly for larger countries, which is not surprising due to the complex and rather stable nature of modern supply chains. The bilateral financial balances changed considerably more. For example, the deficit

countries still ran large current account deficits, but had to shift their financing sources. Most of them served as net lenders to the rest of world, while they borrowed heavily from the euro area (i.e. refinancing liabilities toward non-euro lenders with liabilities toward the euro area). Interestingly, the major offsetting move was to be found in the Netherlands, whose entire surplus served now to finance the euro area. In contrast, German net capital outflows became more balanced between the euro area and the rest of the world.

For a broad sample of 40 countries over 2001-12, bilateral trade and financial balances are not statistically associated: the correlation coefficient between the geographical components of these balances (expressed as % of GDP) is close to zero (0.002). The same applies just for the EU (0.013). Bilateral net trade thus does not provide a good indication of net bilateral financial flows. Looking at the geographical patterns of trade and capital exports (as % of GDP) in the broad sample and the EU, the correlation coefficients are 0.27 and 0.31 respectively, i.e., statistically significant but rather small. In the absence of similarity between the bilateral trade and financial flows, it is the latter that appear to be more aligned with the pattern of current account balances in the euro area.

To see whether there is a statistical relationship among current account balances associated with the geographical patterns of trade or financial links, we compute the spatial correlation coefficients (Moran's I) using as distance matrices the trade interlinkages as well as financial flows respectively. To account for the possibility that spatial correlations could tend to pick up the uneven distribution of fundamental factors driving current account imbalances during the last decade, we apply the same spatial autocorrelation estimator to the residuals from a regression of current account balances on their determinants.⁽²⁹⁾ Table 1 presents the results for a broad sample of 37 countries over the period 1999-2010 which show that there is a positive and strongly significant

correlation between current account balances and both trade and financial flows. This would imply that countries are more likely to run a current account surplus if their trade or financial partners run a surplus, and vice versa for deficits. However, the spatial correlation coefficient becomes insignificant for trade linkages when the residuals for a current account regression are used. This finding indicates that any positive spatial correlation of unadjusted current account balances along trade links is mainly reflecting secular trends in the underlying current account determinants. In contrast, the spatial correlation of current account residuals is significantly negative along financial links. This implies that on top of the effects of current account determinants captured in the underlying regression, the variation in current account balances is also influenced by spillovers along financial links. The negative coefficient means that a country is more likely to run a deficit if its financial partners run a surplus, and vice versa. This result holds both for the whole sample as well as the sub-sample of euro area countries.

Table 1: Spatial Correlation along Financial and Trade Linkages

	Trade linkages	Financial linkages
Current account balances	0.11***	0.06***
Residuals from a current account regression	0.02	-0.05*

(1) This table shows spatial correlations (Moran's I) for pooled annual data 1999-2010 for 37 countries along matrices of trade weights and financial weights respectively. The first row presents the spatial correlation of current account balances as % of GDP. The second row shows the correlation of residuals from a regression of current account balances on their determinants based on the IMF (2013) approach (estimated via OLS). 'Trade linkages' are represented by a distance matrix that uses, for each country, the share of goods and services imports from each partner (with row sums equal to one) averaged over the preceding three years. Data sources for trade flows are UN COMTRADE and UN service trade database. 'Financial weights' matrix uses, for each country, the share of gross financial inflows from each partner averaged over the preceding three years (for 1999-2004, the average of financial weights in 2001-2003 is used). ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Source: Authors' calculations.

⁽²⁹⁾ IMF (2013) represents a recent such estimation, and succeeds in explaining a high share of current account variation by the regressors in its data set. We therefore use the residuals from the original IMF (2013) dataset to construct a set of current account balances adjusted for 'fundamental' factors (such as demography) and temporary variables (such as output gaps) over the period 2001-2010.

5. CONCLUSION

We have constructed a new consistent dataset of bilateral financial stocks and flows covering the period 2001-12 that focuses on euro area countries

and their main partners. In particular, we propose an approach to disentangle the underlying transactions, i.e., the financial flows, from the valuation effects on the outstanding stocks of foreign assets and liabilities. Our dataset can be used for a number of analytical purposes. This matters, *inter alia*, for analysing cross-border spillovers among economies. Common modelling approaches typically rely on the bilateral trade data as a main transmission channel of spillover effects. For example, the literature on global VAR models has widely used the weight matrices based on trade flows to estimate the cross-border transmission of shocks. Our results show that financial interlinkages may play even more prominent role in transmitting shocks and data on bilateral financial flows could be more appropriate in this respect.⁽³⁰⁾

⁽³⁰⁾ Some authors have considered both trade and financial links (e.g., Chudik and Fratzscher, 2011), but only used matrices of financial links that covered specific financial instruments, such as BIS bank exposures (which are heavily offset by TARGET2).

