Working Paper Series

Vincent Arthur Floreani and
Maurizio Michael Habib

Financial exposure to the euro
area before and after the crisis:
home bias and institutions at home

Abstract

This paper investigates whether global investors are over or under exposed towards the euro area and the role of home bias and institutions at home in shaping this exposure. According to a simple benchmark from standard portfolio theory, euro area investors - in particular those from euro area low-rating economies - are overexposed to euro area securities. Instead, investors outside the EU are underexposed to euro area securities in their total portfolio, proportionally to their degree of home bias, but not in their foreign portfolio. Nevertheless, once we account for gravity factors, the largest foreign investors overweigh euro area securities, especially debt of euro area high rating economies. Crucially, this overexposure was resilient to the euro area crisis. Moreover, we show that institutions at home are important to explain exposure to euro area securities. In particular, the higher the standards of governance at home, the greater the exposure to the euro area debt.

Non-technical summary

Are global investors over or under exposed towards the euro area? What is the role of the home bias - the tendency to hold a disproportionate share of domestic assets in the total portfolio of domestic investors - in shaping the exposure to euro area financial assets? What are the characteristics of the countries investing in the euro area? The purpose of this study is to answer these three important questions, documenting the evolution of home bias and exposure to the euro area of four groups of countries, disentangling as much as possible intra-euro area exposure from the exposure of foreign investors, and establishing a link between the institutional settings of the investor countries and their portfolio exposure to the euro area. Indeed, a number of studies have shown that the level of governance or financial development in an investor's home country can matter to explain foreign investment. There are two possible orders of explanation to include these determinants. First, foreign investors from countries with a lower level of institutional or financial development may attach greater value to investment in countries that have good institutions, e.g. stronger property rights and better information disclosure, or offer larger, more liquid and deep financial markets (Forbes, 2010). Second, there is an alternative potential relationship between institutions and foreign investment, based on the concept of "familiarity" (Huberman, 2001) or institutional distance. Similar institutions, by reducing the informational asymmetry between domestic and foreign investment, may foster stronger cross-border financial linkages (Abdioglu et al. 2013). This paper tests both these hypotheses for the euro area.

The answers to the questions raised by this paper are the following. First, according to a simple benchmark from standard portfolio theory, euro area investors are overexposed to euro area securities, whereas other EU investors are close to (above) that benchmark in their total (foreign) portfolio. Investigating euro area financial integration, we show that investors from euro area low-rating economies have generally a stronger *euro area bias* than investors from euro area high-rating economies; however, euro area high-rating economies are overexposed compared to other countries towards the debt - but not the equity - issued by euro area low-rating economies. Investors outside the EU are instead underexposed to euro area securities in their "total" portfolio of domestic and cross-border securities, proportionally to their degree of home bias. However, when focussing on the portfolio of "foreign" assets, foreign investors hold a share of euro area securities that is

close to the notional benchmark implied by standard finance theory. Once we account for the determinants of an international finance gravity model, we discover that the largest foreign, extra-EU, investors have a positive bias towards euro area securities, in particular debt securities issued by euro area high-rating economies.

Second, the analysis of the home bias is crucial to understand the overall exposure of countries in their portfolio of domestic and foreign securities. The institutional characteristics *at home* that explain the home bias across countries - e.g. higher GDP per capita, capital account openness – are also the same determinants of the financial exposure towards the euro area in the "total" portfolio of investors.

Third, our results show that, beyond traditional gravity variables (see Lane and Milesi-Ferretti 2005, Lane 2006, or De Santis and Gerard 2009), it is possible to establish a relationship between institutions at home and exposure to the euro area. In particular, countries that have a more open capital account and a higher degree of governance, but a lower degree of financial development, are more exposed to euro area securities, in particular securities issued by the high-rating economies until the onset of the crisis. The relationship is robust for the first two variables - capital account openness and governance - less robust for financial development.

Importantly, our evidence does not identify any remarkable decline in the financial exposure to the euro area between 2010 and 2012, with the exception of debt securities issued by low-rating economies. Despite rising financial volatility and the idiosyncratic shock to the euro area, several important categories of investors - from the euro area as well as from foreign countries with large financial positions - maintained their exposure towards euro area debt securities in line with the market share of euro area debt in global markets, in particular debt issued by euro area high-rating economies. Moreover, the positive relationship between governance at home and exposure to euro area debt tightened. Our results would suggest that, most likely, the safe haven attraction of the debt securities issued by euro area high-rating economies played an important role to explain the resilience of investors' appetite towards euro area securities.

1 Introduction

While economists have so far devoted large attention to the role of the United States as a major financial centre, creating those safe assets that are in high demand by risk averse investors, our understanding of the factors behind the financial exposure towards the euro area is more limited. Are global investors over or under exposed towards the euro area? What is the role of the home bias - the tendency to hold a disproportionate share of domestic assets in the total portfolio of domestic investors - in shaping the exposure to euro area financial assets? What are the characteristics of the countries investing in the euro area? The purpose of this study is to answer these three important questions, documenting the evolution of the home bias and the financial exposure to the euro area, disentangling as much as possible intra-euro area exposure from the exposure of foreign investors. In addition, we establish a link between the institutional settings of the investor countries and their portfolio exposure to the euro area. Indeed, a number of studies have shown that the level of governance or financial development in an investor's home country can matter to explain foreign investment. There are two possible orders of explanation to include these determinants. First, foreign investors from countries with a lower level of institutional or financial development may attach greater value to investment in countries that have good institutions, e.g. stronger property rights and better information disclosure, or offer larger, more liquid and deep financial markets (Forbes, 2010). Second, there is an alternative potential relationship between institutions and foreign investment, based on the concept of "familiarity" (Huberman, 2001) or institutional distance. Similar institutions, by reducing the informational asymmetry between domestic and foreign investment, may foster stronger cross-border financial linkages (Kim et al., 2011 and Abdioglu et al. 2013). This paper will test both these hypotheses.

In this paper, we provide the following answers to our three questions. First, we show that according to a simple benchmark from standard portfolio theory, euro area investors are overexposed to euro area securities and, in particular, investors from euro area low-rating economies have generally a stronger *euro area bias* than investors from euro area high-rating economies. Investors outside the EU are instead underexposed to euro area securities in their "total" portfolio of domestic and cross-border securities, but not far from a theoretical benchmark in their "foreign" portfolio, including only cross-border

holdings. Once we account for the determinants of an international finance gravity model, we discover that the largest foreign, extra-EU, investors have a positive bias towards euro area securities, in particular debt securities issued by euro area high-rating economies.

Second, the analysis of the home bias is crucial to understand the overall exposure of countries in their portfolio of domestic and foreign securities. The institutional characteristics *at home* that explain the home bias across countries - e.g. higher GDP per capita or capital account openness – are also the same determinants of the financial exposure towards the euro area in the "total" portfolio of investors.

Third, it is possible to establish a relationship between institutions *at home* and exposure to the euro area. The higher the governance at home, the greater the exposure to the euro area, in particular for debt portfolios and for countries with a level of governance below that of the euro area. Moreover, there is tentative evidence that countries with a lower degree of financial development tend to be more exposed to the euro area securities, in particular those of the high rating economies.

Finally, we show that the exposure towards the euro area has been remarkably stable since the onset of the euro area crisis in 2010. Despite rising financial volatility and the idiosyncratic shock to the euro area, several important categories of investors - from the euro area as well as from countries with large financial positions, a higher level of governance or financial development - maintained their exposure towards euro area debt securities in line with the market share of euro area debt in global markets, in particular debt issued by euro area high-rating economies. This a rather comforting result for the residents issuing securities in the second most important reserve currency.

The paper is structured as follows. In the next section we provide a review of the related literature. Section 3 introduces the basic concepts to measure financial exposure to the euro area and the underlying theory. Section 4 describes the data to support this analysis. Section 5 offers descriptive evidence regarding the financial exposure towards the euro area. Section 6 develops the empirical model. Section 7 discusses the results for equity portfolios and debt portfolios. Section 8 investigates the intra-euro area exposure and that of the largest foreign investors. Finally, Section 9 concludes.

2 Related literature

As the dust raised by the global financial crisis and the euro area crises started settling, researchers have begun investigating the link between the intra-euro area process of financial integration and the global one. The global financial crisis triggered a retrenchment in cross-border capital flows on a global scale (Milesi-Ferretti and Tille, 2011) and a setback in the process of financial integration within the euro area, which was accentuated by the specific idiosyncratic shock of the euro area crisis (ECB, 2012). This was not unusual; gross capital flows tend to re-trench in crisis periods, with both domestic investors shedding foreign assets and foreign investors selling domestic assets (Broner et al. 2011). There are indeed only a few exceptions to this trend (Habib and Stracca, 2013). Global and euro area financial integration were apparently interconnected. Hale and Obstfeld (2014) posit that the core euro area countries took on extra foreign leverage to expose themselves to the peripheral economies. Was this exposure excessive? Was it confined to some investors in particular? What role played the home bias in the asset allocation? In this paper, we want to answer these questions following the lead of a number of different, partly overlapping, strands of literature, which include: (i) studies of the determinants of home bias and, in particular the specific role of informational asymmetries; and (ii) the transposition of these analyses in empirical international finance gravity models with a particular focus on the study of financial integration process of the euro area and the role of institutions in determining the pattern of foreign investment.

Home bias is the general tendency to hold a disproportionate share of wealth in domestic asset; a share larger than the one suggested by standard portfolio theory, namely the Solnik (1974) International Capital Asset Price Model (ICAPM). Informational asymmetries between domestic and foreign investors have been identified in the economic literature as one of the main explanations of the home bias.[1] The basic assumption is that domestic investors may obtain a more precise signal regarding domestic fundamentals and expected returns compared to foreign investors (Gehrig 1993, Brennan and Cao 1997 or Tille and van Wincoop 2009) and this may offer greater incentives to specialise in domestic assets (Van Niewenburg and Veldkamp 2009 and Mondria and Wu 2010). In international finance gravity models, bilateral cross-border financial positions are explained by variables

---

[1]See Coeurdacier and Rey (2012) for a review of the literature on home bias.

proxying for these informational frictions, such as physical distance (Portes and Rey, 2005), common language, legal origin and, in particular, trade (Aviat and Coeurdacier 2007 and Lane and Milesi-Ferretti 2008).[2]

The inclusion of gravity variables provides a good picture of cross-border financial positions on a global scale, even though it falls short to explain the higher degree of integration of financial markets among euro area economies. Even accounting for the greater degree of trade integration and lower distance among euro area economies, there is still an *euro area bias* - a stronger preference for euro area securities relative to other securities - in the portfolio of euro area residents (Lane and Milesi-Ferretti 2005, Lane 2006, Berkel 2007, De Santis and Gerard 2009). This *euro area bias* has been tentatively explained by the decline in default risk and transaction costs (Balli et al. 2010), but can also be more naturally linked to the decline in real exchange rate volatility among EMU economies.[3]

The presence of an euro area bias suggests that not only physical distance is important, but also other factors could play a role in accounting for bilateral financial asset holdings: institutional quality and institutional distance. Countries with deeper, more liquid and better regulated financial markets may attract more foreign investors. Regulations, accounting standards, rule of law, absence of corruption are all factors that raise the transparency of financial information and reduce informational asymmetries across countries. Ahearne et al. (2004) offer an excellent example of how institutions may reduce information asymmetries. They show that the portion of a country's market that has a public listing in the US is a major positive determinant of a country's weight in US investors' portfolios.

Nevertheless, it remains an open issue in this literature whether it is the relative level of the institutional quality across countries ("comparative advantage" hypothesis) that matters for bilateral financial positions or it is their similarity (*familiarity* hypothesis). On the one hand, Forbes (2010) provides evidence that the exposure of foreign investors into the United States is inversely related to the degree of financial development in the investor's home country; an indirect confirmation of the special role of the United States

---

[2]Martin and Rey (2004) and Okawa and van Wincoop (2012) provide general theoretical frameworks that produce a gravity form specification of bilateral financial holdings.

[3]Indeed, on a more global scale, Fidora et al. (2007) show that real exchange rate volatility is an important factor behind bilateral portfolio home bias.

in supplying safe financial assets, especially for emerging markets (Caballero 2006 and Caballero et al. 2008).[4] This is also in line with the findings of Berkel (2007) who shows that the degree of equity market development in the host economies has a positive impact on foreign portfolio shares. Similarly, Salins and Bénassy-Quéré (2006) show that a set of institutional variables in the host economies have a statistical significant impact in explaining bilateral asset holdings. Ahrend and Schwellnus (2012) also find that the institutional quality in the "host" country is associated with greater financial exposure towards that destination; whereas Forbes (2010) finds that a positive impact of governance "at home" leads to greater investment in the United States.

On the other hand, a number of papers claim that "familiarity" (Huberman, 2001, Grinblatt and Keloharju, 2001 or Chan et al. 2005) is the driving force of bilateral asset positions. Regulatory differences have a strong negative impact on cross-country portfolio holdings in an international finance gravity model (Vlachos, 2004). Kim et al. (2011) show that investors from countries with better corporate governance dislike shares of Korean firms with poor governance, but this is not the case for investors from countries with poor governance. Likewise, extending this result to the United States, Abdioglu et al. (2013) find that investors from countries with governance setups similar to the United States have a positive bias towards this country. This also relates to the importance of cultural bias and bilateral trust in economic exchange, as shown by Guiso, Sapienza and Zingales (2009).

Our work is closely related to the papers by Forbes (2010), Hale and Obstfeld (2014) and Abdioglu et al. (2013) contributing to the growing literature on international finance gravity models in several different ways. First, it provides an in-depth analysis of financial portfolio exposure towards the euro area, distinguishing between exposure to high-rating economies and low-rating ones, using a sample that runs from 2001 to 2012 to account for potential differences between the pre-crisis and the crisis period. While other papers looked at the holdings of euro area investors, to our knowledge there is no such an analysis focusing on the euro area as a destination for global investors. Second, our work looks also at the determinants of home bias and stresses how these drivers may influence the results regarding the "total" financial exposure - the one related to the total portfolio of domestic and foreign assets of global investors - towards the euro area. Third, it investigates whether

---

[4]This evidence is contested by Ahrend and Schwellnuss (2012) on a multilateral basis.

the degree of financial development or the quality of institutions at home – i.e. in the investor economies – matter for the exposure towards the euro area, testing whether the relative level of these variable (*comparative advantage* hypothesis) or the institutional distance (*familiarity* hypothesis) have an impact. Finally, the paper investigates euro area financial integration and the exposure of the largest foreign investors towards the euro area before and after the crisis. Differently from Hale and Obstfeld (2014), our focus is on portfolio securities. We do not simply track the share of holdings in foreign portfolios, but we exploit our finance gravity model to understand deviations from a notional portfolio allocation that accounts for valuation effects.

3 Measuring financial over or under exposure towards the euro area

Following Forbes (2010), the main objective of our investigation is to study the deviation of the exposure towards the euro area in the actual portfolio of different countries from the notional share of euro area securities that would be held according to the International CAPM. If markets are efficient and there are no transaction costs and taxes, standard portfolio theory predicts that global investors with the same risk-return preferences should hold the same world market portfolio, a portfolio where the weight of each security is equal to its relative weight in the world market capitalisation. In this paper, we shall use the term *Total Bias* to denote the deviation of the actual total portfolio of domestic and foreign assets from the ICAPM benchmark. In particular, for each investor country i and each asset class j (equity and debt), the *Total Bias* towards the Euro Area (EA) at time t, TB_{ijt}^{EA}, is equal to:

$$TB_{ijt}^{EA} = \left(\frac{I_{ijt}^{EA}/T_{ijt}}{MC_{jt}^{EA}/MC_{jt}^{W}} \right) \tag{1}$$

where I_{ij}^{EA} is the investment by the investor country i in the security j issued by a euro area resident; T_{ij} is the total (domestic and foreign) portfolio in the asset class j of the investor country i; MC_j^{EA} is the market capitalisation of the euro area for the asset class j and, finally, MC_j^W is the world market capitalisation in the same segment.

When this ratio is greater (smaller) than 1, the total portfolio of country i is over-

(under-) weighing the securities j issued by euro area residents according to the ICAPM metric. In general, this ratio is smaller than 1, due to the presence of the home bias in the asset allocation of domestic investors. To see this, equation (1) may be further decomposed into:

(i) a *Foreign Bias* (FB_i): the propensity to hold a greater or smaller share of foreign securities in the *total* (domestic plus foreign) portfolio of country i compared to the notional share implied by the International CAPM, where the term *foreign* identifies the total cross-border portfolio investment of country i in equity or debt (see first term in the right hand-side of equation (2) below); and

(ii) a *euro area Country Bias in the foreign portfolio* (CB_i^{EA}): the propensity to hold a greater or smaller share of euro area securities in the *foreign* portfolio of country i compared to the notional share implied by the International CAPM (see second term in the right hand-side of equation (2));

$$TotalBias(TB_i^{EA}) = ForeignBias(FB_i) * CountryBias(CB_i^{EA})$$

$$\left(\frac{I_i^{EA}/T_i}{MC^{EA}/MC^W} \right) = \left(\frac{F_i/T_i}{MC_i^F/MC^W} \right) * \left(\frac{I_i^{EA}/F_i}{MC^{EA}/MC^F} \right) \tag{2}$$

where we simplified the notation omitting the time t and asset class j subscripts, F_i is the foreign investment of country i and MC_i^F is the market capitalisation of the rest of the world for the investor country i. It should be noted that the *Foreign Bias* is specific to each investor country and does not include any particular euro area variable. The *Foreign Bias* is usually smaller than 1 due to the preference of domestic investors to hold a disproportionate large share of domestic securities compared to the notional ICAPM allocation (home bias), underweighting foreign assets.[5]

(Figures 1 and 2 here)

Figures 1 and 2 compare the average degree of *Foreign Bias* - for equity and debt, respectively - for four groups of countries since 2001: the 12 euro area countries having

---

[5]Note that in the international finance literature, the Home Bias of country i (HB_i) is defined as the the opposite of the the foreign bias: $HB_i = 1 - FB_i$.

already adopted the euro in 2001 (EA12), the other EU countries, a sample of advanced economies and of emerging markets outside the EU (see Table A.2 in appendix for the list of countries). For both equity and debt, the euro area is the group of countries with the highest *Foreign Bias*, hovering around 0.5-0.6; other EU and advanced economies have on average a similar degree of *Foreign Bias*, ranging between 0.3 and 0.4, slightly below that of the EA12 countries; finally, emerging markets have the lowest level of *Foreign Bias*, about 0.1. Therefore, even if the country i has a neutral exposure towards the euro area in its portfolio of *foreign* securities ($CB_i^{EA} = 1$), the presence of the home bias (*Foreign Bias* less than one) implies that the country i is underweighting euro area assets in its *total* portfolio.[6]

4   Data

Cross-border positions. As in the majority of other international finance gravity studies, to construct our measures of financial exposure we use the IMF Coordinated Portfolio Investment Survey (CPIS), which provides the bilateral holdings of debt and equity of 80 investing countries into 245 territories from 2001 until 2012.[7]

Total portfolio and ICAPM benchmark. The total portfolio is the sum of foreign and domestic securities held by residents in the investor country i. The latter, the holding of domestic securities by domestic residents, is not directly available and is derived as the difference between the market capitalisation of country i and its foreign liabilities.[8] Foreign assets and liabilities are obtained from the IMF Balance of Payment

---

[6]Interestingly, since the onset of the global financial crisis, the foreign bias has generally continued to increase in the case of equity and has remained stable for debt, with the exception of the euro area countries. Therefore, it looks like that the global financial crisis exacted the highest toll in terms of financial integration among euro economies, not worldwide.

[7]As noted by Lane and Milesi-Ferretti (2008), this dataset presents several shortcomings. First, the survey only includes private investments and, therefore, does not cover sovereign or central banks holdings. Second, no breakdown is available in terms of sectors or currencies. Third, several major foreign investors do not report their data in the IMF survey (e.g. China and Gulf countries). Fourth, the residence principle adopted to determine investments' destinations may involve third party distortions, especially for financial centres (Felettigh and Monti, 2008 and Zucman, 2013). Such shortcomings call for a careful use of the data. Thus, we exclude investor countries whose cross-border holdings are too concentrated (less than 20 destination countries or a single destination accounting for more than 90% of the total foreign portfolio) or too small (less than USD 1 bn). In addition, in our quantitative analysis, small financial centres are dropped from the sample. See Table A.2 in the appendix.

[8]For a small number of financial centres (e.g. Luxembourg and Ireland), this estimate is problematic

Statistics for International Investment Positions. Data for market capitalisation are from the World Bank for equity (World Development Indicators) and the BIS for debt (Debt Securities Statistics).[9] Data for equity market capitalisation are at market value and include valuation effects, whereas for debt are at nominal value. Data for equity have been cross-checked with other sources such as as Thomson-Reuters/Datastream.

Euro area groups. We consider three different partitions of the euro area. The benchmark group is the Euro Area 12 (EA12), including the euro area countries that had already adopted the euro at the beginning of our sample in 2001. Moreover, we exclude the two major financial centres, Ireland and Luxembourg, and divide the remaining countries in two subgroups: the euro area high-rating economies (Austria, Belgium, Finland, France, Germany, and Netherlands) and the low-rating economies (Greece, Italy, Portugal, and Spain). To calculate the various measures of bias, we aggregate portfolio holdings into and market capitalisations of the various euro area countries.[10]

Determinants of financial exposure. Deviations of bilateral asset holdings from the ICAPM benchmark will be related to a number of explanatory variables. These include: *bilateral trade*, measured as the logarithm of the bilateral imports and exports between investor country i and the euro area, obtained from the IMF Direction of Trade Statistics; *bilateral distance*, measured as the logarithm of distance in miles between the capital of country i and the capital of the closest euro area country, which was taken from the CEPII distance database; *governance*, the average of four indices from the World Bank Worldwide Governance Indicators database (government effectiveness, regulatory quality, rule of law and control of corruption), where a higher value of the index indicates better governance; *financial development*, the first standardized principal component of

---

as the reported foreign liabilities may be larger than the data for market capitalisation. For this reason, these observations have been dropped when calculating the *Foreign Bias* and the *Total Bias*.

[9]The World Bank WDI equity market capitalisation is computed as the share price times the number of shares outstanding of listed companies. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year, excluding investment companies, mutual funds, or other collective investment vehicles. As regards debt market capitalisation, the source is Table 18 (total debt securities) of BIS debt securities statistics. For the countries not reported in Table 18, we used the sum of Table 11A (all international debt securities) and Table 16A (all domestic debt securities), only if both series were available. It is to be noted that BIS debt securities statistics are collected according to the issuer's residence criteria.

[10]For the euro area economies we adjust the individual country's market capitalisation excluding their own market capitalisation from the relative aggregates (e.g. excluding Germany's market capitalisation from the EA12 and EA high-rating aggregates when calculating the ICAPM benchmark for Germany).

three measures of depth and efficiency for equity and credit markets from the World Bank Global Financial Development Database (extending Cihák et al., 2012), including (i) the total value of stocks traded as a percentage of GDP, (ii) the total value of stocks traded over the average market capitalization (turnover ratio), and (iii) the domestic credit provided to the private sector by financial corporations as a share of GDP; *capital account openness*, using the Chinn-Ito financial openness index, which is based on the IMF Annual Reports on Exchange Arrangements and Exchange Restrictions; and the logarithm of US dollar *GDP per capita* from the IMF World Economic Outlook. Finally, we include also the *volatility of the nominal exchange rate* of the investor country *i against the euro* - the WM/Reuters spot rates downloaded from Datastream - calculated as the standard deviation of weekly returns in each calendar year. Table 1 shows the summary statistics for the main dependent variables and regressors, the latter measured relatively to the euro area (see next sections). Table A.1 in the appendix provides a more detailed overview of data construction and sources.

(Table 1 here)

5 The exposure towards the euro area

Having constructed the measures of exposure towards the euro area, we may answer the first question of our paper: are global investors over or under exposed towards the euro area?

Equity. We shall start from the analysis of equity portfolios. Figures 3 and 4 display the *Total Bias*, TB_i^{EA12}, and *Country Bias* in foreign portfolio, CB_i^{EA12}, towards the equity issued by EA12 residents. As in the case of the foreign bias, the figures show the average for four different groups: EA12, other EU economies, advanced economies and emerging markets outside the EU. The figures include also an horizontal line corresponding to the value 1 on the y axis: the benchmark when the share of euro area equity in total portfolio is equal to the notional one implied by the ICAPM.

As expected, euro area economies are strongly exposed to other euro area economies, with a weight of euro area equities in their total portfolio three times larger than the share of euro area to world market capitalisation. The other EU economies are also overexposed

to euro area equities, at least since 2009. Advanced economies and emerging markets are instead under-exposed to the euro area in their total equity portfolio. The exposure of emerging markets is farther away than that of advanced economies from the ICAPM benchmark for the total equity portfolio due to the higher degree of home bias (figure 3). However, focussing only on the portfolio of cross-border equity holdings - excluding domestic holdings - the picture is different: all four groups of economies, on average, are overexposed to the euro area equities (figure 4). Somewhat surprisingly, the exposure towards the euro area of all group of countries, also those outside the euro area or the EU, is remarkably stable since the onset of the euro area crisis in 2010, suggesting a rather muted impact of this idiosyncratic shock.

(Figures 3 and 4 here)

Debt. Turning to the exposure towards debt securities issued by euro area residents in figures 5 and 6, we may note a similar ranking of the four groups. The euro area economies are again overexposed to euro area debt in their total portfolio, but not other EU economies. The *Total Bias* towards the euro area of emerging markets is lower than that of advanced economies (figure 5). Euro area and other EU economies are over-weighting euro area debt securities in their foreign portfolio, whereas advanced economies outside the EU are close to the benchmark ICAPM weight (horizontal line), even though slightly departing from the benchmark since 2010, most likely on account of the euro area crisis (figure 6).

(Figures 5 and 6 here)

Available data indicate that investors are globally more exposed towards euro area equity than debt. However, this result is not necessarily accurate as data are distorted by a particular bias of international statistics. Investors searching for exposure to euro area debt may use investment funds as a vehicle, buying shares or units of these funds, which are recorded under equity, therefore increasing the reported share of cross-border equity holdings at the expense of debt (Felettigh and Monti, 2008). For the euro area, this statistical bias can be partly purged by excluding the financial centres such as Ireland and

Luxembourg, where a large share of the euro area investment fund industry is located to take advantage of favourable taxation.[11] Table A.3 in the appendix reports the *Total* and *Country Bias* for equity and debt for the euro area as a whole (EA12) and, in addition, the breakdown between euro area high-rating economies and low-rating economies, excluding Ireland and Luxembourg. Differently from the result for EA12 economies, for euro area high-rating economies and low-rating economies, the exposure of global investors towards debt securities is larger than the one towards equity (see average across all countries), revealing that the bias of financial centres may be significant.[12] Finally, Table A.3 shows that, not surprisingly, all investors are generally more exposed towards the securities issued by euro area high-rating economies compared to that issued by euro area low rating countries.

Summing up, euro area investors overweigh euro area securities, whereas other EU investors are close to (above) the ICAPM benchmark in their total (foreign) portfolio. Investors outside the EU are underexposed to euro area securities in their total portfolio of domestic and cross-border securities. However, when focussing on the portfolio of foreign assets, both advanced economies and emerging markets hold a share of euro area securities that is close to the notional benchmark implied by standard finance theory. These results do not take into account other factors that can influence the geographical portfolio allocation, such as distance. Our analysis will show that, accounting for these factors in an international finance gravity model, one may reach partly different conclusions.

6 Empirical methodology

We now turn to the analysis of the potential features of investor countries that may explain their exposure towards the euro area. We take the logarithm of equation (2) and investigate the determinants of the log of the total bias towards the euro area (tb_{it}^{EA}) as

---

[11]According to the ECB, as of June 2014, the total assets of euro area investment funds amounted to EUR 8.7 trillion, of which around a half were held by funds located in Luxembourg (EUR 3.0 trillion) and Ireland (EUR 1.4 trillion).