ANNEX

Table A.1: Countries and country groups used in the tables

Country group	Entity	Description
Euro area (17 members)	Germany	Germany
	Greece	Greece
	Spain	Spain
	France	France (including overseas departments)
	Italy	Italy
	Austria	Austria
	Portugal	Portugal
	Benelux	Belgium, Netherlands and Luxembourg
	Rest euro area	Ireland, Finland, Slovenia, Cyprus, Malta, Slovakia, Estonia
Non-euro area EU	Poland	Poland
	Sweden	Sweden
	United Kingdom	United Kingdom
	Rest of EU-27	Bulgaria, Czech Rep., Denmark, Hungary, Latvia, Lithuania, Romania
	<i>ROW (non EU)</i>	<i>Non-EU-27 countries and territories</i>
Non-EU OECD members	USA	USA (includes Virgin Islands and Puerto Rico)
	Japan	Japan
	Switzerland	Switzerland
	Rest of OECD	Remaining OECD members as of 2012
Others	OFFSHORE	Bahamas, Bahrain, Barbados, Bermuda, Cayman Islands, Gibraltar, Guernsey, Isle of Man, Jersey, Lebanon, Liechtenstein, Macao, Mauritius, Former Dutch Antilles (Aruba, Bonaire, Curacao, Sint Maarten), Panama, and 'British West Indies' (Anguilla, Antigua & Barbuda, British Virgin islands, Montserrat, Saint Kitts & Nevis)
	Hong Kong	Hong Kong
	Rest of World	All other countries. Includes foreign-exchange reserves by all central banks, including those of the countries mentioned above (which is particularly relevant for Japan and Switzerland).
	Total	Total outflows/inflows according to balance of payments

Table A.2: Estimated gross financial flows, average 2004-2006, EUR bn

from \ to	Germany	Greece	Spain	France	Italy	Austria	Portugal	Benelux	Rest of EA	Poland	Sweden	UK	Rest of EU	Non-EU	USA	Japan	Switzerland	Rest OECD	OFFSHORE	Hong Kong	ROW	Total
Germany	-	3	41	27	23	20	5	56	38	4	4	84	15	61	29	-5	12	15	18	1	-11	382
Greece	1	-	0	0	0	0	0	2	1	0	0	7	1	9	1	0	0	1	1	0	6	20
Spain	2	0	-	16	7	3	5	23	5	1	0	34	4	54	8	0	1	6	-2	0	40	154
France	27	4	29	-	35	7	3	69	45	1	1	95	5	126	43	11	13	13	32	-1	13	445
Italy	20	3	8	15	-	6	1	39	8	1	-1	30	1	5	-10	-3	-1	1	5	-1	9	131
Austria	13	1	2	3	5	-	0	6	9	2	0	4	11	15	1	0	1	2	4	0	3	68
Portugal	1	1	4	2	0	0	-	4	1	0	0	2	0	5	1	0	0	1	1	0	2	21
Benelux	48	9	43	78	38	9	4	-	47	6	4	155	6	167	100	14	14	36	38	3	-46	602
Rest euro area	20	3	17	15	24	3	9	25	-	2	6	67	7	110	51	11	0	13	25	1	9	308
Poland	1	0	0	1	0	1	0	2	0	-	0	1	1	4	0	0	1	0	0	0	2	11
Sweden	6	0	2	2	0	0	0	6	13	0	-	12	7	16	5	1	0	10	6	0	-7	63
United Kingdom	24	3	41	110	1	2	-3	64	64	2	7	-	14	562	228	59	35	53	102	9	69	884
Rest of EU-27	7	0	1	3	1	1	1	2	3	0	6	16	-	17	16	1	-14	4	2	0	7	57
ROW (non EU)	72	7	27	181	33	17	8	275	78	1	12	431	9	-	816	80	-4	165	19	61	0	2287
USA	-6	1	8	68	9	4	-1	40	30	2	8	156	-2	427	-	64	16	75	202	8	56	738
Japan	5	1	2	18	1	0	0	21	2	1	-1	36	1	130	44	-	1	12	82	2	-18	212
Switzerland	9	1	0	9	1	2	0	4	4	0	0	60	2	24	-1	5	-	8	60	0	-53	111
Rest of OECD	16	2	4	11	3	1	1	26	9	0	2	26	4	178	82	4	5	-	-7	2	73	262
OFFSHORE	7	0	-18	29	-1	2	4	29	9	0	5	90	0	-10	173	4	23	9	-	16	-58	323
Hong Kong	0	0	0	2	0	0	0	7	2	0	0	10	0	71	6	-2	2	12	64	-	-11	94
Rest of World	9	1	23	40	14	4	2	134	15	-2	-4	19	4	0	443	-11	-56	21	-6	31	-	682
Total	211	33	209	447	162	66	32	559	305	20	39	904	82	1973	1219	155	51	290	627	71	87	