[12]Moreover, one can note that, in the case of equity portfolio, there is a large discrepancy between the average level of exposure towards EA12 economies, on the one hand, and exposure towards euro area high-rating and low-rating economies, on the other hand. This discrepancy largely disappears in the case of debt.

the sum of the log of the foreign bias (fb_{it}) and the log of the country specific euro area bias in foreign portfolios (cb_{it}^{EA}):

$$tb_{it}^{EA} = fb_{it} + cb_{it}^{EA} \tag{3}$$

Differently from traditional gravity models, the euro area - alternatively EA12, euro area high-rating or low-rating economies - is the destination of foreign investment. Therefore one dimension of the dataset is fixed and we are able to work in a traditional panel setting, as in Forbes (2010), estimating the following *linear model* for two different asset classes, equity and debt:

$$tb_{it}^{EA} = fb_{it} + cb_{it}^{EA} = \alpha + \beta x_{it}^{EA} + \gamma y_{it}^{EA} + \delta EUR_{it} + \tau_t + \varepsilon_{ijt} \tag{4}$$

where x_{it}^{EA} are traditional gravity variables such as distance and bilateral trade between the investor country i and the euro area or the exchange rate volatility of the currency of country i against the euro, EUR_{it} is a dummy variable that identifies investor countries which have adopted the euro, τ_t are time-fixed effects. The focus of our analysis is on y_{it}^{EA}, which is a set of institutional and control variables that are measured in relation to the euro area, including: governance, financial development, capital account openness and, as a more generic control, GDP per capita.[13] For each of these institutional variables, we calculated $y_{it}^{EA} = (z_{it} - z_{EAt})$, the difference between the investor country i's observation and that of the euro area, measured as the nominal GDP weighted average of each euro area country observation. Table 2 summarises the level or score of these variables for different countries and groups. Even though the ranking according to GDP per capita is similar to the ranking according to other variables, there are important differences. In particular, low-rating economies rank significantly lower than euro area high-rating economies in terms of governance. Moreover, euro area high-rating economies rank close to the top of the table for all indicators with the exception of financial development.

(Table 2 here)

Differently from previous studies that use simply the level of various regressors as in (4), we extend the previous linear model introducing a measure of institutional distance

---

[13]See section 4 for a description of these variables.

of each investor country from the euro area, taking the absolute value of the difference between the investor country i's observation and that of the euro area $|y_{it}^{EA}| = |z_{it} - z_{EAt}|$. Moreover, we allow for a non-linear impact of the regressors, distinguishing between countries with institutional scores above the euro area and those with scores below the euro area.[14] Formally:

$|y_{it}^{EA}|^+ = |z_{it} - z_{EAt}|$ if $(z_{it} - z_{EAt}) \geq 0$ and $|y_{it}^{EA}|^+ = 0$ if $(z_{it} - z_{EAt}) < 0$

Similarly,

$|y_{it}^{EA}|^- = |z_{it} - z_{EAt}|$ if $(z_{it} - z_{EAt}) \leq 0$ and $|y_{it}^{EA}|^- = 0$ if $(z_{it} - z_{EAt}) > 0$

The extended *non-linear model* is the following:

$$tb_{it}^{EA} = fb_{it} + cb_{it}^{EA} = \alpha + \beta x_{it}^{EA} + \gamma_1 |y_{it}^{EA}|^+ + \gamma_2 |y_{it}^{EA}|^- + \delta EUR_{it} + \tau_t + \varepsilon_{ijt} \quad (5)$$

The general specification in equation (5) encompasses the linear model of equation (4) and is able to accommodate different hypotheses regarding the impact of our regressors without imposing *a priori* any undue restriction on the two coefficients γ_1 and γ_2. There are four possible combinations of the sign of these two coefficients, each of these combinations identifies one particular hypothesis regarding the relationship between the regressors and the exposure to the euro area.

Case 1 (*comparative advantage*): $\gamma_1 < 0$ and $\gamma_2 > 0$. Countries with a level of financial development (or quality of institutions) lower than the level of the euro area are expected to invest more in the euro area in order to benefit from financial services (or standards of governance) that are not available at home. The higher the institutional score in the investor country, the lower the exposure to the euro area. Note that this corresponds to testing a negative relationship between $(z_{it} - z_{EAt})$ and exposure to the euro area in a non-linear fashion.

Case 2 (*familiarity*): $\gamma_1 < 0$ and $\gamma_2 < 0$. It is the similarity of institutions, irrespective of the relative level, that matters for bilateral asset holdings. The greater the institutional distance from the euro area, the lower the exposure to the euro area.

---

[14]For one regressor, capital account openness, we do not distinguish between positive and negative values of y_{it}^{EA} because the euro area is at the top of the ranking and there are only few observations for $y_{it}^{EA} > 0$.

Case 3 (*institutional divergence*): $\gamma_1 > 0$ and $\gamma_2 > 0$. This is the opposite of the previous case. The greater the difference of institutions at home with respect to the euro area, the stronger the exposure to the euro area.

Case 4 (*high-standard investors' attraction*): $\gamma_1 > 0$ and $\gamma_2 < 0$. Investor countries with higher institutional scores are more exposed to the euro area. This corresponds to testing a positive relationship between $(z_{it} - z_{EAt})$ and exposure to the euro area in a non-linear fashion.

After having estimated the unrestricted model in equation (5), we test two simple linear restrictions on the coefficients γ_1 and γ_2 ($\gamma_1 = \gamma_2$ and $\gamma_1 = -\gamma_2$) to identify a more parsimonious *nested model* that assumes a uniform impact of our regressors for scores that are above or below those of the euro area. In particular, note that if $\gamma_1 = -\gamma_2$ we recover the linear model in equation (4). Instead if $\gamma_1 = \gamma_2$ we are estimating a linear model using the absolute value $|z_{it} - z_{EAt}|$ as a regressor.

The model is estimated through Feasible Generalised Least Squares (FGLS) allowing for panel specific autocorrelation structure of the error term, heteroskedasticity across panels and pooled coefficients for the constant and slope. The estimation choice and, in particular, the absence of country fixed-effects, is motivated by the relatively short time dimension (T=max 12) and the resulting low variance of the series across time. A fixed-effects estimator exploiting only the within variability would leave little to explain. Indeed, Table 1 shows that for all the dependent and explanatory variables the between variability across countries is much larger than the within variability across time, calling for an estimator such as the FGLS that caters for the variance across groups.[15] Moreover, for robustness, the model has been re-estimated through OLS pooled cross-section with Huber-White robust standard errors clustered by countries. This method is robust to any type of correlation across residuals but comes at the price of the loss of efficiency.

A number of robustness checks have been carried out to test additional hypotheses. We have extended equation (4) and (5) with a number of interaction terms between financial development and per capita GDP, and governance and per capita GDP to test if the impact of these variables varies with level of economic development. The coefficients of these interaction terms were in general not statistically significant. Moreover, we have

---

[15]Moreover, the inclusion among the regressors of several country features and, in particular, a generic control variable such as GDP per capita lessens the risk of an omitted variable bias.

also included other popular explanatory variables such as colonial relationship, common language and returns correlation. Their coefficients were not robust or not significant and those variables have been excluded from the baseline model.[16]

7 Results

7.1 Equity

Exposure to euro area equity. Let us start analysing equity portfolio and testing the impact of traditional international finance gravity regressors and institutional variables at home – i.e. in the investor countries – relative to the euro area. Table 3 reports the results for the estimation of equation (4), the linear model taking simply the level of the various regressors (columns 1 and 2), and the estimation of equation (5), the extended non-linear model (columns 3 and 4).[17] The lower panel of Table 3 (columns 3 and 4) reports the Wald χ^2statistics with one degree of freedom testing the hypothesis that the impact of institutional scores is homogeneous when their value is above or below that of the euro area. Finally, Table 3 shows the nested model (columns 5 and 6), restricting some of the parameters in equation (5) on the basis of the results of the Wald test.[18] The dependent variable is alternatively the *Total Bias* towards the euro area (columns 1, 3 and 5) or the *Country Bias* towards the euro area in the foreign portfolio (column 2, 4 and 6). In the last column, we report also a simple model for the *Foreign Bias* (columns 7), which is a component of the *Total Bias*, regressed on the level of a number of institutional regressors, but excluding the gravity variables. Indeed, since the *Foreign Bias* is a component of the *Total Bias*, institutional determinants of the former, such as the degree of capital account openness of one country, may influence the latter variable.

The coefficients for the traditional gravity variables - in particular, physical distance - are generally statistical significant and have the expected sign. Countries that are closer to the euro area have a greater financial exposure towards the euro area equity. Countries

---

[16]These additional results are omitted for reasons of space and available upon request to the authors.

[17]Note that in the linear model we measure institutional regressors relative to the euro area, but this implies simply a level shift of the variables in our panel. The related coefficients are identical to those of a regression including simply the level of institutional variables, not measured relative to the euro area.

[18]When both two alternative null hypotheses cannot be rejected, we select the one with the lower χ^2 and, for ease of readibility of tables, we specify the same nested restricted model for both the Total Bias and the Country Bias.

that trade more with the euro area allocate a greater portion of their "foreign" portfolio to euro area equity securities. The euro dummy is also positive and statistically significant confirming the presence of a *euro area bias* for the countries that have adopted the euro, similarly to previous studies. The euro dummy is highly correlated with our measure of exchange rate volatility against the euro, but the former tends to have greater explanatory power than the latter regressor. Indeed, exchange rate volatility comes with the expected negative sign (see columns 1-4) - the greater the volatility the lower the exposure towards the euro area - but it is not statistically significant unless we exclude the euro dummy (a result not shown in the table). Therefore, we conclude that the adoption of the euro tends to foster a euro area bias in portfolio allocation and that this result is not exclusively driven by the elimination of exchange rate volatility. The restricted nested model includes the euro dummy, but not exchange rate volatility (columns 5 and 6).

Turning our attention to the institutional variables, the main objective of our research, a number of interesting results emerge. First of all, it should be noted that the sign, size and significance of coefficients of regressors for the *Total Bias* towards the euro area are often driven by those of the *Foreign Bias* (compare columns 1 and 7). Countries with more open capital account, better governance and a higher level of GDP per capita are countries with greater *Foreign Bias*. Therefore, countries with these characteristics are also over-exposed to the euro area in their total equity portfolio of domestic and foreign equity. Financial development instead, somewhat surprisingly, is associated with less *Foreign Bias*.

The analysis of the extended model in columns 3 and 4 shows that the impact of the institutional regressors on *Total* and *Country Bias* is not necessarily linear and that institutional distance from the euro area may also matter. In particular, the Wald test suggests that the impact of GDP per capita is different if investor countries are above or below the level of economic development of the euro area, whereas it is possible to constrain $\gamma_1 = -\gamma_2$ for financial development reverting to the linear model for this regressor. The negative sign of the coefficient associated with financial development suggests that financially less developed countries have a greater exposure towards the euro area in their equity portfolio, providing support to the *comparative advantage* hypothesis, a result similar to the one found by Forbes (2010) in the case of the United States, even though the statistical significance is weak (columns 5 and 6). Finally, the Wald tests

suggest to impose $\gamma_1 = \gamma_2$ for governance and use the institutional distance from the euro area as explanatory variable, not the level of governance. The coefficient associated with governance is negative and statistically significant in the nested restricted model, providing instead support to the *familiarity* hypothesis (columns 5 and 6): the greater the institutional vicinity to the euro area in terms of governance, the greater the exposure to the euro area.

(Table 3 here)

The estimation in Table 3 assumes that the parameters of our regression are stable across time. However, our sample includes the global financial crisis and the euro area sovereign crisis, which may have affected standard relationships. In Table 4, we control for the stability of parameters in different regimes of global financial volatility, using the nested restricted model and splitting the sample in a pre-crisis regime until 2007, the global financial crisis in 2008-09 and the euro area crisis since 2010. It is comforting to note that the model is generally stable and the coefficients do not change sign across sub-samples, even though one may identify some differences in terms of size and statistical significance. In particular, the size of the coefficient associated with governance distance from the euro area is negative and larger since the start of the global financial crisis, suggesting that *familiarity* played a greater role in a regime of high financial volatility. However, we included this regressor interacted with step dummies for the two crises periods, extending the baseline model, to test if the difference in the coefficient for governance distance is statistically significant across different periods and found that this is not the case. Finally, in Table 4a we replicate our estimates using OLS (pooled cross-section) with robust standard errors. As expected, the efficiency of our estimates declines and it is more difficult to detect statistical significance. Nevertheless, the coefficient associated with distance appears particularly robust, but also the impact of governance - distance from the euro area - and the level of financial development are statistically significant in a few instances or sub-samples.

(Tables 4 and 4a here)

High-rating versus low-rating euro area economies. Are these results driven by the exposure towards a particular group of countries within the euro area? To control this, we distinguish between exposure to euro area high-rating economies, which obtain stronger scores in terms of governance, and exposure to low-rating economies with lower governance scores, excluding euro area financial centres (Ireland and Luxembourg) from the analysis. Table 5 shows the results of the nested restricted model replacing the measures of exposure towards the euro area - *Total* and *Country Bias* - with the exposures towards the euro area high-rating economies and euro area low rating economies, respectively, as dependent variables.[19] The first four columns of Table 5 show estimates through Feasible GLS, columns 5 to 8 estimates through OLS.

The patterns of statistical significance and sign of the coefficients are generally similar. Three major differences stand out. First, surprisingly, the euro dummy is not always statistical significant or with the expected sign, in particular when the dependent variable is the *Country Bias* (columns 2, 4 and 6). Second, less surprisingly, the relationship between low financial development at home and investment in the euro area appears to be driven by the exposure towards high-rating economies (columns 1 and 5), and not towards low-rating economies. The *comparative advantage* hypothesis holds for the exposure towards euro area high-rating economies. Finally, the evidence in favour of the *familiarity* hypothesis, in particular as regards governance, does not appear to be consistent with the previous set of results. Countries with a level of governance that is distant - not close to as in Table 4 - from euro area high-rating or low-rating economies are more exposed towards these two subgroups of the euro area.

(Table 5 here)

7.2 Debt

Exposure to euro area debt. Table 6 reports the results for the exposure towards the euro area in debt portfolio. The results are broadly similar to the case of equity portfolio. Traditional gravity variables work well in explaining exposure to the euro area debt (with the exception of trade for the *Total Bias*) and the country determinants of the *Foreign*

---

[19]As in the case of the euro area, we first estimated a general model with unrestricted coefficients and tested whether the linear restrictions applied in Table 3 hold also for these two different subgroups.

Bias (physical and institutional proximity to the euro area and higher per capita GDP) influence the determinants of the *Total Bias*. As in the case of equity exposure, there is some evidence that countries with less developed financial markets assign a greater weight to euro area debt in their portfolios. The main difference with the results in the previous subsection is represented by the impact of governance. When governance in the investor countries is above the level of the euro area, the relationship is positive or not statistically different from zero. It appears that the exposure towards euro area debt increases with the level of governance at home (*high-standard investors' attraction* hypothesis). The nested model in Table 6 (columns 5 and 6) imposes $\gamma_1 = -\gamma_2$ for both the governance and the financial development coefficients, therefore these two variables are measured as the simple difference between the level in the investor country and that in the euro area (not in absolute value), similarly to the linear model in columns 1 and 2. The *Total Bias* towards the euro area debt increases with the level of governance at home and decreases with the level of financial development at home (column 5). This pattern is similar when the dependent variable is the *Country Bias*, even though the related coefficients are not statistically significant (column 6).

(Table 6 here)

The robustness of these results across time and different estimation methods is broadly confirmed with two exceptions (see Tables 7 and 7a). First, as in the case of equity, the impact of governance on exposure towards the euro area seems to increase after the global financial crisis. However, we find that the upward shift in the coefficient for governance is statistically significant only during the euro area crisis when the dependent variable is the *Country Bias*. Second, the negative relationship between financial development and *Total Bias* - the *comparative advantage hypothesis* - holds before the crisis, but not afterward when the coefficient changes sign.

(Tables 7 and 7a here)

High-rating versus low-rating euro area economies. The comparison between the exposure towards euro area high-rating economies and that towards euro area low-

rating economies confirms that both financial development and governance at home are important to explain exposure towards the euro area (see Table 8). The higher the standards of governance in the investor country, the greater the exposure of this country towards the euro area high-rating or low rating economies debt, a result that remains robust with the panel cross-sectional estimates. Again, financial development comes with a negative sign, statistically significant when the dependent variable is the *Total Bias* in the benchmark specification estimated through FGLS. The robustness across time - not shown for reasons of space - suggests that the positive relationship between governance at home and exposure to the euro area sub-groups has become stronger following the euro area crisis in 2010, in particular for the exposure to high-rating economies in the cross-border portfolio, where the related coefficient is two times larger than in the pre-crisis period and the difference statistically significant. In addition, the negative relationship between financial development in the investor country and exposure to the euro area - the comparative advantage hypothesis - is robust in the case of exposure to euro area low-rating economies and for euro area high-rating economies before the crisis, but not afterward when exposure to euro area high-rating debt increases with the level of financial development at home.

Summarising the results of this section, countries that have a more open capital account and a higher degree of governance, but a lower degree of financial development, are more exposed to euro area securities. However, since the start of the global financial crisis in 2008 and in particular since the onset of the euro area crisis, countries with a higher level of governance and financial development increased their exposure towards euro area debt securities, in particular those issued by euro area high-rating economies, most likely owing to the safe haven attraction of those economies. The next section will try to shed further light on the impact of the global financial and euro area crisis on the financial exposure towards the euro area.

(Tables 8 here)

8 Intra-euro area exposure and the role of large foreign investors during the crisis

Our analysis has shown that while the parameters of an international finance gravity model are qualitatively robust across time, the global and euro area crises triggered changes in the portfolio allocation across countries that may alter the magnitude of the relationship between investors' characteristics and exposure to the euro area. This is not surprising. Indeed, already Kim et al. (2011) in their study of Korean firms note that governance (dis-)similarity becomes important after the Asian crisis, which served as a wake-up call to investors, whereas Ahrend and Schwellnus (2013) find that more generally the impact of distance in international finance gravity models increases with investors' uncertainty aversion. Galstyan and Lane (2013) show that traditional gravity regressors, as well as the size of the initial bilateral holding, help to explain the adjustment of portfolio during the global financial crisis. Our set-up allows to investigate two interesting questions related to the dynamic of portfolio exposure during the crisis period.[20] First, was there a different attitude of euro area investors, in particular investors form euro area high-rating and low rating economies compared to foreign investors, towards the euro area during the crisis? Second, are large foreign investors over-exposed to the euro area and did they change their exposure during the global and euro area crisis? These two questions are relevant because the distribution of portfolio holdings is not uniform. For instance, at the end of 2012, all CPIS reporting countries, including financial centres and international organisations, had an exposure of USD 4.8 trillion towards euro area equity and USD 10.2 trillion towards euro area debt. Euro area investors accounted for 52% of this total euro area exposure in the case of equity, 56% in the case of debt. Of the remaining part held outside the euro area, the eight largest foreign - extra-EU - holders of portfolio securities - according to the CPIS database - accounted for almost 70% of euro area equity securities and more than 40% of debt securities.[21] By focussing on these two groups of countries - euro area

---

[20] A dynamic specification of our model, like in Galstyan and Lane (2013) or De Santis and Gérard (2009), including the delicate task to control for valuation effects, goes beyond the scope of this paper and would deserve a separate analysis.

[21] The foreign - outside the EU - large investors are: the United States, Canada, Australia, Norway, Switzerland, Japan, Honk Kong and Singapore. We prefer to exclude other EU countries and, in particular, the United Kingdom, because the latter is one of the main financial centres used by euro area investors and this may partly bias the results. Switzerland is also a financial centre largely used by euro

investors and large foreign investors - compared to the rest of the sample, we account for the bulk of financial holdings of euro area securities.

To answer these questions, the restricted nested model has been slightly modified. First, we replace the euro dummy with two separate dummies, one for euro area high-rating economies and one for euro area low-rating economies, so that we can control whether there is a substantially different behaviour across these two groups of investors. Moreover, we introduce a dummy for the eight largest investors outside the EU to control whether these important financial players are over- or under-exposed to the euro area and if they altered their financial strategy during the global and euro area crisis. To control for parameters' stability, we run regressions across separate periods, as shown in Table 9 for equity and Table 10 for debt, where we show *only* the coefficients of our dummies. In parallel, first, we control for each pair of dummies if the coefficients are statistically different with a Wald test and, second, we check if they are significantly different through time, estimating the model including interaction terms between the investor-specific dummies and step-dummies for the crisis periods.[22]

8.1 Intra-euro area exposure

Equity. Table 9 reports the results for the exposure to euro area equity. The upper panel (A) shows the model for the *Total* and *Country Bias* towards the Euro Area 12, including Ireland and Luxembourg, the middle panel (B) refers to the exposure to euro area high-rating economies and the lower panel (C) to euro area low-rating economies. In each panel, the first row reports the coefficient associated with the euro dummy - the original model - and below the dummies of the modified model.[23]

Let us start with the first question, focussing on the intra-euro area exposure to euro area equity. As noted in the previous sections, investors being part of the euro area are expected to have a greater exposure towards the euro area equity, which notably includes also issuance of equity by investment funds based in Ireland and Luxembourg. The impact of euro area financial integration is significantly large. The coefficient for the euro dummy

---

area investors, but the inclusion or exclusion of this country from the group of foreign investors does not alter the main results.

[22] The results of these additional controls are omitted for reasons of space and available upon request to the authors.

[23] For instance, the first line of Table 9 is exactly the same as the third line of Table 4.

ranges between 0.27 (*Country Bias*) and 0.69 (*Total Bias*). Since our dependent variable is taken in logarithm, this implies that being part of the euro area leads to an increase in the *Country Bias* or in the *Total Bias* towards the euro area equity by 30% or by 100%, respectively. Conditioning on all the other gravity and institutional regressors, a country outside the euro area which holds a portfolio share of euro area equity securities in the total portfolio equal to the market share of the euro area in global stock markets (i.e. starting with a *Total Bias* equal to one) would be expected to double its share of euro area equity securities in the total portfolio of domestic and cross-border equity securities, by adopting the euro.

The euro area equity bias is stronger for the investors from euro area low-rating economies compared to euro area high-rating economies (panel A); indeed additional tests confirm that the difference between the two dummies is statistically significant, in particular when the dependent variable is the *Country Bias*. Actually, if we look a the exposure towards equity of euro area high-rating economies (panel B) and low-rating economies (panel C), we discover that euro high-rating investors have a negative bias towards euro area equity issued by either euro area high-rating or low-rating economies (i.e. excluding the financial centres) since the start of the global financial crisis. This is not the case for investors from euro area low-rating economies, which consistently overweigh euro area securities.[24]

(Table 9 here)

Debt. Turning to the analysis of exposure to euro area debt securities in Table 10, where the statistical bias of euro area investment funds is less important, we find a number of interesting results. First, if we focus on the *Total Bias*, the euro area debt bias is always large and statistical significant: the coefficient of the euro dummy (0.76) is of a similar size of that of equity (panel A, column 1). However, the euro area bias is less evident for the euro area cross-border portfolio of debt securities (panel A, column

---

[24] As noted in Section 5, the discrepancy between the results in panel A and those in panels B and C is driven by the euro area financial centres, where investment funds attract large financial flows from other euro area countries that is recorded as equity, even though the final investment could be a debt security. As of the end of 2014, according to the ECB, debt securities accounted for 35 and 40% of total assets held by funds residing in Luxembourg and Ireland, respectively. Excluding investment fund shares, debt securities accounted for almost 40% of total assets in Luxembourg and for around 45% in Ireland.

5). This latter result is mainly driven by investors from euro area high-rating economies, which - somewhat surprisingly - underweigh euro area "high-rating" debt in their cross-border portfolio since the start of the global financial crisis (panel B, columns 14 and 15). As in the case of equity, are above all investors from euro area low-rating economies that are overweighing euro area debt securities, in particular those issued by high-rating economies (panel B). While this is not surprising, it is interesting to note that euro area high-rating economies remain substantially overexposed to debt securities issued by euro area low-rating economies, even after the euro area crisis (panel C, columns 20 and 24).

(Table 10 here)

8.2   Large foreign investors

Equity. The last row of each panel of Table 9 shows the coefficient of a dummy for large foreign investors, outside the EU, when modelling the exposure to euro area equity. This dummy is positive and statistically significant in the upper panel A - exposure to Euro Area 12 equity - for the whole sample and, in particular during the global financial crisis, not during the euro area crisis. This implies that large foreign investors, on average, overweigh euro area equity compared to all the other investors excluding euro high-rating and low-rating investors - as we include specific dummies for these two groups - and controlling for other gravity regressors. The size of the coefficient of the dummy for large foreign investors is lower than that for euro area low-rating economies, but not euro area high-rating economies. Therefore, once gravity factors are taken into account, large foreign investors gained an exposure to euro area equity of similar size of investors from euro area high-rating economies, in particular during the global financial crisis. The middle and lower panel of Table 9 show that large foreign investors overweigh equity issued by firms residing in euro area high-rating economies, not those in euro area low-rating economies.

Debt. Turning to exposure to debt securities in Table 10, we find similar patterns for the exposure to the euro area by large foreign investors. The dummy for this group of investors is positive and statistically significant in the upper panel A - exposure to EA12 debt - and the middle panel B - exposure to euro area high-rating debt, whereas is negative or not statistically different from zero in the lower panel C - exposure to euro area low-rating debt. Here, the impact of the euro area crisis is more evident. Since 2010, the

distinction between high-rating and low rating euro area debt by large foreign investors is particularly visible, since the absolute value of the dummy for the large foreign investors increases, a tentative evidence of portfolio reallocation within the euro area.[25]

In a nutshell, this section has shown that investors from euro area low-rating economies have a stronger euro area bias than investors from euro area high-rating economies. However, euro area high-rating economies remain overexposed to euro area low-rating debt, echoing one of the main findings of Hale and Obstfeld (2014). Moreover, once we account for the determinants of an international finance gravity model, large foreign investors are overexposed to securities issued by euro area high-rating economies compared to other investors outside the euro area, and even compared to investors from euro area high-rating economies. This positive bias is stronger for euro area debt securities than for equity. At the same time, large foreign investors underweigh securities issued by low-rating economies, not surprisingly, accentuating this pattern in the case of debt securities after the euro area crisis.

9 Conclusions

The objective of this paper was to answer three related questions. First, are global investors over or under exposed towards the euro area? Second, what is the role of the home bias - the tendency to hold a disproportionate share of domestic assets in the total portfolio of domestic investors - in shaping the exposure to euro area financial assets? Third, what are the characteristics of the countries investing in the euro area?

First, according to a simple benchmark from standard portfolio theory, euro area investors are overexposed to euro area securities, whereas other EU investors are close to (above) that benchmark in their total (foreign) portfolio. In addition, particularly relevant for the literature on the euro area financial integration, we show that investors from euro area low-rating economies have generally a stronger *euro area bias* than investors from euro area high-rating economies; however, euro area high-rating economies are overexposed compared to other countries towards the debt - but not the equity - issued by euro area

---

[25]When testing the significance of these differences across different periods, the exposure of large foreign investors towards euro area low-rating debt is significantly lower compared to the pre-euro area crisis period, but their exposure towards euro area high-rating economies is not significantly higher.

low-rating economies. Investors outside the EU are instead underexposed to euro area securities in their "total" portfolio of domestic and cross-border securities, but they are close to the notional benchmark implied by standard finance theory in their "foreign" portfolio, including only cross-border holdings. Once we account for the determinants of an international finance gravity model, we discover that the largest foreign, extra-EU, investors have a positive bias towards euro area securities, in particular debt securities issued by euro area high-rating economies.

Second, the analysis of the home bias is crucial to understand the overall exposure of countries in their portfolio of domestic and foreign securities. The institutional characteristics of investors at home that explain the home bias across countries - for instance, higher GDP per capita and capital account openness – are also the same determinants of the financial exposure towards the euro area in the "total" portfolio of investors.

Third, our results show that it is possible to establish a relationship between institutions at home and exposure to the euro area. In particular, countries that have a more open capital account and a higher degree of governance, but a lower degree of financial development, are more exposed to euro area securities, in particular securities issued by the high-rating economies until the onset of the crisis. The relationship is robust for the first two variables - capital account openness and governance - less robust for financial development.

Importantly, our evidence does not identify any remarkable decline in financial exposure to the euro area between 2010 and 2012, with the exception of debt securities issued by low-rating economies. Despite rising financial volatility and the idiosyncratic shock to the euro area, several important categories of investors - from the euro area as well as from foreign countries with large financial positions - maintained their exposure towards euro area debt securities in line with the market share of euro area debt in global markets, in particular debt issued by euro area high-rating economies. Moreover, the positive relationship between governance at home and exposure to euro area debt tightened. Our results would suggest that, most likely, the safe haven attraction of the debt securities issued by euro area high-rating economies played an important role to explain the resilience of investors' appetite towards euro area securities. In this context, the role of valuation effects in the dynamic adjustment of portfolio shares during the crisis is a topic that would certainly deserve futher investigation in the future.

References

[1] Abdioglu, N., Khurshed, A., and K. Stathopoulos (2013): "Foreign Institutional Investment: Is Governance Quality at Home Important?", Journal of International Money and Finance, 32, pp. 916-940.

[2] Ahearne, A. G., Griever, W. L., and F. E. Warnock (2004): "Information costs and home bias: an analysis of US holdings of foreign equities", Journal of International Economics, 62, 2, pp. 313-336.

[3] Ahrend, R., and C. Schwellnus (2012): "International Capital Mobility and Financial Fragility - Part 2. The Demand for Safe Assets in Emerging Economies and Global Imbalances: New Empirical Evidence", OECD Economics Department Working Papers, No. 903.