(1) Estimated gross flows (net asset acquisitions) of direct, portfolio and 'other' investment (excluding financial derivatives). Note that asset acquisitions by all central banks are comprised within 'Rest of World'. The net financial flows between countries may be derived by subtracting the transpose of this matrix. For a description of country groups, refer to Table A.1. *Source:* Authors' calculations.

Table A.3: Estimated gross financial flows, average 2007-2009, EUR bn

from \ to	Germany	Greece	Spain	France	Italy	Austria	Portugal	Benelux	Rest of EU	Poland	Sweden	UK	Rest of EU	Non-EU	USA	Japan	Switzerland	Rest OECD	OFFSHORE	Hong Kong	ROW	Total
Germany	-	13	16	49	-4	6	5	75	51	6	7	-18	11	63	18	-1	-8	6	5	3	33	272
Greece	-2	-	0	-1	0	0	0	5	13	0	0	14	2	3	0	0	0	1	1	0	0	33
Spain	-2	1	-	3	8	0	4	1	-2	0	1	16	2	34	10	-1	1	9	0	1	12	66
France	24	12	26	-	30	7	9	79	-10	3	4	-7	9	82	7	4	-2	6	-5	8	59	263
Italy	-6	1	14	10	-	8	2	-26	10	0	0	7	2	8	-1	-2	-7	0	-6	1	27	34
Austria	-2	0	0	1	0	-	0	-1	5	1	0	-4	13	25	1	0	1	2	-2	0	19	35
Portugal	-2	1	3	0	0	0	-	1	7	0	0	2	0	3	0	0	0	0	-1	0	3	15
Benelux	3	5	20	48	-4	1	5	-	20	4	10	12	8	199	68	-9	0	23	20	9	74	318
Rest euro area	7	9	0	13	3	0	8	17	-	2	8	56	9	65	28	-1	-1	9	-2	0	30	196
Poland	0	0	0	0	0	0	0	1	0	-	0	0	0	2	0	0	1	1	0	0	1	3
Sweden	1	0	0	0	0	0	0	6	8	1	-	1	6	31	5	-1	3	7	-2	0	19	53
United Kingdom	11	1	32	7	3	-3	1	35	21	1	-1	-	1	110	45	-6	3	19	40	1	10	220
Rest of EU-27	6	1	0	5	0	2	0	4	7	1	5	-7	-	22	1	0	0	1	2	0	17	45
ROW (non EU)	92	18	48	148	33	7	-3	121	91	11	23	244	31	-	491	48	40	253	-3	71	0	1764
USA	14	1	8	18	4	-4	1	106	1	2	-5	37	4	93	-	5	7	79	88	8	-111	263
Japan	7	1	1	-5	2	0	1	-6	2	0	3	20	0	134	60	-	-1	31	-2	4	36	153
Switzerland	4	0	1	10	1	5	0	-34	6	1	3	6	8	20	10	-1	-	5	-39	1	45	32
Rest of OECD	1	-1	5	8	2	0	0	18	7	0	8	29	3	208	113	5	8	-	32	5	23	265
OFFSHORE	-12	1	-4	0	2	-1	-6	14	2	1	3	37	3	9	30	8	2	25	-	17	-24	99
Hong Kong	2	0	0	9	-1	0	0	0	4	0	0	9	0	64	6	1	1	6	38	-	9	83
Rest of World	50	15	29	68	17	6	-1	7	68	7	9	86	11	0	109	4	23	72	-21	39	-	598
Total	104	61	152	245	62	25	31	303	220	31	55	296	93	1176	508	6	28	300	147	96	282	

(1) Estimated gross flows (net asset acquisitions) of direct, portfolio and 'other' investment (excluding financial derivatives). Note that asset acquisitions by all central banks are comprised within 'Rest of World'. The net financial flows between countries may be derived by subtracting the transpose of this matrix. For a description of country groups, refer to Table A.1. **Source:** Authors' calculations.