[4] Ahrend, R., and C. Schwellnus (2013): "Do investors disproportionately shed assets of distant countries during global financial crises? The role of increased uncertainty", OECD Journal: Economic Studies, Vol. 2012/1.

[5] Aviat, A., and N. Coeurdacier (2007): "The geography of trade in goods and asset holdings", Journal of International Economics, 71, 1, pp. 22-51.

[6] Balli, F., Basher, S. A., and Ozer-Balli, H. (2010): "From home bias to Euro bias: Disentangling the effects of monetary union on the European financial markets" Journal of Economics and Business, 62(5), pp. 347-366.

[7] Berkel, B., (2007): "Institutional Determinants of International Equity Portfolios - A Country-Level Analysis", The B.E. Journal of Macroeconomics, 7, 1, pp. 1935-1960.

[8] Brennan, M. J. and H. Cao (1997): "International portfolio investment flows", Journal of Finance, 52, 5, pp. 1851-1880.

[9] Broner, F., Didier, T., Erce, A. and S. L. Schmukler (2011): "Gross capital flows: Dynamics and crises", CEPR Discussion Paper No. 8591.

[10] Caballero, R. J., (2006): "On the Macroeconomics of Asset Shortages", NBER Working Papers, No. 12753.

[11] Caballero, R. J., Farhi, E., and P. Gourinchas (2008): "An Equilibrium Model Of "Global Imbalances" And Low Interest Rates", American Economic Review, 98, 1, pp. 358-393.

[12] Chan, K., Covrig, V., and L. Ng (2005): "What Determines the Domestic Bias and Foreign Bias? Evidence from Mutual Fund Equity Allocations Worldwide", The Journal of Finance, 60, 3, pp. 1495-1534.

[13] Chinn., M and H., Ito (2008): "A New Measure of Financial Openess", Journal of Comparative Policy Analysis, 10, 3, pp. 309-322.

[14] Cihák, M., Demirgüç-Kunt, A., Feyen, E., and R. Levine (2012): "Benchmarking Financial Systems around the World", Policy Research Working Paper, No. 6175, World Bank.

[15] Coeurdacier, N. and H. Rey (2012): "Home bias in open economy financial macro-economics", Journal of Economic Literature, 51, 1, pp. 63-115.

[16] De Santis, R. A., and B. Gérard (2009): "International portfolio reallocation: Diversification benefits and European monetary union", European Economic Review, 53, pp. 1010-1027.

[17] European Central Bank (2012): Financial Integration in Europe, April 2012.

[18] Felettigh, A., and P. Monti, (2008): "How to interpret the CPIS data on the distribution of foreign portfolio assets in the presence of sizeable cross-border positions in mutual funds. Evidence for Italy and the main euro-area countries", Occasional papers, No. 16, Banca d'Italia.

[19] Fidora, M., Fratzscher, M., and C. Thimann (2007): "Home bias in global bond and equity markets: The role of real exchange rate volatility", Journal of International Money and Finance, 26, 4, pp. 631-655.

[20] Forbes, J., (2010): "Why do foreigners invest in the United States?", Journal of International Economics, 80, pp. 3-21.

[21] Galstyan, V. and P. R. Lane (2013): "Bilateral portfolio dynamics during the global financial crisis", European Economic Review, 57, pp. 63-74.

[22] Gehrig, T., (1993): "An Information Based Explanation of the Domestic Bias in International Equity Investment", Scandinavian Journal of Economics, 95, 1, pp. 97-109.

[23] Grinblatt, M., and M. Keloharju (2001): "How Distance, Language, and Culture Influence Stockholdings and Trades", Journal of Finance, 56, 3, pp. 1053-1073.

[24] Guiso, L., Sapienza, P., and L. Zingales (2009): "Cultural Biases in Economic Exchange?", Quarterly Journal of Economics, 124, 3, pp. 1095-1131.

[25] Habib, M., and L. Stracca (2013): "Foreign Investors and Risk Shocks Seeking a Safe Haven or Running for the Exit?",Working Paper Series, No. 1609, European Central Bank.

[26] Hale, G., and M. Obstfeld (2014): "The Euro and The Geography of International Debt Flows", NBER Working Paper, No. 20033, April.

[27] Huberman, G., (2001): "Familiarity Breeds Investment", Review of Financial Studies, 14, 3, pp. 659-680.

[28] Kaufmann, D., Kraay., A and M. Mastruzzi (2010): "The Worlwide Governance Indicators - Methodology and Analytical Issues", Policy Research Working Paper, No. 5430, World Bank.

[29] Kim, W., Taeyoon, S., and S-J. Wei (2011): "Does corporate governance risk at home affect investment choices abroad?", Journal of International Economics, 85, pp. 25-41.

[30] Lane, P. R., (2006): "Global Bond Portfolios and EMU", International Journal of Central Banking 2, 1-23, June.

[31] Lane, P. R., and G.M. Milesi-Ferretti (2005): "The International Equity Holdings of Euro Area Investors", The Institute for International Integration Studies Discussion Paper Series, iiisdp104.

[32] Lane, P. R., and G.M. Milesi-Ferretti (2008): "International Investment Patterns", Review of Economics and Statistics, 90, 3, pp. 538-549.

[33] Martin, P., and H. Rey (2004): "Financial super-markets: size matters for asset trade", Journal of International Economics, 64, 2, pp. 335-361.

[34] Mayer, T., and S. Zignago (2011): "Notes on CEPII 's distances measures: the GeoDist database", Working Paper, No. 2011-25, CEPII.

[35] Milesi-Ferretti, G.M. and Tille, C. (2011), "The great retrenchment: international capital flows during the global financial crisis", Economic Policy, April, pp. 289-346.

[36] Mondria, J., and T. Wu (2010): "The Puzzling Evolution of the Home Bias, Information Processing and Financial Openness", Journal of Economic Dynamics and Control, 34, pp.875-896.

[37] Okawa, Y., and E. van Wincoop (2012): "Gravity in International Finance. Journal of International Economics", 87, 2, pp. 205-215.

[38] Portes, R., and H. Rey (2005): "The determinants of cross-border equity flows", Journal of International Economics, 65, 2, pp. 269-296.

[39] Salins. V., and A. Bénassy-Quéré (2006): "Institutions and Bilateral Asset Holdings", Working Papers, No. 2006-19, CEPII.

[40] Solnik, B., (1974): "An equilibrium model of international capital markets", Journal of Economic Theory, 8, pp. 500-524.

[41] Tille, C., and E. van Wincoop (2009): "Disconnect and Information Content of International Capital Flows: Evidence and Theory", Unpublished.

[42] Van Nieuwerburgh S., and L. Veldkamp (2009): "Information immobility and the home bias puzzle", Journal of Finance, 64, 3, pp. 1187-1215.

[43] Vlachos, J., (2004): "Does Regulatory Harmonization Increase Bilateral Asset Holdings?", CEPR Discussion Papers, No. 4417.

[44] Zucman, G., (2013): "The missing wealth of nations: are Europe and the U.S. net debtors or net creditors", Quaterly Journal of Economics, 128, 3, pp. 1321-1364.

TABLE 1. Summary statistics

Variable	Mean	Standard Deviation			Min	Max	Obs
		Overall	Between	Within			
Dependent variables:							
EA 12 Total Bias - Equity (log)	-1.57	2.30	2.33	0.85	-12.34	1.80	502
EA 12 Bias - Equity (log)	0.59	1.10	1.08	0.43	-4.98	2.08	577
Foreign Bias - Equity (log)	-2.27	1.96	1.90	0.65	-9.53	0.09	507
EA 12 Total Bias - Debt (log)	-1.44	1.99	1.97	0.47	-7.95	1.49	459
EA 12 Bias- Debt (log)	0.14	1.01	0.91	0.49	-4.31	1.53	588
Foreign Bias - Debt (log)	-1.69	1.35	1.34	0.30	-5.63	0.57	459
Regressors relative to EA12:							
Trade (log)	10.68	1.65	1.57	0.54	1.97	13.92	581
Distance (log)	7.03	1.78	1.79	0.00	2.95	9.63	582
Euro exchange rate volatility	0.75	0.67	0.58	0.32	0.00	5.04	570
Governance	-0.42	0.80	0.81	0.10	-2.36	0.89	582
Financial Dev.	-0.68	1.30	1.21	0.51	-3.04	5.07	537
Capital Account (KA) Openness	-0.93	1.29	1.22	0.43	-4.25	0.05	570
GDP per Cap.	-0.77	1.06	1.08	0.19	-3.88	1.00	582
Governance (abs)	0.75	0.51	0.52	0.10	0.00	2.36	582
Financial Dev. (abs)	1.21	0.84	0.69	0.50	0.00	5.07	537
KA Openess (abs)	0.94	1.28	1.21	0.42	0.01	4.25	570
GDP per Cap. (abs)	0.96	0.88	0.91	0.19	0.00	3.88	582

Notes: see Table A.1 in the appendix and Section 4 in the main text for definitions and sources.

Table 2. Institutional scores and control variables

	GDP per cap. (log)	Governance (index)	Financial Dev. (princ. comp.)	KA Openness (index)
United States	10.7	1.6	2.9	2.4
EA High Rating	10.5	1.7	0.3	2.4
Japan	10.5	1.2	1.1	2.4
EA 12	**10.5**	**1.4**	**0.2**	**2.4**
Advanced	10.4	1.5	0.4	2.1
EA Low Rating	10.1	0.9	0.4	2.4
EU not EA	9.5	1.0	-0.5	1.6
Emerging	8.7	0.3	-1.1	0.6

Notes: see Table A.1 in the appendix and Section 4 in the main text for definitions and sources. The table reports GDP weighted averages for the various euro area groups.

TABLE 3. EQUITY. Exposure to the euro area (EA12) and foreign bias

Dep. variable:	(1) Total bias	(2) Country bias	(3) Total bias	(4) Country bias	(5) Total bias	(6) Country bias	(7) Foreign bias
	Linear model		Non-linear model		Nested model		Memo
Trade	0.011	0.151***	0.031	0.149***	-0.009	0.200***	
	(0.041)	(0.020)	(0.047)	(0.024)	(0.042)	(0.021)	
Distance	-0.488***	-0.267***	-0.453***	-0.292***	-0.432***	-0.310***	
	(0.038)	(0.020)	(0.035)	(0.024)	(0.030)	(0.021)	
Euro dummy	0.657***	0.484***	0.559***	0.283***	0.687***	0.265***	
	(0.084)	(0.062)	(0.138)	(0.079)	(0.118)	(0.074)	
Euro volatility	-0.039	0.000	-0.045	-0.011			
	(0.046)	(0.026)	(0.049)	(0.027)			
KA Openness	0.231***	-0.045	0.226***	-0.067*	0.274***	-0.100***	0.370***
	(0.066)	(0.034)	(0.058)	(0.036)	(0.060)	(0.032)	(0.055)
Governance	0.456***	0.028					0.362***
	(0.118)	(0.052)					(0.087)
$|Governance|^+$			-0.009	-0.178			
			(0.209)	(0.111)			
$|Governance|^-$			-0.372*	-0.142			
			(0.213)	(0.086)			
$|Governance|$					-0.375**	-0.177***	
					(0.151)	(0.055)	
Financial development	-0.051**	-0.039***			-0.033	-0.021	-0.047**
	(0.022)	(0.014)			(0.025)	(0.013)	(0.019)
$|Financial Dev.|^+$			-0.040	-0.017			
			(0.029)	(0.020)			
$|Financial Dev.|^-$			0.022	0.061**			
			(0.059)	(0.029)			
GDP per capita	0.830***	-0.133**					0.961***
	(0.116)	(0.060)					(0.079)
$|GDP per capita|^+$			0.300	-0.055	0.325	-0.073	
			(0.215)	(0.129)	(0.217)	(0.122)	
$|GDP per capita|^-$			-1.001***	0.142*	-1.025***	0.152**	
			(0.146)	(0.078)	(0.095)	(0.061)	
Observations	464	510	464	510	464	519	469
Countries	43	47	43	47	43	48	43
Testing restrictions (Wald χ2)							
$|Gov|^+ = |Gov|^-$	.	.	1.63	0.07	.	.	.
$|Gov|^+ = - |Gov|^-$	.	.	1.49	4.68	.	.	.
$|Fin. Dev.|^+ = |Fin. Dev.|^-$	.	.	0.95	5.19	.	.	.
$|Fin. Dev.|^+ = - |Fin. Dev|^-$	.	.	0.08	1.42	.	.	.
$|GDP pc|^+ = |GDP pc|^-$	.	.	27.73	2.10	.	.	.
$|GDP pc|^+ = - |GDP pc|^-$	.	.	6.66	0.28	.	.	.
Joint significance	1264	1974	1165	935.6	1148	1471	748.8

Notes: the table reports in columns (1) and (2) the coefficients associated with the estimation of equation (4) in the main text and in columns (3) and (4) of equation (5). As indicated at the top of the table, the dependent variable is either the Total Bias or the Country Bias towards the euro area (EA12) The last column reports the model with the Foreign Bias as dependent variable excluding gravity regressors. See section 3 in the main text for the definition and construction of these dependent variables. The regressions are estimated through Feasible GLS allowing for panel specific autocorrelation structure of the error term, heteroskedasticity across panels and pooled coefficients for the constant and slope. The model includes time dummies (not reported). The asterisks ***, ** and * indicate statistical significance at the 1, 5 or 10 percentage level, respectively. The lower panel of the table reports Wald $\chi^2(1)$ statistic testing one linear combination of the coefficients. With one degree of freedom, the null hypothesis cannot be rejected when the statistic is lower than 2.71 (10% level), 3.84 (5% level) or 6.64 (1% level). The last row reports the χ^2 statistic for the joint test of significance of all coefficients in the model.