Table A.4: Estimated gross financial flows, average 2010-2012, EUR bn

<i>from \ to</i>	Germany	Greece	Spain	France	Italy	Austria	Portugal	Benelux	Rest of EA	Poland	Sweden	UK	Rest of EU	Non-EU	USA	Japan	Switzerland	Rest OECD	OFFSHORE	Hong Kong	ROW	Total
Germany	-	23	51	41	72	14	7	26	-19	6	4	16	-4	70	-2	0	5	14	-2	-1	41	292
Greece	1	-	1	0	1	0	0	16	-8	0	0	-8	-1	5	-2	0	0	1	-2	0	9	7
Spain	-5	7	-	-16	-4	-1	-1	-18	4	2	-1	10	-2	36	-4	0	0	2	-6	0	32	-2
France	-30	-2	-9	-	4	-1	-8	34	-1	1	2	28	-2	37	6	2	1	-1	-20	-4	46	43
Italy	-8	6	-2	-8	-	-1	-1	4	5	1	-1	9	0	8	-13	0	0	2	0	0	20	13
Austria	-2	0	1	1	2	-	0	1	-4	1	0	-1	-2	12	-1	0	1	3	0	0	9	8
Portugal	-2	0	0	-3	1	0	-	1	-8	0	0	4	0	2	-1	0	0	0	-4	0	7	-6
Benelux	47	5	25	23	-2	3	3	-	23	3	9	29	1	278	76	-2	7	39	38	6	102	435
Rest euro area	6	-1	1	0	1	0	-3	11	-	0	3	-21	4	64	17	1	-1	7	6	0	31	62
Poland	0	0	0	0	0	0	0	2	1	-	0	1	1	2	0	0	-1	0	0	0	2	6
Sweden	3	0	-1	1	0	0	0	14	14	1	-	0	2	23	3	0	1	10	2	0	6	57
United Kingdom	36	-14	1	-11	-9	0	1	48	0	2	-2	-	13	88	-48	30	-9	10	-12	5	100	141
Rest of EU-27	3	-1	0	0	1	0	0	11	4	1	0	9	-	-2	-2	-1	-1	-1	2	1	-2	24
ROW (non EU)	104	-1	-36	59	2	-6	5	243	78	12	19	110	16	-	675	182	63	346	35	143	0	2048
USA	13	0	-2	-12	4	-1	-1	84	21	3	9	51	2	169	-	68	-10	169	97	15	-186	325
Japan	-7	-2	-2	15	-3	0	-2	14	1	1	4	6	1	262	48	-	0	46	68	11	66	266
Switzerland	7	-1	0	-1	2	-12	0	-13	3	0	2	13	-2	37	17	-2	-	10	-27	3	34	30
Rest of OECD	9	0	4	8	2	1	0	36	10	1	0	8	2	223	106	7	1	-	1	3	72	268
OFFSHORE	0	0	-3	-17	-4	-1	-6	45	-9	1	-2	-43	3	30	-84	-11	-9	6	-	37	72	-23
Hong Kong	1	0	0	-7	0	0	0	6	-3	0	0	-16	0	168	-2	5	-3	-3	44	-	125	147
Rest of World	62	-3	-22	62	10	5	2	67	43	5	3	86	9	0	437	95	84	46	-12	70	-	1050
Total	133	17	44	75	78	5	-10	387	75	29	31	183	23	1512	552	191	65	361	174	146	586	

(1) Estimated gross flows (net asset acquisitions) of direct, portfolio and 'other' investment (excluding financial derivatives). Note that asset acquisitions by all central banks are comprised within 'Rest of World'. The net financial flows between countries may be derived by subtracting the transpose of this matrix. For a description of country groups, refer to Table A.1. **Source:** Authors' calculations.

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