TABLE 4. EQUITY. Exposure to the euro area (EA12). Nested model: robustness across time

Dep. variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Bias				Country Bias			
Sample period:	2001-12	2001-07	2008-09	2010-12	2001-12	2001-07	2008-09	2010-12
Trade	-0.009	0.005	0.039***	0.046*	0.200***	0.182***	0.180***	0.297***
	(0.042)	(0.044)	(0.015)	(0.026)	(0.021)	(0.020)	(0.014)	(0.022)
Distance	-0.432***	-0.409***	-0.535***	-0.580***	-0.310***	-0.225***	-0.367***	-0.364***
	(0.030)	(0.038)	(0.015)	(0.037)	(0.021)	(0.019)	(0.003)	(0.022)
Euro dummy	0.687***	0.388***	0.613***	0.384***	0.265***	0.543***	0.372***	0.144*
	(0.118)	(0.130)	(0.025)	(0.102)	(0.074)	(0.072)	(0.029)	(0.075)
KA Openness	0.274***	0.223***	0.101***	0.371***	-0.100***	-0.131***	-0.146***	-0.042
	(0.060)	(0.069)	(0.008)	(0.044)	(0.032)	(0.040)	(0.025)	(0.057)
|Governance|	-0.375**	-0.236	-1.501***	-1.042***	-0.177***	-0.252***	-0.659***	-0.514***
	(0.151)	(0.169)	(0.019)	(0.154)	(0.055)	(0.066)	(0.023)	(0.080)
Financial development	-0.033	-0.142***	-0.092***	-0.072**	-0.021	-0.034*	-0.091***	-0.104***
	(0.025)	(0.039)	(0.004)	(0.032)	(0.013)	(0.019)	(0.009)	(0.011)
|GDP per capita|$^+$	0.325	0.331	2.129***	0.367*	-0.073	0.011	0.931***	0.306**
	(0.217)	(0.329)	(0.062)	(0.198)	(0.122)	(0.154)	(0.123)	(0.138)
|GDP per capita|$^-$	-1.025***	-1.418***	-0.543***	-0.589***	0.152**	0.151**	0.490***	0.470***
	(0.095)	(0.123)	(0.016)	(0.110)	(0.061)	(0.067)	(0.017)	(0.090)
Observations	464	264	80	116	519	297	86	130
Countries	43	40	40	39	48	46	43	44
Wald χ2	1148	740.3	1.3E+06	7569	1471	1701	557913	3345

Notes: the model is estimated through FGLS, similarly to Table 3, imposing the restrictions on the coefficients for Governance (absolute value) and Financial Development.

TABLE 4a. EQUITY. Exposure to the euro area (EA12). Nested model: OLS pooled cross-section

Dep. variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Bias				Country Bias			
Sample period:	2001-12	2001-07	2008-09	2010-12	2001-12	2001-07	2008-09	2010-12
Trade	0.041	0.025	0.043	-0.024	0.266***	0.255***	0.214	0.339***
	(0.131)	(0.160)	(0.172)	(0.178)	(0.095)	(0.089)	(0.141)	(0.126)
Distance	-0.418***	-0.322***	-0.506***	-0.645***	-0.266***	-0.215***	-0.345***	-0.314**
	(0.094)	(0.093)	(0.141)	(0.201)	(0.072)	(0.068)	(0.087)	(0.133)
Euro dummy	0.586*	0.645	0.656	0.417	0.341	0.356	0.354	0.310
	(0.298)	(0.412)	(0.399)	(0.469)	(0.223)	(0.226)	(0.262)	(0.319)
KA Openness	0.335	0.364*	0.124	0.249	-0.009	-0.064	-0.059	0.090
	(0.219)	(0.204)	(0.327)	(0.338)	(0.140)	(0.122)	(0.179)	(0.228)
|Governance|	-0.992	-0.604	-1.470***	-1.384**	-0.456	-0.368	-0.602*	-0.603
	(0.710)	(0.909)	(0.520)	(0.645)	(0.341)	(0.355)	(0.324)	(0.416)
Financial development	-0.163	-0.276**	-0.091	-0.028	-0.119*	-0.141*	-0.112	-0.108
	(0.098)	(0.114)	(0.103)	(0.171)	(0.064)	(0.080)	(0.076)	(0.086)
|GDP per capita|$^+$	1.176*	1.487*	2.219*	0.593	0.061	0.098	0.813	-0.017
	(0.669)	(0.877)	(1.102)	(0.960)	(0.512)	(0.575)	(0.837)	(0.698)
|GDP per capita|$^-$	-0.776*	-1.016**	-0.549	-0.590	0.445*	0.295	0.532*	0.716*
	(0.391)	(0.440)	(0.360)	(0.594)	(0.244)	(0.229)	(0.271)	(0.364)
Observations	464	265	82	117	519	299	89	131
Countries	43	40	40	39	48	46	43	44
R-squared	0.755	0.759	0.782	0.762	0.497	0.462	0.591	0.542
F-test	55.34	42.74	26.46	35.70	11.81	8.94	12.25	17.47

Notes: the table reports OLS pooled cross-section estimates with robust standard errors clustered by country. In this case, the test for joint significance of coefficients is an F-test.

TABLE 5. EQUITY. Exposure to euro area high-rating versus low-rating economies. Nested model: FGLS and OLS pooled cross-section

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimation method:	Feasible GLS				Pooled cross-section			
Exposure to:	EA high-rating		EA low-rating		EA high-rating		EA low-rating	
Dep. variable:	Total Bias	Country bias	Total Bias	Country bias	Total Bias	Country bias	Total Bias	Country bias
Trade	-0.053	0.261***	0.334***	0.309***	0.041	0.330***	0.387**	0.340**
	(0.054)	(0.050)	(0.051)	(0.048)	(0.152)	(0.092)	(0.178)	(0.128)
Distance	-0.537***	-0.411***	-0.140**	-0.314***	-0.514***	-0.408***	-0.207	-0.232
	(0.043)	(0.051)	(0.061)	(0.084)	(0.078)	(0.090)	(0.323)	(0.220)
Euro dummy	0.412***	-0.001	0.578***	-0.032	0.144	-0.124	0.785	0.682*
	(0.091)	(0.111)	(0.128)	(0.227)	(0.404)	(0.256)	(0.584)	(0.364)
KA Openness	0.433***	0.072	0.705***	0.282***	0.495**	0.174	0.715*	0.246
	(0.072)	(0.062)	(0.110)	(0.083)	(0.228)	(0.165)	(0.396)	(0.239)
|Governance|	-0.185	0.206	1.116***	0.693***	0.010	0.357	1.233	0.776*
	(0.163)	(0.134)	(0.140)	(0.152)	(0.630)	(0.356)	(0.927)	(0.443)
Financial development	-0.051*	-0.033	-0.006	-0.003	-0.241***	-0.140	-0.219	-0.051
	(0.028)	(0.027)	(0.031)	(0.027)	(0.088)	(0.107)	(0.204)	(0.161)
|GDP per capita|$^+$	0.910***	0.510***	0.189	-0.275	0.861	0.327	0.926	0.602
	(0.183)	(0.198)	(0.254)	(0.218)	(0.689)	(0.610)	(1.434)	(0.989)
|GDP per capita|$^-$	-1.065***	0.097	-1.099***	-0.351**	-1.334***	-0.081	-1.195*	-0.017
	(0.120)	(0.111)	(0.202)	(0.174)	(0.493)	(0.313)	(0.611)	(0.441)
Observations	458	508	433	474	458	508	433	474
Countries	43	48	42	47	-	-	-	-
R-squared	-	-	-	-	0.774	0.448	0.637	0.385
Wald χ2 / F-test	980.7	289.0	938.7	332.7	26.16	7.208	18.85	10.48

Notes: Euro Area high-rating indicates the exposure to Austria, Belgium, Finland, France, Germany and Netherlands. Euro area low-rating indicates the exposure to Greece, Italy, Portugal and Spain. See notes to Tables 3, 4 and 4a for further explanations.

TABLE 6. DEBT. Exposure to the euro area (EA12) and foreign bias

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Linear model		Non-linear model		Nested model		Memo
Dep. variable:	Total bias	Country bias	Total bias	Country bias	Total bias	Country bias	Foreign bias
Trade	-0.008	0.191***	-0.003	0.178***	-0.043	0.216***	
	(0.029)	(0.023)	(0.031)	(0.021)	(0.048)	(0.025)	
Distance	-0.467***	-0.338***	-0.483***	-0.345***	-0.537***	-0.337***	
	(0.037)	(0.022)	(0.038)	(0.020)	(0.040)	(0.022)	
Euro dummy	0.685***	0.046	0.768***	0.019	0.760***	-0.005	
	(0.077)	(0.065)	(0.084)	(0.062)	(0.103)	(0.063)	
Euro volatility	-0.074	-0.023	-0.070	-0.029			
	(0.050)	(0.023)	(0.049)	(0.025)			
KA Openness	0.324***	0.042	0.314***	0.024	0.275***	0.056*	0.181***
	(0.055)	(0.032)	(0.056)	(0.030)	(0.058)	(0.030)	(0.042)
Governance	0.517***	0.088*			0.421***	0.077	0.231***
	(0.064)	(0.051)			(0.087)	(0.047)	(0.064)
$|\text{Governance}|^{+}$			0.305**	0.013			
			(0.146)	(0.097)			
$|\text{Governance}|^{-}$			-0.600***	-0.136**			
			(0.130)	(0.061)			
Financial development	-0.061**	0.003			-0.062***	-0.006	-0.030**
	(0.025)	(0.013)			(0.024)	(0.012)	(0.012)
$|\text{Financial Dev.}|^{+}$			-0.071**	-0.016			
			(0.033)	(0.016)			
$|\text{Financial Dev.}|^{-}$			0.074	-0.065**			
			(0.048)	(0.028)			
GDP per capita	0.159*	-0.086					0.341***
	(0.088)	(0.059)					(0.068)
$|\text{GDP per capita}|^{+}$			0.968***	-0.356***	0.853***	-0.142	
			(0.270)	(0.131)	(0.258)	(0.151)	
$|\text{GDP per capita}|^{-}$			-0.096	0.088	-0.212*	0.051	
			(0.103)	(0.061)	(0.109)	(0.064)	
Observations	421	520	421	520	421	529	421
Countries	39	46	39	46	39	47	39
Testing restrictions (Wald χ2)							
$|\text{Gov}|^{+} = |\text{Gov}|^{-}$	.	.	32.21	2.87	.	.	.
$|\text{Gov}|^{+} = -|\text{Gov}|^{-}$	.	.	1.71	0.80	.	.	.
$|\text{Fin. Dev.}|^{+} = |\text{Fin. Dev.}|^{-}$	.	.	6.84	2.45	.	.	.
$|\text{Fin. Dev.}|^{+} = -|\text{Fin. Dev}|^{-}$	.	.	0.00	5.72	.	.	.
$|\text{GDP pc}|^{+} = |\text{GDP pc}|^{-}$	.	.	14.33	11.14	.	.	.
$|\text{GDP pc}|^{+} = -|\text{GDP pc}|^{-}$	.	.	8.70	3.01	.	.	.
Joint significance	2088	991.6	2323	1171	1802	1086	227.9

Notes: the table reports in columns (1) and (2) the coefficients associated with the estimation of equation (4) in the main text and in columns (3) and (4) of equation (5). As indicated at the top of the table, the dependent variable is either the Total Bias or the Country Bias towards the euro area (EA12) The last column reports the model with the Foreign Bias as dependent variable excluding gravity regressors. See section 3 in the main text for the definition and construction of these dependent variables. The regressions are estimated through Feasible GLS allowing for panel specific autocorrelation structure of the error term, heteroskedasticity across panels and pooled coefficients for the constant and slope. The model includes time dummies (not reported). The asterisks ***, ** and * indicate statistical significance at the 1, 5 or 10 percentage level, respectively. The lower panel of the table reports Wald $\chi^2(1)$ statistic testing one linear combination of the coefficients. With one degree of freedom, the null hypothesis cannot be rejected when the statistic is lower than 2.71 (10% level), 3.84 (5% level) or 6.64 (1% level). The last row reports the χ^2 statistic for the joint test of significance of all coefficients in the model.

TABLE 7. DEBT. Exposure to the euro area (EA12). Nested model: robustness across time

Dep. variable:	(1) Total Bias	(2)	(3)	(4)	(5) Country Bias	(6)	(7)	(8)
Sample period:	2001-12	2001-07	2008-09	2010-12	2001-12	2001-07	2008-09	2010-12
Trade	-0.043	-0.070**	-0.043**	-0.095	0.216***	0.232***	0.306***	0.050*
	(0.048)	(0.030)	(0.017)	(0.064)	(0.025)	(0.030)	(0.009)	(0.027)
Distance	-0.537***	-0.490***	-0.426***	-0.296***	-0.337***	-0.312***	-0.273***	-0.391***
	(0.040)	(0.039)	(0.010)	(0.050)	(0.022)	(0.026)	(0.008)	(0.025)
Euro dummy	0.760***	0.757***	0.780***	1.110***	-0.005	-0.014	-0.158***	0.061
	(0.103)	(0.106)	(0.028)	(0.125)	(0.063)	(0.084)	(0.023)	(0.064)
KA Openness	0.275***	0.512***	0.449***	0.703***	0.056*	0.030	-0.068***	0.033
	(0.058)	(0.058)	(0.014)	(0.068)	(0.030)	(0.036)	(0.005)	(0.039)
Governance	0.421***	0.434***	0.785***	0.767***	0.077	0.014	0.316***	0.308***
	(0.087)	(0.078)	(0.033)	(0.113)	(0.047)	(0.066)	(0.019)	(0.070)
Financial development	-0.062***	-0.109***	0.023***	0.147***	-0.006	-0.020	-0.096***	-0.013
	(0.024)	(0.033)	(0.006)	(0.036)	(0.012)	(0.019)	(0.003)	(0.008)
$\lvert$GDP per capita$\rvert^{+}$	0.853***	0.608*	-0.342**	1.588***	-0.142	-0.125	-0.539***	-0.424***
	(0.258)	(0.353)	(0.165)	(0.292)	(0.151)	(0.195)	(0.094)	(0.146)
$\lvert$GDP per capita$\rvert^{-}$	-0.212*	-0.130	0.052***	0.658***	0.051	0.037	0.012	-0.020
	(0.109)	(0.085)	(0.018)	(0.135)	(0.064)	(0.079)	(0.011)	(0.091)
Observations	421	240	72	107	529	312	84	130
Countries	39	38	36	36	47	47	42	44
Wald χ2	1802	2698	407191	1921	1086	573.0	40245	3294

Notes: the model is estimated through FGLS, similarly to Table 6, imposing the restrictions on the coefficients for Governance and Financial Development.

TABLE 7a. DEBT. Exposure to the euro area (EA12). Nested model: OLS pooled cross-section

Dep. variable:	(1) Total Bias	(2)	(3)	(4)	(5) Country Bias	(6)	(7)	(8)
Sample period:	2001-12	2001-07	2008-09	2010-12	2001-12	2001-07	2008-09	2010-12
Trade	-0.109	-0.129	-0.048	-0.000	0.215***	0.253***	0.294***	0.110
	(0.138)	(0.151)	(0.177)	(0.141)	(0.061)	(0.081)	(0.076)	(0.100)
Distance	-0.437***	-0.481***	-0.447***	-0.275*	-0.332***	-0.328***	-0.304***	-0.342***
	(0.128)	(0.137)	(0.141)	(0.160)	(0.059)	(0.057)	(0.083)	(0.113)
Euro dummy	0.947**	0.894*	0.779*	1.362***	0.018	0.028	-0.212	0.064
	(0.415)	(0.477)	(0.395)	(0.464)	(0.165)	(0.201)	(0.217)	(0.224)
KA Openness	0.476***	0.483**	0.430*	0.729***	0.000	-0.001	-0.071	0.051
	(0.174)	(0.197)	(0.247)	(0.261)	(0.068)	(0.074)	(0.122)	(0.163)
Governance	0.650	0.551	0.785	0.844	0.185	0.091	0.332	0.288
	(0.452)	(0.405)	(0.604)	(0.695)	(0.158)	(0.173)	(0.224)	(0.264)
Financial development	0.040	0.014	0.038	0.105	-0.015	-0.004	-0.094	-0.009
	(0.109)	(0.139)	(0.117)	(0.125)	(0.061)	(0.073)	(0.073)	(0.095)
$\lvert$GDP per capita$\rvert^{+}$	0.768	0.671	-0.345	1.858**	-0.211	-0.150	-0.738	-0.198
	(0.962)	(1.173)	(1.541)	(0.858)	(0.461)	(0.547)	(0.624)	(0.831)
$\lvert$GDP per capita$\rvert^{-}$	0.046	-0.084	0.078	0.889	0.114	0.128	0.011	0.088
	(0.344)	(0.300)	(0.512)	(0.730)	(0.147)	(0.171)	(0.185)	(0.327)
Observations	421	240	74	107	529	312	87	130
Countries	39	38	36	36	47	47	42	44
R-squared	0.775	0.776	0.794	0.786	0.613	0.623	0.705	0.588
F-test	50.11	77.48	25.89	39.40	29.77	15.86	38.27	13.23

Notes: the table reports OLS pooled cross-section estimates with robust standard errors clustered by country. In this case, the test for joint significance of coefficients is an F-test.

TABLE 8. DEBT. Exposure to euro area <u>high-rating</u> versus <u>low-rating economies</u>. Nested model: FGLS and OLS pooled cross-section

Estimation method:	(1) Feasible GLS	(2)	(3)	(4)	(5) Pooled cross-section	(6)	(7)	(8)
Exposure to:	EA high-rating		EA low-rating		EA high-rating		EA low-rating	
Dep. variable:	Total Bias	Country bias	Total Bias	Country bias	Total Bias	Country bias	Total Bias	Country bias
Trade	-0.170**	0.125***	-0.041	0.242***	-0.214	0.095	-0.078	0.252*
	(0.067)	(0.021)	(0.065)	(0.036)	(0.147)	(0.071)	(0.224)	(0.126)
Distance	-0.509***	-0.335***	-0.205***	-0.310***	-0.444***	-0.338***	-0.274	-0.310*
	(0.049)	(0.020)	(0.069)	(0.091)	(0.134)	(0.069)	(0.196)	(0.164)
Euro dummy	0.890***	0.035	2.243***	1.462***	1.216***	0.228	2.439***	1.352***
	(0.117)	(0.071)	(0.188)	(0.197)	(0.374)	(0.171)	(0.562)	(0.361)
KA Openness	0.377***	0.111***	0.837***	0.226**	0.508***	0.019	0.690**	0.217
	(0.067)	(0.036)	(0.105)	(0.090)	(0.171)	(0.088)	(0.285)	(0.138)
Governance	0.452***	0.291***	0.754***	0.536***	0.856*	0.307	1.113**	0.804**
	(0.142)	(0.056)	(0.141)	(0.152)	(0.439)	(0.185)	(0.430)	(0.388)
Financial development	-0.079***	-0.026	-0.100**	-0.022	0.079	0.026	-0.100	-0.113
	(0.029)	(0.018)	(0.040)	(0.035)	(0.115)	(0.077)	(0.113)	(0.107)
$|GDP\ per\ capita|^+$	1.355***	0.073	0.468	0.125	1.454	0.254	0.684	0.163
	(0.286)	(0.149)	(0.296)	(0.297)	(0.995)	(0.407)	(0.993)	(1.079)
$|GDP\ per\ capita|^-$	-0.217	0.143**	-0.341**	0.171	0.222	0.203	-0.086	0.419
	(0.134)	(0.070)	(0.161)	(0.149)	(0.329)	(0.167)	(0.445)	(0.259)
Observations	420	527	408	505	420	527	408	505
Countries	39	47	39	47	39	47	39	47
R-squared	-	-	-	-	0.765	0.517	0.776	0.546
Wald χ2 / F-test	1174	939.3	1518	936.2	44.86	23.63	72.96	22.90

Notes: Euro Area <u>high-rating</u> indicates the exposure to Austria, Belgium, Finland, France, Germany and Netherlands. Euro area <u>low-rating</u> indicates the exposure to Greece, Italy, Portugal and Spain. See notes to Tables 6, 7 and 7a for further explanations.

TABLE 9. EQUITY. Exposure to the euro area. Dissecting intra-euro area exposure and the role of large extra-EU investors. Nested model: FGLS

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. variable:		Total Bias vs. EA12				Country Bias vs. EA12		
Sample period:	2001-12	2001-07	2008-09	2010-12	2001-12	2001-07	2008-09	2010-12
Euro dummy	0.687***	0.388***	0.613***	0.384***	0.265***	0.543***	0.372***	0.144*
	(0.118)	(0.130)	(0.025)	(0.102)	(0.074)	(0.072)	(0.029)	(0.075)
EA high-rating dummy	0.604***	0.310**	0.563***	0.367**	0.436***	0.579***	0.462***	0.039
	(0.128)	(0.135)	(0.025)	(0.172)	(0.073)	(0.076)	(0.041)	(0.077)
EA low-rating dummy	0.807***	0.506***	0.924***	0.791***	0.888***	0.774***	0.813***	0.601***
	(0.159)	(0.154)	(0.017)	(0.230)	(0.133)	(0.071)	(0.044)	(0.143)
Large investors dummy	0.649***	0.099	0.568***	0.156	0.257***	0.186**	0.494***	-0.177*
	(0.140)	(0.181)	(0.065)	(0.145)	(0.094)	(0.083)	(0.045)	(0.101)
Observations	464	264	80	116	519	297	86	130
Countries	43	40	40	39	48	46	43	44

Panel B	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Dep. variable:		Total Bias vs. EA high-rating				Country Bias vs. EA high-rating		
Sample period:	2001-12	2001-07	2008-09	2010-12	2001-12	2001-07	2008-09	2010-12
Euro dummy	0.412***	0.627***	0.056**	0.164*	-0.001	0.224**	-0.234***	-0.045
	(0.091)	(0.185)	(0.026)	(0.097)	(0.111)	(0.091)	(0.070)	(0.065)
EA high-rating dummy	0.224	0.771***	-0.086	-0.349**	-0.130	0.087	-0.426***	-0.432***
	(0.139)	(0.258)	(0.054)	(0.146)	(0.127)	(0.112)	(0.062)	(0.096)
EA low-rating dummy	0.543***	0.967***	0.527***	0.467**	0.463*	0.905***	-0.082	0.190
	(0.196)	(0.267)	(0.052)	(0.190)	(0.237)	(0.184)	(0.149)	(0.174)
Large investors dummy	0.854***	0.702***	0.855***	0.930***	0.679***	0.781***	1.249***	1.331***
	(0.168)	(0.198)	(0.054)	(0.252)	(0.165)	(0.157)	(0.142)	(0.182)
Observations	458	262	78	113	508	291	82	127
Countries	43	40	39	38	48	46	41	43

Panel C	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Dep. variable:		Total Bias vs. EA low-rating				Country Bias vs. EA low-rating		
Sample period:	2001-12	2001-07	2008-09	2010-12	2001-12	2001-07	2008-09	2010-12
Euro dummy	0.578***	1.009***	0.116	1.316***	-0.032	0.256*	0.012	0.591***
	(0.128)	(0.187)	(0.103)	(0.230)	(0.227)	(0.148)	(0.061)	(0.142)
EA high-rating dummy	0.319***	0.683***	-0.357***	1.118***	-0.079	0.332**	-1.050***	-0.132
	(0.114)	(0.199)	(0.123)	(0.329)	(0.082)	(0.131)	(0.050)	(0.128)
EA low-rating dummy	0.405	1.592***	0.636***	2.427***	-0.034	1.977***	0.044	1.004
	(0.275)	(0.394)	(0.156)	(0.368)	(0.833)	(0.576)	(0.245)	(0.731)
Large investors dummy	-0.181	-0.300	-0.615***	-0.533	-0.061	-0.020	-0.439***	-0.481*
	(0.177)	(0.221)	(0.055)	(0.435)	(0.186)	(0.188)	(0.081)	(0.265)
Observations	433	241	76	112	474	261	80	126
Countries	42	37	38	38	47	41	40	43

Notes: the table reports only the coefficients associated with the dummy for two different models. The first model is the benchmark nested model in Table 4 for the exposure to euro area equity (panel A) and Table 5 for the exposure to the equity of euro area high-rating (panel B) and low-rating (panel C) economies, using a dummy for euro area investors which is shown in the first row of each panel. In the second model, we replace the euro dummy with two dummies: one for euro area high-rating economies and one for euro area low-rating economies, as defined in the rest of the paper. In addition, we include a dummy for the 8 largest holders of portfolio securities, outside the EU, in the CPIS dataset namely: the United States, Canada, Australia, Norway, Switzerland, Japan, Honk Kong and Singapore. The model is estimated through FGLS. The asterisks ***, ** and * indicate statistical significance at the 1, 5 or 10 percentage level, respectively.

TABLE 10. DEBT. Exposure to the euro area. Dissecting intra-euro area exposure and the role of large extra-EU investors. Nested model: FGLS

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. variable:		Total Bias vs. EA12				Country Bias vs. EA12		
Sample period:	2001-12	2001-07	2008-09	2010-12	2001-12	2001-07	2008-09	2010-12
Euro dummy	0.760***	0.757***	0.780***	1.110***	-0.005	-0.014	-0.158***	0.061
	(0.103)	(0.106)	(0.028)	(0.125)	(0.063)	(0.084)	(0.023)	(0.064)
EA high-rating dummy	1.059***	0.788***	0.552***	1.789***	0.116	0.136	-0.118***	0.132
	(0.205)	(0.168)	(0.140)	(0.149)	(0.079)	(0.122)	(0.039)	(0.119)
EA low-rating dummy	0.882***	0.783***	0.987***	1.381***	0.101	0.230*	0.007	0.492***
	(0.173)	(0.197)	(0.038)	(0.151)	(0.087)	(0.128)	(0.033)	(0.119)
Large investors dummy	1.075***	0.770***	1.279***	1.797***	0.377***	0.376***	0.350***	0.678***
	(0.183)	(0.219)	(0.065)	(0.221)	(0.102)	(0.145)	(0.053)	(0.167)
Observations	421	240	72	107	529	312	84	130
Countries	39	38	36	36	47	47	42	44

Panel B	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Dep. variable:		Total Bias vs. EA high-rating				Country Bias vs. EA high-rating		
Sample period:	2001-12	2001-07	2008-09	2010-12	2001-12	2001-07	2008-09	2010-12
Euro dummy	0.890***	0.916***	1.024***	1.281***	0.035	0.207**	0.040	-0.009
	(0.117)	(0.097)	(0.020)	(0.115)	(0.071)	(0.096)	(0.040)	(0.053)
EA high-rating dummy	0.597***	0.914***	0.560***	0.705***	0.120	-0.011	-0.161***	-0.167**
	(0.178)	(0.121)	(0.100)	(0.136)	(0.085)	(0.108)	(0.048)	(0.082)
EA low-rating dummy	1.533***	1.762***	1.684***	1.624***	0.655***	0.462***	0.519***	0.852***
	(0.227)	(0.133)	(0.027)	(0.163)	(0.082)	(0.101)	(0.053)	(0.075)
Large investors dummy	0.862***	0.952***	1.210***	1.471***	0.255***	0.206*	0.445***	0.666***
	(0.186)	(0.208)	(0.037)	(0.164)	(0.085)	(0.110)	(0.053)	(0.072)
Observations	420	239	72	107	527	310	84	130
Countries	39	38	36	36	47	47	42	44

Panel C	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Dep. variable:		Total Bias vs. EA low-rating				Country Bias vs. EA low-rating		
Sample period:	2001-12	2001-07	2008-09	2010-12	2001-12	2001-07	2008-09	2010-12
Euro dummy	2.243***	2.243***	2.593***	2.433***	1.462***	1.684***	1.299***	1.250***
	(0.188)	(0.159)	(0.059)	(0.211)	(0.197)	(0.198)	(0.134)	(0.107)
EA high-rating dummy	2.109***	1.879***	1.934***	2.224***	1.008***	1.446***	0.977***	0.639***
	(0.283)	(0.237)	(0.153)	(0.216)	(0.198)	(0.218)	(0.084)	(0.188)
EA low-rating dummy	1.255***	1.228***	2.731***	2.146***	0.547	1.316***	1.851***	1.121***
	(0.475)	(0.431)	(0.217)	(0.285)	(0.361)	(0.416)	(0.180)	(0.337)
Large investors dummy	0.300	-0.201	-0.609***	-1.165***	-0.327	-0.122	-0.447***	-1.364***
	(0.349)	(0.247)	(0.155)	(0.355)	(0.284)	(0.199)	(0.141)	(0.455)
Observations	408	232	68	103	505	295	80	123
Countries	39	38	34	35	47	47	40	42

Notes: the table reports only the coefficients associated with the dummy for two different models. The first model is the benchmark nested model in Table 7 for the exposure to euro area equity (panel A) and Table 8 for the exposure to the equity of euro area high-rating (panel B) and low-rating (panel C) economies, using a dummy for euro area investors which is shown in the first row of each panel. In the second model, we replace the euro dummy with two dummies: one for euro area high-rating economies and one for euro area low-rating economies, as defined in the rest of the paper. In addition, we include a dummy for the 8 largest holders of portfolio securities, outside the EU, in the CPIS dataset namely: the United States, Canada, Australia, Norway, Switzerland, Japan, Honk Kong and Singapore. The model is estimated through FGLS. The asterisks ***, ** and * indicate statistical significance at the 1, 5 or 10 percentage level, respectively.
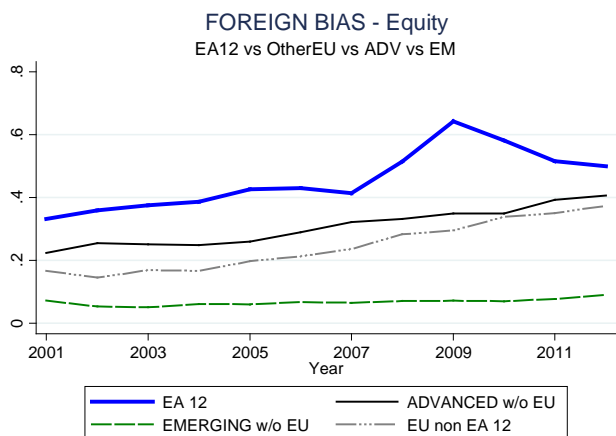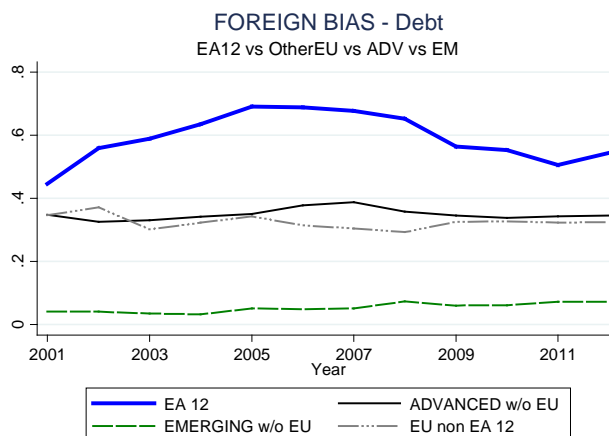
Figure 1. Equity - Foreign Bias

FOREIGN BIAS - Equity
EA12 vs OtherEU vs ADV vs EM

Figure 2. Debt – Foreign Bias

FOREIGN BIAS - Debt
EA12 vs OtherEU vs ADV vs EM

Figure 3. Equity - Total Bias towards the euro area

EA12 TOTAL BIAS - Equity
EA12 vs OtherEU vs ADV vs EM
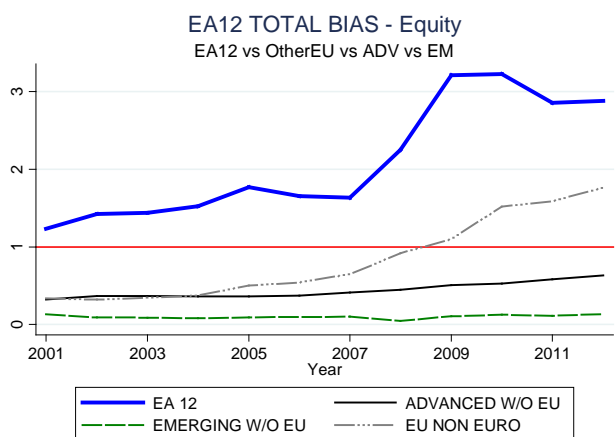
Figure 4. Equity - Country Bias towards the euro area in foreign portfolios

EA12 BIAS - Equity
EA12 vs OtherEU vs ADV vs EM
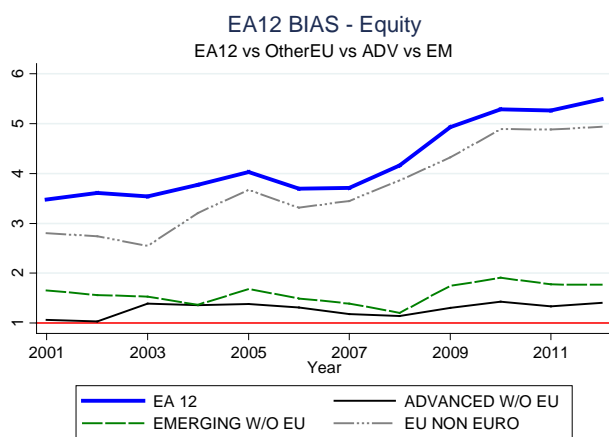
Figure 5. Debt - Total Bias towards the euro area

EA12 TOTAL BIAS - Debt
EA12 vs OtherEU vs ADV vs EM
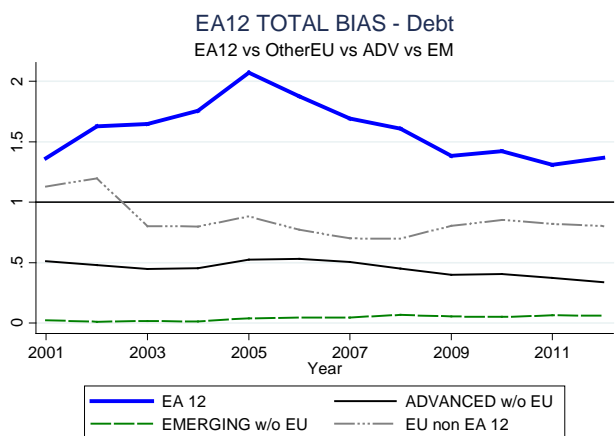
Figure 6. Debt - Country Bias towards the euro area in foreign portfolios

EA12 BIAS - Debt
EA12 vs OtherEU vs ADV vs EM
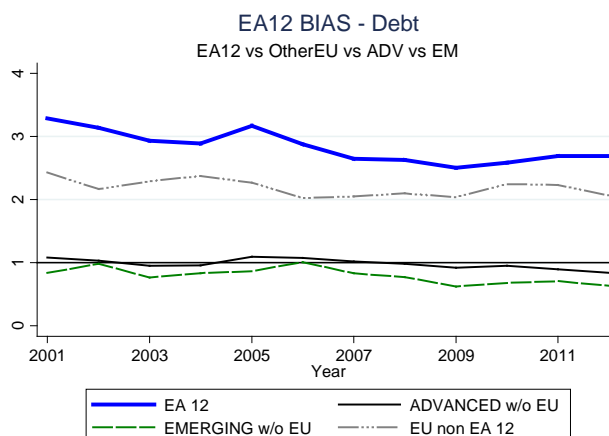
Notes: See section 3 in the main text for the definition and construction of the Foreign Bias, Total Bias, and Country Bias. Figures 1 to 6 show the average of these variables across four different groups: EA12, other EU economies, advanced economies and emerging markets outside the EU. See Table A.2 for a detailed list of the countries included in these groups.

Table A.1 Data.

Variable	Definition(s)	Notes	Source	Series
Dependent Variables				
Cross-border investment positions		Values aggregated for the EA countries taken as destination	IMF CPIS Database	Bilateral investments Total foreign portfolio
Foreign Assets/Liabilities			IMF Balance of Payment Statistics	BPM5 and BPM6
Equity Market Capitalisation		Values aggregated for the EA countries taken as destination	World Bank WDI	Market capitalization of listed companies (current US$)
Debt Market Capitalisation		Values aggregated for the EA countries taken as destination	BIS Debt Securities Statistics	Tables 18, 11A and 16A
Independent Variables				
Bilateral Trade	Sum Bilateral Imports and Exports	Values aggregated for the EA countries taken as destination	IMF Direction of Trade Statistics	Bilateral Exports Bilateral Imports
Bilateral Distance	Simple distance (in miles) between capital cities	Distance with the closest EA country's capital city taken as destination	CEPII GeoDist Database	distcap
Euro exchange rate volatility	Volatility of the nominal exchange rate of investor country i against the euro	Standard deviation of the weekly returns for each calendar year	Datastream	WM/Reuters spot rates
Governance	1. Government Effectiveness − quality of public services, the quality and the degree of its independence from political pressures 2. Regulatory Quality − ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development 3. Rule of Law − extent to which agents have confidence in and abide by the rules of society 4. Control of Corruption − extent to which public power is exercised for private gain	Simple mean of the four components. GDP-weighted average of the observations for the EA countries taken as destination	World Bank WGI	3. Government Effectiveness (GE) 4. Regulatory Quality (RQ) 5. Rule of Law (RL) 6. Control of Corruption (CC)
Financial Development	1. Stocks traded - total value of shares traded during the period (% GDP) 2. Turnover ratio - total value of shares traded during the period divided by the average market capitalization for the period 3. Domestic credit to private sector - financial resources provided to the private sector by financial corporations	First standardized principal component of the three terms GDP-weighted average of the observations for the EA countries taken as destination	World Bank WDI	Stocks traded, total value (% of GDP) Stocks traded, turnover ratio (%) Domestic credit to private sector (%
Capital Openess	Index measuring a country's degree of capital account openess	GDP-weighted average of the observations for the EA countries taken as destination	Chinn-Ito Financial Openess Index	KAOPEN
GDP per Capita	GDP per Capita in $ per person	GDP-weighted average of the observations for the EA countries taken as destination	IMF WEO	GDP per capita (current US$)

Table A.2 Country groups

EA 12	EA High Rating	EA Low Rating	Other EU not EA12	Advanced	Emerging	SEIFiC	Excluded
Austria	Austria	Greece	Bulgaria	Australia	Bahrain, Kingdom of	Aruba	Argentina
Belgium	Belgium	Italy	Cyprus	Canada	Brazil	Bahamas, The	Aruba
Finland	Finland	Portugal	Czech Republic	Hong Kong	Chile	Barbados	Bolivia
France	France	Spain	Denmark	Iceland	Colombia	Bermuda	Curacao & St. Maarten
Germany	Germany		Estonia	Israel	Costa Rica	Cayman Islands	Kosovo
Greece	Netherlands		Hungary	Japan	Egypt	China, P.R.: Macao	Lithuania
Ireland			Latvia	Korea, Rep.	India	Cyprus	Mongolia
Italy			Malta	Norway	Indonesia	Gibraltar	Netherlands Antilles
Luxembourg			Poland	Singapore	Kazakhstan	Guernsey	New Zealand
Netherlands			Romania	Switzerland	Kuwait	Iceland	Pakistan
Portugal			Slovak Republic	United States	Malaysia	Isle of Man	Slovenia
Spain			Sweden		Mexico	Jersey	Ukraine
			United Kingdom		Philippines	Lebanon	Vanuatu
					Russian Federation	Malta	Venezuela, Rep.
					South Africa	Mauritius	
					Thailand	Netherlands Antilles	
					Turkey	Panama	
					Uruguay	Vanuatu	

Notes: SEIFiC indicates Small Economies with International Financial Centres

Table A.3 Total and Country bias towards the euro area (EA12), the euro area high-rating economies and low rating economies

EQUITY

		EA12 - Total Bias					EA12 - Country Bias				
		EA12	Other EU	Advanced excl. EU	EM excl. EU	All	EA12	Other EU	Advanced excl. EU	EM excl. EU	All
Level:	2012	2.9	1.8	0.9	0.1	1.3	5.5	4.7	1.7	1.6	2.9
Change:	2001-2007	*0.4*	*0.3*	*0.1*	*0.0*	*0.2*	*0.2*	*0.6*	*0.2*	*-0.2*	*0.0*
	2008-2012	*0.6*	*0.9*	*0.3*	*-0.1*	*0.4*	*1.3*	*1.0*	*0.4*	*0.4*	*0.7*

		EA High Rating - Total Bias					EA High Rating - Country Bias				
		EA12	Other EU	Advanced excl. EU	EM excl. EU	All	EA12	Other EU	Advanced excl. EU	EM excl. EU	All
Level:	2012	1.0	0.8	0.4	0.0	0.5	2.1	2.4	0.9	0.5	1.2
Change:	2001-2007	*-0.1*	*0.2*	*0.1*	*0.0*	*0.0*	*-0.5*	*0.6*	*0.2*	*-0.4*	*-0.2*
	2008-2012	*0.1*	*0.2*	*0.0*	*-0.1*	*0.1*	*0.2*	*-0.1*	*0.0*	*-0.1*	*0.0*

		EA Low Rating - Total Bias					EA Low Rating - Country Bias				
		EA12	Other EU	Advanced excl. EU	EM excl. EU	All	EA12	Other EU	Advanced excl. EU	EM excl. EU	All
Level:	2012	0.7	0.1	0.2	0.0	0.2	1.7	0.2	0.4	0.7	0.7
Change:	2001-2007	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*-0.2*	*-0.6*	*-0.1*	*-0.6*	*-0.5*
	2008-2012	*-0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*-0.3*	*0.0*	*0.6*	*0.2*

DEBT

		EA12 - Total Bias					EA12 - Country Bias				
		EA12	Other EU	Advanced excl. EU	EM excl. EU	All	EA12	Other EU	Advanced excl. EU	EM excl. EU	All
Level:	2012	1.4	0.9	0.3	0.1	0.7	2.7	2.0	0.9	0.6	1.4
Change:	2001-2007	*0.3*	*-0.4*	*0.0*	*0.0*	*0.0*	*-0.6*	*-0.4*	*0.0*	*-0.1*	*-0.3*
	2008-2012	*-0.2*	*0.1*	*-0.1*	*0.0*	*-0.1*	*0.1*	*0.0*	*-0.2*	*-0.1*	*-0.1*

		EA High Rating - Total Bias					EA High Rating - Country Bias				
		EA12	Other EU	Advanced excl. EU	EM excl. EU	All	EA12	Other EU	Advanced excl. EU	EM excl. EU	All
Level:	2012	1.5	0.9	0.4	0.1	0.7	2.7	2.2	1.2	0.5	1.5
Change:	2001-2007	*0.3*	*-0.5*	*0.0*	*0.0*	*-0.1*	*-0.6*	*-0.3*	*0.1*	*0.0*	*-0.2*
	2008-2012	*0.0*	*0.0*	*-0.1*	*0.0*	*0.0*	*0.3*	*-0.1*	*-0.2*	*-0.2*	*0.0*

		EA Low Rating - Total Bias					EA Low Rating - Country Bias				
		EA12	Other EU	Advanced excl. EU	EM excl. EU	All	EA12	Other EU	Advanced excl. EU	EM excl. EU	All
Level:	2012	0.9	0.7	0.1	0.0	0.4	2.1	1.1	0.2	0.2	0.8
Change:	2001-2007	*0.1*	*0.0*	*0.0*	*0.0*	*-0.1*	*-0.9*	*-0.4*	*-0.2*	*-0.1*	*-0.5*
	2008-2012	*-0.6*	*0.2*	*-0.1*	*0.0*	*-0.1*	*-0.3*	*0.2*	*-0.2*	*0.0*	*0.0*

Notes: See section 3 in the main text for the definition and construction of the Total Bias, and the Country Bias. Euro Area high-rating indicates the exposure to Austria, Belgium, Finland, France, Germany and Netherlands. Euro area low-rating indicates the exposure to Greece, Italy, Portugal and Spain.

Vincent Arthur Floreani
The World Bank, 1818 H Street, NW, Washington, DC 20433, USA
vfloreani@worldbank.org

Maurizio Michael Habib
European Central Bank, Sonnemannstraße 20 60314 Frankfurt am Main, Germany
maurizio.habib@ecb.int